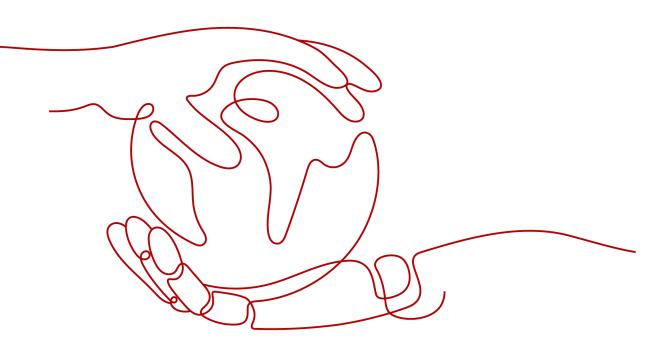
**SAP Best Practices** 

## **SAP Best Practices**

 Issue
 01

 Date
 2024-03-12





HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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# SAP Best Practices

This document summarizes operation practices in common SAP application scenarios. Each practice provides detailed solution description and operation guide, helping you easily use SAP services.

Table 1-1 SAP best practices

Best Practice	Description
HUAWEI CLOUD SAP on DB2 Installation Best Practice	This section provides guidance for preparing resources (such as cloud servers and network resources) on the HUAWEI CLOUD platform and installing SAP on DB2.
HUAWEI CLOUD SAP on SQL Server Installation Best Practice	This section provides guidance for preparing resources (such as cloud servers and network resources) on the public cloud platform and installing SAP on SQL Server.
SAP S/4HANA (1809) HA Deployment Best Practice	This section provides instructions to prepare resources (such as ECSs and network resources) on the public cloud platform, and install SAP S/ 4HANA (1809) in high availability (HA) mode.
HUAWEI CLOUD SAP Business One on HANA Installation Best Practice	This section provides guidance for preparing resources (such as cloud servers and network resources) on the public cloud platform and installing SAP Business One on HANA.
SAP Monitoring Best Practices	This section describes how to deploy the SAP large-screen monitoring on the public cloud platform to monitor the SAP system and learn about the resource usage, alarms, and SAP system running status in real time.
Best Practices of SAP Migration to HUAWEI CLOUD	This section describes how to migrate the SAP system to HUAWEI CLOUD. HUAWEI CLOUD provides an improved solution to help you migrate with higher efficiency and lower costs.

Best Practice	Description
Best Practice of Using Block-Level Migration of SMS to Migrate SAP Applications and Databases Running on Linux Servers	This section describes how to use block-level migration of SMS to migrate SAP applications and databases running on Linux servers, helping you improve efficiency and reduce costs.
Best Practice of SAP Migration from Xen to KVM	This section describes how to migrate the SAP system from the Xen platform of HUAWEI CLOUD to the KVM platform to meet service development and capacity expansion requirements.
Best Practice of SAP Disaster Recovery with SDRS	This section describes how to use SDRS to implement the SAP disaster recovery on the public cloud platform.
Best Practice of Rsync- based SAP Disaster Recovery	This section describes how to Rsync to implement SAP disaster recovery on the public cloud platform.
SAP Backint Installation Guide	This section describes how to install Backint Agent to back up the data in the SAP HANA database to the OBS bucket, restore the data using backups, and delete backups.
Best Practices for Uploading SAP Backups to the OBS Bucket	This section describes how to use scripts to call obsutil to back up local files to the OBS bucket and store copies locally within a certain period of time.
Best Practices of the SAP ASE Solution	This section describes the HUAWEI CLOUD SAP on ASE solution, including information about resource selection, system backup, high availability (HA), disaster recovery (DR), and offline system migration. HUAWEI CLOUD provides various cloud services to ensure stable and secure running of the SAP Adaptive Server Enterprise (ASE) system.
Best Practices of SAP System Capacity Expansion	This section describes how to expand ECSs and EVS disk capacity in the SAP systems.

## **2** Huawei Cloud SAP on DB2 Installation Best Practice

About This Document Preparations Resource Planning Preparing for SAP Installation Installing SAP Software and DB2 Verifying the Installation Change History

## 2.1 About This Document

This document provides guidance for preparing resources (such as cloud servers and network resources) on the HUAWEI CLOUD platform and installing SAP on DB2. SAP is authorized in Bring Your Own License (BYOL) mode. You need to log in at SAP Support Portal to purchase licenses.

This document cannot replace the standard SAP document. If you have any trouble in installing and using SAP due to its own problems, contact the SAP technical support.

This document is written based on the OS SUSE Linux Enterprise Server and applies to the standalone installation and deployment of SAP on DB2. The deployment modes mentioned in the document are only for reference. Install it by referring to the standard SAP installation manual or based on site requirements.

For details about the official SAP installation guide and related notes, see the following documents:

- SAP Installation Guides
- SAP Notes
- SAP Library

## 2.2 Preparations

#### Logging in to Huawei Cloud

Before deploying the SAP system on Huawei Cloud, register a HUAWEI ID and enable Huawei Cloud services. Through this account, you can use Huawei Cloud services and pay only for the services you use.

For details, see Registering a HUAWEI ID and Enabling Huawei Cloud Services.

You can log in to Huawei Cloud using any of the methods described in **Logging In to Huawei Cloud**.

#### SAP License

SAP is authorized in Bring Your Own License (BYOL) mode. In this mode, you need to log in to the SAP Support Portal and apply for a license.

#### NAT Server

Prepare a Network Address Translation (NAT) server on which SAP GUI for accessing SAPinst installation page and SAP application is installed.

## 2.3 Resource Planning

## 2.3.1 Network Planning

The network information needs to be planned based on application scenarios and SAP planning. The following table lists the network segments and IP addresses required for installing standard standalone SAP on DB2. You can configure it based on site requirements.

Parameter	Description	Example
IP address of the server/client plane	Specifies the IP address of the primary NIC plane. The ABAP SAP Central Services (ASCS) nodes communicate with the SAP GUI and SAP databases using this IP address.	ASCS/Primary Application Server (PAS) node: 10.10.1.93 DB2 node: 10.10.1.93

## 2.3.2 Security Group Planning

#### SAP Security Group Planning

The security group planning needs to meet the requirements for communication between SAP nodes over the management plane and internal communication

plane. You need to configure the security group together with the network department. For details about SAP's requirements for security group rules, see **TCP/IP ports used by SAP applications**.

You can configure the security group by referring to **Table 1 SAP node security** group rules.

#### **NOTE**

- Plan the network segments and IP addresses based on the site requirements. The following security group rules are for reference only. You can configure your own security group rules as needed.
- In the following table, ## stands for the SAP instance number, which must be consistent with the instance number specified when the SAP software is installed. If there are multiple instance numbers, enter them in sequence.

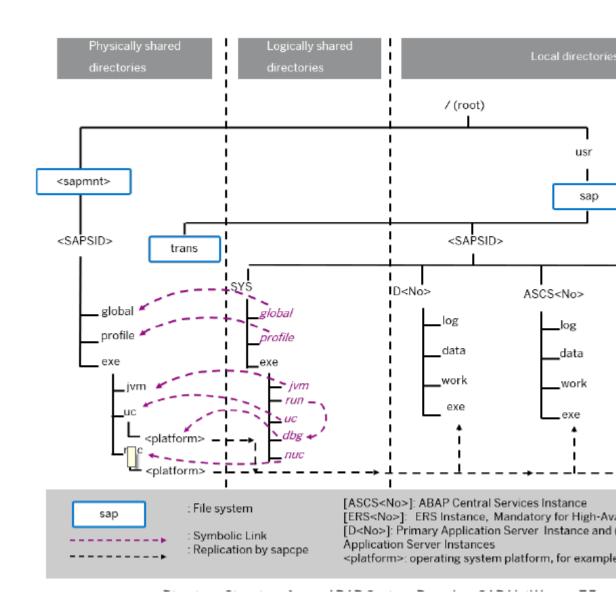
Source/ Destination	Protocol	Port Range	Description		
Inbound	Inbound				
Automatically specified by the system	All	All	Security group rule created by the system by default It enables ECSs in the same security group to communicate with each other.		
10.10.1.0/24	ТСР	32##	Allows SAP GUI to access SAP.		
10.10.1.0/24	ТСР	36##	Message port with profile parameter rdisp/msserv		
10.10.1.0/24	ТСР	5##13 ~ 5##14	Allows ASCS to access SAP application server.		
10.10.1.0/24	ТСР	33##, 38##, 48##	Port used by CPIC and RFC		
10.10.1.0/24	ТСР	22	Allows SAP to be accessed using SSH.		
10.10.1.0/24	ТСР	123	Allows other servers to synchronize time with SAP.		
Outbound	Outbound				
All	All	All	Security group rule created by the system by default Allows SAP to access all peers.		

#### Table 2-1 SAP node security group rules

## 2.3.3 File System Planning

#### SAP File System Planning

The following figure shows the SAP file system planning. Ensure that the capacity of the **/sapmnt** and **/usr/sap** file systems is greater than 2.5 GB and 25 GB, respectively. For details, see SAP official document.



#### DB2 File System Planning

Before the installation, set required file system nodes for the DB2 database. Table 1 shows the file system planning. The total capacity of the **/DB2** file must be greater than 100 GB.

For details about the file system size, see section "3.1 Setting Up File Systems for Shared Disk Scenario" in related SAP official document.

Table	2-2
lavie	Z-Z

File System	Description
/db2/db2 <dbsid></dbsid>	Contains the home directory of db2 <sapsid></sapsid>
/db2/ <dbsid>/log_dir</dbsid>	Contains at least the online database log files
/db2/ <dbsid>/db2dump</dbsid>	Contains DB2 diagnostic log files, DB2 dump files, and further service engineer information
/db2/ <dbsid>/db2<dbsid></dbsid></dbsid>	Contains the local database directory
/db2/ <dbsid>/db2<dbsid></dbsid></dbsid>	Contains the temporary tablespace(s)
/db2/ <dbsid>/sapdata1</dbsid>	SAP data for container type database managed space (DMS) FILE or for use of DB2's automatic storage management

The following table shows an example of the SAP file system.

Mount Point	File System Capacity	File System Type	Shared	Description
/	100 GB	-	No	OS volume
/usr/sap	100 GB	xfs	No	/usr/sap volume
/sapmnt	40 GB	xfs	No	Shared to all nodes in the SAP system
/db2sfs	Auto capacity SFS expansion		No	Stores the SAP installation package, which is shared to all nodes in the SAP system.
/db2	/db2 300 GB		No	Used to store DB2 file system nodes.
- 20 GB s		swap	No	Swap volume

## 2.3.4 Software and Hardware Planning

#### Hardware Planning

The following table lists the requirements for the disk space of SAP hardware. For details, see **SAP official document**.

#### Table 2-3

Requirement	Parameter
Hardware	Supports 64 bits.
CPU	> 2 cores
CD/ROM or DVD drive	Compatible with ISO9600
Available disk	Archive space for kernel: 2 GB
	ABAP central services instance (ASCS): 2G
	ERS instance: 2 GB
	Database Instance:
	SAP ERP: Minimum 75 GB
	SAP CRM: Minimum 50 GB
	SAP SRM: Minimum 55 GB
	SAP SCM: Minimum 50 GB SAP NetWeaver: Minimum 40 GB
	Primary application server instance: Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB)
	Additional application server instance: Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB)
	SAP Host Agent: Minimum 0.5 GB
Memory	ABAP central services instance (ASCS instance): Minimum 1 GB
	Database Instance: Minimum 2 GB
	Primary application server instance: Minimum 3 GB (BW server: Minimum 2 GB)
	Additional application server instance: Minimum 3 GB
	SAP Host Agent: Minimum 1 GB
Linux: Swap space	SWAP required
Linux: Swap space	

#### Software Planning

The following table lists the requirements of the SAP application and database for OS. For details, see **SAP official document**.

Requirement	Parameter
Database	View supported database platforms at http://support.sap.com/pam.
Linux OSs	Install DB212 on SLES12.
SAP kernel release version	To use regular Software Provisioning Manager (SWPM10 <version> SAR) with SAP kernel 7.49 or later on RHEL 6, SLES 11, or DB2 Linux 6, you must install the libstdc ++ RPM software package.</version>
Linux kernel parameters	Obtain the Linux kernel version certified by SAP DB2 Linux: SAP Note 1565179 SLES 15: SAP Note 2578899 SLES 12: SAP Note 1984787 SLES 11: SAP Note 1310037 RHEL8: SAP Note 2772999 RHEL7: SAP Note 2002167 RHEL6: SAP Note 1496410
Language environment.	de_DE, en_US

#### Table 2-4

## 2.3.5 ECS Planning

SAP ECS specifications

Before applying for SAP ECSs, evaluate the SAP Application Performance Standard (SAPS) value based on the standard SAP Sizing method. Then apply for the ECSs based on the evaluation results. For details, see **SAP Quick Sizer**.

For details about the minimum disk space, RAM, and software requirements of each SAP component, see the **SAP Installation Guides**.

SAP-certified ECSs must be used for installing the SAP application. For details, see **SAP Notes**.

• OS

The following table lists the OS supported by SAP ECSs.

#### Table 2-5 SAP ECS OS

Name	Specification	
OS	SUSE Linux Enterprise Server for SAP Applications 12 SP1	

• SAP node planning

ECS Name	Server/ Client IP Address	Specific ation	Туре	Instanc e Numbe r	SID	Image
sapond b2	10.10.1.9 3	c6.3xlarg e.2	ASCS Instance	01	S01	SUSE Enterprise
			PAS Instance	02		12 SP1 for SAP
			DB Instance	None		

## 2.4 Preparing for SAP Installation

Before installing the SAP system, you need to purchase and mount an SFS disk to the ECS, initialize the disk, and set the SWAP partition.

## 2.4.1 Creating a VPC

A VPC is logically isolated, configurable, and manageable virtual network for cloud servers, cloud containers, and cloud databases. It improves resource security and simplifies network deployment on the cloud. With a VPC, you can configure and manage the networks in the VPC, and make changes to these networks as needed, quickly and securely. For more information about VPC, see **VPC Overview**.

When creating a VPC, create the subnet 10.10.1.0, which is used as the server/ client plane IP address and system replication/heartbeat plane IP address of SAP and DB2.

#### Procedure

- **Step 1** Log in to the management console.
- **Step 2** Click <sup>(1)</sup> in the upper left corner and select the desired region and project.
- **Step 3** In the navigation pane on the left, click and choose **Network** > **Virtual Private Cloud**.

HUAWEI CLOUD   Console	🗴 Bangkok 🔹	Sear	ch Q Billing Center	Resources Service Tickets Enterprise	Develop Tools ICP License Support English gamang   🖻
≡ Service List →	Enter a service or function name.		Q	×	Quick Links Create Security Group
Elastic Cloud Server	Recently Visited Services: Elastic Cloud Server   Virt	tual Private Network   Identity and Access Mi	anagement Object Storage Service		
Relational Database Service	Elastic Cloud Server	torage astic Volume Service	Network Virtual Private Cloud Elastic Load Balance	Database GaussDB Relational Database Service	c to and from the servers in a security group, making your VPC more secure.
Bare Metal Server     Elastic Volume Service	Image Management Service Clo	iorage Disaster Recovery Service loud Server Backup Service	Direct Connect Virtual Private Network	Document Database Service GaussDB NoSQL	• Name • Q ] [C]
Volume Backup Service Virtual Private Cloud	Auto Scaling	oud Backup and Recovery olume Backup Service	Domain Name Service NAT Gateway Elastic IP	Distributed Database Middleware Data Replication Service Data Admin Service	rprise Project Operation ult Manage Rule   More +
Elastic Load Balance     Domain Registration	Dedicated Host Da	ata Express Service calable File Service	Cloud Connect VPC Endpoint	Security	
<ul> <li>Elastic IP</li> </ul>	Application CD AppCube Clic ServiceStage	DN loud Storage Gateway	Container Cloud Container Engine	DDoS Mitigation Web Application Firewall Vulnerability Scan Service	
	Cloud Service Engine ServiceComb On	fanagement & Deployment neAccess ioud Trace Service	Cloud Container Instance Software Repository for Container Multi-Cloud Container Platform	Host Security Service Container Guard Service Data Security Center	
	Distributed Message Service Ap	ioud Eye pplication Operations Management pplication Performance Management	CCE Aglie Application Service Mesh Application Orchestration Service	Database Security Service Data Encryption Workshop Cloud Certificate Management Service	
	Distributed Message Service for High R Log	entity and Access Management og Tank Service og Management Service	Migration Server Migration Service	Managed Detection Response Situation Awareness Managed Threat Detection	
	Blockchain Service Res API Gateway	esource Management	Object Storage Migration Service Cloud Data Migration	SSL Certificate Manager Cloud Bastion Host	

**Step 4** Click **Create VPC** on the right of the page.

2	HUAWEI CLOUD	Console		Search Q Billing Center Resources Service Tickets Enterprise Develop Tools ICP Locence	Support	English	ganyang fuchuandong   E
E			< 🗌 Create VPC 🔞				
			Basic Information Region Name IPv4 CIDR Block	Ar-Banglak        Argins as geographic areas holder from each other. Browners are region-specific and cannot be used across regions through internal network connections, for low network lattice year (second end) internal network connections, for low network (second end) internal network connections, for low network (second end) internal network connections, for low network (second end) internal network (second end) internal network connections, for low network (second end) internal network (second			
A A A							
			Default Subnet AZ Name IPy4 CIDR Block IPy6 CIDR Block	x21         •           solver: 507.4           102         •         10         •         0         /         24         •         •         Available IP Addresses: 221           TAC COR licks cannot be modified after the solvert itau been created.         Evable: •         • </th <th></th> <th></th> <th></th>			
			Free	Create Now			

Table 2-6 VPC configuration parameters

ltem	Parameter	Description
Basic information	Region	A region is a geographical area where you can run your VPC service. Each region comprises one or more availability zones (AZs) and is completely isolated from other regions. Only AZs in the same region can communicate with one another through an internal network. You can use the region selector on the upper left of the page to change the region.
	Name	VPC name

ltem	Parameter	Description
	Network segment	CIDR block of the VPC. The CIDR block of a subnet can be the same as the CIDR block for the VPC (for a single subnet in the VPC) or a subset of the CIDR block for the VPC (for multiple subnets in the VPC). The following CIDR blocks are
		supported:
		10.0.0/8~24 172.16.0.0/12~24
		192.168.0.0/16~24
		Configure the CIDR block based on the subnet information provided in <b>Network Planning</b> .
	Enterprise project	The enterprise project to which the VPC belongs.
		An enterprise project facilitates project- level management and grouping of cloud resources and users. The name of the default project is <b>default</b> .
		For details about creating and managing enterprise projects, see the <b>Enterprise Management User Guide</b> .
	Tag	The VPC tag, which consists of a key and value pair. You can create 10 tags for a VPC. This parameter is optional. Click <b>Advanced Settings</b> to configure it. For details about the tag naming rules, see <b>VPC Tag Naming Rules</b> .
Default subnet	AZ	An AZ is a geographic location with independent power supply and network facilities in a region. AZs are physically isolated, and AZs in the same VPC are interconnected through private networks.
	Name	Subnet name
	CIDR Block (of the subnet)	The CIDR block for the subnet. This value must be within the VPC CIDR block. Configure the subnet CIDR block based on the information provided in <b>Network Planning</b> .
	Advanced settings	Click <b>Advanced Settings</b> to set parameters such as <b>Gateway</b> and <b>DNS</b> <b>Server Address</b> .

Item	Parameter	Description
	Gateway	Gateway address of the subnet
	DNS server address	External DNS server addresses are used by default. If you need to change the DNS server address, ensure that the DNS server addresses you configured are available.
	DHCP lease time	Period during which a client can use an IP address automatically assigned by the DHCP server. After the lease time expires, a new IP address will be assigned to the client. The unit is day.
	Tag	Subnet tag, which consists of a key and value pair. You can add 10 tags for a subnet. This parameter is optional.
		For details about the tag naming rules, see <b>VPC Tag Naming Rules</b> .
Add a subnet	You can click <b>Add Su</b>	<b>bnet</b> to add a subnet.

#### Step 6 Click Create Now.

----End

## 2.4.2 Creating a Security Group

A security group is a collection of access control rules for ECSs that have the same security protection requirements and are mutually trusted. After a security group is created, you can create various access rules for the security group, and these rules will apply to all ECSs added to this security group. For more information about security groups, see **Security Group Overview**.

#### Procedure

**Step 1** Create a SAP security group.

Choose **Access Control** > **Security Groups** in the navigation pane on the left of the VPC console. On the **Security Groups** page, click **Create Security Group**.

Network Console	Security Groups ③				Quick Links Create Security
Dashboard Virtual Private Cloud Subnets	Your account comes with a default sec	ntrol for servers (such as BMSs and ECSs) that have the same security protec unity group named Sys-default, which has default security group rules. The d- rules. You can also create new security groups based on your requirements. I	afault outbound rule allows all outbound traffic, and the de		
Route Tables				All projects	*   Q
Security Groups	Name default	Security Group Rules	Associated Instances Description 36 default	Enterprise Project default	Operation Manage Rule   More +
Network ACLs					
Elastic IP and Bandwidth					
NAT Gateway					
/PC Peering					
/PC Endpoint					
Direct Connect					
Cloud Connect					

**Step 2** Set required parameters to create a security group.

- **Template**: The template contains security group rules, which help you quickly create a security group. The following templates are provided:
  - **Custom**: This template allows you to create security groups with custom security group rules.
  - General-purpose web server: The security group that will be created using this template is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and allow inbound traffic on ports 22, 80, 443, and 3389.
  - All ports open: The security group that will be created using this template includes default rules that allow inbound traffic on any port. Allowing inbound traffic on any port may pose security risks. Exercise caution when using this template.
- **Name**: specifies the name of the security group. Name the security group that is easy to identify, for example, **sg\_sap\_**.
- **Enterprise project**: You can add the security group to an enabled enterprise project. You can select an enterprise project from the drop-down list, for example, **SAP**.

h as BMSs and ECSs) that have th	e same security protection requirements in a \	VPC. You can define inbound and outbou
eat Create Security (	Group	× ault
* Name	sg-54a8	
* Enterprise Project	Select   C Cr	eate Enterprise Project
* Template	General-purpose web server 💌	
Description	The security group is for general-purpose w servers and includes default rules that allor all inbound ICMP traffic and inbound traffi ports 22, 80, 443, and 3389. The security g is used for remote login, ping, and hosting website on ECSs.	w ic on roup
Show Default Rule 🗨	OK Cancel	

#### Step 3 Click OK.

Locate the row that contains the newly created security group, and click **Manage Rule** in the **Operation** column to switch to the page for managing inbound and outbound rules. On the **Inbound Rules** tab, click **Add Rule**. In the displayed dialog box, add the desired ports listed in **Security Group Planning**.

< default				십 Import Rule [1]
Summary Inbound Rules Outbound Rules	Associated Instances			
Add Rule Fast-Add Rule Delete Allow	Common Ports     Inbound Rules: 12 Learn mor	about security group configuration.		
Protocol & Port 🖓 🛞	Туре	Source ②	Description	Operation
- All	IPv4	default (?)		Modify   Replicate   Delet
TCP: 111	IPv4	0.0.0.0	Create by sfs turbo	Modify   Replicate   Delet
TCP: 445	IPv4	0.0.0.0/0 🕥	Create by sfs turbo	Modify   Replicate   Delet
TCP: 2049	IPv4	0.0.0.0	Create by sfs turbo	Modify   Replicate   Delet
TCP: 2051	1Pv4	0.0.0.0/0 ③	Create by sfs turbo	Modify   Replicate   Delet
TCP: 2052	IPv4	0.0.0.0/0 ⑦	Create by sfs turbo	Modify   Replicate   Delet
TCP:18522	IPv4	0.0.0.0		Modify   Replicate   Delet
TCP:20048	IPv4	0.0.0.0/0 ③	Create by sfs turbo	Modify   Replicate   Delet
TCP: 30015	IPv4	0.0.0.0 ()		Modify   Replicate   Delet
TCP: 33899	IPv4	0.0.0.0/0 ③		Modify   Replicate   Delet
10 • Total Records: 12 < 1 2 >				



## 2.4.3 Purchasing ECSs

You need to create two ECSs. One is used to install SAP applications and DB2 using Linux, and the other is used to install SAP GUI and functions as a jump server. **Table 1** lists the details of the two ECSs for reference. Purchase them based on the site requirements.

ECS Name	Specific ation	Model	Image	Remarks
sapondb2	c6.3xlarg e.2	12vCPUs   24GB	SUSE Enterprise 12 SP1 for SAP	Installing SAP and DB2
ecswindows	c6.4xlarg e.2	16vCPUs   32GB	Windows Server 2012 R2 Standard 64-bit Chinese	Installing SAP GUI and functioning as a jump server

Table 2-7 ECS details

ECS Specificat ions	Model	File Syste m Size	Disk Size ((	GB)	Stora ge Categ ory	OS
c6.3xlarg e.2	12 vCPUs,	570	System disk	100	High I/O	Suse 12.1 for SAP
	24 GB		/usr/sap	100	High I/O	
			/sapmnt	40	High I/O	
			SWAP	30	High I/O	
			/DB2	300	High I/O	
			/orasfs	N/A	SFS	
c6.4xlarg e.2	16vCPUs   32GB	700	System disk	200	High I/O	Windows Server 2012 R2
			D	500	High I/O	Standard 64- bit Chinese

**Step 1** Log in to the HUAWEI CLOUD management console, click the service list icon, and choose **Computing** > **Elastic Cloud Server**.

Service List >	Enter a service or function name.		Q	×	Greate Security G
Elastic Cloud Server	Recently Visited Services: Virtual Private Cloud	Elastic Cloud Server Virtual Private Network	Identity and Access Management Object	Storage Service	
Relational Dubbase Service Auto Scaling Bare Metal Server Eastic Volume Service Volume Backop Service Volume Backop Service Domain Registration Eastic Leo	Computing East: Courd Server a Bare Mittal Server a Courd Prove Hingo Muasyment Service FunctionGraph Auto Scaling a Dedicated Foat Dedicated Foat Application Application	Storage  Extet: Volume Simile  Storage Distributed Storage Service Storage Distributed Storage Service Cloud Service Tackup Service Cloud Service Tackup Service Otab Exclusion Service Otab Exclusion Service Cloud Service Service Service Cloud Service S	Network Virsus Private Cloud Estimic Load Islance Estimic Load Islance Estimic Load Islance Unitual Prisate Network Unitual Prisate Network Estimic IP Est	Database Gwar00 Relational Database Service Gwar00 Database Service Gwar00 Nixo(), Distribution Database Middieware Data Replication Service Data Adminis Service Data Adminis Service Documpgion Documpgion	c to and from the servers in a security group, making you VPC more secure. Indoord traffic AB servers within a security group can access each other, Law           Non         •           Name         •         Operation           prifie Project         Operation         Manage fulle         More *
	Sentestage Canad Service Boyte Canad Service Dagene Servinacamb Distributed Cache Service Redis Distributed Kenesge Service for Kalha Distributed Kenesge Konflandton Simple Kenesge Notification Biochamba Service	Cloud Storage Calkerary Management & Deployment Cherketers Cloud Tars Service Cloud Fig Application Operations Management Application Performance Management Meeting and Access Management Lang Tarik Service Tag Management Service Resource Management	Container Cond Octamer Ingine Closel Octamer Ingine Software Reporting for Container Multi-Could Container Platform Oct Agle Application Service Mech Application Service Migration Server Migration Service Object Stoppa Migration Service Object Stoppa Migration Service Object Stoppa Migration Service	Vulnesbilly San Service Hot Security Service Outainer Gard Service Data Security Center Data Encrystor Workhop Cloud Certificate Management Service Managed Detection Reports Statutori Aurores Managed Threat Detection 5.51, Certificate Manager Courd Bettor Hot	

#### Step 2 Click Buy ECS.

Cloud Server Console	Elastic Cloud Server ③					Quickly learn login method	s and security group configura	-	I ECS News Do not show this	<ul> <li>E# Quick Links</li> <li>s again.</li> </ul>	Bu
Dashboard	We would much appreciate if	you could complete our questionnaire	on Elastic Cloud Serv	er. Your feedback will help	us provide a better user experier	ice.					_
Elastic Cloud Server											
Dedicated Host	Start Stop Ro	eset Password More *								с 🐵 🗳	88
Bare Metal Server	Searched by name by default.										
Elastic Volume Service		Monitoring	AZ 🏹	Status 😨	Specifications/Image	IP Address	Billing Mode 🖓	Enterprise Project	Tag	Operation	
Image Management Service			AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	Mor
Auto Scaling			AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	Mo
Key Pair ECS Group			AZ1	Stopped			Pay-per-use Created on May 24	SAP		Remote Login	Mor
Recovery		e (1997)	AZ1	Stopped			Pay-per-use Created on May 21,	SAP		Remote Login	Mor
Cloud Server Backup Service		() ()	AZ2	Stopped			Pay-per-use Created on May 20,	SAP		Remote Login	Mor
Volume Backup Service			AZ2	Stopped			Pay-per-use Created on May 18,	SAP		Remote Login	Mor
			AZ2	Stopped Locked by S			Pay-per-use Created on May 17,	default		Remote Login	Mor
			AZ2	Stopped Locked by S			Pay-per-use Created on May 17,	default		Remote Login	Mor
			AZ1	Stopped			Pay-per-use Created on May 13	SAP		Remote Login	Mo

#### Step 3 Select the ECS flavor, image, and disk size based on Table 2-7.

OANEIOE000	100%		Search	G only concerned inco	ource service encoprise	остстор того тст состок зорро	fuchuandong
	m6.large.8	2 vCPUs   16GIB	Intel Cascade Lake 3.0GHz	1.2 / 4 Gbit/s	400,000	No N	1.03/hour
	m6.xlarge.8	4 vCPUs   32GIB	Intel Cascade Lake 3.0GHz	2.4 / 8 Gbit/s	800,000	No i	1.99/hour
	m6.2xlarge.8	8 vCPUs   64GIB	Intel Cascade Lake 3.0GHz	4.5 / 15 Gbit/s	1,500,000	No 1	4.05/hour
	O m6.3xlarge.8	12 vCPUs   96GIB	Intel Cascade Lake 3.0GHz	7 / 17 Gbit/s	2,000,000	No à	6.04/hour
	m6.4xlarge.8	16 vCPUs   128GIB	Intel Cascade Lake 3.0GHz	9 / 20 Gbit/s	2,800,000	No No	8.03/hour
	m6.6xlarge.8 (Sold Out) Available Regions/AZs	24 vCPUs   192GIB	Intel Cascade Lake 3.0GHz	14 / 25 Gbit/s	4,000,000	No 1	12.08/hour
	M6.8xlarge.8 (Sold Out) Available Regions/AZs	32 vCPUs   256GIB	Intel Cascade Lake 3.0GHz	18 / 30 Gbit/s	5,500,000	No	16.13/hour
	Selected specifications Memory-opt	imized   m6.2xlarge.8   8 vCPUs	64GiB				
Image Host Security	Public Image         Private Image           If Windows         Windows           Select the OS language.         Windows           If table         Ottable of	Shared image	bit Chinese(4068)				
System Disk Data Disk			2,600, IOPS <u>burst limit</u> : 5,000 <b>(2)</b> 800, IOPS <u>burst limit</u> : 5,000 Quantity	- 1 + Show~			G G
Quantity 1	+ ECS Pro This price is an estimate and may diffe	r from the final price. Pricing deta	als				Next: Configure Network

**Step 4** Click **Next: Configure Network**. Select the created VPC and security group, confirm the configuration, and click **Next: Configure Advanced Settings**.

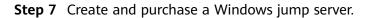
~							Assured Purchase 📀 Flexi
1 Configure Basic	Settings — 2 Configure Network –	Onfigure Advanced Settings	④ Confirm				
Network	vpc-sap(10.10.0.0/16) Create VPC	• C subnet-hana(10.10.2.0/24)	C Automatically-assigned	IP address   Available private IP addresse	240 🕥		
Extension NIC	Add NIC You can add 3 more NICs.						
Security Group	default (3471b566-8789-4857-9845-70 Similar to a firewall, a security group log Security Group Rules Inbound Rules Utbound F	ically controls network access.	y and p				
	Security Group Name	Protocol & Port ③	Туре	Source ③	Des	cription	
	Security Group Name	Protocol & Port ③ TCP: 2049	Type IPv4	Source ③		cription	
	Security Group Name				Cre		
	Security Group Name	TCP: 2049	IPv4	0.0.0.0/0	Cre	eate by sfs turbo	
	Security Group Name	TCP: 2049 UDP: 111	IPv4 IPv4	0.0.0.0/0	Cre Cre Cre	eate by sfs turbo eate by sfs turbo	
	Security Group Name	TCP: 2049 UDP: 111 TCP: 445	1Pv4 1Pv4 1Pv4	0.0.0.00	Cre Cre Cre Cre	eate by sfs turbo eate by sfs turbo eate by sfs turbo	

**Step 5** Enter the ECS name and password of the **root** user, and click **Next: Confirm**.

	node Saurch Q Billing Center Resources Service Tolets Enterprise Develop Tools KP License Support English furthandroom
< Elastic Cloud Ser (1) Configure Basic Set	
ECS Name	Restant         Allow duplicate name           If multiple ECSs are created at the same time, the system astarcally adds a higher followed by a four digit incremental number to the end of each ICS name. For example, if you enter ess and there is no entiting ECS in the system, the first ECS's name will be ess 0001. If an ECS with the name or 000 analysis of the time of the ICS name. For example, if you enter ess and there is no entiting ECS in the system, the first ECS's name will be ess 0001. If an ECS with the name or 000 analysis of the time of the ICS name. For example, if you enter ess and there is no entiting ECS in the system, the first ECS's name will be ess 0001. If an ECS with the name of the time of the time of the ICS name. For example, if you enter ess and there is no entiting ECS in the system. The first ECS's name will be ess 0001. If an ECS with the name of the time of the time.
Login Mode	Password Key pair Set password later
Username	Administrator
Password	Reep the parsword secure. If you forget the password, you can log in to the ECS console and change it.
Confirm Password	
Cloud Backup and Recovery	To use CBE, you need to purchase a backup wait. A wait is a container that stores backups for servers. Auto ansign Use existing Not required O
ECS Group (Optional)	Attrailinty O
	lokat ICS group. • C Credet ICS Group
Quantity 1	786726726726

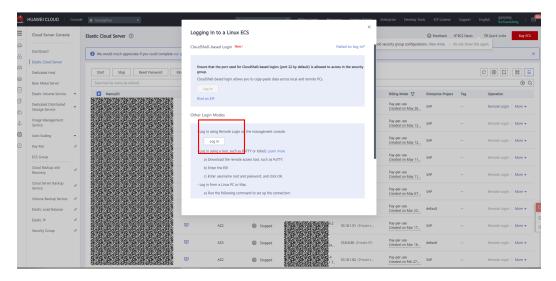
**Step 6** Select an enterprise project and click **Next**.

HL.	JAWEI CLOUD			Search	Q Billing Center Resou					ganyang fuchuandong	
	<   Elastic Cloud S	erver							Assured Pu	rchase 😔 Flexi I	Purchase
	(1) Configure Basic S	iettings — 2	Configure Network — ③ Configure Advanced Settings	🚯 Confirm							
	Note:	The primary netwo	k interface does not have an EIP bound, and the ECS cannot access	the Internet.							
	Configuration	Basic 🖉									
		Billing Mode Specifications System Disk	Pay-per-use Memory-optimized   m6.2xlarge.8   8 vCPUs   64GiB High I/0,100GiB	Region Image Data Disk	Bangkok Windows Server 2012 R2 Standard 64bit CP 1 disks   High I/O, 250GIB	linese	AZ Host Security	AZ1 Basic			
		Network 🖉 VPC EIP	vpc-sap(10.10.0.0/16) No EIP bound to the primary network interface	Security Group	default		Primary NIC	subnet-hana(10.10.2.0/2	4)		
		Advanced 🖉									
		ECS Name	ecssap2	Login Mode	Password		ECS Group				
	Enterprise Project		C Create Enterprise Project (?)								
	Quantity		+ You can create a maximum of 980 EC5s. You can create a max								
	Agreement		<ul> <li>Tou can create a maximum of year ec.s. tou can create a max d agree to the image Disclaimer.</li> </ul>	mum of 500 ec.5s at a time. D	ann now to increase quoca.						
	TENDENTEN	cavasca									-
	ECS Price 5 an estimate an									Previous	Ne



*0		Console 🛛 Guangzhou 🔹	Search Q Billing Center Resources Service Tickets Enterprise Develop Tools KP Licence Support English (schandong   1
	< ecs-windows	nana-fcd .ks NICs Security Groups EIPs Monitoring Tags	© Feedback Remote Login Start Stop Restart More ▼
5	ECS Information	ins security groups cirs workdowing rags	Construction O Montoring O Montoring Host Security O Ease ( Insulated
20,	ID	32a11779-98c0-4048-a974-80ba8ff1311e	Stopped Monitoring O Monitoring Host Security O Basic   Enabled
	Name	ecs-windowshama-fcd 🖉	
	Description	🖉	
	Region	Guangzhou	System Disk
	AZ	AZ2	ecs-windowshana High I/O   200 GIB
	Specifications	General computing-plus   c6.4xlarge.2   16 vCPUs   32GIB	Data Disk volume-e1db Ultra-high I/O   500 GIB
	Image	Windows Server 2012 R2 Standard 64bit Chinese   Public image	Wanterstop opamily (o ) soo de
	VPC	vpc-fodtest	
	Billing Informatio		Primary NIC subnet-hana 10.10.2.40
	Billing Mode	Pay-per-use	300/1011010 10.102/10
	Obtained	Jan 27, 2021 20:20:40 GMT+08:00	▼ Security Groups
	Launched	Jan 27, 2021 20:21:00 GMT+08:00	default
	Management Info	rmation	v EIPs
	Enterprise Project		No BPs are bound to the ECS.
	ECS Group	Create ECS Group	To make the ECS accessible from the Internet, apply for an EIP and bind it to the ECS. Bind
	Agency	🖉 🕐 Create Agency	Cloud Backup and Recovery
			backup, for Image 8274193a-5911-4 Mar 03, 2021 09:37:08 GMT+08:00

**Step 8** After ECSs are created, locate the created ECSs in the ECS list and click **Remote Login** in the **Operation** column. Log in to the ECSs as user **root** using VNC.



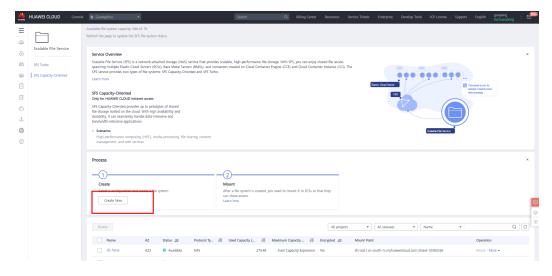
----End

## 2.4.4 Purchasing and Mounting an SFS Disk

**Step 1** Log in to the HUAWEI CLOUD management console, click the service list icon, and choose **Storage** > **Scalable File Service**.

Enter a service or function name.			Q		Х	
Recently Visited Services: Elastic Cloud	Server	Data Security Center   DDoS Mitigation   De	dicated Cloud			
Computing Elastic Cloud Server		<b>Storage</b> Elastic Volume Service	Network Virtual Private Cloud	Database GaussDB		
Bare Metal Server		Dedicated Distributed Storage Service	Elastic Load Balance	Relational Database Service		
Cloud Phone		Storage Disaster Recovery Service	Direct Connect	Document Database Service		
Image Management Service		Cloud Server Backup Service	Virtual Private Network	GaussDB NoSQL		
FunctionGraph		Cloud Backup and Recovery	Domain Name Service	Distributed Database Middleware		
Auto Scaling		Volume Backup Service	NAT Gateway	Data Replication Service		
Dedicated Cloud	Ŧ	Object Storage Service	Elastic IP	Data Admin Service		
Dedicated Host		Data Express Service	Cloud Connect			
		Scalable File Service	VPC Endpoint	Security DDoS Mitigation		
Application		Cloud Storage Gateway	Container	Web Application Firewall		
AppCube			Cloud Container Engine	Vulnerability Scan Service		
ServiceStage		Management & Deployment	Cloud Container Instance	Host Security Service		
Cloud Service Engine		OneAccess	Software Repository for Container	Container Guard Service		
Cloud Service Engine ServiceComb		Cloud Trace Service	Multi-Cloud Container Platform	Data Security Center	- 1	
Distributed Cache Service Redis		Cloud Eye	CCE Agile	Database Security Service		
Distributed Cache Service Memcached		Application Operations Management	Application Service Mesh	Data Encryption Workshop		
Distributed Message Service		Application Performance Management	Application Orchestration Service	Cloud Certificate Management Service		
Distributed Message Service for Kafka		Identity and Access Management		Managed Detection Response		
Distributed Message Service for Rabbit.		Log Tank Service	Migration	Situation Awareness		t se
Distributed Message Service for High R		Tag Management Service	Server Migration Service	Managed Threat Detection		ores.
Simple Message Notification		Resource Management	Object Storage Migration Service	SSL Certificate Manager		
Blockchain Service			Cloud Data Migration	Cloud Bastion Host		
API Gateway		EI Enterprise Intelligence				
Cloud Performance Test Service		DGC Data Lake Center	DevCloud ProjectMan			
		eiHealth	CodeHub			

#### **Step 2** Create a file system and record the mount address.



	< Create File System ⑦				
	Details				
	Product Name	Configuration	CN South-Guangzhou		Quantity
		Region			
		Name	sfs-turbo-5fb4		
	SFS Turbo	Specifications	Standard		1
		Capacity (GB)			
		Encryption	No		
		Enterprise Projec	t default		
		AZ	AZ2		
	Network	VPC	vpc-gl		
		Subnet	subnet-gl(192.168.0.0/24)		
		Security Group	sg-qlusl1		
	Automatic Backup	Do not use			
Th	is price is an estimate and may differ from the fin	al price. Pricing details			Previr us Submit
	is price is an estimate and may differ from the fits	al price. Pricing details			Previe us Submit
	Refresh the page to update the SFS file system status.				Previ us Submit
	Refresh the page to update the SFS file system status. Service Overview Solable File Service (SFS) to a network-attached stora spanning multiple Earlier (Dod Servers (ESS), Bare Is	ige (NAS) service that provides steeled	volable, high-performance file stooge, WITH 975, you can eijoy shared file access men cealed on Chool Costainer Engine (CCD) and Costainer Instance (CC). The	123	A23 A23
able File Service	Refresh the page to update the SFS file system status.	ige (NAS) service that provides steeled	sculable, high-performance file stronge, WHI SP3, you can enjoy shared file access many contact on Could Container Engine (CCL) and Could Container Instance (CCL). The	123	
lable File Service	Referable and system registrary - stores re- Referable the page to update the 55% file system status. Service Overview Scalable File Service (55%) is a network-attached store spanning multiple Elastic Could servers (155%), Ber 55% service provide the system in 55% cardio stores for the system in 55% cardio stores and	ige (NAS) service that provides steeled	scalable. Not approvement file storage WHI SP, you can enjay name file access inees created on Cloud Container Engine (CCB) and Cloud Container Instance (CC). The	123	
lable File Service	Referch the page to update the SFS file system status. Service Overview Scalab FIS Society (SF) is a whork-without door spanning multiple Battle Cloud Servers (SSS), but to SFS service provide two types of file systems SFS Cap Learn more SFS Capacity-Oriented Origh for HAMPE the Scalab YM histopharmited SFS Capacity-Oriented provides us paralytics of the hamiliability list strates how the Scalab YM histopharmited	ge (NAS) service that provides ketal (evers (BMS), and conta lacity-Oriented and SPS Turbo. sectory or the sectory of the sectory of the sectory and	scalable, high gentremaner file starage. HHR 557 you can etypy shared file accest inees created on Cloud Container Engine (CCB) and Cloud Container Instance (CCI). The	123	
lable File Service	Refeat: the page to update the 55% file system status. Scalable file Service (55% and except status) Scalable file Service (55) a and except status and systemic protection (55) a and except status) Service protection to system (56%), and the Systemic protection to system) (56%), and the Systemic protection to system) (56%), and the Systemic protection of the Service (56%) (56\%) (	ge (NAS) service that provides ketal (evers (BMS), and conta lacity-Oriented and SPS Turbo. sectory or the sectory of the sectory of the sectory and	scalable, high-performance file stronge, With 975, you can enjoy shared file access men created on Cloud Container Engine (CCD and Cloud Container Instance (CC). The	123	
lable File Service	Refresh the page to spoke the SFS for system status.  Service Overview Sociale File Serves (SFS) is a network-attached store spanning multiple Eastic Could servers (ESS), Ber & SFS serves provide too spins of file system: 3FS Car Learn rove  SFS Capacity-Oriented Only for HAMMIN ECOUP interest acces  SFS Capacity-Oriented Disp Capacity-Orient	gg (1443) service that provides the device (1446), and contain the device (1446), and contain the device (1446) and s154 Turbs. And and and and and and and and and and a	iscable, top-performance file storage, WITH SFS, you can enjoy shared file access near created on Cloud Container Engine (ICCE) and Cloud Container Instance (ICC). The	123	
lable File Service	Referch the page to update the SFS file system status. Sector Telescond Sector	gg (1443) service that provides the device (1446), and contain the device (1446), and contain the device (1446) and s154 Turbs. And and and and and and and and and and a	sculde, hylu-performance file strange, WHI SP3, you can enjoy shared file access meny created on Cloud Constance Engine (CC) and Cloud Constance Instance (CC). The	123	
lable File Service	Referit the gapes to update the 55% for yourse statu. <b>Sector Overview</b> Stability Ties forwards (55%) as a dosed waves (55%), as to 55% strate profession (55%) as a dosed waves (55%), as to 55% strate profession to gape of flery system; 35% of <b>Left nove</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b> <b>S5%</b>	ye (1445) envice that provides the Metal Servers (MMS), and contained Metal Servers (MMS), and contained active Content of SFS Turbo. and and ting, file sharing, content	-Q	123	
lable File Service	Refresh the page to spekte the 35° for system status.  Scheduler Teis Service (57) is an encode control of the system status of the system status (55) and the problem status (55) and the status (55) and	ge (NAS) service that provides that provides that provides that Servers (NASS), and contain that Servers (NASS), and a startly-Oriented and 315 Turbo. and and the sharing content that the sharing content the sharing content that the sharing content the sharing content that the sharing content the sharing		123	
lable File Service	Referit the gaps to spoke the 35° file system statu.  Sector Overview Statle File server (55), as not-set, statue of the server (55), as not-server of the system server (55), and the server (55), and the server (55), and the system server (55). The server (55) are to spoke the system server (55) are to spoke the system server (55). The server (55) are to spoke the system server (55), and the system server (55) are to spoke the system server (55). The server (55) are to spoke the system server (55) are to spoke the system server (55), and the spoke the system server (55). The server (55) are to spoke the system server (55) are to spoke the system server are to spoke the system server (55) are to spoke the	ge (NAS) service that provides that provides that provides that Servers (NASS), and contain that Servers (NASS), and a startly-Oriented and 315 Turbo. and and the sharing content that the sharing content the sharing content that the sharing content the sharing content that the sharing content the sharing	Department of the ECS so that they can there are the exact of the ECS so that they can there access. Learn how		
lable File Service	Refeat: the gaps to spatial the 35° file system status.  Sector Overview Status File Service (57) as a resolver, Status, Bert Systems protection (57) as a resolver, Status, Bert Systems protection (57) as a resolver, Status, Bert Systems, Dented to type of file system; Status, Dente Systems, Dented to type of file system; Status, Bert Systems, Dented provides up to plastystem status, and Systems, Dented provides up to plastystem, and Systems,	ge (NAG) service that provides that provides that provides that Servers (BAG), and contain the Servers (BAG), and contain the Servers (BAG), and and and and and and and the Servers (BAG) servers (BAG) and the Servers (BA	After a file system is created, you need to mouse it to ICCs so that they can the system is to be solved to mouse it to ICCs so that they can have be a solved to be solv		

Step 3 Log in to the ECS server and create the mkdir /db2sfs folder.



Step 4 Mount the /db2sfs directory to SFS.

```
echo "sfs-nas1.***:/share-cd3dc3c2 /db2sfs nfs vers=3,timeo=600,nolock 1 2" >>/etc/fstab
```

Run the **mount -a** command to mount the directory.



**Step 5** Run the **df -h** command to view the mounting result.

í í				
Size	Used	Avail	Use%	Mour
99G	4.3G	90G	5%	1
48G	8.0K	48G	1%	/dev
71G	84K	71G	1%	/dev
48G	9.8M	48G	1%	/rur
48G	0	48G	0%	/sys
10P	0	10P	0%	/db2
	99G 48G 71G 48G 48G	99G 4.3G 48G 8.0K 71G 84K 48G 9.8M 48G 0	99G 4.3G 90G 48G 8.0K 48G 71G 84K 71G 48G 9.8M 48G 48G 0 48G	99G 4.3G 90G 5% 48G 8.0K 48G 1% 71G 84K 71G 1% 48G 9.8M 48G 1% 48G 0 48G 0%

----End

## 2.4.5 Creating a File System

**Step 1** Run the **fdisk** -l command to check the unformatted disks.

```
sapondb2:~ # fdisk -1
Disk /dev/vda: 100 GiB, 107374182400 bytes, 209715200 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x000434aa
Device
          Boot Start
                            End
                                  Sectors Size Id Type
                 2048 209715166 209713119 100G 83 Linux
/dev/vda1
Disk /dev/vdb: 100 GiB, 107374182400 bytes, 209715200 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk /dev/vdc: 40 GiB, 42949672960 bytes, 83886080 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk /dev/vdd: 30 GiB, 32212254720 bytes, 62914560 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk /dev/vde: 300 GiB, 322122547200 bytes, 629145600 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

Format disks and logical volumes.

#### mkfs.xfs /dev/vdb

mkfs.xfs /dev/vdc

mkfs.xfs /dev/vde

sapondb2	∼ # mkfs.xfs /dev/vdb	
	a=/dev/vdb	isize
incea adde	=	sects
	=	crc=(
data	=	bsize
uaca	=	sunit
naming	- =version 2	bsize
log	=internal log	bsize
108	=	sects
realtime		extsz
	∼ # mkfs.xfs /dev/vdc	EXC32
	a=/dev/vdc	isize
meta-uata	=	sects
	=	crc=6
data	=	bsize
uaca	=	sunit
naming	=version 2	bsize
log	=internal log	bsize
108	=	sects
realtime	=	extsz
	∼ # mkfs.xfs /dev/vdd	EXC32
	a=/dev/vdd	isize
meta-uato	=	sects
	=	crc=6
data	=	bsize
uaca	=	sunit
naming	- =version 2	bsize
log	=internal log	bsize
108	=	sects
realtime		extsz
	<pre>-none -none - # mkfs.xfs /dev/vde</pre>	EXC32
	a=/dev/vde	isize
meta-uata	=	sects
	=	crc=6
data	=	bsize
uaca	=	sunit
noming	- =version 2	bsize
naming log	=internal log	bsize
108	=	sects
realtime	=0000	extsz
rearcime		CX(32

e=256 agcount=4, agsize=6 sz=512 attr=2, projid32bit finobt=0 e=4096 blocks=26214400, im t=0 swidth=0 blks e=4096 ascii-ci=0 ftype=0 e=4096 blocks=12800, versi sz=512 sunit=0 blks, lazyz=4096 blocks=0, rtextents e=256 agcount=4, agsize=2 attr=2, projid32bit sz=512 finobt=0 e=4096 blocks=10485760, im t=0 swidth=0 blks e=4096 ascii-ci=0 ftype=0 e=4096 blocks=5120, version sz=512 sunit=0 blks, lazyz=4096 blocks=0, rtextents e=256 agcount=4, agsize=1 sz=512 attr=2, projid32bit finobt=0 e=4096 blocks=7864320, ima t=0 swidth=0 blks e=4096 ascii-ci=0 ftype=0 e=4096 blocks=3840, version sz=512 sunit=0 blks, lazyz=4096 blocks=0, rtextents e=256 agcount=4, agsize=1 sz=512 attr=2, projid32bit finobt=0 e=4096 blocks=78643200, in t=0 swidth=0 blks ascii-ci=0 ftype=0 e=4096 blocks=38400, versi e=4096 sz=512 sunit=0 blks, lazyz=4096 blocks=0, rtextents

Create a file system directory.

sapondb2:~

mkdir -p /usr/sap /sapmnt /db2

```
sapondb2:~ # mkdir -p /usr/sap /sapmnt /db2
sapondb2:~ #
sapondb2:~ #
```

Run the **blkid** command to obtain the UUID of the disk.

```
sapondb2:~ # blkid
/dev/vda1: UUID="27a5e4ec-1915-4161-b94c-675c7393b494" TYPE="ext
/dev/vdb: UUID="3813b122-7ba0-4333-a791-d8881dbf9783" TYPE="xfs"
/dev/vdc: UUID="4c1a7079-9aee-4e80-9a04-fac2bf19734f" TYPE="xfs"
/dev/vdd: UUID="5c33db87-94b0-4e04-b417-5e6d8df4a6d4" TYPE="xfs"
/dev/vde: UUID="5e1e498e-e704-4e46-840b-4dbea0205166" TYPE="xfs"
```

Create mount points in /etc/fstab.

```
echo "UUID=3813b122-7ba0-4333-a791-d8881dbf9783 /usr/sap xfs defaults 0
0" >>/etc/fstab
```

echo "UUID=4c1a7079-9aee-4e80-9a04-fac2bf19734f /sapmnt xfs defaults 0 0" >>/etc/fstab

echo "UUID=5e1e498e-e704-4e46-840b-4dbea0205166 /db2 xfs defaults 0 0" >>/etc/fstab

sapondb2:~	#			
sapondb2:~	#	echo	"UUID=3813b122-7ba0-4333-a791-d8881dbf9783	/usr
sapondb2:~	#	echo	"UUID=4c1a7079-9aee-4e80-9a04-fac2bf19734f	/sap
sapondb2:~	#	echo	"UUID=5e1e498e-e704-4e46-840b-4dbea0205166	/db2
sapondb2:~	#			

Run the **mount** -a command to mount all disks and run the **df** -h command to check the disk mounting results.

<pre>sapondb2:~ # mount -a</pre>		
ing at incep for more informations		
<pre>sapondb2:~ # df -h</pre>		
Filesystem	Size	Used
/dev/vda1	99G	4.3G
devtmpfs	48G	8.0K
tmpfs	71G	84K
tmpfs	48G	9.8M
tmpfs	48G	Ø
sfs-nas1.cn-south-1c.myhuaweicloud.com:/share-cd3dc3c2	10P	0
/dev/vdb	100G	33M
/dev/vdc	40G	33M
/dev/vde	300G	33M
sanondh2+# #		

----End

DOLLAD

## 2.4.6 Configuring the Swap Partition

**Step 1** Use partitions/disks as the swap partition.

Run the following command to configure the swap partition.

#### mkswap /dev/vdd

Juev/vue
<pre>sapondb2:~ # mkswap /dev/vdd</pre>
<pre>mkswap: /dev/vdd: warning: wiping old xfs signature.</pre>
Setting up swapspace version 1, size = 31457276 KiB
no label, UUID=43a73cdb-4359-4141-a255-b86156d1f433
sapondb2:~ #

**Step 2** Run the following command to enable the swap partition.

#### swapon /dev/vdd



**Step 3** Write the following information to **/etc/fstab**.

echo "UUID=43a73cdb-4359-4141-a255-b86156d1f433 swap swap defaults 0 0" >> /etc/fstab

sapondb2:~ # echo "UUID=43a73cdb-4359-4141-a255-b86156d1f433 swap sapondb2:~ #

**Step 4** Run the following command to check the size of the current memory and swap space. The default unit is KB, and the unit of **-m** is MB

#### free -m

sapondb2:	✓ # free -m				
	total	used	free	shared	buffers
Mem:	96879	1182	95696	9	36
-/+ buffer	rs/cache:	765	96113		
Swap:	30719	0	30719		
sanondh2+	. #				

**Step 5** Run the following command to check swap information, including detailed information about files and partitions.

swapon -s

5mapi 50715 0	50715	
<pre>sapondb2:~ # swapon -s</pre>		
Filename	Туре	Size U
/dev/vdd	partition	31457276
sapondb2:~ #		

#### ----End

## 2.4.7 Configuring the hosts File

Configure the **hosts** file. During SAP software installation, the SAP software automatically maps host names to IP addresses.

**Step 1** Run the **vi /etc/hosts** command to add the IP addresses mapped to the host names.

#	
127.0.0.1	localhost
# special IPv6	addresses
::1	localhost ipv6-localhost ipv6-loopback
fe00::0	ipv6-localnet
ff00::0	ipv6-mcastprefix
ff02::1	ipv6-allnodes
ff02::2	ipv6-allrouters
r r 02 + + 3	ipvo allhasta
10.10.1.93	sapondb <mark>2</mark>
~	

----End

# 2.4.8 Downloading and Decompressing the SAP Software Package

Download the SAP application and DB2 installation files from the official website, upload them to the OBS bucket, copy them to the ECSs, decompress them, and start the software installation.

Download the software from **https://support.sap.com/swdc** by referring to official SAP installation guide.

### **Decompressing the Software Packages**

After the SAP software is downloaded and copied to the ECS, decompress the software package.

Step 1 Decompress the ERP6.0 EHP7 software package compressed using exe in Windows and copy it to the SAP DB2 virtual machine (VM) using SCP. An example is as follows:

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**Step 2** Go to the directory where the downloaded software package is stored on the ECS and run the **unzip** command to decompress it. An example is provided as follows:



**Step 3** Go to the **DATA\_UNITS** folder and modify the **LABELIDX.ASC** file. This step will be verified during SAP software installation.

vi LABELIDX.ASC

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**Step 4** Decompress the SWPM. An example is as follows:

Go to the **SWPM** directory and run the following command:

chmod 777 SAPCAR.EXE

./SAPCAR.EXE -xvf SWPM\*\*.SAR

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----End

## 2.5 Installing SAP Software and DB2

Download the SAP application installation packages from the official website, upload them to the ECSs, decompress the packages, and start the software installation.

## 2.5.1 Installing the SAP Application

Before installing SAP on DB2, you need to install SAP using the sapint (during the installation, DB2 is automatically installed).

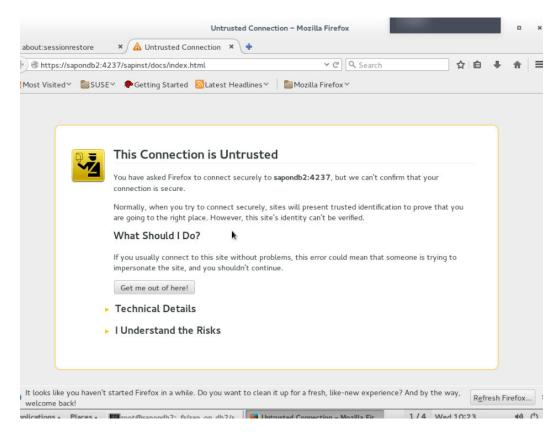
**Step 1** On the HUAWEI CLOUD console, log in to the ECS as the **root** user using VNC, right-click, and choose **Open in Terminal**.

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**Step 2** Go to the **swpm** directory and run the **./sapinst** command.

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Step 3 Open a browser, enter https://host name:4237/sapinst/docs/index.html in the address box, and press Enter.



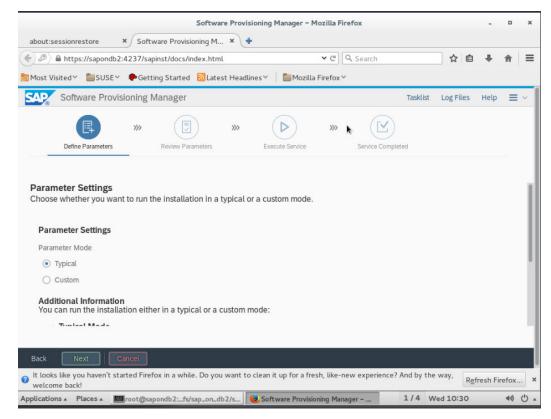
**Step 4** Enter the **root** username and password.

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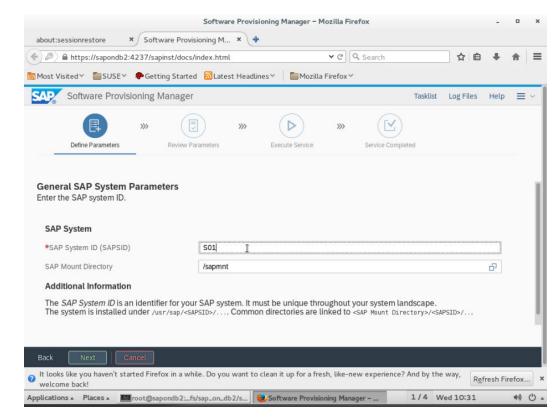
# Step 5 Choose SAP NetWeaver 7.5 > IBM DB2 for Linux, UNIX, and Windows > Installation > Application Server ABAP > Standard System > Standard System, and click Next.

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Step 6 Use the default settings, and click Next.



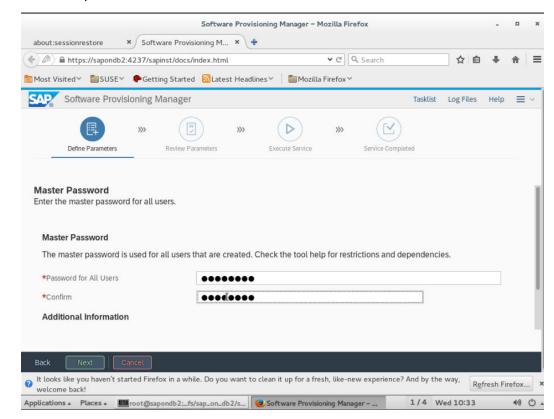
Step 7 Enter the SID to be created and click Next.



Step 8 Deselect Set FQDN for SAP system and click Next.

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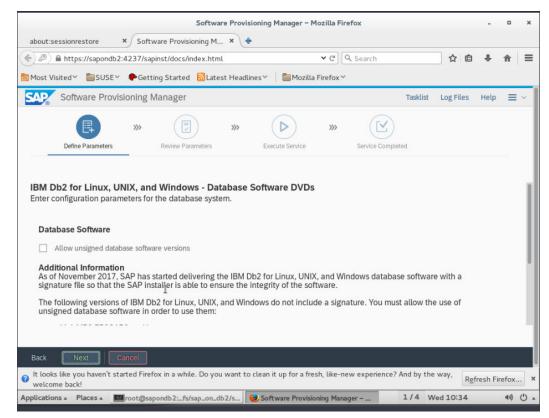
Step 9 Enter the passwords of all users to be created and click Next.



Step 10 Enter the SID of the database to be created, select a file system, and click Next.

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**Step 11** Use the default settings and click **Next**.



**Step 12** Select the path where the kernel software package is stored and click **Next**.

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**Step 13** After the software package status changes to **Available**, click **Next**.

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**Step 15** Select the path where EXPORT\_1 is located and click **Next**.

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**Step 16** Select the path where EXPORT3 is located and click **Next**.

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#### **Step 17** Select the path where EXPORT2 is located and click **Next**.

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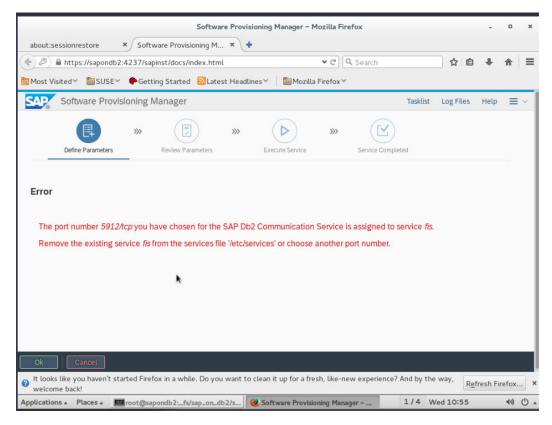
**Step 18** Select the path where RDBMS is located and click **Next**.

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**Step 19** Use the default port, and click **Next**.

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**Step 20** A message indicating that the port is occupied is displayed. Go to **/etc/services** to view the idle ports.



vi /etc/services

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		5913/sctp	
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	mppolicy-mgr		
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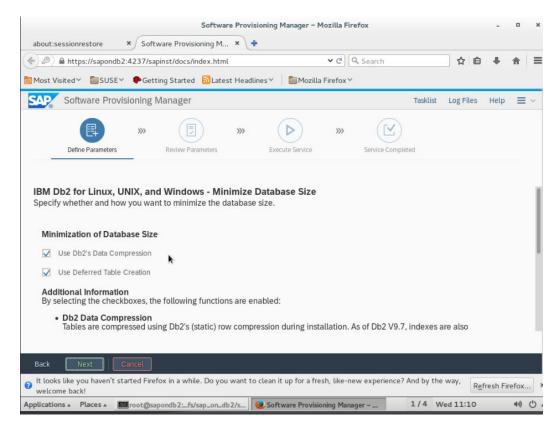
**Step 21** Change the default port to an idle one in the service and the security group, and click **Next**.

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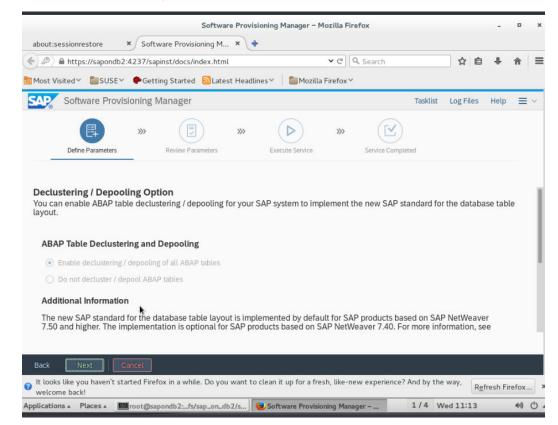
**Step 22** Select the path of the **Client** database for the first installation and click **Next**.

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Softv 1 Addi	Media CLI/JDBC-Driv itional Informat	rer IBM Db2 for Linux, UNIX and Windows	/db2sfs/sap_on_d			fresh Fi	refox.

**Step 23** Use the default settings and click **Next**.



**Step 24** Use the default settings and click **Next**.



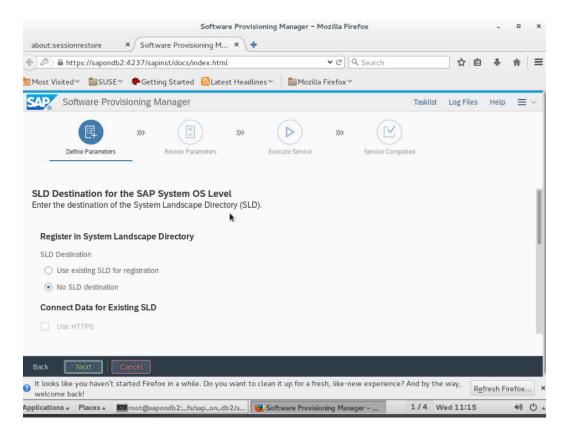
**Step 25** Use the default settings and click **Next**.

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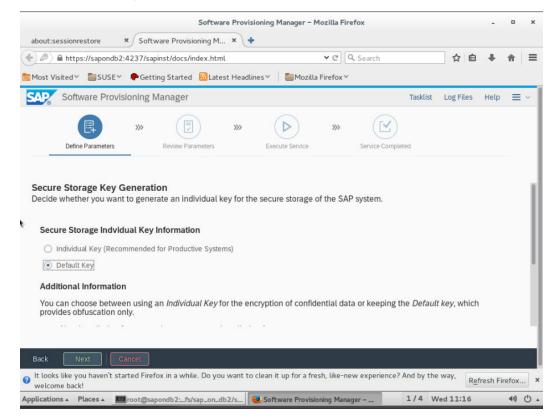
**Step 26** Enter the ASCS and PAS instance numbers and click **Next**.

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*PAS Instanc	e Number	02					
*PAS Instanc	e Host	sapondb2					
*ASCS Instar	nce Number	01					
	ice Host Name	sapondb2				12	

**Step 27** Use the default settings and click **Next**.



Step 28 Select Default Key and click Next.



**Step 29** Use the default settings and click **Next**.

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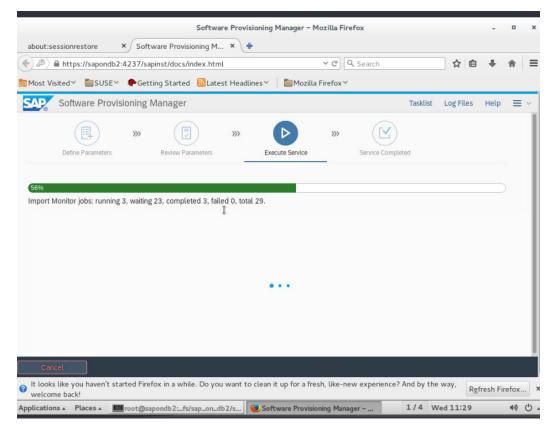
**Step 30** Confirm the parameters and click **Next**.

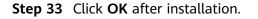
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Choose 'Next' to start with the screen where you car Parameter List Parameter Settings Parameter Mode Typical Custom	n change th	e parameter. Y	'ou might b	e guided throug	h other s	creens that hav	ve so far be	e way			

**Step 31** Install SAP.

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Step 32 Wait patiently. The installation takes about one hour.





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SAP NetWeaver 7.5 > IBM Db2 for Linux, UNIX, and Windows > Installation > Application Server ABAP > Standard System >		Ш
Standard System		Ш
has completed.		Ш
Perform initial system configuration tasks in an automated way by using the ABAP task manager for lifecycle management automation.		Ш
For more information, see SAP Note 1923064.		Ш
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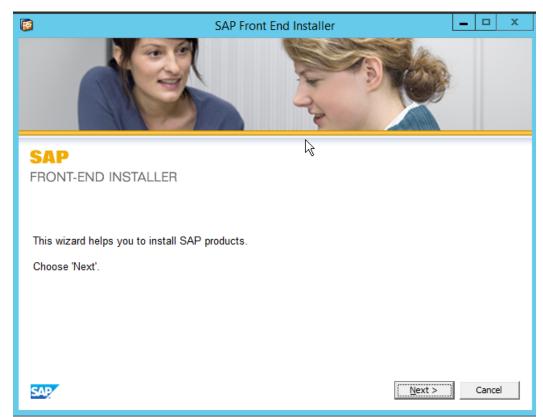
## 2.5.2 Installing SAP GUI

Install SAP GUI on the ECS running Windows.

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DVD Drive (E:) MSSC	🔞 SapBiSetup	11/2/2017 2:58	Application	241 KB	
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🗣 Network	😰 SapGuiSetup	11/2/2017 2:58	Application	241 KB	
	SapNwBcSetup	11/2/2017 2:58	Application	241 KB	
	SapSncClientEncryptionSetup	11/2/2017 2:58	Application	241 KB	
	📴 SapSn:Setup	1/24/2018 2:57	Application	241 KB	
	SanVevSetup	1/23/2018 7:34	Application	241 KB	

**Step 1** Go to the SAP GUI installation directory. Run the installation program.

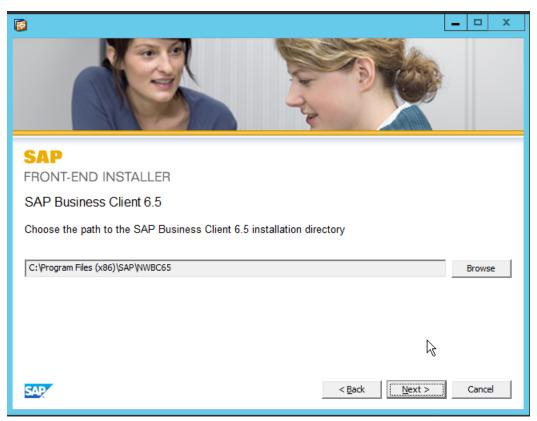


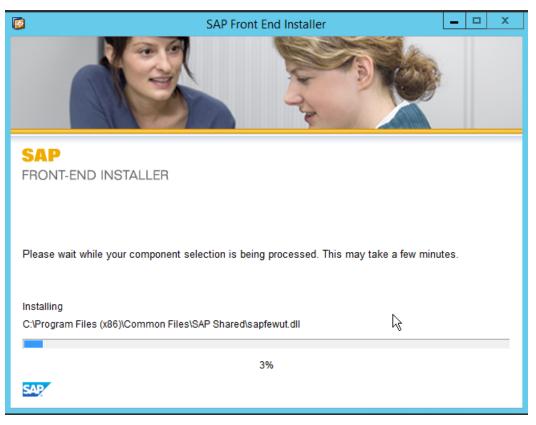




SAP From	t End Installer
SAP FRONT-END INSTALLER	
Image: Second system         Image: Second system <td><ul> <li>Business Explorer         This item will be installed         </li> <li>Business Intelligence Suite of SAP NetWeaver         that provides tools for analysis, reporting and         planning.</li> </ul></td>	<ul> <li>Business Explorer         This item will be installed         </li> <li>Business Intelligence Suite of SAP NetWeaver         that provides tools for analysis, reporting and         planning.</li> </ul>
Selan all Deselect all	< Back Next > Cancel

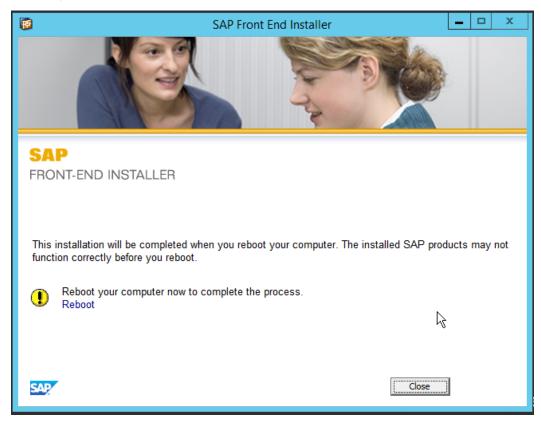
**Step 4** Select the installation location for each component. Retain the default settings and click **Next** until the installation location is set for all components.



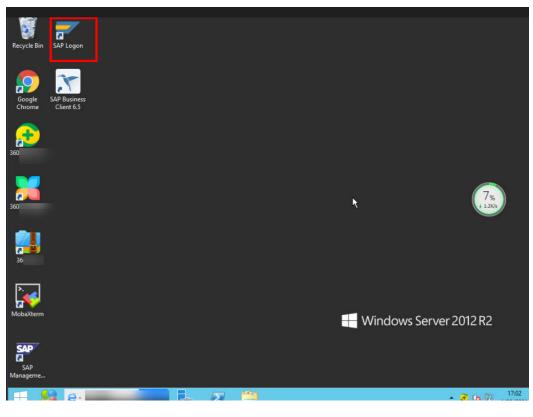


#### **Step 5** Start the installation.

**Step 6** After the installation is complete, restart the computer as required. You can restart it during off-peak hour.



#### **Step 7** Restart the computer.



----End

## 2.6 Verifying the Installation

## 2.6.1 Checking Instance Status

#### Procedure

**Step 1** Log in to the ECS as the **root** user and switch to the **sidadm** user.

su - s01adm

sapondb2:/db2sts/sap\_on\_db2/swpm # v1 /etc/passwd
sapondb2:/db2sfs/sap\_on\_db2/swpm # su - s0ladm
control = 20 control

**Step 2** Run the following commands to check the instance status:

sapcontrol -nr 01 -function GetProcessList

sapcontrol -nr 02 -function GetProcessList

```
saputiunzi/unzsis/sap uti unz/swpiii # su - sutauiii
sapondb2:s01adm 2> sapcontrol -nr 01 -function GetProcessList
uncti
03.03.2021 14:12:34
GetProcessList
0K
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
msg_server, MessageServer, GREEN, Running, 2021 03 03 12:02:44, 2:09:50, 5
enserver, EnqueueServer, GREEN, Running, 2021 03 03 12:02:44, 2:09:50, 570
sapondb2:s01adm 3> sapcontrol -nr 02 -function GetProcessList
03.03.2021 14:12:37
GetProcessList
0K
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
disp+work, Dispatcher, GREEN, Running, 2021 03 03 12:14:20, 1:58:17, 14414
igswd_mt, IGS Watchdog, GREEN, Running, 2021 03 03 12:14:20, 1:58:17, 1441
gwrd, Gateway, GREEN, Running, 2021 03 03 12:14:23, 1:58:14, 14435
icman, ICM, GREEN, Running, 2021 03 03 12:14:23, 1:58:14, 14436
sapondb2:s01adm 4>
sapondb2:s01adm 4>
```

```
----End
```

## 2.6.2 Using SAP GUI to Connect to the SAP Application

**Step 1** Log in to the ECS running Windows, open the SAP GUI, and click **Variable Login**.

		SAP Logon 750			_ 7
rlable Logon New Item Change Iter	n Delete Item		R	Explore	r View
	Connection	15		🗊 🛛 Filter It	ems
Favorites	Name	System Description	SID Gr	oup/Server Insta	Message
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Step 2 Double-click the User Specified System.

		SAP Logon 750	
	L	ogon to System	
Select o	ne of the available systems from the parameters yourself.	list below if you choose the first entry, you can spec	cify the
V	Search For:	Cigar Filter	
SID	Description User Specified System		
<b>₽</b> 50	1 S01	-	

**Step 3** Enter the IP address of SAP on DB2, instance ID of PAS, and SID, and click **Next**.

Phones the connection have and	change the system parameters as required. Butt	and these of and these
On' are only active when all requi	red input data has been entered.	UNS NEXT > and LOY
Connection Type:	Custom Application Server	~
System Connection Paramete	rs	
Application Server:	ecssap1	
Instance Number:	00	
System ID:	sopl	
SAProuter String		
are rearing only		
Use this page as the first pag	e for subsequent logons; setting takes effect imm	hediately

**Step 4** Retain the default settings and click **Next**.

	SAP Logon 750	
	Logon to System	>
Choose	network settings.	
Secure	Network Settings	
5	Activate Secure Network Communication	-
-	SNC Name	-
	Authentication only	
	Integrity protection	
	Privacy protection	
	Maximum security settings available	
	SNC logon with user/password (no Single Sign-On)	
Netwo	rk Settings	
	High Speed Connection (LAN)	
	Low Speed Connection (Reduced Network Traffic)	
	Low Speed Connection (Reduced Network Tranic)	
	Low Speed Connection (Reduced Remork Tranic)	
	Help Cancel < Back Next >	Log On

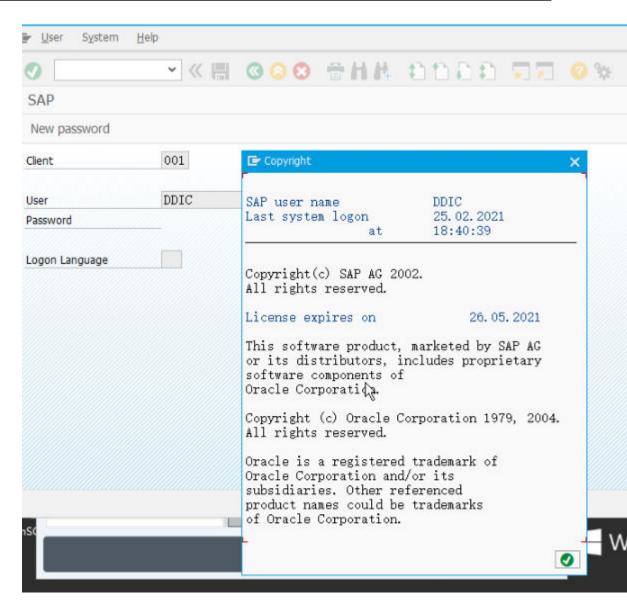
Step 5 Click Log On.

			SAP Logon 750	
		Logon to	System	×
elect code ownload.	pages for communication	on between SAP	GUI and application server / file up	pload and
Communic	ation Language / Cod	le Page	R	
server.		d only in very rare	nmunication between SAP GUI and cases when legacy products are	
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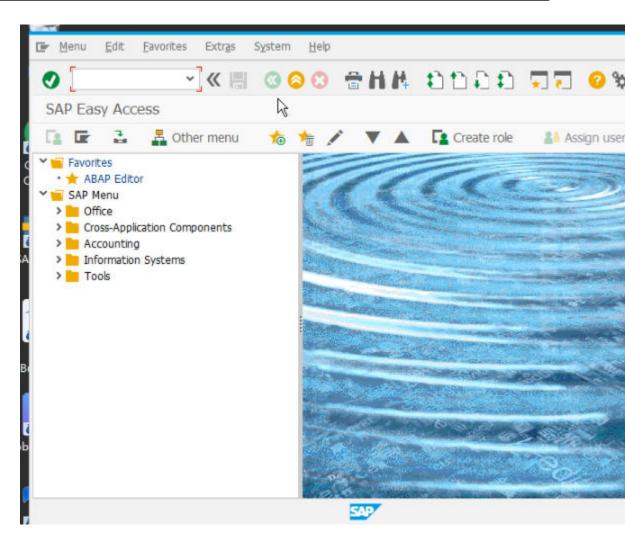
**Step 6** Enter the username **ddic** and password, and press **Enter**.

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Logen Language						

Step 7 Click Yes.



Step 8 Enter slicense in the search box and press Enter to view the hardware key.



0		~	« 🗒 🔘	0	會自然	111	1 🗐 🔁	0
SAP I	icen	se Administra	ation					
9	.r. 1	12 i Onlir	e Documentation	1				
Current	Settin	qs						
Active Hardware Key Installation Number			B126984	2796	2.2			
			INITIAL					
License	Expire	s On	01.06.2	021	B			
System	Numb	er	System :	no. enj	pty			
		^		e Key				
	NetW	Veaver_DB6	A valid licer		or this software	product is requi	red to operate t	this syste
00 <b>=</b> Insta		Veaver_DB6 enses in Database			or this software	product is requi	red to operate 1	this syste
Insta	lled Lic	and the second	8		or this software	product is requi Valid From	red to operate t Valid To	this syste Type
Insta Sta	lled Lic	enses in Database	8		Limit			
Insta Sta	lled Lic	enses in Database Hardware Key	e SW Product		Limit	Valid From	Valid To	Туре
Insta Sta	lled Lic	enses in Database Hardware Key	e SW Product		Limit	Valid From	Valid To	Туре
Insta Sta	lled Lic	enses in Database Hardware Key	e SW Product		Limit	Valid From	Valid To	Туре
Insta Sta	lled Lic	enses in Database Hardware Key	e SW Product		Limit	Valid From	Valid To	Туре

----End

# 2.7 Change History

#### Table 2-8

Change History	Date	Prepared By	
Initial version	2021-05-20	Fu Chuandong/00469497	

# **3** Huawei Cloud SAP on SQL Server Installation Best Practice

About This Document Pre-installation Preparations Resource Planning Preparing for SAP Installation SAP Software Installation Installation Verification FAQ Change History

## **3.1 About This Document**

This document provides guidance for preparing resources (such as cloud servers and network resources) on the public cloud platform and installing SAP on SQL Server. SAP is authorized in Bring Your Own License (BYOL) mode. You need to log in at **SAP Support Portal** to purchase licenses.

This document cannot replace the standard SAP document. If you have any trouble in installing and using SAP due to its own problems, contact the SAP technical support.

This document is written based on the Windows OS. The deployment methods mentioned in the document are only for reference. Install SAP on SQL Server by referring to the standard SAP installation manual or based on site requirements.

For details about the official SAP installation guide and related notes, see the following documents:

- SAP Installation Guides
- SAP Notes
- SAP Library

## **3.2 Pre-installation Preparations**

#### Logging in to Huawei Cloud

Before deploying the SAP system on Huawei Cloud, register a HUAWEI ID and enable Huawei Cloud services. Through this account, you can use Huawei Cloud services and pay only for the services you use.

For details, see Registering a HUAWEI ID and Enabling Huawei Cloud Services.

You can log in to Huawei Cloud using any of the methods described in **Logging In** to Huawei Cloud.

#### SAP License

SAP is authorized in Bring Your Own License (BYOL) mode. In this mode, you need to log in to the SAP Support Portal and apply for a license.

## **3.3 Resource Planning**

### 3.3.1 Network Planning

The network information needs to be planned based on application scenarios and SAP planning. The following table lists the network segments and IP addresses required for installing standard SAP on SQL Server. You can configure it based on site requirements.

Parameter	Description	Example
IP address of the server/client plane	Specifies the IP address of the primary NIC plane. The ABAP SAP Central Services (ASCS) nodes communicate with the SAP GUI and SAP databases using this IP address.	ASCS/Primary Application Server (PAS) node: 10.10.0.2 SQL node: 10.10.0.2 Additional Application Server (AAS) node: 10.10.0.3

## 3.3.2 Security Group Planning

#### SAP Security Group Planning

The security group planning needs to meet the requirements for communication between SAP nodes over the management plane and internal communication plane. You need to configure the security group together with the network department. For details about SAP's requirements for security group rules, see TCP/IP ports used by SAP applications.

You can configure the security group by referring to Table 3-1.

## **NOTE**

- Plan the network segments and IP addresses based on the site requirements. The following security group rules are for reference only. You can configure your own security group rules as needed.
- In the following table, *##* stands for the SAP instance number, which must be consistent with the instance number specified when the SAP software is installed.

Table 3-1 SAP node secur	rity group rules
--------------------------	------------------

Source/ Destination	Protocol	Port Range	Description
Inbound	•		
Automatically specified by the system	All	All	Security group rule created by the system by default It enables ECSs in the same security group to communicate with each other.
10.10.0.0/24	ТСР	32##	Allows SAP GUI to access SAP.
10.10.0.0/24	ТСР	36##	Message port with profile parameter rdisp/msserv
10.10.0.0/24	ТСР	5##13 ~ 5##14	Allows ASCS to access SAP application server.
10.10.0.0/24	ТСР	33##, 38##, 48##	Port used by CPIC and RFC
10.10.0.0/24	ТСР	22	Allows SAP to be accessed using SSH.
10.10.0.0/24	ТСР	123	Allows other servers to synchronize time with SAP.
Outbound			
All	All	All	Security group rule created by the system by default Allows SAP to access all peers.

## 3.3.3 File System Planning

When the SAP system is installed, a home directory is automatically created. The following describes the directory planning for the SAP system.

Directory Type	Directory Structure	Description
SAP System	\usr\sap \usr\sap\trans	SAP kernel and related files SAP transport directory
Database Management System (DBMS)	\Program Files\Microsoft SQL Server	SQL Server program files including the master, msdb and model database files.
SAP Database	\ <sapsid>DATA0 \<sapsid>DATA1 \<sapsid>DATA2 \<sapsid>DATA3  \<sapsid>DATA<n></n></sapsid></sapsid></sapsid></sapsid></sapsid>	Database data files <0- N>
SAP Database Transaction Log	\ <sapsid>log<n></n></sapsid>	Database transaction log files
Tempdb	\Tempdb	Tempdb data files

#### Table 3-2

# 3.3.4 Software and Hardware Planning

## Hardware Planning

The following table lists the requirements for the SAP hardware disk space. For details, see **SAP official document**.

Item	Requirement
Minimum Disk Space	Database software:4 GB
	<ul> <li>ABAP central services instance (ASCS) (not including paging file):</li> </ul>
	5 GB (x64)
	8 GB (IA64)
	<ul> <li>Database instance (not including paging file):18 GB</li> </ul>
	<ul> <li>Primary application server instance (not including paging file):</li> </ul>
	5 GB (x64)
	8 GB (IA64)
	<ul> <li>Additional application server instance (not including paging file):</li> </ul>
	2.5 GB (x64)
	5 GB (IA64)
	• SAP Host Agent:256 MB
	<ul> <li>Temporary disk space for every required installation medium that you have to copy to a local hard disk:Up to 6 GB</li> </ul>
Minimum Memory	All instances, except SAP Host Agent:4 GB
	• SAP Host Agent:0.5 GB
CPU	> 2 cores

#### Table 3-3

## **Software Planning**

The following table lists the requirements of the SAP application and database for OS. For details, see **SAP official document**.

## Table 3-4

ltem	Requirement
Windows OS	64Bit
	It must be later than Windows Server 2008 (R2).

Item	Requirement
Database	ABAP central services instance (ASCS), primary application server instance, or additional application server instance:
	SQL 2014 and higher ODBC Driver for SQL Server.
	SQL Server 2012 or SQL Server 2008 (R2) Native Access Client (SNAC) software
	Database instance:o
	SQL 2008 (R2) and higher: Enterprise Edition: Server Softwareo
	Latest service pack and hotfix, if available.
	SQL_Latin1_General_CP850_BIN2
SAP Kernel Version	SAP kernel 7.40 and higher: IP Multicast Configu-ration
	Make sure that you have applied the operating system patches required for IP Multicast Config-uration.
Region	English (United States) must be set by default. For more information about localized Windows versions, see SAP Note 362379.
	You can install additional languages but the default setting for new users must always be English (United States).
Browser	Use the latest version of the following browsers:
	<ul> <li>Microsoft Internet Explorer 11 or higher</li> </ul>
	•Microsoft Edge
	•Mozilla Firefox
	•Google Chrome

## 3.3.5 ECS Planning

• SAP ECS specifications

Before applying for SAP ECSs, evaluate the SAP Application Performance Standard (SAPS) value based on the standard SAP Sizing method. Then apply for the ECSs based on the evaluation results. For details, see **SAP Quick Sizer**. For details about the minimum disk space, RAM, and software requirements of each SAP component, see the **SAP Installation Guides**. SAP-certified ECSs must be used for installing the SAP application. For details, see SAP Note 2582296 - SAP Applications on Huawei Cloud Supported Products and ECS VM types.

• Operating system

The following table lists the OS supported by SAP ECSs.

ECS Name	Flavor	Disk	Image	Remarks
ecssap1	m6.2xlarge.8	System disk: 100 GB, ultra- high I/O Data disk: 250	Windows Server 2012 R2 Standard 64- bit English (40	Used for installing SAP ERP and SQL Server
ecssap2	m6.xlarge.8	GB, ultra-high I/O	GB)	Used for installing AAS and SAP GUI

• SAP node planning

Host Name	Server/Client IP Address	Туре	Instance Number	SID
ecssap1	10.10.0.2	ASCS Instance	01	S01
		PAS Instance	02	
		DB Instance	None	
ecssap2	10.10.0.3	AAS Instance	03	

# 3.4 Preparing for SAP Installation

## 3.4.1 Creating a VPC

A VPC is logically isolated, configurable, and manageable virtual network for cloud servers, cloud containers, and cloud databases. It improves resource security and simplifies network deployment on the cloud. With a VPC, you can configure and manage the networks in the VPC, and make changes to these networks as needed, quickly and securely. For more information about VPC, see VPC Overview.

When creating a VPC, create the subnet 10.10.1.0, which is used as the server/ client plane IP address and system replication/heartbeat plane IP address of SAP and DB2.

## Procedure

**Step 1** Log in to the management console.

**Step 2** Click <sup>1</sup> in the upper left corner and select the desired region and project.

**Step 3** In the navigation pane on the left, click = and choose **Network** > **Virtual Private Cloud**.

siden	HUAWEI CLOUD Console	le	🗣 Bangkok 👻		Sea	arch Q Billing	Center	Resources Service Tickets	Enterprise	Develop Tools	ICP License	Support	English	ganyang fuchuandong	e
Ξ	Service List >		Enter a service or function name.			Q			×			📝 Quick Lir	iks 📕	Create Security Gr	oup
٢	Elastic Cloud Server		Recently Visited Services: Elastic Cloud Server	Virtual Private Network Identity and	Access N	danagement Object Storage Service							_		
& m	Relational Database Service		Computing Elastic Cloud Server	Storage Elastic Volume Service		Network Virtual Private Cloud		Database GaussDB						VPC more secure. ss each other. Learn	, ×
6	Bare Metal Server		Bare Metal Server	Dedicated Distributed Storage Service Storage Disaster Recovery Service		Elastic Load Balance Direct Connect	*	Relational Database Service Document Database Service	*						
0	Elastic Volume Service Volume Backup Service		Image Management Service FunctionGraph	Cloud Server Backup Service Cloud Backup and Recovery		Virtual Private Network Domain Name Service		GaussDB NoSQL Distributed Database Middleware		<ul> <li>Na</li> <li>rprise Project</li> </ul>	me	• Opera	tion	Q	С
Ø	Virtual Private Cloud		Auto Scaling	Volume Backup Service Object Storage Service	*	NAT Gateway Elastic IP		Data Replication Service Data Admin Service		ult		Mana	ge Rule   N	tore 💌	
 @	Elastic Load Balance		Dedicated Host	Data Express Service Scalable File Service		Cloud Connect VPC Endpoint		Security							
Ð	Elastic IP		Application AppCube	CDN Cloud Storage Gateway		Container		DDoS Mitigation Web Application Firewall							
			ServiceStage Cloud Service Engine	Management & Deployment		Cloud Container Engine Cloud Container Instance		Vulnerability Scan Service Host Security Service							
			Cloud Service Engine ServiceComb Distributed Cache Service Redis	OneAccess Cloud Trace Service		Software Repository for Container Multi-Cloud Container Platform		Container Guard Service Data Security Center							
			Distributed Cache Service Memcached Distributed Message Service	Cloud Eye Application Operations Management		CCE Aglie Application Service Mesh		Database Security Service Data Encryption Workshop							
			Distributed Message Service for Kafka Distributed Message Service for Rabbit	Application Performance Management Identity and Access Management		Application Orchestration Service		Cloud Certificate Management Se Managed Detection Response	nice						F
			Distributed Message Service for High R Simple Message Notification	Log Tank Service Tag Management Service		Migration Server Migration Service		Situation Awareness Managed Threat Detection							
			Blockchain Service API Gateway	Resource Management		Object Storage Migration Service Cloud Data Migration		SSL Certificate Manager							

- **Step 4** Click **Create VPC** on the right of the page.
- **Step 5** Configure required parameters as prompted based on **Table 3-5**.

HUAWEI CLOUD   Console		Search	۵	Billing Center	Resources	Service Tickets	Enterprise	Develop Tools		English	ganyang fuchuandong	ΙB
=	Create VPC 🔞											
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Basic Information Region Name IPv4 CIDR Block		glon.	16-24 (Select) PC in the current re	gion. If you inte							
<b>6</b>	Enterprise Project Advanced Settings •	-select C C	eate Enterprise Project	0								
	Default Subnet AZ Name IPv4 CIDR Block IPv6 CIDR Block	A21         •         •         •           submet 6074         112         •         16         •         0         /         24           112         •         16         •         0         /         24           112         •         16         •         0         /         24           112         •         16         •         0         /         24           The CRR biol charmed to modified after the subset is         •         •         0         •         0		IP Addresses: 251								
	Free								Create Now			

Parameter	Description					
Region	A region is a geographical area where you can run your VPC service. Each region comprises one or more AZs and is completely isolated from other regions. Only AZs in the same region can communicate with one another through an internal network. You can use the region selector on the upper left of the page to change the region.					
Name	VPC name					
CIDR Block	The CIDR block of the VPC. The CIDR block of a subnet can be the same as the CIDR block for the VPC (for a single subnet in the VPC) or a subset of the CIDR block for the VPC (for multiple subnets in the VPC).					
	The following CIDR blocks are supported:					
	10.0.0/8~24					
	172.16.0.0/12~24					
	192.168.0.0/16~24					
	Configure the CIDR block based on the subnet information provided in <b>Network Planning</b> .					
Enterprise Project	The enterprise project to which the VPC belongs.					
	An enterprise project facilitates project- level management and grouping of cloud resources and users. The name of the default project is <b>default</b> .					
	For details about creating and managing enterprise projects, see the <b>Enterprise Management User Guide</b> .					
Tag	The VPC tag, which consists of a key and value pair. You can create 10 tags for a VPC. This parameter is optional. Click <b>Advanced Settings</b> to configure it. For details about the tag naming rules, see <b>VPC Tag Naming Rules</b> .					
	Region Name CIDR Block Enterprise Project					

Table 3-5 Parameters required for creating a VPC

ltem	Parameter	Description
Default Subnet	AZ	An AZ is a geographic location with independent power supply and network facilities in a region. AZs are physically isolated, and AZs in the same VPC are interconnected through private networks.
	Name	Subnet name
	CIDR Block (of the subnet)	The CIDR block for the subnet. This value must be within the VPC CIDR block. Configure the subnet CIDR block based on the information provided in <b>Network Planning</b> .
	Advanced Settings	Click <b>Advanced Settings</b> to set parameters such as <b>Gateway</b> and <b>DNS</b> <b>Server Address</b> .
	Gateway	The gateway address of the subnet.
	DNS Server Address	External DNS server addresses are used by default. If you need to change the DNS server address, ensure that the DNS server addresses you configured are available.
	DHCP Lease Time	The period during which a client can use an IP address automatically assigned by the DHCP server. After the lease time expires, a new IP address will be assigned to the client. The unit is day.
	Tag	The subnet tag, which consists of a key and value pair. You can add 10 tags for a subnet. This parameter is optional. For details about the tag naming rules, see VPC Tag Naming Rules.
Add Subnet	You can click <b>Add Su</b>	bnet to add a subnet.

## Step 6 Click Create Now.

----End

## 3.4.2 Creating a Security Group

A security group is a collection of access control rules for ECSs that have the same security protection requirements and are mutually trusted. After a security group is created, you can create various access rules for the security group, and these rules will apply to all ECSs added to this security group. For more information about security groups, see **Security Group Overview**.

## Procedure

**Step 1** Create a SAP security group.

Choose **Access Control** > **Security Groups** in the navigation pane on the left of the VPC console. On the **Security Groups** page, click **Create Security Group**.

HUAWEI CLOUD	rsole 🛛 Bangkok 🔹	Search	Q Billing Center	Resources Service Tickets	Enterprise Develop Tools ICP License	Support English ganyang   Tuchuandong
Network Console	Security Groups ③					Quick Links Create Security Gro
Dashboard	A security group implements access control for servers (such	a as BMSs and ECSs) that have the same security protecti	on requirements in a VPC. You ca	n define inbound and outbound	rules to control traffic to and from the servers in a	security group, making your VPC more secure.
Virtual Private Cloud	Your account comes with a default security group named Sy more about the default security group rules. You can also cr	/s-default, which has default security group rules. The def	ault outbound rule allows all out	bound traffic, and the default in	oound rule denies all inbound traffic. All servers wi	thin a security group can access each other. Learn
Subnets	more about the detault security group rules. You can also cr	eate new security groups based on your requirements. Le	am now to create a security grou	ip.		
Route Tables					All projects	• Q
Access Control	Name	Security Group Rules	Associated Instances	Bernhalter	Enterprise Project	Operation
Security Groups	Name default	security Group Rules		default	default	Manage Rule   More +
Network ACLs	verauit	13	30	deladit	GENDEL	Manage Kole   More +
VPC Flow Logs						
Elastic IP and Bandwidth						
NAT Gateway						
Elastic Load Balance						
VPC Peering						
VPC Endpoint						
Virtual Private Network	e					
Direct Connect	e					
Cloud Connect	e					
Elastic Cloud Server	e					

**Step 2** Set required parameters to create a security group.

- **Template**: The template contains security group rules, which help you quickly create a security group. The following templates are provided:
  - **Custom**: This template allows you to create security groups with custom security group rules.
  - General-purpose web server: The security group that you create using this template is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and allow inbound traffic on ports 22, 80, 443, and 3389.
  - All ports open: The security group that you create using this template includes default rules that allow inbound traffic on any port. Note that allowing inbound traffic on any port poses security risks.
- **Name**: specifies the name of the security group. Name the security group that is easy to identify, for example, **sg\_sap\_**.
- **Enterprise Project**: You can add the security group to an enabled enterprise project. You can select an enterprise project from the drop-down list, for example, **SAP**.

n as BN	1Ss and ECSs) that have the	e same security protection requirements in a VPC. You can define inbound	and outbou
rs-c reat	Create Security C	Group	× <sub>ault</sub>
L	* Name	sg-54a8	
	* Enterprise Project	Select   C Create Enterprise Project	
÷	* Template	General-purpose web server 🔹	
	Description	The security group is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and inbound traffic on ports 22, 80, 443, and 3389. The security group is used for remote login, ping, and hosting a website on ECSs.	
l	Show Default Rule 🔻	OK Cancel	

Step 3 Click OK. Locate the row that contains the newly created security group, and click Manage Rule in the Operation column to switch to the page for managing inbound and outbound rules. On the Inbound Rules tab, click Add Rule. In the displayed dialog box, add the desired ports listed in Security Group Planning.

< default				십 Import Rule C
Summary   Inbound Rules   Outbound Rules	Associated Instances			
Add Rule Fast-Add Rule Delete Allow	Common Ports Inbound Rules: 12 Learn more	about security group configuration.		
Protocol & Port 🍞 🕐	Туре	Source (2)	Description	Operation
All	1Pv4	default (?)	-	Modify   Replicate   Dele
TCP:111	1Pv4	0.0.0.0.0	Create by sfs turbo	Modify   Replicate   Dele
C TCP : 445	1Pv4	0.0.0.00 ②	Create by sfs turbo	Modify   Replicate   Dele
TCP : 2049	IPv4	0.0.0.00 ②	Create by sfs turbo	Modify   Replicate   Dele
TCP : 2051	IPv4	0.0.0.0/0 ②	Create by sfs turbo	Modify   Replicate   Dele
TCP : 2052	IPv4	0.0.0.0/0 ③	Create by sfs turbo	Modify   Replicate   Dele
C TCP : 18522	IPv4	0.0.0.0/0 ⑦	-	Modify   Replicate   Dele
TCP : 20048	IPv4	0.0.0.0/0 ③	Create by sfs turbo	Modify   Replicate   Dele
TCP: 30015	IPv4	0.0.0.0/0 ③	-	Modify   Replicate   Dele
CP: 33899	IPv4	0.0.0.0/0 ③	-	Modify   Replicate   Dele

----End

# 3.4.3 Creating ECSs

You need to create two ECSs. One is used to install the SAP application and SQL Server, and the other is used to install AAS.

Name	Flavor	Disk	Image	Remarks
ecssap1	m6.2xlarge.8	System disk: 100 GB, ultra-high I/O Data disk: 250	Windows Server 2012 R2 Standard 64-bit English (40 GB)	Used for installing SAP ERP and SQL Server
ecssap2	m6.xlarge.8	GB, ultra-high I/O		Used for installing AAS and SAP GUI

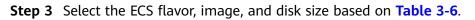
Table 3-6 ECS details

**Step 1** Log in to the HUAWEI CLOUD management console, click the service list icon, and choose **Computing** > **Elastic Cloud Server**.

														ganyang fuchuandong
Service List >	Enter a service or function name.					Q			×			📝 Quick	Links	Create Security
Elastic Cloud Server	Recently Visited Services: Virtual Pri	ivate Cloud	Elastic Cloud Server	Virtual Private Ne	stwork	Identity and Access Management	Object S	torage Service						
Relational Database Service	Computing		Storage			Network		Database		c to and fr	om the servers in a t	ecurity group,	making your V	PC more secure
Auto Scaling	Elastic Cloud Server		Elastic Volume Service			Virtual Private Cloud		GaussDB		inbound t	raffic. All servers with	nin a security o	group can acces	s each other. Le
	Bare Metal Server		Dedicated Distributed St	orage Service		Elastic Load Balance		Relational Database Service						
Bare Metal Server	Cloud Phone		Storage Disaster Recover	ry Service		Direct Connect		Document Database Service						
Elastic Volume Service	Image Management Service		Cloud Server Backup Ser	vice		Virtual Private Network		GaussDB NoSQL		×	Name	Ψ		Q
Volume Backup Service	FunctionGraph		Cloud Backup and Recov	iery		Domain Name Service		Distributed Database Middle	vare	rprise Proje	xt	Opi	eration	
	Auto Scaling		Volume Backup Service		۰.	NAT Gateway		Data Replication Service				Ma	nage Rule   Mi	
Virtual Private Cloud	Dedicated Cloud		Object Storage Service			Elastic IP		Data Admin Service		un			nage none - mi	
Elastic Load Balance	Dedicated Host		Data Express Service			Cloud Connect								
Domain Registration			Scalable File Service			VPC Endpoint		Security						
-	Application		CDN					DDoS Mitigation						
Elastic IP	AppCube		Cloud Storage Gateway			Container		Web Application Firewall						
	ServiceStage					Cloud Container Engine		Vulnerability Scan Service						
	Cloud Service Engine		Management & Depl	oyment		Cloud Container Instance		Host Security Service						
	Cloud Service Engine ServiceComb		OneAccess			Software Repository for Container		Container Guard Service						
	Distributed Cache Service Redis		Cloud Trace Service			Multi-Cloud Container Platform		Data Security Center						
	Distributed Cache Service Memcache	ed	Cloud Eye			CCE Agile		Database Security Service						
	Distributed Message Service		Application Operations M	Management		Application Service Mesh		Data Encryption Workshop						
	Distributed Message Service for Kaf	a	Application Performance	Management		Application Orchestration Service		Cloud Certificate Managemer	it Service					
	Distributed Message Service for Rabi	bit	Identity and Access Man	agement				Managed Detection Response						
	Distributed Message Service for High	h R	Log Tank Service			Migration		Situation Awareness						
	Simple Message Notification		Tag Management Servio	e		Server Migration Service		Managed Threat Detection						
	Blockchain Service		Resource Management			Object Storage Migration Service		SSL Certificate Manager						
	API Gateway					Cloud Data Migration		Cloud Bastion Host						

Step 2 Click Buy ECS.

Cloud Server Console	Elastic Cloud Server ③					Quickly learn login methor	is and security group configura	C Feedback		EP Quick Links	
Dashboard	We would much appreciate if you could complete	e our questionnaire o	n Elastic Cloud Serve	er. Your feedback will help	us provide a better user experier		o and occarry group compare			is ogain.	-
Elastic Cloud Server											
Dedicated Host	Start Stop Reset Password	More *								C 🕲 🖸	8
Bare Metal Server	Searched by name by default.										
Elastic Volume Service 🔹		Monitoring	AZ 🏹	Status 🍞	Specifications/Image	IP Address	Billing Mode 🖓	Enterprise Project	Tag	Operation	
Image Management Service		Ø	AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	м
Auto Scaling •		Ø	AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	М
ECS Group		Ø	AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	м
Cloud Backup and P Recovery		Ø	AZ1	Stopped			Pay-per-use Created on May 21,	SAP		Remote Login	м
Cloud Server Backup d <sup>0</sup> Service		國	AZ2	Stopped			Pay-per-use Created on May 20,	SAP		Remote Login	м
Volume Backup Service d <sup>a</sup> Elastic Load Balance d <sup>a</sup>		Ø	AZ2	Stopped			Pay-per-use Created on May 18,	SAP		Remote Login	м
Elastic IP d <sup>o</sup> Security Group d <sup>o</sup>		۲	AZ2	Stopped Locked by S.			Pay-per-use Created on May 17,	default		Remote Login	м
Security Group d <sup>9</sup>		國	AZ2	Stopped Locked by S.			Pay-per-use Created on May 17,	default		Remote Login	м
		•	AZ1	Stopped			Pay-per-use Created on May 13	SAP		Remote Login	1.04



CARLE OLOOD	100A		Search	Q ching control inc.	sources service notes enterprise	bereispiloob ier elenne sopport er	fuchuandong
	🔘 mőlarge.8	2 vCPUs   16GIB	Intel Cascade Lake 3.0GHz	1.2 / 4 Gbit/s	400,000	No ¥1.03/hou	11
	O m6.xlarge.8	4 vCPUs   32GIB	Intel Cascade Lake 3.0GHz	2.4 / 8 Gbit/s	800,000	No ¥1.99/hot	Ir
	m6.2xlarge.8	8 vCPUs   64GIB	Intel Cascade Lake 3.0GHz	4.5 / 15 Gbit/s	1,500,000	No ¥4.05/hou	ir .
	m6.3xlarge.8	12 vCPUs   96GIB	Intel Cascade Lake 3.0GHz	7 / 17 Gbit/s	2,000,000	No ¥6.04/hou	ır
	m6.4xlarge.8	16 vCPUs   128GiB	Intel Cascade Lake 3.0GHz	9 / 20 Gbit/s	2,800,000	No ¥8.03/hou	Ir
	M6.6xlarge.8 (Sold Out) Available Regions/AZs	24 vCPUs   192GIB	Intel Cascade Lake 3.0GHz	14 / 25 Gbit/s	4,000,000	No ¥12.08/hc	bur
	Min	32 vCPUs   256GIB	Intel Cascade Lake 3.0GHz	18 / 30 Gbit/s	5,500,000	No ¥16.13/ht	Jur
	Selected specifications Memory-optin	nized   m6.2xlarge.8   8 vCPUs	64GiB				
Image Host Security	Public image         Private image           If Windows         Windows           Stelet: the OS language.         Windows           If Public OS language.         Trable OS language.           If Public OS language.         Stelet: the OS language.	Shared Image	it Chinese(40GB)				
System Disk			600, IOPS <u>burst limit</u> : 5,000 ⑦				C C C
Data Disk		250 + GIB IOPS limit: 3,0	00, IOPS <u>burst limit</u> : 5,000 Quantity	- 1 + Show~			
Quantity 1	+ ECS Price This price is an estimate and may differ		ls				Next: Configure Network

**Step 4** Click **Next: Configure Network**. Select the created VPC and security group, confirm the configuration, and click **Next: Configure Advanced Settings**.

		â	0			
1 Configure Basic	: Settings ——— 🕗 Configure Network —	Onfigure Advanced Settings	④ Confirm			
Network	vpc-sap(10.10.0.0/16) Create VPC	• C subnet-hana(10.10.2.0/24)	C Automatically-assigned i	P address   Available private IP addresses: 24	i0 (f)	
Extension NIC	Add NIC You can add 3 more NICs.					
Security Group	default (3471b566-8789-4857-9845-706	83b51462a5) I C Create Secu	ity Group 🔞			
	Similar to a firewall, a security group logic Security Group Rules  Inbound Rules  Outbound Ru					
	Security Group Name	Protocol & Port	Туре	Source ③	Description	
		TCP: 2049	1Pv4	0.0.0.0/0	Create by sfs turbo	
			1Pv4	0.0.0.0/0	Create by sfs turbo	
		UDP: 111	1944			
		UDP: 111 TCP: 445	1Pv4	0.0.0.0/0	Create by sfs turbo	
				0.0.0.0/0	Create by sfs turbo Create by sfs turbo	
		TCP: 445	IPv4			
		TCP: 445 TCP: 2051	IPv4 IPv4	0.0.0.0/0	Create by sfs turbo	

**Step 5** Enter the ECS name and password of the **root** user, and click **Next: Confirm**.

2	HUAWEI CLOUD			: English gariyang   🛃	94
:	< Elastic Cloud S	Gerver		Assured Purchase 🔗 Flexi Purchase	
Ð	(1) Configure Basic Se	Settings ——— (2) Configure Network ———— (3) Configure Advanced Settings ———— (4) Confirm			
5 1 2	ECS Name	encap1         Allow diplicate name           If multiple ECS are created at the same time, the system and contractualy adds. hyperin followed by a four digit incremental number to the end of each ECS name. For example, if you enter ecs and there is no existing E name ecs of all alrandy entits, the name of the inter example. If you enter ecs and there is no existing E	ECS in the system, the first ECS's name	will be ecs-0001. If an ECS with the	
1	Login Mode	Password Key pair Set password later			
ß	Username	Administrator			
5	Password	Reap the parsmoot secure. If you longet the parameter, you can log in to the ECS console and change 4.			
è )	Confirm Password				
	Cloud Backup and Recovery	To use CER, you need to purchase a backup walk. A walk is a container that stores backups for servers.           Auto assign         Use existing         Not required         To			
	ECS Group (Optional)	Arel alfordy			
		Select ECS group			
		Create ECS Group			
			_		
	Quantity 1	+ to prote a unitative and may differ from the final prote. Pricety details		Previous Next: Confirm	1

**Step 6** Select an enterprise project and click **Next**.

			Search	Q Billing Center Resources Service Ti	okets Enterprise De	evelop Tools ICP License Supp	Iuchuanc	
< Elastic Cloud Ser							Assured Purchase 😔	Flexi
<ol> <li>Configure Basic Set</li> </ol>	tings — 2	Configure Network — 3 Configure Advanced Settings	🙆 Confirm					
Note:	The primary networ	k interface does not have an EIP bound, and the ECS cannot access	the Internet.					
Configuration	Basic 🖉							
	Billing Mode	Pay-per-use	Region	Bangkok	AZ	AZ1		
	Specifications System Disk	Memory-optimized   m6.2xlarge.8   8 vCPUs   64GIB High I/O,100GIB	Image Data Disk	Windows Server 2012 R2 Standard 64bit Chinese 1 disks   High I/O, 250GIB	Host Security	Basic		
	Network 🖉							
	VPC EIP	vpc-sap(10.10.0.0/16) No EIP bound to the primary network interface	Security Group	default	Primary NIC	subnet-hana(10.10.2.0/24)		
	Advanced 🖉							
	ECS Name	ecssap2	Login Mode	Password	ECS Group			
Enterprise Project	576 (676	C Create Enterprise Project (2)						
Quantity	- 1 4	You can create a maximum of 980 ECSs. You can create a maxim	num of 500 ECSs at a time. Le	am how to increase quota.				
Agreement	I have read and	agree to the Image Disclaimer.						
								_
ECS Price Price	1008							

- **Step 7** Repeat the preceding steps to create another ECS (ecssap2).
- **Step 8** After ECSs are created, locate the created ECSs in the ECS list and click **Remote Login** in the **Operation** column. Log in to the ECSs as user **root** using VNC.

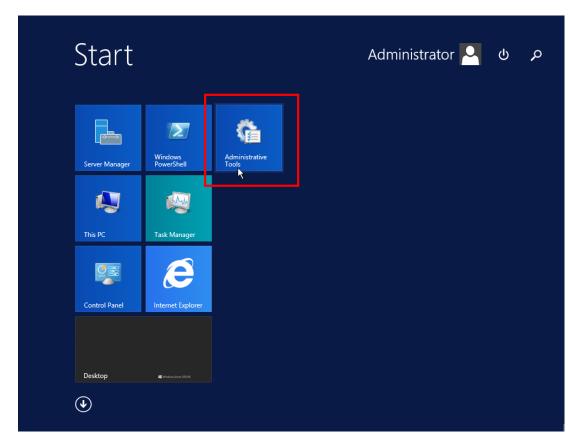
<u>**</u>	HUAWEI CLOUD Consc	le 🛛 Guangzhou 👻	e stillion Conter Buccourse Counter Tickets Enterprise Develop Tools KCP License Supp	ort English ganyang i 🖉
	Cloud Server Console	Elastic Cloud Server ③	Logging In to a Linux ECS	
8	Dashboard	We would much appreciate if you could complete our q	CloudShell-based Login New1 Failed to log in?	×
m e	Elastic Cloud Server Dedicated Host Bare Metal Server	Start Stop Reset Password Mo Searched by name by default.	Ensure that the port used for CloudShell-based logins (port 22 by default) is allowed to access in the security group. CloudShell-based login allows you to copy-paste data across local and remote PCs.	C @ C
0	Elastic Volume Service 🔹	Name/ID	Log In Bitling Mode 🏹 Enterprise Project Tag	Operation
۵ ۵	Dedicated Distributed Storage Service		Payper use Created on May 26. SAP	Remote Login   More 👻
4	Image Management Service		Pay-per-use SAP	Remote Login   More 👻
•	Auto Scaling		Log In using Remote Login or the management controls.           Log In         Pay port usit           Log In         Created on May 12	Remote Login   More 💌
	ECS Group		Log In using a tool, such as p <sup>1</sup> TY or XXHL Learn more Payper-use	Remote Login   More 👻
	Cloud Backup and P Recovery		b) Enter the EIR. Pagn-parture c) Enter username root and parsword, and click OK. Created on May 11 SAP	Remote Login   More 👻
	Cloud Server Backup de Service de Volume Backup Service de		- Log in from a Linux PC or Mac. Pagr-per-use a) Run the following command to set up the connection: Created on May 07 SAP	Remote Login   More 👻
	Elastic Load Balance		Pap-per-use Created on Mar 23 default ···	Remote Login   More +
	Elastic IP d <sup>o</sup> Security Group d <sup>o</sup>		AZZ    Stopped	Remote Login   More +
	accenty woodp 0		A23              Stopped               10.0.0.50 (Physics IP)               Pay per use                  Chasted on Mar 16.	Remote Login   More 👻
			A22      (9) Stopped     St	Remote Login   More 👻

----End

## 3.4.4 Creating Data Disk and Specifying the Size

Perform the following operations on the two ECSs.

Step 1 In the window similar to the following figure, click Administrative Tools.



Step 2 Click Computer Management.

2   🗋 🛄 🖛	Administrative 1	ools		_ □	)
File Home Shar	e View				$\sim$
🔄 🕞 🔻 🕇 🔞 « 4	Il Control Panel Items 🕨 Administrative Tools 🕨	~ ¢	Search Admini	strative Tools	,o
👉 Favorites	Name	Date modified	Туре	Size	
Desktop	Terminal Services	8/22/2013 23:39	File folder		
Downloads	R Component Services	8/22/2013 14:57	Shortcut	2 KB	1
Recent places	🛃 Computer Management	8/22/2013 14:54	Shortcut	2 KB	
		8/22/2013 14-47	Shortcut	2 KB	
🖳 This PC	Event View remote computers.	cess to other tools to m	anage local and	2 KB	1
膭 Desktop	R iSCSI Initiator	8/22/2013 14:57	Shortcut	2 KB	)
📗 Documents	ᡖ Local Security Policy	8/22/2013 14:54	Shortcut	2 KB	)
🐌 Downloads	Microsoft Azure Services	11/22/2014 9:48	Shortcut	2 KB	)
🜗 Music	📷 ODBC Data Sources (32-bit)	8/22/2013 7:56	Shortcut	2 KB	(
📔 Pictures	📷 ODBC Data Sources (64-bit)	8/22/2013 14:59	Shortcut	2 KB	;
📔 Videos	Performance Monitor	8/22/2013 14:52	Shortcut	2 KB	(
🃥 Local Disk (C:)	Resource Monitor	8/22/2013 14:52	Shortcut	2 KB	í
	🛃 Security Configuration Wizard	8/22/2013 14:45	Shortcut	2 KB	1
👊 Network	🔁 Server Manager	8/22/2013 14:55	Shortcut	2 KB	í
	😹 Services	8/22/2013 14:54	Shortcut	2 KB	í
	🛃 System Configuration	8/22/2013 14:53	Shortcut	2 KB	í
	🛃 System Information	8/22/2013 14:53	Shortcut	2 KB	(
	🔝 Task Scheduler	8/22/2013 14:55	Shortcut	2 KB	1
	🞓 Windows Firewall with Advanced Security	8/22/2013 14:45	Shortcut	2 KB	1
	減 Windows Memory Diagnostic	8/22/2013 14:52	Shortcut	2 KB	1
	🔝 Windows PowerShell (x86)	8/22/2013 23:37	Shortcut	3 KB	1
24 items					]==
items					
comp					

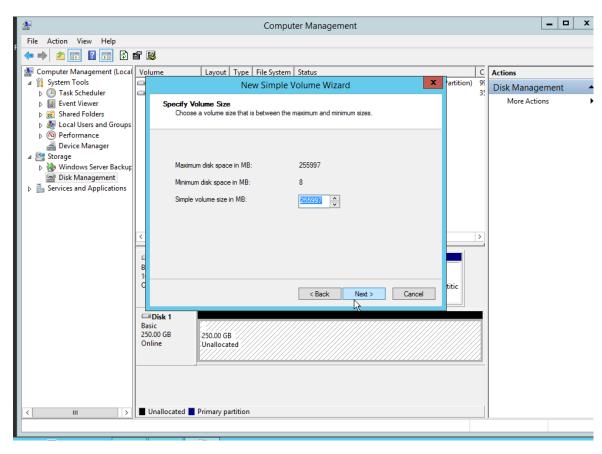
Step 3 Choose Disk Management.

		Computer Management		- 0	x
File     Action     View     Help       Image: Constraint of the second seco	r 🖻 🖻 🔯				
Computer Management (Loca)  System Tools  Computer Management (Loca)  System Tools  Computer Management  Software Folders  Computer Manager  Software Folders  Computer Manager  Software Folders  Software Folders  Software Folders  Software Folders  Computer Management  Software Folders  Computer Management  Software Folders  Computer Management  Computer Manageme	olume a (C:) a System Reserver	Layout       Type       File System       Status         Simple       Basic       NTFS       Healthy (Boot, Page File, Crash Dump, Primary Partition)         Simple       Basic       NTFS       Healthy (System, Active, Primary Partition)         Initialize Disk         You must initialize a disk before Logical Disk Manager can access it.         Select disks:	Actions Disk Manage More Action		•
	Unallocated	Primary partition			
			 		15:01
			- 👍 🖁	2 🐻	1/21/202

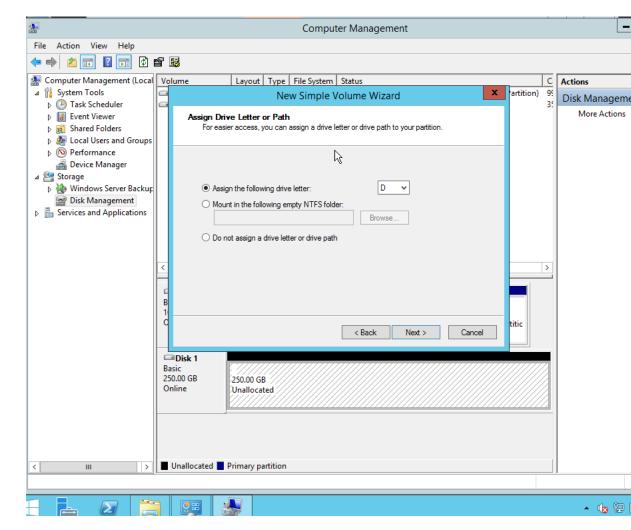
**Step 4** Right-click the disk and choose **New Simple Volume**.

<b>4</b>		Comp	uter Management				x
File Action View Help							
🗢 🤿 🙇 🖬 🚺 🚺	ef 😼						
Computer Management (Local		Layout Type File Syster			C Actions		
⊿ <sup>™</sup> System Tools ▷ (P) Task Scheduler	🕞 (C:)	Simple Basic NTFS I Simple Basic NTFS	Healthy (Boot, Page File, Healthy (System, Active,	Crash Dump, Primary Partition)	99 Disk Man	agement	
I Construction Provide America Construction Provided America Constructica Construction Provid	System Reserved	i simple basic ivirs	Healthy (System, Active,	Primary Partition)	5. More A		•
Shared Folders							
Association of the second s							
Bevice Manager							
⊿ 🔄 Storage							
Windows Server Backup Disk Management							
Services and Applications							
	<				>		
	Disk 0						
	Basic 100.00 GB	System Reserved 350 MB NTFS	(C:) 99.66 GB NTFS				
2	Online	Healthy (System, Active, F	Healthy (Boot, Page File, C	rash Dump, Primary Partitic			
	Disk 1     Basic						
	250.00 GB	250.00 GB			41,		
	Online	Unallocated		New Simple Volume			
				New Spanned Volume New Striped Volume			
				New Mirrored Volume			
				New RAID-5 Volume			
		Deinen undiking		Properties			
< III >	Unallocated	Primary partition		Help			
				Tielp			
- 🔺 🛛 📜					<b>~</b> 📢	8 12 Ro 1	15:02 1/21/202

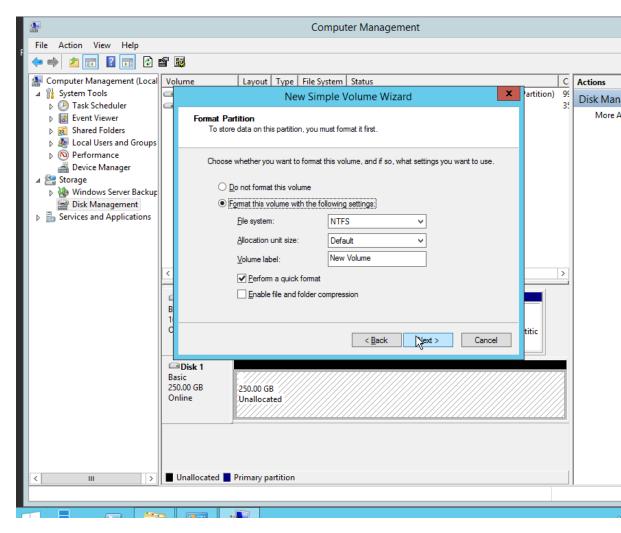
**Step 5** Enter the disk size to be allocated.



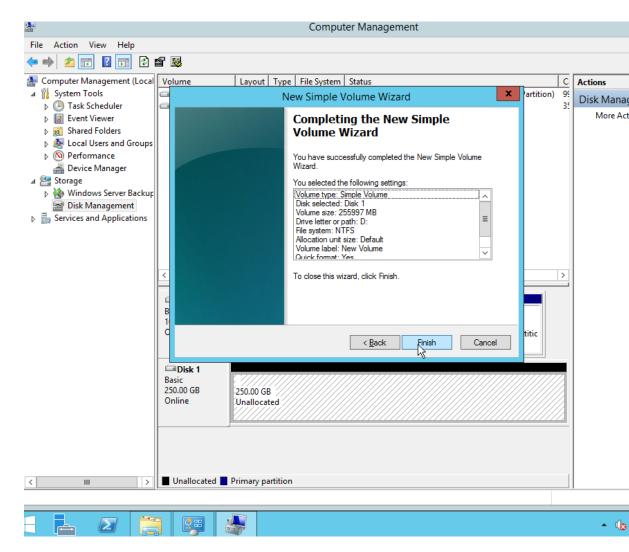
**Step 6** Assign drive letter or path.



**Step 7** Use the default settings, and click **Next**.



Step 8 Click Finish.



----End

## 3.4.5 Customizing the Virtual Memory

Perform the following operations on the two ECSs to set the virtual memory to 64 GB, that is, 65,536 MB.

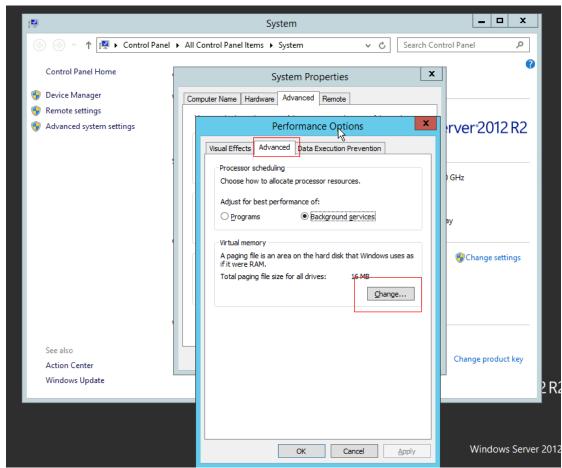
1. Click the start icon in the lower left corner of the PC, right-click **This PC**, and choose **Properties** from the shortcut menu.

Start			Administrator 🎴	ብ	م
Server Manager	Vindows PowerShell	Administrative Tools			
This P Properti Map <u>n</u> et		> \2			
Desktop	dindonsform 20042				

2. Choose Advanced system settings, select Advanced, and click Settings in the Performance area.

1	System	<b>– –</b> X
🔄 💿 🔹 🕇 🛃 🕨 Control Panel	→ All Control Panel Items → System → ♂ C Search Control Panel	el 🔎
Control Panel Home	System 2 roperties	0
<ul> <li>Device Manager</li> <li>Remote settings</li> <li>Advanced system settings</li> </ul>	Computer Name Hardware Advanced Remote You must be logged on as an Administrator to make most of these changes. Performance Visual effects, processor scheduling, memory usage, and virtual memory Settings User Profiles Desktop settings related to your sign-in Settigs By	r°2012 R2
	Startup and Recovery System startup, system failure, and debugging information Settings Environment Variables	hange settings
See also Action Center Windows Update	OK Cancel Apply Char	nge product key

3.



In the displayed dialog box, choose Advanced > Virtual memory > Change.

4. In the **Custom size** area of the displayed dialog box, set **Initial size (MB)** and **Maximum size (MB)** to **65536**. Then, click **Set** and **OK**.

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	System	_ 🗆 X
🍥 💿 🔹 🕇 🕎 ואלי Control Panel 🕨 All Cont	rol Panel Items 🔸 System 🗸 🗸 Search Con	trol Panel 🔎
Control Panel Home View bas	ic information about your computer	0
😵 Device Manager 🛛 🗤 🗤	Performance Options X	ΓΙ
🚱 R System Prop		
Generation Advanced R	Virtual Memory	rver <sup>2</sup> 012 R2
You must be logged on as an Administrator	Automatically manage paging file size for all drives	
Performance Visual effects, processor scheduling, mem	Paging file size for each drive           Drive [Volume Label]         Paging File Size (MB)           C:         65536 - 65536           D:         [New Volume]	10 GHz
User Profiles Desktop settings related to your sign-in	Selected drive: C:	у
	Space available: 86152 MB  Custom size: Initial size (MB):	Change settings
Startup and Recovery System startup, system failure, and debug	Maximum size (MB):     65536       O System managed size     O No paging file         Set	
S A V OK	Total paging file size for all drives Minimum allowed: 16 MB Recommended: 7679 MB Currently allocated: 65536 MB	Change product key
	OK Cancel Apply	

## 3.4.6 Modifying the Registry

The following operations must be performed on the two ECSs. For details, see http://support.microsoft.com/kb/2820470.

#### Resolution

Important This section, method, or task contains steps that tell you how to modify the registry. However, serious problems might occur if you modify the registry incorrectly. Therefore, make sure that you follow these steps carefully. For added protection, back up the registry before you modify it. Then, you can restore the registry if a problem occurs. For more information about how to back up and restore the registry, click the following article number to view the article in the Microsoft Knowledge Base:

322756 How to back up and restore the registry in Windows To resolve this issue in Windows 8 or Windows Server 2012, install the hotfix that is described in this article on the SMB client computer. This hotfix is also available at Microsoft Update Catalog.

To resolve this issue on a Windows 8.1-based, Windows 10-based, Windows Server 2012 R2-based, Windows Server 2016-based, or Windows Server 2019-based SMB client computer, create a new registry key named DisableCARetryOnInitialConnect and set the value of the registry key to 1 by following these steps:

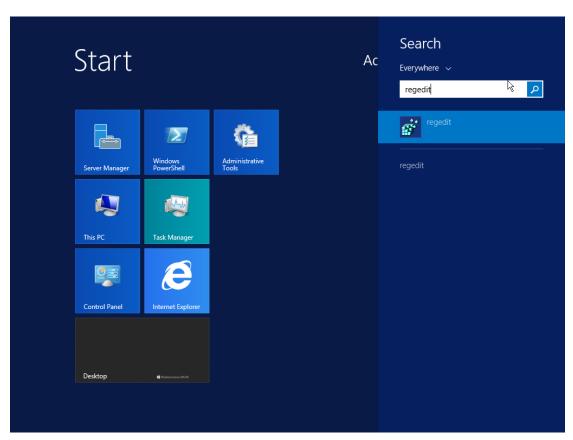
- Swipe in from the right edge of the screen, and then tap Search. Or, if you are using a mouse, point to the lower-right corner of the screen, and then click Search.
- 2. In the search box, type regedit, and then tap or click regedit.

If you are prompted to enter an administrator password, type the password. If you are prompted to provide confirmation, provide confirmation.

- Locate and then tap or click the following registry subkey:
- ${\sf HKEY\_LOCAL\_MACHINE} \\ {\sf System} \\ {\sf CurrentControlSet} \\ {\sf Services} \\ {\sf LanmanWorkStation} \\ {\sf Parameters} \\ {\sf Parameters} \\ {\sf Supplementary} \\ {\sf Supple$
- On the Edit menu, point to New, and then tap or click DWORD Value.
- 5. Type DisableCARetryOnInitialConnect.
- 6. Press and hold or right-click DisableCARetryOnInitialConnect, and then tap or click Modify.
- 7. In the Value data box, type 1, and then tap or click OK.
- 8. Exit Registry Editor.

After you configure the DisableCARetryOnInitialConnect registry key, the Continuous Availability feature is disabled for the initial Server Message Block (SMB) tree connect command that is run against a share. If you want to enable the Continuous Availability feature, set the value of the registry key to 0.

#### 1. Search for regedit.



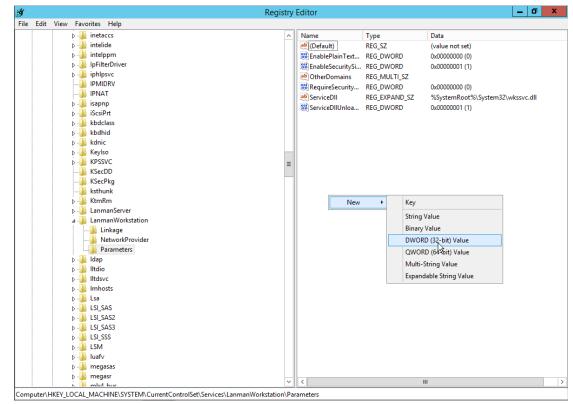
2. Locate and then tap or click the following registry subkey: HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\Services \LanmanWorkStation\Parameters

💣 Registry	Editor			_ 0	x
<u>File Edit View Favorites H</u> elp					
⊿ 📲 Computer	Name	Туре	Data		
HKEY_CLASSES_ROOT	(Default)	REG_SZ	(value not set)		
HKEY_CURRENT_USER					
HKEY_LOCAL_MACHINE					
D - BCD0000000					
DRIVERS					
HARDWARE					
sam					
SOFTWARE					
A SYSTEM					
D- ControlSet001					
ControlSet002					
∠ - LucrentControlSet					
D - L Control					
b 🖟 Enum					
b - → Hardware Profiles					
Policies					
⊳ - 📗 Services					
DriverDatabase					
🔉 - 🌗 HardwareConfig					
		R			
		45			
⊳ Setup					
D-III WPA					
HKEY_USERS					
HKEY_CURRENT_CONFIG					
	<		Ш		>
					,
Computer\HKEY_LOCAL_MACHINE					

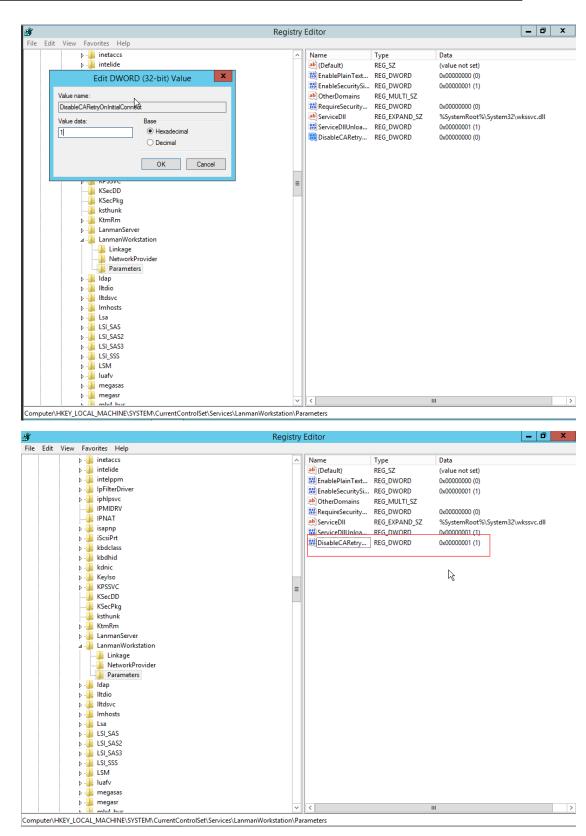
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🗊 Reg	istry	Editor		_ 0	x
File Edit View Favorites Help					
Pile       Edit       View       Pavorites       Help         Pile       initalide         Pile       initelide         Pile       IpfilterDriver         Pile       Ksthunk         Pile       Ksthunk         Pile       Ksthunk         Pile       IpfilterDriver         Pile       IpfilterDriver         Pile       IpfilterDriver         Pile       IpfilterDriver         Pile       IpfilterDriver         Pile       IpfilterDriver         Pile       IpfilterDriver		Name (Default) EnablePeainText TenableSecurityS RequireSecurity ServiceDII ServiceDIIUnIoa	REG_DWORD REG_MULTI_SZ REG_DWORD REG_EXPAND_SZ	Data (value not set) 0x0000000 (0) 0x0000000 (0) %SystemRoot%\System32\wkssvc.dll 0x00000001 (1)	
h in mb/t hue	~	<			>
Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanWorkstatic	on\Pa	rameters			

3. On the **Edit** menu, point to **New**, and then click **DWORD Value**.



 Type DisableCARetryOnInitialConnect. Right-click DisableCARetryOnInitialConnect, and then click Modify. In the Value data box, type 1, and then click OK.



# 3.4.7 Configuring the Hosts Configuration File

Write the private IP addresses and host names of the two ECSs into their hosts files, respectively. C:\Windows\System32\drivers\etc\hosts

```
LIVING.
                         Junio
                                110.00
                                       hosts - Notepad
File Edit Format View Help
# Copyright (c) 1993-2009 Microsoft Corp.
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
# For example:
#
#
      102.54.94.97
                      rhino.acme.com
                                                # source server
#
       38.25.63.10
                      x.acme.com
                                                # x client host
# localhost name resolution is handled within DNS itself.
#
       127.0.0.1
                        localhost
#
       ::1
                        localhost
10.10.0.2
                        ecssap1
10.10.0.3
                        ecssap2
```

After the IP addresses and host names are added to the ECSs, restart them.

# **3.4.8 Downloading and Decompressing the SAP Software Package**

Download the SAP application and SQL Server installation files from the official website, upload them to the OBS bucket, copy them to the ECSs, decompress them, and start the software installation.

For details about how to download the software, see section "4.7 Preparing the Installation Media" in the SAP installation guide.

Download the required software from https://support.sap.com/swdc.

## **Decompressing the Software Packages**

**Step 1** Decompress the swpm package.

🎉 l 💽 🚺 = l	swpm		
File Home Share	View		
🔄 🍥 👻 🕆 퉬 🕨 Th	is PC → New Volume (D:) → SWPM → swpm	► v d	; s
🔆 Favorites	Name	Date modified	Туре
Desktop	S4HANAONPREM1511SR1	1/21/2021 19:49	File f
\rm Downloads	🐌 SBC	1/21/2021 19:49	File f
📳 Recent places	SCRATCHINST	1/21/2021 19:49	File f
	🐌 SOLMAN71HANA	1/21/2021 19:49	File f
🖳 This PC	🐌 SOLMAN71HANAJAVA	1/21/2021 19:49	File f
隆 Desktop	SOLMAN72	1/21/2021 19:49	File f
Documents	SOLMAN72SR1	1/21/2021 19:49	Filef
鷆 Downloads	💁 catalog	1/21/2021 19:49	XML
🚺 Music	deprecated_product.catalog	1/21/2021 19:49	CAT
📔 Pictures	LABEL.ASC	1/21/2021 19:49	ASC
📑 Videos	manifest.mf	1/21/2021 19:49	MF F
📥 Local Disk (C:)	💁 messages	1/21/2021 19:49	XML
👝 New Volume (D:)	📄 messages	1/21/2021 19:49	XML
	NTQUST.SAR	1/21/2021 19:49	SAR
📬 Network	product.catalog	1/21/2021 19:49	CAT
	📄 resourcepool	1/21/2021 19:49	XML
	resources	1/21/2021 19:49	XML
	SAPCAR_1014-80000938	1/21/2021 19:49	App
	🔞 sapinst	1/21/2021 19:49	App
	SIGNATURE.SMF	1/21/2021 19:49	SMF
	SWPM10SP23_3-20009707.SAR	1/21/2021 19:49	SAR
60 items			

Step 2 (Optional) If the downloaded package is in the SAR format, run the SAPCAR -xvf SWPM20SP04\*.SAR command in CMD to decompress it to the current file.

----End

# 3.5 SAP Software Installation

Download the SAP application and SQL Server installation packages from the official website, upload them to the ECSs, decompress the packages, and start the software installation.

## 3.5.1 Installing SQL Server Database

Log in to the ECS **ecssap1** where the SAP application and SQL Server are to be deployed. Install the SQL Server and then the SAP application.

File Home Share				
⊖ ⊚ - ↑ 🔮 • T	his PC + DVD Drive (E:) MSSQL2012 +	×	C Search DVD Drive	e (E:) MSSQL2
🔆 Favorites	Name	Date modified	Туре	Size
Desktop	퉬 bin	10/30/2013 23:02	File folder	
鷆 Downloads	퉬 config	10/30/2013 22:57	File folder	
📃 Recent places	퉬 prerequisites	10/30/2013 22:57	File folder	
	SqINativeClient	10/30/2013 22:57	File folder	
🌉 This PC	퉬 х8б-хб4	10/30/2013 22:57	File folder	
隆 Desktop	SqlAuth.bat	10/30/2013 23:02	Windows Batch File	1 KB
Documents	CDLABEL.ASC	10/30/2013 23:02	ASC File	1 KB
鷆 Downloads	CDLABEL.EBC	10/30/2013 23:02	EBC File	1 KB
🜗 Music	COPY_TM.HTM	10/30/2013 23:02	HTM File	25 KB
📔 Pictures	COPY_TM.TXT	10/30/2013 23:02	Text Document	11 KB
📔 Videos	LABEL.ASC	10/30/2013 23:02	ASC File	1 Has
🃥 Local Disk (C:)	LABEL.EBC	10/30/2013 23:02	EBC File	1 KB
💼 New Volume (D:)	MD5FILE.DAT	10/30/2013 23:02	DAT File	425 KB
🔮 CD Drive (E:)	📄 readme.txt	10/30/2013 23:02	Text Document	3 KB
	SHAFILE.DAT	10/30/2013 23:02	DAT File	527 KB
📬 Network	SQL4SAP.bat	10/30/2013 23:02	Windows Batch File	1 KB
	SQL4SAP_docu.pdf	10/30/2013 23:02	Chrome HTML Do	4,132 KB
	VERSION.ASC	10/30/2013 23:02	ASC File	1 KB
	VERSION.EBC	10/30/2013 23:02	EBC File	1 KB

**Step 1** Click and run the installation program.

**Step 2** Retain the default settings, press **Enter**, and wait until the installation is complete.

CA.	C:\Windows\system32\cmd.exe	_	٥	x
Microsoft (R) Windows S Copyright (C) Microsoft	cript Host Version 5.8 Corporation. All rights reserved.			^
* Customized installati *******	**************************************		****	* * =
= The following SQL Ser	ver instances were found:		====	=
No instances found				
2. SQL Server Client To	the SQL Server installation mode.			
Please enter the name o Press <enter> to instal Instance Name [MSSQLSEF</enter>	f the SQL Server instance for this installation l a default instance. WER]:	1		
	me of the SQL Server admin ne BUILTIN\Administrators group. istrators]:			
SQL Instance: SQL Version: SQL Collation: Authentication: Login sa: Checking prerequisites.	MSSQLSERVER 11.0.3339.0 SQL_Latin1_Genera1_CP850_BIN2 Windows only random password, login disabled 			
= Installing SQL Server			====	=
Execution successful. Press <enter> to exit_</enter>			====	=
				~

----End

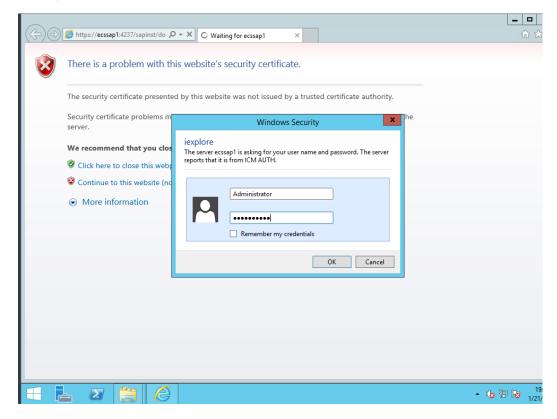
# 3.5.2 Installing the SAP Application

You need to use a browser to install the SAP application. In this example, Google Chrome is used. Log in to **ecssap1** where the SQL Server is installed and install the SAP application.

**Step 1** Go to the decompressed SAP application installation package, go to the installation directory, and run the installation program.

Wideos       manifest.mf       3/2/2019 8:26       MF File       1 KB         Local Disk (C:)       messages.dtd       3/2/2019 1:23       XML Document T       2 KB         New Volume (D:)       messages.xml       3/2/2019 1:23       XML File       1,000 KB         CD Drive (E:)       NTCLUST.SAR       2/28/2019 21:04       SAR File       3,511 KB         product.catalog       3/2/2019 1:23       XML File       18,904 KB         resourcepool.xml       3/2/2019 1:23       XML File       631 KB         resources.dtd       3/2/2019 1:23       XML Document T       2 KB         SAPCAR_windows.EXE       8/18/2020 10:01       Application       4,721 KB	(   🔁 🕕 🖛	Application Tools	swpm			
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		SWPM10SP25_3-20009707_windows.SAR	8/18/2020 10:02	SAR File	695,192 KB	

**Step 2** Enter your username and password.



Step 3 Select SAP NetWeaver 7.5/MS SQL Server/Installation/Application Server ABAP/Standard System, click Next, and then Next.

ecssap1:4237/sapinst/docs/index.html	07
oftware Provisioning Manager	Le
Welcome to SAP Installation	
Go to the option you want to execute.	
Available Options	Description
SAP NetWeaver AS for ABAP 7.51 Innovation Package	When you start a new project, SAP recommends that you download the latest version o
✓ ☐ SAP NetWeaver 7.5	Software Provisioning Manager 1.0.
▶ □ IBM Db2 for I	For more information, see the respective tool guides at https://support.sap.com/sitoolse
<ul> <li>IBM Db2 for Linux, UNIX, and Windows</li> </ul>	System Provisioning and the following SAP Notes:
► TIBM Db2 for z/OS	Installation: SAP Note 1680045     System copy: SAP Note 1738258
MaxDB	<ul> <li>Dual-stack split: SAP Note 1797362</li> </ul>
✓ ☐ MS SQL Server	System rename: SAP Note 1619720
Preparations	Plan new SAP systems based on AS ABAP including the required Support Package lev (applicable for SAP S/4 HANA, SAP NetWeaver, SAP Business Suite, and SAP Financi
✓ ☐ Installation	or AS Java (applicable for SAP NetWeaver and S/4HANA) as available in the Maintenance Planner and run sapinst SAPINST_STACK_XML= <stack configuration="" fil-<="" td=""></stack>
Application Server ABAP	order to benefit from an automated installation process.
Application Server Java	Consider sending the Software Provisioning Manager feedback form with statistics back SAP. For more information about how this feedback helps to improve SAP tools, see the
Application Server ABAP for SAP Process Integration	related SAP Community blog.
Application Server Java for SAP Process Integration	
Cin Standalone Engines	
Coptional Standalone Units	
-	
- oftware Provisioning Manager Welcome to SAP Installation	
Welcome to SAP Installation Go to the option you want to execute.	
Welcome to SAP Installation	Description
Welcome to SAP Installation         Go to the option you want to execute.         Available Options <ul> <li>Instruct on the options</li> <li> </li></ul>	
Welcome to SAP Installation Go to the option you want to execute. Available Options	
Welcome to SAP Installation         Go to the option you want to execute.         Available Options <ul> <li>Isom Duz tor Cirrux: ontx: and vindows</li> <li>Isom Duz tor ziOS</li> <li>MaxDB</li> </ul>	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hos
Welcome to SAP Installation Go to the option you want to execute. Available Options >	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory Instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services Instance (ASCS Instance)
Welcome to SAP Installation Go to the option you want to execute. Available Options Term Doz Tor Embx- ONTAL, and Windows > [] IBM Db2 for z/OS > [] MaxDB ~ [] Ms SQL Server > [] Preparations	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory Instances of an SAP NetWeaver 7.5 ABAP system are:
Welcome to SAP Installation Go to the option you want to execute. Available Options Terr Doz Tor CINIX, ONTX, and WINDOWS I DBM Db2 for z/OS I DBM Db2 for z/OS	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services instance (ASCS Instance) • Database instance • Primary application server instance You can have one or more additional application server instances. You can find
Welcome to SAP Installation Go to the option you want to execute. Available Options Available Options	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services instance (ASCS Instance) • Database instance • Primary application server instance You can have one or more additional application server instances. You can find
Welcome to SAP Installation Go to the option you want to execute. Available Options	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services instance (ASCS Instance) • Database instance • Primary application server instance You can have one or more additional application server instances. You can find installation option for additional application server instances in Additional SAP S
Welcome to SAP Installation Go to the option you want to execute. Available Options	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same hor SAP System Instances Mandatory instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services instance (ASCS Instance) • Database instance • Primary application server instance You can have one or more additional application server instances. You can find installation option for additional application server instances in Additional SAP S
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Welcome to SAP Installation Go to the option you want to execute. Available Options Available Options	Installs an SAP NetWeaver 7.5 ABAP system with all instances on the same host SAP System Instances Mandatory instances of an SAP NetWeaver 7.5 ABAP system are: • ABAP central services instance (ASCS instance) • Database instance • Primary application server instance You can have one or more additional application server instances. You can find installation option for additional application server instances in Additional SAP S

Step 4 Select Custom and click Next.

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SAP	Software Provisioning Manager	Legend   Mo
	2 3 4 Define Review Execute Service Parameters Parameters Service Completed	
	Parameter Settings	
	Choose whether you want to run the installation in a typical or a custom mode.	
	Parameter Settings         Parameter Mode         Typical         Outsom         Additional Information         You can run the Installation either in a typical or a custom mode:         • Typical Mode         Hyou choose Typical, the option is performed with default settings. As a result, you only have to respond to a small selection of prompts. If you want to change any of the default settings, you choose are to the Typical setting and then choose Back after processing one or more input screens, the Custom setting is activated. You are now guided through all cattom Mode         Cattom Mode       If you choose Custom, you are prompted for all parameters. At the end, you can still change any of these parameters on the Parameter Summary screen.	
	Back Next Cancel	

Step 5 Enter the SAP system ID and click Next.

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SARY Software Provisioning Manager		Legend   More .
1 2 3 Define Review Execut Parameters Parameters Servic	4 Service Completed	TASK LIST
General SAP System Paramete Enter the system ID and destination drive.	•	LOG FILES
SAP System		HILL HERE HERE HERE HERE HERE HERE HERE HE
*SAP System ID (SAPSID)	S01	
Destination Drive Additional Information	D: V	
The SAP System ID is an identifier for your SA The system is installed under @Destination Dr	system. It must be unique throughout your system landscape. e>:\usr\ssp\\SAFSID\	
Back Next Cancel		

Step 6 Deselect Set FQDN for SAP System and click Next.

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←	→ C ▲ ecssap1:4237/sapinst/docs/index.html	07	☆	Θ
SAP	Software Provisioning Manager	Leg	gend	More.
	2     3     4       Define     Review     Execute       Parameters     Parameters     Service			TASK LIST L
	DNS Domain Name Enter the DNS domain name for the SAP system to calculate the fully qualified domain name (FQDN).			LOG FILES
	SAP System Domain Name			HELP
	*DNS Domain Name for SAP System Additional Information			
	The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTPULL. This parameter is needed to define URLs for the ABAP and Java application servers. See SAP Note 654982.	e the		
	Back Next Cancel			

**Step 7** Set the password and click **Next**.

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Software Provisioning Manager		Legend	Mor
Define Review E	3 4 xecute Service ervice Completed		
Master Password			
Enter the master password for all users.			
			i
Master Password			
The master password is used for all users	that are created. Check the tool help for restrictions and dependencies.		
*Password for All Users			
*Confirm			
Additional Information			
If you want to set an individual password master password does not overwrite thes	or each user, you can do this in the corresponding parameter section on the Parameter Summary screen. If you set individual passwords, a new individual settings		
	ni er ronan ger		
Back Next Cancel			

**Step 8** Retain the default settings and click **Next**.

SAP	Software Provisioning Manager	Legend   More
	1 2 3 4 Define Review Execute Service Parameters Parameters Service Completed	
	MS SQL Server Database Connection Enter the MS SQL Server Instance name.	ינים ייורני יירני י
	Database Connection           Database instance           Additional Information           Make sure that your database is running. The database server connection uses Windows authentication. You can only use a local instance of MS SQL Server for this installation type.	Ē
	Back Next Cancel	
	C      C      ecssap1:4237/sapinst/docs/index.html  Software Provisioning Manager	☆ ( Legend   [
	1 2 3 4 Define Review Execute Service Parameters Parameters Service Completed	
	Existing MS SQL Server Database Note that an existing database will be used.	
	Database Identification       The SAP installation service will be executed based on an existing database.       Database ID (DBSID)	
	Back Next Cancel	

**Step 9** Specify the package path and click **Next**.

🎖 Software Provisioning Manager		
1 2 Define Review Parameters Parameters	3 4 Execute Service Service Completed	
Software Package Brow	wser	
Specify the path to a download folde	ar containing all software packages, or the paths to media locations or to several individual download locations of software packages.	
Search Location		
Specify the path to a SAR archive	e, to a download folder or to a media location as Package Path.	
Package Path	D:/kernel/kernel Browse	
Archive Locations		
You can download the archives from the following locations on SAP Software Download Center: SAPEXE.SAR (any version supporting your release), IGSEXE.SAR, IGSHELPER.SAR		
The table below is updated with a	The table below is updated with all packages detected at the specified Package Path when you choose Next.	
While staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are specified and you do not wish to make any further adjustments, leave the above Package Path empty to continue.		
Archive Scanning Information		
	the archives have been scanned. There you can find detailed information about matching and non matching archive files. results of the latest archive scan.	

**Step 10** The required packages are located, and click **Next**.

	e Scanning Information		
	rmation file is written after the archives have been scanner formation file contains only results of the latest archive sca	d. There you can find detailed information about matching an n.	d non matching archive files.
Detect	ed Packages		
	Package Name	Individual Package Location	Status
1	SAPEXE.SAR (any version supporting your release)	D:\kernel\SAPEXE_500-70001664.SAR	Available
2	IGSEXE.SAR	D:\kernel\kernel\igsexe_5-70002880.sar	Available
3	IGSHELPER.SAR	D:\kernel\kernel\igshelper_17-10010245.sar	Available
4	SAPEXEDB.SAR, part of the Kernel	D:\kernel\SAPEXEDB_500-70001663.SAR	Available
Additic	onal information		

### **Step 11** Retain the default settings and click **Next**.

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$\leftarrow$	$\rightarrow$	C 🔺	ecssap1:	4237/sapinst/do	cs/index.html						
SAP	Soft	ware Provis	sioning Mana	ager							
	ŀ	1 Define Parameters	2 Review Parameters	3 Execute Service	4 Service Completed						
			P Host Age	ent e the existing SAP H	iost Agent						
		Additional Info	AP Host Agent to t rmation gent is already ins	stalled on this host.		o a higher version if		STAGENT.SAR archive v		ent remains unchanged.	E
		Back	Next	Cancel							

Step 12 Click Next.

Packar	e Provisioning Manager							
		Browse						
Archiv	ve Locations							
	You can download the archives from the following locations on SAP Software Download Center: SAPHOSTAGENT.SAR 721 (Latest Patch)							
The tal	ble below is updated with all packages detect	ed at the specified Package Path when you choose Next.						
	staying on this screen you can add or adjust ments, leave the above <i>Package Path</i> empty	paths for required packages by searching other locations. When all archives to continue.	are specified and you do not wish to make any furthe					
Archiv	ve Scanning Information							
	- information file is written after the archives have been scanned. There you can find detailed information about matching and non matching archive files.							
This in	nformation file contains only results of the late	st archive scan.						
Detected Packages								
Detect	Aca T dollages							
Detec	Package Name	Individual Package Location	Status					

**Step 13** Specify the package path, and then click **Next**.

Define     Review     Service       Parameters     Parameters     Service       Completed	
Enter the location of the required software packages.	
Software Package Requests	
Media Package Location	
1 Installation Export NW750 (folder EXP1) Dr/51050829_3/DATA_UNITS/EXP1	Browse
Additional Information The required software packages available on the media are detected using the identification files LABEL ASC or LABELIDX. ASC. If there are complete media available on the host, you only need to enter the path to the root directory of the media in the <i>Package Location</i> column. The signature of media is checked automatically during the <i>Define Parametera</i> phase while processing the Media Browser screens. Keep in mind that this automatic check is on committed once and not repeated if you only need to enter soft and a screen the media after the initial check has been done. The signature is not checked again if artefacts later - either during the <i>Define Parameters</i> phase or later on during the <i>Execute Service</i> phase. See also the description of this new security feature in SAP Note 2393	f you modify

**Step 14** Specify the package path, and then click **Next**.

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onware	Provisioning Manager		
	2 3 4		
Def	fine Review Execute Service		
Param	neters Parameters Service Completed		
Media	Browser		
Enter the lo	ocation of the required software packages.		
Softwar	re Package Requests		
	Media	Package Location	
			-
1	Installation Export NW750 (folder EXP3)	D:/51050829_3/DATA_UNITS/EXP3	Brows
Additio	nal Information		
	uired software packages available on the media are detected using the id		
If there a	are complete media available on the host, you only need to enter the path	to the root directory of the media in the Package Location column.	
	Cancel		
Software	e Provisioning Manager		
Para Media	e Provisioning Manager 1 2 3 4 ofine Review Execute Service meters Parameters Service Completed		
Para Media	e Provisioning Manager 1 2 3 4 efine Review Execute Service meters Parameters Service Completed		
Do Para Media Enter the	e Provisioning Manager 1 2 3 4 ofine Review Execute Service meters Parameters Service Completed		
Do Para Media Enter the	e Provisioning Manager	Package Location	
Do Para Media Enter the	e Provisioning Manager  enders	Package Location D/51050829_3/DATA_UNITS/EXP2	Brow
Media Enter the Softw	Provisioning Manager      Provisioning Manager      Provisioning Manager      Provisioning Manager      Provision Service     Service     Service     Service     Service     Completed      Provision of the required software packages.      Provision of the required software packages.      Refla      Installation Export NW750 (folder EXP2)		Brow
Media Enter the Softw 1 Additi	Provisioning Manager	D:/51050829_3/DATA_UNITS/EXP2	Brow

**Step 15** Retain the default settings and click **Next**.

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SAP	Softwar	e Provisi	oning Mar	nager				Lege	and   🛛
	Par	Define ameters	2 Review Parameters	ES	3 4 ecute Service Completed				
			of the SAP dat						
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	Men	nory Config	uration Optio	ons					
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		ax. Memory (							
		litional Info							
		<ul> <li>Default N</li> <li>The men</li> </ul>	demory Confi nory is calcula	guration ated base	I on the amount of memory on this machi	ne. The minimum and the maximum n	nemory that SQL Server can use is set to the same	value.	
		You can	Memory Conf enter values f mum value.	iguration for the mir	imum and maximum memory that SQL S	erver can use. The values must be gr	eater than zero and the minimum value must be les	s than or equal to	
		• Do not c	onfigure mem	ory onfigurati	on of the selected SQL Server is unchang	ed.			

**Step 16** Retain the default settings and click **Next**.

sap/	Software Provisioning Manager	
	1 2 3 4 Define Review Execute Service Parameters Parameters Service Completed	
	Declustering / Depooling Option You can enable ABAP table declustering / depooling for your SAP system to implement the new SAP standard for the database table layout.	
	ABAP Table Declustering and Depooling  Enable declustering / depooling of all ABAP tables  Do not decluster / depool ABAP tables	
	Additional Information The new SAP standard for the database table layout is implemented by default for SAP products based on SAP NetWeaver 7.50 and higher. The implementation is optional for SAP products based on SAP NetWeaver 7.40. For more information, see SAP Note 1892354.	B
	Select Enable declustering / depooling of all ABAP tables if you want to decluster / depool all ABAP tables in your target system. Select <i>Do not decluster / depool ABAP tables</i> in the following cases: • You want to install the target system without using declustering / depooling. • You perform a system copy and want the tables to have the same declustering / depooling status as in the source system.	
	Back Next Cancel	

**Step 17** Retain the default settings and click **Next**.

tware Provisioning Manag	er	
1 2 Define Review Parameters Parameters	3 4 Execute Service Service Completed	
AP System Database In	nport	
•		
Database Load		
*SAP Code Page	4103	
*Number of Parallel Jobs	3	
Additional Information		
You can improve import performance Number of <i>Parallel Export Jobs</i> = 3 However, such a setting might negat To avoid impact, reduce the number	a using the following formula: (number of CPU cores). Itvely impact other applications running at the same time on the same host. of f3load jobs, for example by using the default value.	B
Back Next Ca	incel	

**Step 18** Configure the PAS and ASCS instance numbers and host names and click **Next**.

Enter the	e required parameters for the prin	nary application server (	PAS) instance and for the ABAP central	I services (ASCS) instance.
PAS a	and ASCS Instance			
The f	following SAP system instance	s already exist on this	host:	
	SAP System ID (SAPSID)		Instance Name	Instance Number
1	S01		D00	00
2	S01		ASCS01	01
*PAS	S Instance Number	00		
*PAS	S Instance Host	ecssap1		
*ASC	CS Instance Number	01		
	CS Instance Host Name tional Information	ecssap1		
the vi The ir	Instance Number and Host Name Irtual host names. In a High Availa Instance number must be unique Provisioning Manager	ability system installation for this installation host.	for controlling internal processes, such n, use a virtual host name for the ASCS :	as assigned memory. The <i>Host Name</i> can be either the physical host name or instance.
the vi The ir ftware	irtual host names. In a High Availa nstance number must be unique	ability system installation for this installation host.	n, use a virtual host name for the ASCS	i as assigned memory. The <i>Host Name</i> can be either the physical host name or Instance.
the vi The ir ftware De Parar	Irtual host names. In a High Availi nstance number must be unique Provisioning Manager	ability system installation for this installation host.	n, use a virtual host name for the ASCS : 4 vice Deleted	as assigned memory. The <i>Host Name</i> can be either the physical host name or instance.
the vi The ir ftware De Parar	Irual host names. In a High Avail nstance number must be unque: Provisioning Manager 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	ability system installation for this installation host.	n, use a virtual host name for the ASCS : 4 vice Deleted	as assigned memory. The <i>Host Name</i> can be either the physical host name or instance.
the vi The ir ftware De Parar	Irual host names. In a High Avail nstance number must be unque: Provisioning Manager 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	ability system installation for this installation host.	n, use a virtual host name for the ASCS : 4 vice Deleted	i as assigned memory. The <i>Host Name</i> can be either the physical host name or instance.
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the vi The ir ftware De Parar ABAP Enter the I ABAP *ABAF *ABAF *Intern Transp	Irrual host names. In a High Availinstance number must be unique. Provisioning Manager I 2 Trevisioning Raview Parameters Message Server Ports PMessage Server Ports PMessage Server Port hal ABAP Message Server Port bort Host	ability system installation for this installation host.	n, use a virtual host name for the ASCS : 4 vice Deleted	i as assigned memory. The <i>Host Name</i> can be either the physical host name or instance.
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Step 19 Select Default Key and click Next.

Software Provisioning Manager × +	→ H all	139.159.248.25	_ d' ×	
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🕏 Software Provisioning Manager				
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Decide whether you want to generate an individua	I key for the secure storage of the	SAP system.		
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For more information, see the installation, syste https://support.sap.com/sitoolset -> System Pro		or SAP systems based on SAP NetWeaver 7.1 a	and higher ABAP for your operating system platform at:	
Back Next Cancel				

**Step 20** Confirm the parameters and click **Next**.

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**Step 21** Wait until the installation is complete.

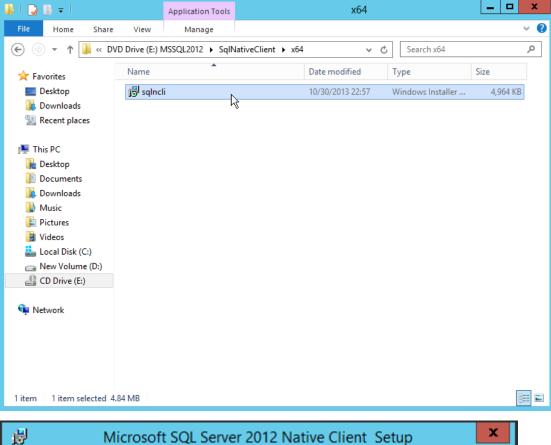
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----End

## 3.5.3 Installing the SQL Server Client

Log in to the ECS **ecssap2** where the AAS is to be installed. Install the SQL Server Client and then AAS.

1. Go to the SQL Server Client installation directory and run the installation program.





副	Microsoft SQL Server 2012 Native Client Setup
Program Ma Repair or re	aintenance amove the program.
ا Modify و	Allows users to change the way features are installed.
 ○ Repair	
C Remov	Repair installation errors in the program. This option fixes missing or corrupted files, shortcuts, and registry entries.
9	Remove SQL Server 2012 Native Client from your computer.
	< Back Next > Cancel

2. Select I accept the terms in the license agreement, and click Next.

Microsoft SQL Server 2012 Native Client Setup	x
License Agreement Please read the following license agreement carefully.	<u>.</u>
MICROSOFT SOFTWARE LICENSE TERMS	^
MICROSOFT SQL SERVER 2012 NATIVE CLIENT	
These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on whice you received it, if any. The terms also apply to any Microsoft	h
updates,	~
<ul> <li>I accept the terms in the license agreement</li> <li>I do not accept the terms in the license agreement</li> </ul>	
< Back Next > Cancel	

3. Retain the default settings and click **Next**.

Feature	Selection	1
	the program features you would like to instal	
Select	the program reatures you would like to instal	
Click a	n icon in the following list to change how a fe	ature is installed.
-		Feature description
		Microsoft SQL Server Native
		Client
Installati	on path	
		Browse
		Gonzen
		Disk Cost
	N	
	13	
	< Back	Next > Cancel

#### 4. Click Install.

谩	Microsoft SQL Server 2012 Native Client Setup	
Ready to	o Install the Program	
Setup is	s ready to begin installation.	P
Click In:	stall to begin the installation.	
If you v exit Set	want to review or change any of your installation settings, click Back. Click Cancel to tup.	
	< Back Install Cancel	

# 3.5.4 Installing AAS

Log in to the ECS **ecssap2** where the SQL Server Client has been installed and install AAS.

Go to the SAP AAS installation directory and run the installation program.

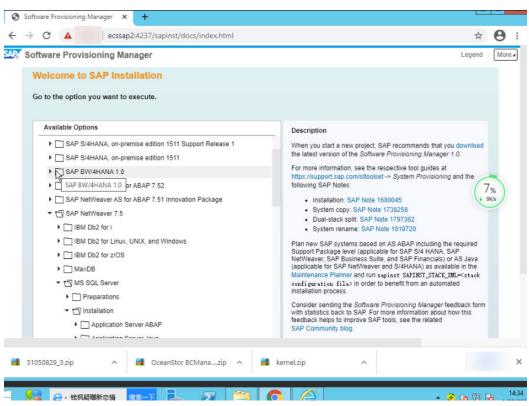
**Step 1** Run the installation program.

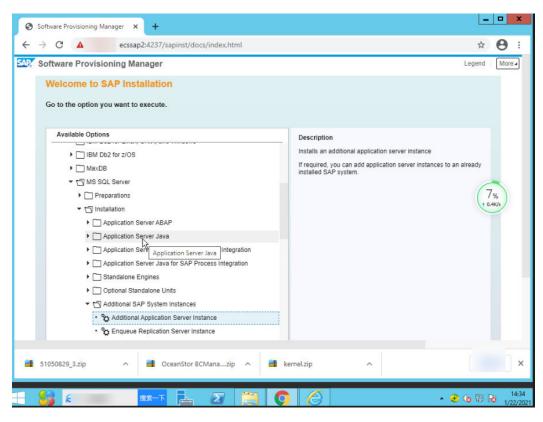
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	🐌 SOLMAN71HANA	3/4/2019 18:51	File folder		
🌉 This PC	퉬 SOLMAN71HANAJAVA	3/4/2019 18:51	File folder		
膧 Desktop	SOLMAN72	3/4/2019 18:51	File folder		
Documents	SOLMAN72SR1	3/4/2019 18:51	File folder		
\rm Downloads	📄 catalog.dtd	3/2/2019 8:02	DTD File	3 KB	
🜗 Music	deprecated_product.catalog	3/2/2019 7:50	CATALOG File	8,456 KB	
崖 Pictures	LABEL.ASC	3/2/2019 8:22	ASC File	1 KB	
📔 Videos	manifest.mf	3/2/2019 8:26	MF File	1 KB	
🃥 Local Disk (C:)	messages.dtd	3/2/2019 1:23	DTD File	2 KB	
👝 New Volume (D:)	🔮 messages.xml	3/2/2019 1:23	XML Document	1,000 KB	
🔮 CD Drive (E:)	NTCLUST.SAR	2/28/2019 21:04	SAR File	3,511 KB	
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	resources.dtd	3/2/2019 1:23	DTD File	2 KB	=
	SAPCAR_windows.EXE	8/18/2020 14:40	Application	4,721 KB	
	😰 sapinst.exe	3/2/2019 4:22	Application	248,220 KB	
	SIGNATURE.SMF	3/4/2019 18:51	SMF File	126 KB	
	SWPM10SP25_3-20009707_windows.SAR	8/18/2020 14:41	SAR File	695,192 KB	~
61 items   1 item selected	242 MB				

**Step 2** Enter the username and password to log in.

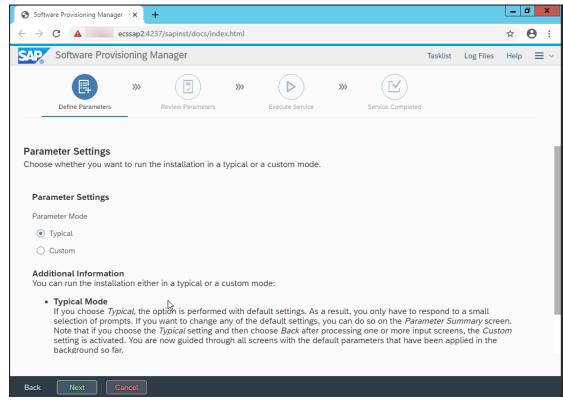
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Step 3Select SAP NetWeaver 7.5/MS SQL Server/Installation/Additional SAP SystemInstance/Additional Application Server Instance and click Next.





Step 4 Select Custom and click Next.



**Step 5** You will log out of the ECS after clicking **OK**. You need to log in to the ECS again. After the login, the SAP installation program automatically runs and continues to install the SAP application.

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Log Off Required			
Software Provisioning Manager needs to log you off in order to reliably continue the installation.			
If you choose <i>OK</i> , Software Provisioning Manager will log you off and continue the installation when you log on again. You can also choose <i>Cancel</i> now, log off yourself and restart Software Provisioning Manager afterwards.			
<b>Note:</b> If this message reappears after the new logon, your domain is probably setting group policies. In this case, make sure the ac which runs the installation has the following User rights before continuing: <i>Act as part of the operating system, Increase quotas</i> and <i>Replace a process level token.</i>	coun	t	
Ok			

- **Step 6** Enter the username and password to log in and continue the installation.
- **Step 7** Find the location of the profile file on **ecssap1**. The profile file location is automatically shared in Windows OS. Write the profile file directory in the following format and click **Next**.

\\ecssap1\sapmnt\S01\SYS\profile

Seftware Provision	oning Manager	Legend More 4
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← → C SAX Software Provisi	ecssap2:4237/sapinst/docs/index.html oning Manager	tr the transmission to th
Define Parameters ABAP Messaa Provide the ABAP me Connection to M Message Server F	essage Server	TASK UST LOG FLES HELP
the default port wi The message sen	ation         ction port of the ABAP message server of the system. If you leave this field empty, the system instances will connect to lich is resolved from the default profile parameter rdisp/msserv.         rer port is defined during the installation of the ASCS instance and its default value is 36 <ascs instance="" number="">.         Next       Cancel</ascs>	

**Step 8** Set the password and click **Next**.

Software Provisioning Manager × +	_ 0 X
← → C ▲ ecssap2:4237/sapinst/docs/index.html	☆ \varTheta :
See Software Provisioning Manager Tasklist Log Files	Help 📃 🗸
Define Parameters >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	
Master Password Enter the master password for all users.	
Master Password	
The master password is used for all users that are created. Check the tool help for restrictions and dependencies.	
*Password for All Users	
*Confirm	
Additional Information	
If you want to set an individual password for each user, you can do this in the corresponding parameter section on the <i>Para Summary</i> screen. If you set individual passwords, a new master password does not overwrite these individual settings.	meter
Back Next Cancel	

**Step 9** Retain the default settings and click **Next**.

→ C A   ecssap2:423	37/sapinst/docs/index.html	\$ C
Software Provisioning Manage	er	Legend   [
Define Review Parameters	3 4 Execute Service Service Completed	
Windows Domain		
Choose the Windows domain in which y	ou want to create the SAP system accounts.	
SAP System User Domain SAP System ID (SAPSID)	S01	8% † 0K/s
Domain Model		
<ul> <li>Local Domain</li> </ul>		
<ul> <li>Domain of Current User</li> </ul>		
O Different Domain		
*Windows Domain		
Additional Information		
<ul> <li>If you want the system to be a authorization problems.</li> </ul>	o run on one host, you can choose <i>Local Domain</i> (local installation). distributed on several hosts, we strongly recommend that you perform a domain installation to avoid vallability system with MSCS, you must perform a domain installation.	
Otherwise, you have to create all ope	have the operating system users created during the installation, you must be a domain administrator. rating system users before the installation. domains, see the Windows documentation.	

**Step 10** Retain the default settings and click **Next**.

→ C ▲ ecssap2:4237/sap	pinst/docs/index.html	☆ 😶
Software Provisioning Manager		Legend
Define Review Exe	3 4 ecute Service rivice Completed	
Operating System Users		
Enter the passwords of the operating system u	users.	
SAP System Administrator		8%
Account: ecssap2\s01adm *Password of SAP System Administrator		
*Confirm		
SAP System Service User Account: ecssap2\SAPServiceS01		
*Password of SAP System Service User		
*Confirm		
A		
Back Next Cancel		

**Step 11** Retain the default settings and click **Next**.

). Software Provisioning Manager 🗙 🕂	
→ C ▲ ecssap2:4237/sapinst/docs/index.html	☆ <b>⊖</b>
Software Provisioning Manager	Legend Mor
1 2 3 4 Define Review Execute Service Parameters Service Completed	
General SAP System Parameters Specify whether your system is a Unicode system.	
SAP System Code Page	8%
System Code Page  Unicode  Non-Unicode	+ OK/s
Back Next Cancel	
6	
18	
13	
	• • • • • •
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html	
Software Provisioning Manager X +	
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager	÷ € Egend   Mo
Software Provisioning Manager × + → C A eccsap2:4237/sapinst/docs/index.html Software Provisioning Manager Provisioning Manager	⊢ □ ☆ ⊖ Legend Mo
Software Provisioning Manager  2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Legend   Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed	Legend   Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed Existing MS SQL Server Database	Legend   Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed	Legend   Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed Existing MS SQL Server Database Note that an existing database will be used.	Legend   Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed Existing MS SQL Server Database Note that an existing database will be used. Database Identification	Legend   Mo
Software Provisioning Manager × + C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Parameters Parameters Service Completed Existing MS SQL Server Database Note that an existing database will be used.	Legend Mo
Software Provisioning Manager × +	Legend Mo
Software Provisioning Manager × + → C A ecssap2:4237/sapinst/docs/index.html Software Provisioning Manager Define Review Execute Service Service Parameters Parameters Service Completed Existing MS SQL Server Database Note that an existing database will be used. Database Identification The SAP installation service will be executed based on an existing database.	Legend Mo
Software Provisioning Manager × +	Legend Mo
Software Provisioning Manager × +	Legend Mo

**Step 12** Specify the package path and click **Next**.

   	ecssap2:4237/sapinst/docs/index.html	\$	0
Software Provisionin	g Manager	Legend	More 4
	2 3 4 eview Execute Service ameters Service Completed		TASK LIST
Software Packag			LOG FILES
Specify the path to a downl packages.	oad folder containing all software packages, or the paths to media locations or to several individual download Ic	ocations of software	т
Search Location Specify the path to a SA	R archive, to a download folder or to a media location as Package Path.		WS P
Package Path	D:/kernel		
Browse Archive Locations			
	rchives from the following locations on SAP Software Download Center: 721 (Latest Patch)		
The table below is updat	ted with all packages detected at the specified Package Path when you choose Next.		
While staying ornthis scr specified and you do not	reen you can add or adjust paths for required packages by searching other locations. When all archives are t wish to make any further adjustments, leave the above <i>Package Path</i> empty to continue.		
Archive Scanning Info	rmation		
· · · · · · · · · · · ·			

Step 13 Click Next.

Soft	tware Prov			
	civere ries	risioning Manager 🗙 🕂		
$\leftrightarrow$ $\rightarrow$	C	A ecssap2:4237/sapinst/d	locs/index.html	
SAR So	ftware	Provisioning Manager		
	Arobiu	e Locations		
		STAGENT.SAR 721 (Latest Patch)	locations on SAP Software Download Center	Γ.
	The tab	le below is updated with all packages detec	cted at the specified Package Path when you	u choose Next.
			paths for required packages by searching o adjustments, leave the above Package Path	
	Archive	e Scanning Information		
	matchin	mation file is written after the archives have ng archive files. ormation file contains only results of the late	e been scanned. There you can find detailed est archive scan.	information abo
	Detect	ed Packages		
		Package Name	Individual Package Location	Status
	1	SAPHOSTAGENT.SAR 721 (Latest Pate	D:\kernel\SAPHOSTAGENT37_37-2000	Available
	12000	onal Information		
	SAP re from the If you h	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the r ble - update the software packages later by	versions of the required software packages. ailable - using the Maintenance Planner. required packages, you can also use them fo using the appropriate tool from the Software	or initial system p
	SAP re from the If you h	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the ble - update the software packages later by	ailable - using the Maintenance Planner. required packages, you can also use them fo	or initial system
	SAP rei from the If you h applical	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the ble - update the software packages later by	ailable - using the Maintenance Planner. required packages, you can also use them fo	or initial system
Software Pro	SAP rei from the If you h applical	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the is ble - update the software packages later by	ailable - using the Maintenance Planner. required packages, you can also use them fo	or initial system (
$\leftrightarrow \rightarrow  {\tt G}$	SAP rei from the If you h applical Back	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the is ble - update the software packages later by k Next Cancel er × + ecssap2:4237/sapinst/docs/index.html	ailable - using the Maintenance Planner. required packages, you can also use them fo using the appropriate tool from the Software	or initial system (
← → C SAX Software	SAP rei from the if you h applical Back evisioning Manag	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the is ble - update the software packages later by k Next Cancel er × + ecssap2:4237/sapinst/docs/index.html	ailable - using the Maintenance Planner. required packages, you can also use them for using the appropriate tool from the Software	or initial system (
← → C SAR Software Para Windo	SAP rei from the if you h applical Back evisioning Manag A i e Provisioning efine meters Pa	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the r ble - update the software packages later by	ailable - using the Maintenance Planner. required packages, you can also use them for using the appropriate tool from the Software 	or initial system (
← → C SNP Software Para Windc Select the	SAP rei from the if you h applical Back evisioning Manag A i e Provisioning efine meters Pa	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the r ble - update the software packages later by k Next Cancel er x + ecssap2:4237/sapinst/docs/index.html ng Manager 2 3 4 5 Service Service armeters Service Completed n for SAP Host Agent in of the SAP system accounts for the SAP Host Agent.	allable - using the Maintenance Planner. required packages, you can also use them for using the appropriate tool from the Software	or initial system (
← → C SAV Software Dr Para Windo Select the SAP F SAP S Domai	SAP rei from the If you h applical Back Back svisioning Manag A I e Provisioning e Provisionin e Provisionin e Windows doma e Windows doma Host Agent User System ID (SAPS in Model	commends that you use the latest released e SAP Software Download Center or - if ava ave DVDs or Blu-ray media containing the r ble - update the software packages later by k Next Cancel er × + ecssap2:4237/sapinst/docs/index.html ng Manager 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	allable - using the Maintenance Planner. required packages, you can also use them for using the appropriate tool from the Software	or initial system p
← → C SNX Software Para Windd Select the SAP F SAP S Domai ⊙ LC ○ Do	SAP rei from the from the applical Back Back Back Back Back Back Back Back	commends that you use the latest released e SAP Software Download Center or - if available - update the software packages later by	allable - using the Maintenance Planner. required packages, you can also use them for using the appropriate tool from the Software	or initial system p

Software Provisioning Manager 🗙 🕂		- 4
→ C A   ecssap2:4237/sapi	nst/docs/index.html	☆ <b>⊖</b>
Software Provisioning Manager		Legend
Define Review Exe Parameters Parameters Ser	rice Completed	
Enter the passwords of the SAP Host Agent ope	rating system users.	
SAP System Administrator Account: ecssap2\sapadm		8% + 0K/s
*Password of SAP System Administrator *Confirm		
Back Next Cancel		
R		

**Step 14** Configure the AAS instance number and click **Next**.

→ C ▲   ecssap2:4237,	/sapinst/docs/index.html		\$
Software Provisioning Manager			Legend   N
1 2 Define Review Parameters Parameters	3 4 Execute Service Service Completed		
Additional Application Ser			
Additional Application Server Instances			8% + 0K/s
SAP System ID (SAPSID)	Instance Name	Instance Number	
	No data		
*AAS Instance Number	00		
*AAS Instance Host Name Additional Information	ecssap2		
The Instance Number and Host Name f assigned memory. The Host Name can The Instance Number must be unique for	be either the physical host name or one of	nical identifier for controlling internal processes, suc the virtual host names.	h as

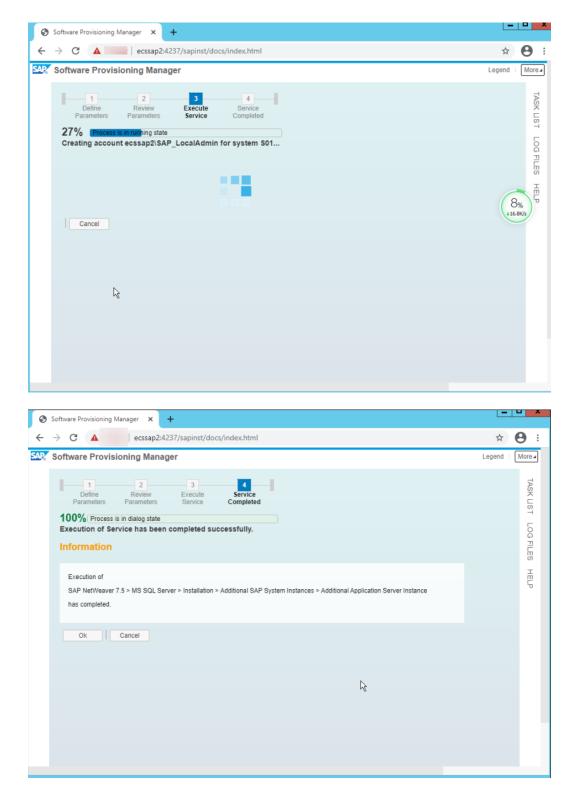
**Step 15** Retain the default settings and click **Next**.

Software Provisioning Manager × +	- U X
← → C c ecssap2:4237/sapinst/docs/index.html	☆ \varTheta :
SAX Software Provisioning Manager	Legend More 4
1 Define Parameters Parameters Dervice Completed	TASK LIST L
Message Server Access Control List	
Specify if you want to have amessage server Access Control List (ACL) created.	Es
Message Server Access Control List         O Create Message Server Access Control List         Do not create Message Server Access Control List         Additional Information         The ACL is created as a file in the / <sapmnt>/<sapsid>/global directory. If it exists, it defines the hosts from which the message server accepts requests.         Caution: Only trigger the creation of this file if you do not plan to install any additional instances for this system. With the creation of this ACL, you overwrite existing settings and prevent instances from being installed on additional hosts.         If you decide to install an additional instance later, you need to remove this file manually before the installation and create it again after the installation, see the information about ms/acl_info in SAP Notes 1495075 and 826779</sapsid></sapmnt>	8% eKs
Back Next Cancel	

**Step 16** Confirm the parameters and click **Next**.

Software Provisioning Manager 🗙	+	_ <b>D</b> X
← → C ▲ ecssap2:4	237/sapinst/docs/index.html	± <b>0</b> :
SARY Software Provisioning Mana	ger	Legend   More -
1 2 Define Review Parameters Parameters	3 4 Execute Service Service Completed	TASK LIST L
Parameter Summary Choose 'Next' to start with the values can change the parameter. You might	shown. Otherwise, select the parameters to be changed and choose 'Revise'. be guided through other screens that have so far been processed.	
Parameter List		8% t ox/s
Parameter Settings Parameter Mode Typical Custom		
General SAP System Parameter	ers	
Profile Directory	\\ecssap1\sapmnt\S01\SYS\profile v	
Destination Drive	D: 🗸	
ABAP Message Server		
Message Server Port		

**Step 17** The installation starts.



----End

### 3.5.5 Installing SAP GUI

Install the SAP GUI on the ECS **ecssap2** where AAS is installed.

**Step 1** Go to the SAP GUI installation directory. Run the installation program.

File Home Share	View		
🔄 💿 👻 🕈 퉲 🔢 N	W_7.0_Presentation_7.50_Comp2_\PRES1\	GUI\WINDOWS\Win32 ¥	C Search Win32
4 🚖 Favorites	Name	Date modified	Туре
E Desktop	📕 BW	1/22/2021 16:53	File folder
📕 Downloads	🎍 iwb	1/22/2021 16:53	File folder
💹 Recent places	🎍 Jaws	1/22/2021 16:53	File folder
	NWBC65	1/22/2021 16:53	File folder
4 👰 This PC	🍌 ReadMe	1/22/2021 16:53	File folder
🖻 膧 Desktop	퉬 SapGui	1/22/2021 16:53	File folder
👂 📗 Documents	🍌 Setup	1/22/2021 16:53	File folder
🛛 🙀 Downloads 🛛 🗼	SncClientEncryption	1/22/2021 16:53	File folder
Þ 🚺 Music	🍌 System	1/22/2021 16:53	File folder
👂 崖 Pictures	🍶 System64	1/22/2021 16:53	File folder
🖻 🛃 Videos	Jan VE	1/22/2021 16:53	File folder
🛛 🚢 Local Disk (C:)	SAP Setup Guide	6/19/2017 16:19	Chrome HTML D
Dew Volume (D:)	📴 SapAXLSetup	11/2/2017 2:58	Application
DVD Drive (E:) MSSC	🔞 SapBiSetup	11/2/2017 2:58	Application
	SAPExcel Setup Guide	7/28/2016 16:16	Chrome HTML Do
🛛 🖣 Network	😰 SapGuiSetup	11/2/2017 2:58	Application
	📴 SapNwBcSetup	11/2/2017 2:58	Application
	SapSncClientEncryptionSetup	11/2/2017 2:58	Application
	🔯 SapSn:Setup	1/24/2018 2:57	Application
	SanVer/Setup	1/23/2018 7:34	Application
	😰 SetupAll	11/2/2017 2:58	Application

Step 2 Click Next.

<b>1</b>	SAP Front E	nd Installer	_	- 🗆	x
		and the second s			
SAP		$\searrow$			
FRONT-END INSTALLER					
This wizard helps you to install SAF	products.				
Choose 'Next'.					
SAP			Next >	Cancel	

Step 3 Select the components to be installed. Here, click Select all and then Next.

SAP Fro	ont End Installer
SAP FRONT-END INSTALLER	
<ul> <li>SAP Business Client 6.5</li> <li>Chromium for SAP Business Client 6.5</li> <li>SAP GUI for Windows 7.50 (Compilation 2)</li> <li>SAP GUI Desktop Icon / Shortcuts even the standard state of the standard state of the state of the</li></ul>	that provides tools for analysis, reporting and planning.
Selent all Deselect all	< Back Next > Cancel

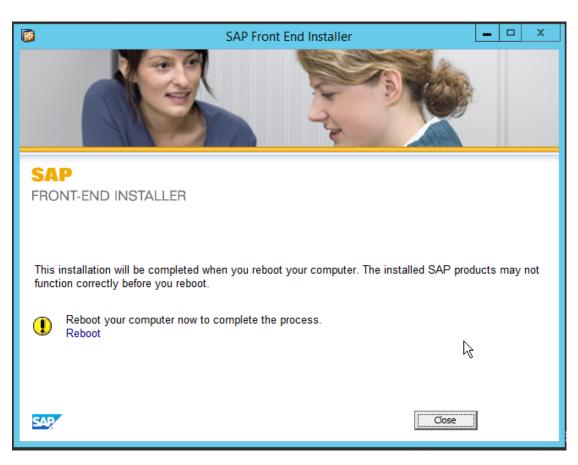
**Step 4** Select the installation location for each component. Retain the default settings and click **Next** until the installation location is set for all components.

·	- 🗆 X
SAP	
FRONT-END INSTALLER	
SAP Business Client 6.5	
Choose the path to the SAP Business Client 6.5 installation directory	
C:\Program Files (x86)\SAP\WWBC65	Browse
k₂	
SAP < Back Next >	Cancel

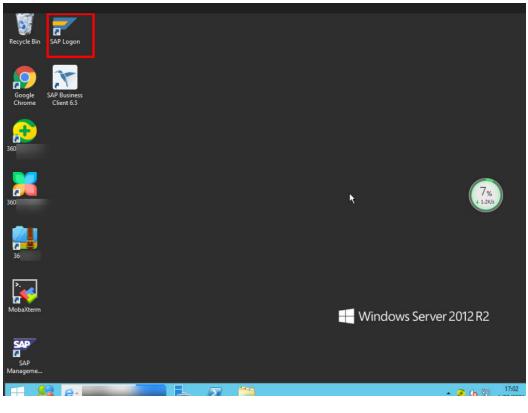
**Step 5** The installation starts.

SAP Front End Installer
SAP FRONT-END INSTALLER
Please wait while your component selection is being processed. This may take a few minutes.
Installing
C:\Program Files (x86)\Common Files\SAP Shared\sapfewut.dll
3%

**Step 6** After the installation is complete, restart the computer as required. You can restart it during off-peak hour.



#### Step 7 Restart the computer.



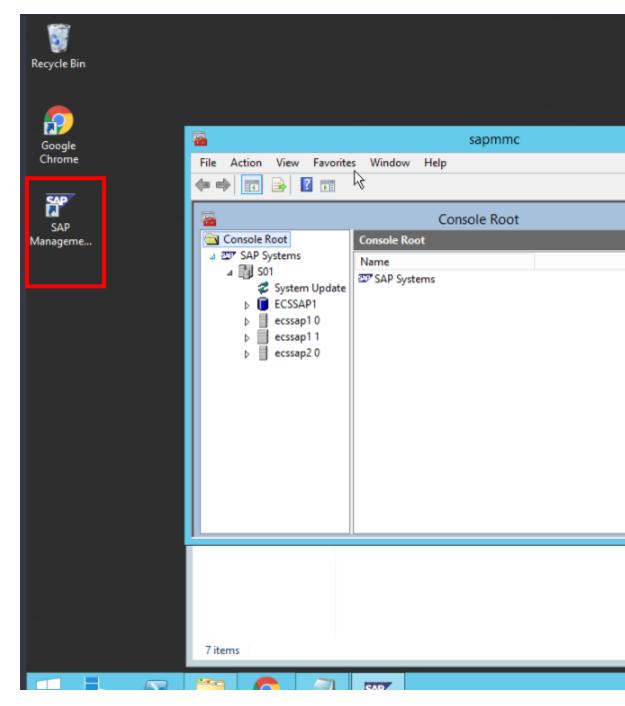
----End

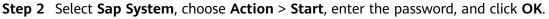
# **3.6 Installation Verification**

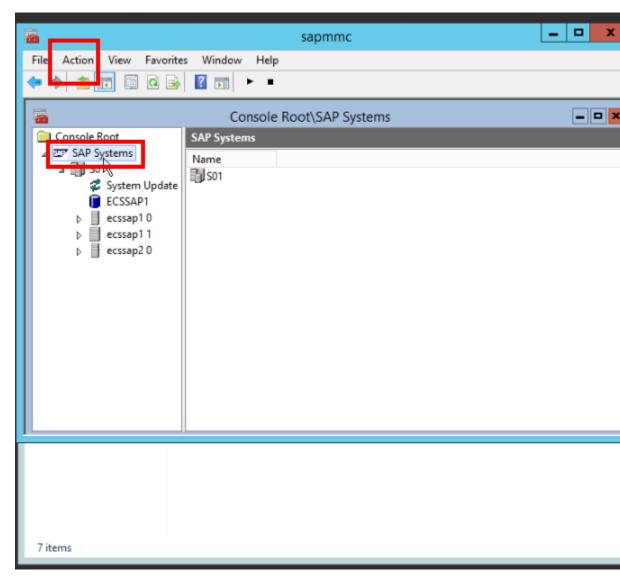
# **3.6.1 Checking Instance Status**

The following demonstrates how to start SAP.

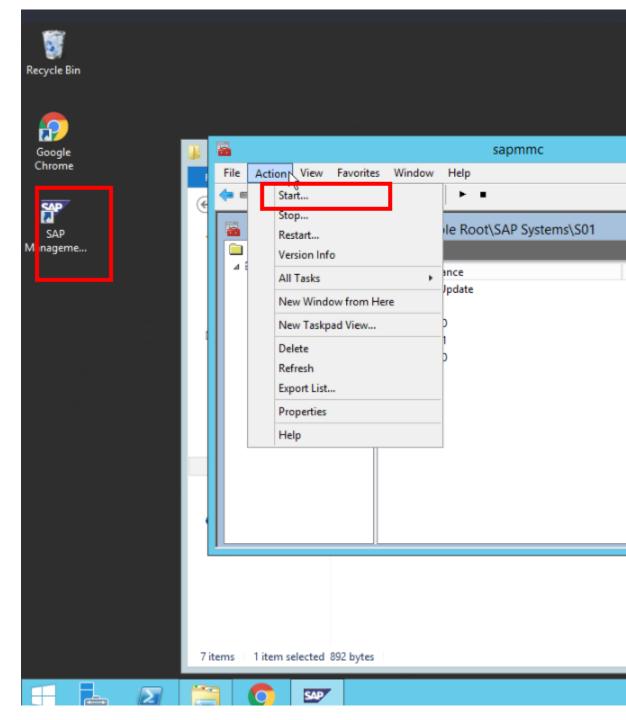
**Step 1** Start the SAP Management Console client on **ecssap1**.







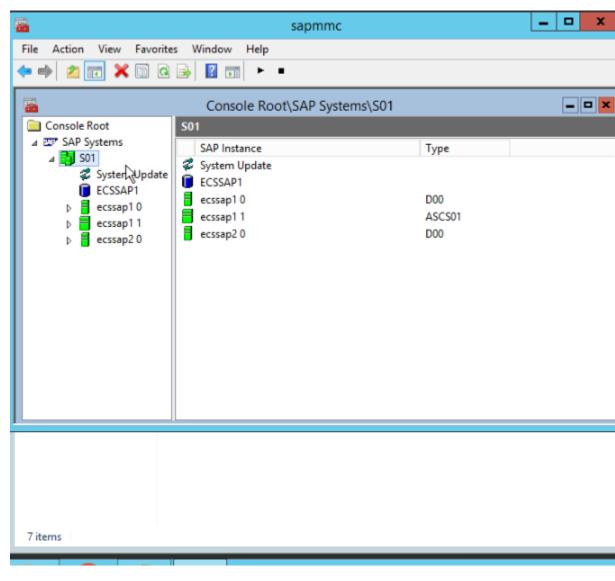
Step 3 Click Start.



Step 4 Enter the username and password of the administrator, and then click OK.

-	sapmmc	-	x
File     Action     View     Favorites     Window     Help       Image: Second			
Console Root  Console Root  SAP Systems  SO1  Critic  System Upda  Webs	WebService Authentication       X         al operations like starting or stopping a SAP instance via the service interface require user authentication. Please specify user and password for this operation.         ECSSAP1\Administrator		
7 items			

**Step 5** Wait for a while. When all the icons before the instance name become green, the SAP instances are running normally.



----End

### 3.6.2 Using SAP GUI to Connect to the SAP Application

**Step 1** Log in to **ecssap2** at the production site, run SAP Logon, and click **Variable Logon**.

=				SAP Logon 750	)
Variable Logon New Item	C <u>h</u> ange Item	Delete Iter	n		
			Connections		
Favorites			Name	System Descr	iption
Shortcuts					
Connections					
	*** +0 **	T L			

Step 2 Double-click User Specified System.

					SAP Logon 750	
			Logon	to System		
Select o system	one of the a parameters	vailable syster yourself.	ms from the list be	low. If you choose	the first entry, yo	ou can specif
$\nabla$	Search	For:			Cle	ar Filter
SID	Descript	ion				
88	-	ecified System	1			
🛛 S0	1 S01				-	
l⊟ S0	1 S01					
1 - CAL		r than the def	ault is required for	- the analisian audi		ther onto fr
If a SAF	Prouter othe	r than the defa	ault is required for	r th∖specified syste	em, select the o	ther entry fr
If a SAF	Prouter othe	r than the defa	ault is required for	r th&specified syste	em, select the o	ther entry fr
If a SAF	Prouter othe ter dropdow	r than the defa	ault is required for	r th <b>\</b> specified syste	em, select the o	ther entry fr
If a SAF SAProu	Prouter othe iter dropdow	r than the defa	ault is required for	r th <b>∖</b> specified syste	em, select the o	ther entry fr
SAProu	iter dropdow	r than the defa	ault is required for	r th <b>∖</b> specified syste	em, select the o	ther entry fro
SAProu	Prouter othe ter dropdow SAProuter:	r than the defa	ault is required for	r th <b>∖</b> specified syste	em, select the o	ther entry fro
SAProu	iter dropdow	r than the defa	ault is required for	r th specified syste	em, select the o	ther entry fr
SAProu	iter dropdow	r than the defa	ault is required for	r th <b>\</b> specified syste	em, select the o	ther entry fro
SAProu	iter dropdow	r than the defa	ault is required for	r th specified syste	em, select the o	ther entry fro
SAProu	iter dropdow	vn list.		• 		
SAProu	iter dropdow	r than the defa vn list.	ault is required for	r th∖specified syste	em, select the o	ther entry fro

**Step 3** Configure required parameters based on the site requirements and click **Next**.

=		S	SAP Logon 750	
	Logon to	System		
Choose the connection type and On' are only active when all requi	change the system ired input data has t	parameters as re been entered.	quired. Buttons 'N	ext >' and 'Log
Connection Type:	Custom Applicati	on Server		~
System Connection Paramete	rs			
Application Server:	ecssap1			
Instance Number:	00			
System ID:	S01			
SAProuter String:				
Use this page as the first pag	e for subsequent lo	gons; setting take	es effect immediate	ely
Help	Cancel	< <u>B</u> ack	<u>N</u> ext >	Log On
·				

=	SAP Logon 750	
	Logon to System	
Choose	network settings.	
Secure	Network Settings	
[] #	Activate Secure Network Communication	2
	SNC Name	
	Authentication only	
	<ul> <li>Integrity protection</li> </ul>	
	Privacy protection	
	Maximum security settings available	
	SNC logon with user/password (no Single Sign-On)	
Network	k Settings	
•	High Speed Connection (LAN)	
01	Low Speed Connection (Reduced Network Traffic)	
	Help Cancel < Back Next > Log	On

Step 4 Click Log On.

	SAP Logon 750	)
	Logon to System	
Select code pages for communic download.	ation between SAP GUI and application server / file	upload and
Communication Language / C	Code Page	
This language determines th server. Adjusting this is requi SAP GUI documentation for r	ne code page for communication between SAP GUI a ired only in very rare cases when legacy products ar more information).	nd application re used (see
Language:	Default	~
Inland/Download Encoding		
Upload/Download Encoding	of the files transferred from or to the back end. The fi	le will be or is
2000 000 000 00	of the files transfered from or to the back end. The fi t machine hard drive.	le will be or is
This specifies the encoding of	t machine hard drive.	le will be or is
This specifies the encoding of currently stored on the client	t machine hard drive.	le will be or is
This specifies the encoding of currently stored on the client	t machine hard drive.	le will be or is
This specifies the encoding of currently stored on the client	t machine hard drive.	le will be or is
This specifies the encoding of currently stored on the client	t machine hard drive.	le will be or is
This specifies the encoding o currently stored on the client	t machine hard drive.	le will be or is

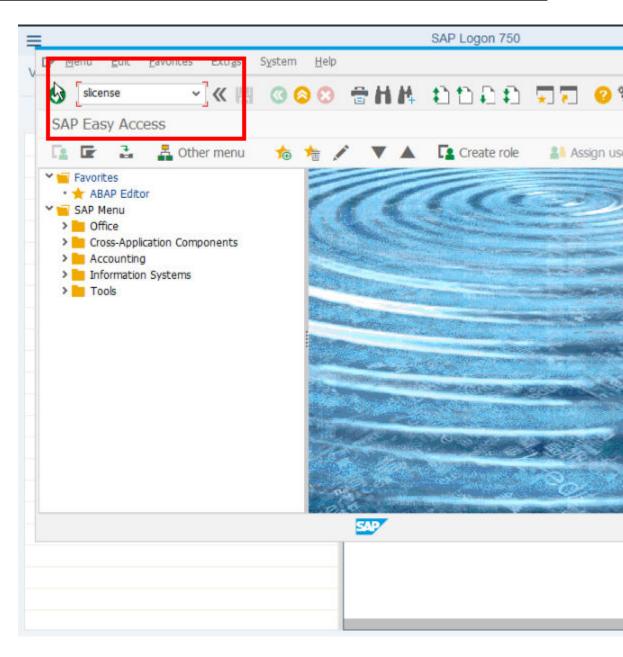
**Step 5** Type the username **ddic** and the password, and then press **Enter**.

	-				SAP Logo	n 750	_
	V 🔄 User System						
	0	~ <	K 🗒 🕜 🙆 🕄		14 001	111 😨 🖥	8
	SAP						
	New password						
	Client	001					
		ddic	7				
	User ** Password	*******	*****				
	Logon Language	EN					
				_ 5497			
	=				SAP Logon	750	
	🕞 🗹 🖉 🖉	Help					
	0	× «	🛯 🕜 🙆 😢	e H	A nnn	f) (17	
	SAP			100 0 0			
	New password						
		12223	-			022	
	Client	001	🕞 Copyright			×	
	User	DDIC	SAP user name		DDIC		
	Password	_	Last system logo	on } at	22.01.2021 12:19:24		
		EN		0		—	
	Logon Language		Copyright(c) SA	0,000			
3-1	12) Copyright ©	Huawei Clo	oud Computing Tec			139	
			License expires	on	22.04.202	1	
					marketed by SAP AG ludes proprietary		

SAP Logon 750 Edit Eavorites 🖙 Menu Extras System Help ~ « 🗏 🔇 🔕 🕄 **T** Ø SAP Easy Access 3 A Other menu Create role 📲 Assign us 10 面 Y 🔚 Favorites SAP Menu 2 > Office Cross-Application Components Accounting > Information Systems > Tools SAP

Step 6 The login to SAP GUI is successful.

**Step 7** Enter **slicense** in the search box and press **Enter** to view the hardware key.



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----End

# 3.7 FAQ

# 3.7.1 What Should I Do If SAP Failed to Be Started?

### Symptom

1. SAP failed to be started because the disp+work instance is not started.

-		sapmmc			_ <b>D</b> X
File Action View Favorite	s Window Help				
🗢 🄿 🙍 📰 🤉 😰	<b>F</b>				
Consc	ole Root\SAP Syste	ems\S01\ecssap*	1 0\Proc	ess List	×
Console Root	Process List (2 ent	ries)			
⊿ 207 SAP Systems	Process	Description	Pid	Status	Start time
⊿ 📑 S01	disp+work.EXE	Dispatcher		Stopped	2021 01 26 14:45:2
System Update	igswd.EXE	IGS Watchdog	3636	Running	2021 01 26 14:45:2
a ecssap10					
Process List					
👂 🖋 Current Stat					
👂 🖉 Open Alerts					
😵 Syslog					
Queue Stati:					
🍞 Access Poin 🎉 AS ABAP WI					
▶ 😵 ICM					
ecssap1 1					
ecssap2 0					
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2. View logs.

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Favorites	Name	Date modified	Туре	Size
🔜 Desktop	dev_rfc15	1/28/2021 11:05	File	0 KB
\rm Downloads	dev_rfc14	1/28/2021 11:05	File	0 KB
Recent places	dev_icm	1/28/2021 11:04	File	0 KB
	dev_id	1/28/2021 11:04	File	0 KB
🖳 This PC	dev_w0	1/28/2021 11:04	File	0 KB
膭 Desktop	📄 dev_w1 😽	1/28/2021 11:04	File	0 KB
Documents	dev_w2	1/28/2021 11:04	File	0 KB
\rm Downloads	dev_w3	1/28/2021 11:04	File	0 KB
🌗 Music	dev_w4	1/28/2021 11:04	File	0 KB
📔 Pictures	dev_w5	1/28/2021 11:04	File	0 KB
📔 Videos	dev_w6	1/28/2021 11:04	File	0 KB
📥 Local Disk (C:)	dev_w7	1/28/2021 11:04	File	0 KB
👝 New Volume (D:)	dev_w8	1/28/2021 11:04	File	0 KB
	dev_w9	1/28/2021 11:04	File	0 KB
📮 Network	dev_w10	1/28/2021 11:04	File	0 KB
	dev_w11	1/28/2021 11:04	File	0 KB
	dev_w12	1/28/2021 11:04	File	0 KB
	dev_w13	1/28/2021 11:04	File	0 KB
	dev_w14	1/28/2021 11:04	File	0 KB
	dev_w15	1/28/2021 11:04	File	0 KB
	dev_w16	1/28/2021 11:04	File	0 KB

Thu Jan 28 09:47:25:342 2021 ThStart: taskhandler started ThInit: initializing DIA work process W0 \*\*\* ERROR => ThSetGwParam : NiHostToAddr ecssap1.openstacklocal failed [thParam.c 3426]

\*\*\* ERROR => ThInit: ThProfileRead (step TH\_INIT, thRc ERROR-CORE-INIT\_FAILED, action STOP\_WP, level 1) [thxxhead.c 2559] Info for wp 0

The root cause is that the domain name has not been added to the hosts file.

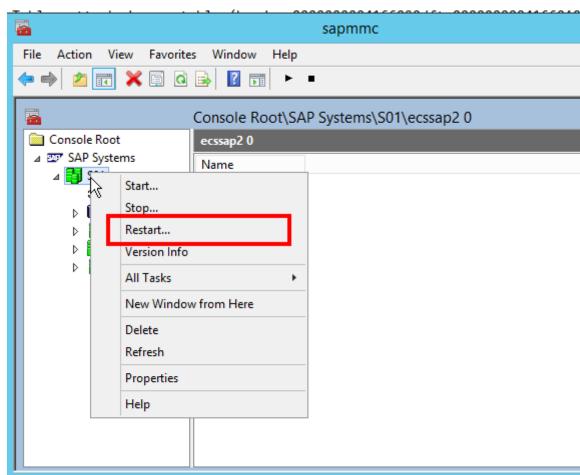
icrosoft Windows [Version 6.3.9600] c> 2013 Microsoft Corporation. All rights reserved. :\Users\Administrator>ipconfig /all lindows IP Configuration : ecssap1 Hybrid No -openstacklocal thernet adapter Ethernet 2: openstacklocal Red Hat VirtIO Ethernet Adapter FA-16-3E-2E-C6-41 Yes Yes Connection-specific DNS Suffix Yes fe80::9175:9a3b:43ba:13d6%14(Preferrer 10.10.0.31(Preferred) 255.255.255.0 Thursday, January 28, 2021 9:42:01 Friday, January 28, 2022 9:42:02 10.10.0.1 10.10.0.254 402265662 00-01-00-01-24-F6-B9-71-F0-16-3F-0B-D -Subnet Madress. . . . Subnet Mask . . . Lease Obtained. . . Lease Expires . . . Default Gateway . . DHCP Server . . . . DHCPv6 IAID . . . DHCPv6 Client DUID. = . --00-01-00-01-24-E6-B9-71-FA-16-3E-0B-D 100.125.136.29 100.125.1.250 DNS Servers . . . . X. NetBIOS over Topip. . . . . Enabled unnel adapter isatap.openstacklocal: Media State . : Media disconnected Connection-specific DNS Suffix Description . . . Physical Address. DHCP Enabled. . . Microsoft ISATAP Adapter #2 00-00-00-00-00-00-00-E0 - - ---No Yes Autoconfiguration Enabled . . . -:\Users\Administrator>

#### Solution

1. Add the domain name to the hosts file.

```
hosts - Notepad
File Edit Format View Help
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#
       102.54.94.97
                        rhino.acme.com
                                                # source server
#
        38.25.63.10
                        x.acme.com
                                                # x client host
# localhost name resolution is handled within DNS itself.
#
        127.0.0.1
                        localhost
                        localhost
#
        ::1
10.10.0.31
                         ecssap1
10.10.0.32
                         ecssap2
10.10.0.31 ecssap1.openstacklocal ecssap1
                                              T
10.10.0.32 ecssap2.openstacklocal ecssap2
```

2. Restart the SAP. The SAP is successfully started.



localnost name resolution is nandled within DWS itself.

# 3.8 Change History

#### Table 3-7

Description	Date	Prepared By
Initial version	2020-08-21	Xiong Peng/00508152
Optimized operations.	2021-05-20	Fu Chuandong/00469497

# **4** SAP S/4HANA (1809) HA Deployment Best Practice

Overview Preparations Resource Planning Resource Creation Software Installation High Availability Configuration Change History

# 4.1 Overview

This document provides instructions to prepare resources (such as ECSs and network resources) on the public cloud platform, and install SAP S/4HANA (1809) in high availability (HA) mode. SAP S/4HANA is authorized in Bring Your Own License (BYOL) mode. In this mode, you must log in at SAP Support Portal Home and apply for a license.

This document cannot replace the standard SAP document. If you have any trouble in installing and using SAP S/4HANA due to its own problems, contact the SAP technical support.

This document is written based on the OS SUSE Linux Enterprise Server. The deployment modes mentioned in the document are only for reference. Install SAP S/4HANA by referring to the standard SAP installation manual or based on sizing results and site requirements.

For details about the official SAP installation guide and related notes, see the following documents:

- SAP Installation Guides
- SAP Notes
- SAP Library

# 4.2 Preparations

### Logging in to Huawei Cloud

Before deploying the SAP system on Huawei Cloud, register a Huawei ID and enable Huawei Cloud services. Through this account, you can use Huawei Cloud services and pay only for the services you use.

For details, see **Registering a HUAWEI ID and Enabling Huawei Cloud Services** 

You can log in to Huawei Cloud using any of the methods described in **Logging In to Huawei Cloud**.

### **SAP License**

BYOL is used for authorizing SAP HANA and SAP S/4HANA. You need to log in at **SAP Support Portal Home** and apply for the licenses.

### **NAT Server**

Prepare a Network Address Translation (NAT) server on which SAP Studio for accessing SAP HANA and SAP GUI for accessing SAP applications are installed.

# 4.3 Resource Planning

### 4.3.1 Network Planning

The network information needs to be planned based on the site requirements and SAP S/4HANA planning. The network segments and IP addresses are for reference only. You can configure it based on site requirements.

In HA scenario, the ABAP Central Services (ASCS) node uses two NICs for the server/client network communication plane and internal communication plane, respectively.

#### **NOTE**

The IP addresses of the server/client plane and internal heartbeat communication plane must belong to different subnets.

Figure 4-1 shows the network planning in HA scenario.

#### Figure 4-1 Network planning in HA scenario

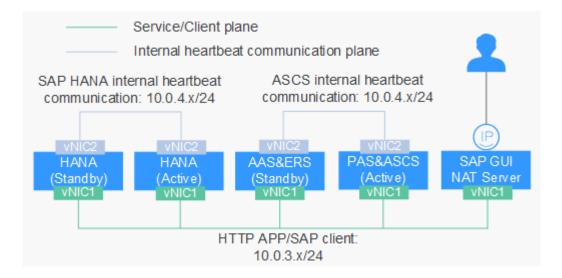


 Table 4-1 describes the network planning parameters.

Parameter	Description	Example Value
IP address of the server/client plane	Specifies the IP address of the primary NIC plane. The	Active ASCS node: 10.0.3.10
	active and standby ASCS nodes communicate with	ERS node: 10.0.3.20
	the SAP GUI and SAP HANA databases using this	Active HANA node: 10.0.3.30
	IP address.	Standby HANA node: 10.0.3.40
IP address of the internal heartbeat	The active and standby ASCS nodes use this	Active ASCS node: 10.0.4.110
communication plane	communicate with each other.	ERS node: 10.0.4.120
		other.
	The active and standby SAP HANA databases use this network plane to communicate with each other.	

 Table 4-1
 Network planning parameters

### 4.3.2 Security Group Rules

### SAP HANA Security Group Planning

 Table 4-2 describes the SAP HANA security group rules.

#### D NOTE

- The network segments and IP addresses are for reference only. The following security group rules are recommended practices. You can configure your own security group rules as needed.
- In the following table, ## stands for the SAP HANA instance ID, such as **00**. The instance ID must be the same as that specified during SAP HANA software installation. For details about SAP HANA instance ID planning, see **SAP HANA ECS Planning**.
- For more information about the specific ports to be accessed by SAP software and security group rules, see SAP official documents.

Source/ Destination	Protocol	Port Range	Description
Inbound	•		
Automatically specified by the system	All	All	Security group rule created by the system by default It enables ECSs in the same security group to communicate with each other.
0.0.0.0	ТСР	22	Allows users to access the SAP HANA Studio using Secure Shell (SSH) protocol. This rule is required only when SAP HANA Studio is deployed on a Linux ECS.
0.0.0.0	ТСР	3389	Allows users to access the SAP HANA Studio using Remote Desktop Protocol (RDP). This rule is required only when the SAP HANA Studio is deployed on a Windows ECS.
10.0.0/24	ТСР	80 (HTTP)	Allows users to access the NAT server using Hypertext Transfer Protocol (HTTP).
10.0.0/24	ТСР	443 (HTTPS)	Allows users to access the NAT server using Hypertext Transfer Protocol Secure (HTTPS).
10.0.0/24	ТСР	1128-1129	Allows access to SAP Host Agent using SOAP/HTTP.

#### Table 4-2 SAP HANA security group rules

Source/ Destination	Protocol	Port Range	Description
10.0.0/24	ТСР	43##	Allows access to XS Engine from the 10.0.0.0/24 subnet using HTTPS.
10.0.0/24	ТСР	80##	Allows access to XS Engine from the 10.0.0.0/24 subnet using HTTP.
10.0.0/24	ТСР	8080	Allows Software Update Manager (SUM) to access SAP HANA using HTTP.
10.0.0/24	ТСР	8443	Allows Software Update Manager (SUM) to access SAP HANA using HTTPS.
10.0.0/24	ТСР	3##13	Allows SAP HANA Studio to access SAP HANA.
10.0.0/24	ТСР	3##15	Provides ports for the service plane.
10.0.0/24	ТСР	3##17	Provides ports for the service plane.
10.0.0/24	ТСР	5##13	Allows SAP HANA Studio to access sapstartsrv.
Outbound		•	
All	All	All	Security group rule created by the system by default
			Allows SAP HANA to access all peers.

### SAP S/4HANA Security Group Planning

The security group planning needs to meet the requirements for communication between SAP nodes over the management plane and internal communication plane. You need to configure the security group together with the network department. For details about SAP's requirements for security group rules, see TCP/IP ports used by SAP applications.

You can configure the security group by referring to Table 4-3.

#### **NOTE**

- Plan the network segments and IP addresses based on the site requirements. The following security group rules are recommended practices. You can configure your own security group rules as needed.
- In the following table, ## stands for the SAP S/4HANA instance ID, which must be consistent with the instance ID specified when the SAP S/4HANA software is installed.

Source/ Destination	Protocol	Port Range	Description
Inbound	•	•	
Automatically specified by the system	All	All	Security group rule created by the system by default It enables ECSs in the same security group to communicate with each other.
10.0.3.0/24	ТСР	32##	Allows SAP GUI to access SAP S/4HANA.
10.0.3.0/24	ТСР	36##	Message Port with profile parameter rdisp/msserv
10.0.3.0/24	ТСР	5##13 ~ 5##14	Allows ASCS to access SAP application server.
10.0.3.0/24	ТСР	33##, 38##, 48##	Port used by CPIC and RFC
10.0.3.0/24	ТСР	22	Allows SAP S/4HANA to be accessed using SSH.
10.0.3.0/24	ТСР	123	Allows other servers to synchronize time with SAP S/ 4HANA.
Outbound			
All	All	All	Security group rule created by the system by default Allows SAP 4/HANA to access all peers.

 Table 4-3 SAP S/4HANA security group rules

# 4.3.3 File System Planning

### SAP HANA File System Planning

 Table 4-4 describes the specifications of the file system planned for SAP HANA.

Mount Point	File System Capacity (GB)	File System Type	Shared	Remarks
/	40 GB or larger	N/A	No	OS volume
/hana/data	400	xfs	No	Data volume: ultra- high I/O; it is recommended that the capacity of the data volume be at least one time the size of the memory; use two physical disks to make a data volume in using Logical Volume Manager (LVM).
/hana/log	200	xfs	No	Log volume: ultra- high I/O; when the memory is less than or equal to 512 GB, the log volume capacity is half of the memory and rounded up for decimal places. When the memory is greater than 512 GB, the log volume capacity is 512 GB.
/hana/shared	400	xfs	No	Shared volume. If the memory size is smaller than 1 TB, the recommended volume size is at least one time that of the memory size. If the memory size is larger than or equal to 1 TB, the recommended volume size is up to 1 TB.
/hana/ backup	Auto expansion	(Optional) SFS/SFS Turbo	No	Create an SFS or SFS Turbo file system as the backup volume.

 Table 4-4 File system planned for SAP HANA

Mount Point	File System Capacity (GB)	File System Type	Shared	Remarks
/usr/sap	50	xfs	No	/usr/sap volume
N/A	10	swap	No	Swap volume
N/A	10	N/A	Yes (SCSI)	SBD volume. You need to create this volume on the active HANA node and mount this volume to the standby HANA node. The SBD volume does not need to be formatted.

### D NOTE

You only need to create an SBD volume on the active ECS and mount it to the standby ECS.

### SAP S/4HANA File System Planning

Table 4-5 describes the specifications of the file system planned for SAP S/4HANA.

Mount Point	File System Capacity (GB)	File System Type	Shared	Description
/	40 GB or larger	N/A	No	OS volume
/usr/sap	50	xfs	No	/usr/sap volume
/sapmnt	40	SFS	Yes	Shared to all nodes in the SAP S/ 4HANA system
/sapcd	Auto expansion	SFS	Yes	Stores the SAP installation package, which is shared to all nodes in the SAP S/ 4HANA system.
/usr/sap/trans	60	SFS	Yes	Shared to all nodes in the SAP S/ 4HANA system

**Table 4-5** File system planned for SAP S/4HANA

Mount Point	File System Capacity (GB)	File System Type	Shared	Description
/usr/sap/ <sid>/ASCS##</sid>	80	xfs	Yes	Shared to the active ASCS node, which is used to install the ASCS instance.
/usr/sap/ <sid>/ERS##</sid>	80	xfs	Yes	Shared to the standby ASCS node, which is used to install the ERS instance.
N/A	10	N/A	Yes	SBD volume, which is shared to the active and standby nodes.
N/A	30G	swap	No	Swap volume

### 

*SID* is the SID parameter specified when SAP S/4HANA is installed., and *##* indicates the instance number when ASCS and ERS are installed. For details, see **SAP S/4HANA ECS Planning**.

# 4.3.4 ECS Planning

### SAP HANA ECS Planning

• ECS specifications

SAP HANA ECSs must be certified by SAP. For details about the SAP-certified ECSs, visit https://www.sap.com/dmc/exp/2014-09-02-hana-hardware/enEN/#/ solutions?filters=iaas;ve:5.

• OS

Table 4-6 lists the OS supported by SAP HANA ECSs.

#### Table 4-6 SAP HANA ECS OS

Name	Specifications
OS	SUSE Linux Enterprise Server for SAP Applications 15 SP1

• SAP HANA node planning

You need to create two ECSs, hana001 and hana002, for installing SAP HANA. ECS hana001 is the active SAP HANA node, and ECS hana002 is the standby SAP HANA node. Table 4-7 describes SAP HANA node information.

ECS Name	Role	Server/ Client IP Address	System Replicatio n/ Heartbeat IP Address	Floating IP Address	SID	Instan ce Numb er
hana001	Active HANA node	10.0.3.30	10.0.4.130	10.0.3.100	S00	00
hana002	Standby HANA node	10.0.3.40	10.0.4.140			

Table 4-7 SAP HANA node information

### SAP S/4HANA ECS Planning

**ECS** specifications

Before applying for SAP S/4HANA ECSs, evaluate the SAP Application Performance Standard (SAPS) value based on the standard SAP Sizing method. Then apply for the ECSs based on the evaluation results. For details, see SAP Quick Sizer.

For details about the minimum hard disk space, RAM, and minimum software requirements of each component in SAP S/4HANA, see SAP note 1953429 and SAP Installation Guides.

SAP-certified ECSs must be used for installing SAP S/4HANA. For details, see SAP Note 2582296 - SAP Applications on Huawei Cloud Supported Products and ECS VM types.

OS

Table 4-8 lists the OS supported by SAP S/4HANA ECSs.

Table 4-8 SA	P S/4HANA	ECS OS
--------------	-----------	--------

Name	Specifications
OS	SUSE Linux Enterprise Server for SAP Applications 15 SP1

SAP S/4HANA node planning

Two ECSs, s4001 and s4002, need to be created for installing SAP S/4HANA. s4001 is the active node and s4002 is the standby node.

Practice

ECS Name	Server/ Client IP Address	Active Heartbe at IP Address	Туре	Instanc e Numbe r	SID	Virtual IP Address
S4001	10.0.3.10	10.0.4.11 0	ASCS Instance	01	S01	10.0.3.110 10.0.3.120
			PAS Instance	02		
			DB Instance	None		
S4002	10.0.3.20	10.0.4.12 0	ERS Instance	10		
			AAS Instance	03		

 Table 4-9 SAP S/4HANA node information

# 4.4 Resource Creation

### 4.4.1 Creating a VPC

The Virtual Private Cloud (VPC) service enables you to provision logically isolated, configurable, and manageable virtual networks for cloud servers, cloud containers, and cloud databases, improving cloud service security and simplifying network deployment. With a VPC, you can configure and manage the networks in the VPC, and make changes to these networks as needed, quickly and securely. For more information about VPC, see VPC Overview.

When creating a VPC, create two subnets 10.0.3.0 and 10.0.4.0, which are used as the server/client plane IP address and system replication/heartbeat plane IP address of SAP HANA and SAP S/4HANA.

### Procedure

- **Step 1** Log in to the management console.
- **Step 2** Click <sup>1</sup> in the upper left corner and select the desired region and project.
- **Step 3** Click in the navigation pane on the left, and choose **Network > Virtual Private Cloud**.

	Service List	Enter a service or function name	e.		Q			×
9	Elastic Cloud Server	Recently Visited Services: Virtual	Private Cloud   Elastic Cloud Serve	er i (	Object Storage Service   Elastic	Volun	e Service   Scalable File Service	
3	Relational Database Ser	Ide	ntity and Access Management					
Ø.	Auto Scaling	Computing	Storage		Network		Database	
0.1	Auto scaling	Elastic Cloud Server	Elastic Volume Service		Virtual Private Cloud 😕		GaussDB	
-	Bare Metal Server	Halo ECS	Dedicated Distributed Storag		Elastic Load Balance		Relational Database Service	
3	Elastic Volume Service	Bare Metal Server	Storage Disaster Recovery Se		Direct Connect		Document Database Service	
		Cloud Phone	Cloud Server Backup Service		Virtual Private Network		GaussDB NoSQL	
	Volume Backup Service	Image Management Service	Cloud Backup and Recovery		Domain Name Service		Distributed Database Middle	
0	Virtual Private Cloud	FunctionGraph	Volume Backup Service		NAT Gateway		Data Replication Service	
5	Elastic Load Balance	Auto Scaling	Object Storage Service		Elastic IP		Data Admin Service	
		Dedicated Cloud	Data Express Service		Cloud Connect			
10	Domain Registration	Dedicated Host	Scalable File Service		VPC Endpoint		Security	
Ð	Elastic IP		CDN				Anti-DDoS	
		Application	Cloud Storage Gateway		Container		Advanced Anti-DDoS	0.00
		AppCube			Cloud Container Engine		Web Application Firewall	
		ServiceStage	Management & Deployment		Cloud Container Instance		Vulnerability Scan Service	ЭК
		Cloud Service Engine	Cloud Trace Service		Software Repository for Cont		Host Security Service	
		Cloud Service Engine Service	Cloud Eye		Multi-Cloud Container Platfor		Container Guard Service	 kbi
		Distributed Cache Service Re	Application Operations Mana		CCE Agile		Database Security Service	
		Distributed Cache Service Me	Application Performance Ma		Application Service Mesh		Data Encryption Workshop	
		Distributed Message Service	Identity and Access Manage		Application Orchestration Ser		Cloud Certificate Manageme	
		Distributed Message Service f	Log Tank Service				Security Expert Service	
		Distributed Message Service f	Tag Management Service		Migration		Situation Awareness	
		Simple Message Notification			Server Migration Service		SSL Certificate Manager	
		No dodania Constan	El Enterprise Intelligence		Object Storage Migration Ser		dead beat a track	

#### **Step 4** Click **Create VPC** on the right of the page.

#### **Step 5** Configure required parameters as prompted based on **Table 4-10**.

Basic Information			
Region	CN East-Shanghai2 *		
	Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.		
Name	vpc-hana-s4		
CIDR Block 10 · 0 · 0 / 16 · If you intend to use VPC peering, specify a CIDR block that does not overlap with the another VPC in the current region.			
	Recommended: 10.0.0.0/8-24 (Select) 172.16.0.0/12-24 (Select) 192.168.0.0/16-24 (Select)		
	The CIDR block 10.0.0.0/16 overlaps with that of another VPC in the current region, if you intend to use VPC Peering, change the CIDR block. View VPC CIDR blocks in the current region		
Enterprise Project	SAP C Create Enterprise Project ③		
Advanced Settings	. Tag		
Default Subnet			
AZ	AZ3 • ⑦		
	AZ3		
Name			
AZ Name CIDR Block	subnet-businessIP		
Name CIDR Block	subnet-businessIP           10         0         3         0         / 24         •         ⑦ Available IP Addresses: 251		
Name CIDR Block Advanced Settings	subnet-businessIP       10     0       3     0       / 24     •       ⑦ Available IP Addresses: 251       The CIDR block cannot be modified after the subnet has been created.		
Name CIDR Block	subnet-businessIP       10     0       3     0       / 24     •       ⑦ Available IP Addresses: 251       The CIDR block cannot be modified after the subnet has been created.		
Name CIDR Block Advanced Settings ਾ Subnet 1 ਯੋ	subnet-businessiP         10       0       3       0       / 24       The Addresses: 251         The CIDR block cannot be modified after the subnet has been created.         Gateway       DNS Server Address       DHCP Lease Time       Tag		
Name CIDR Block Advanced Settings · Subnet 1 교 AZ	subnet-businessIP         10 · 0 · 3 · 0 / 24 · ⑦ Available IP Addresses: 251         The CIDR block cannot be modified after the subnet has been created.         , Gateway   DNS Server Address   DHCP Lease Time   Tag         AZ3 · ⑦		

Category	Parameter	Description
Basic Information	Region	A region is a geographical area where you can run your VPC service. Each region comprises one or more AZs and is completely isolated from other regions. Only AZs in the same region can communicate with one another through an internal network. You can use the region selector on the upper left of the page to change the region.
	Name	VPC name
	CIDR Block	CIDR block of the VPC. The CIDR block of a subnet can be the same as the CIDR block for the VPC (for a single subnet in the VPC) or a subset of the CIDR block for the VPC (for multiple subnets in the VPC).
		The following CIDR blocks are supported:
		10.0.0/8~24
		172.16.0.0/12~24
		192.168.0.0/16~24
		Configure the CIDR block based on the subnet information provided in <b>Network Planning</b> .
	Enterprise Project	When creating a VPC, you can add the VPC to an enabled enterprise project.
		An enterprise project facilitates project- level management and grouping of cloud resources and users. The name of the default project is <b>default</b> .
		For details about creating and managing enterprise projects, see the <b>Enterprise Management User Guide</b> .
	Tag	VPC tag that consists of a key and value pair You can create 10 tags for a VPC. This parameter is optional. Click <b>Advanced Settings</b> to configure it.
		For details about naming rules of tags, see <b>Tag Naming Rules</b> .

Table 4-10 Parameters required for creating a VPC

Category	Parameter	Description
Default Subnet	AZ	An AZ is a geographic location with independent power supply and network facilities in a region. AZs are physically isolated, and AZs in the same VPC are interconnected through private networks.
	Name	Subnet name
	CIDR Block	CIDR block for the subnet. This value must be within the VPC CIDR block. Configure the subnet CIDR block based on the information provided in <b>Network Planning</b> .
	Advanced Settings	Click <b>Advanced Settings</b> to set parameters such as <b>Gateway</b> and <b>DNS</b> <b>Server Address</b> .
	Gateway	Gateway address of the subnet
	DNS Server Address	External DNS server addresses are used by default. If you need to change the DNS server address, ensure that the DNS server addresses you configured are available.
	DHCP Lease Time	Period during which a client can use an IP address automatically assigned by the DHCP server. After the lease time expires, a new IP address will be assigned to the client. The unit is day.
	Tag	Subnet tag that consists of a key and value pair You can add 10 tags for a subnet. This parameter is optional. For details about the tag naming rules, see VPC Tag Naming Rules.
Add Subnet	You can click <b>Add Su</b>	bnet to add a subnet.

#### Step 6 Click Create Now.

----End

# 4.4.2 Creating a Security Group

A security group is a collection of access control rules for ECSs that have the same security protection requirements and are mutually trusted. After a security group is created, you can create various access rules for the security group, and these rules will apply to all ECSs added to this security group. For more information about security groups, see **Security Group Overview**.

You need to create two security groups, one for the active and standby SAP HANA ECSs, and the other for the active and standby SAP S/4HANA ECSs.

### Procedure

**Step 1** Create a security group for SAP HANA ECSs.

 Choose Access Control > Security Groups in the navigation pane on the left of the VPC console. On the Security Groups page, click Create Security Group.

etwork Console	Security Groups ①		Search Q Biling Re		se Support English   19 Quick Links
Dashboard Artual Private				All projects - Name	· · •
tioud	Namo	Security Group Rules	Associated Instances Description	Enterprise Project	Operation
lubnets	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	13	7 -	default	Manage Rule   More -
ccess Control +	10000000	14	0 -	default	Manage Rule   More +
Security Groups		4	0 sdftvfu	default	Manage Rule   More +
Network ACLs	300000	4	0 -	default	Manage Rule   More -
lastic IP and and		5	0 -	default	Manage Rule   More +
AT Outeway	********	5	0	default	Manage Rule   More +
Slastic Load -		13	0 -	default	Manage Rule   More -
/PC Peering /PC Endpoint *		2	0 -	default	Manage Rule   More +
Intual Private		13	0	default	Manage Rule   More +
ietwork 🧳	2000000	11	5 default	default	Manage Rule   More -
Street Connect and	10 - Total Records 26 ( 1 2 3 5				
Itastic Cloud					
ierver d	P				

- 2. On the **Security Group** page, click **Create Security Group**.
  - Template: The template contains security group rules, which help you quickly create a security group. The following templates are provided:
    - **Custom**: This template allows you to create security groups with custom security group rules.
    - General-purpose web server: The security group that will be created using this template is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and allow inbound traffic on ports 22, 80, 443, and 3389.
    - All ports open: The security group that will be created using this template includes default rules that allow inbound traffic on any port. Allowing inbound traffic on any port may pose security risks. Exercise caution when using this template.
  - Name: specifies the name of the security group. Name the security group that is easy to identify, for example, sg\_sap\_hana.
  - Enterprise Project: You can add the security group to an enabled enterprise project. You can select an enterprise project from the dropdown list, for example, SAP.

Create Security Gro	>>> ×
* Template	Custom -
* Name	sg-sap-hana
* Enterprise Project	SAP   C Create Enterprise Project
Description	Inbound traffic is not allowed on any port. After the security group is created, you can add or modify security group rules as required.
Show Default Rule •	0/255
	OK Cancel

- 3. Click **OK**.
- 4. Locate the row that contains the newly created security group **sg-sap-hana**, click **Manage Rule** in the **Operation** column to switch to the page for managing inbound and outbound rules. On the **Inbound Rules** tab, click **Add Rule**. In the displayed dialog box, add the desired ports based on **Table 4-2**.

E < sg-sag					신 Import Rule	Ci Export Rule
Summary         Add Rul           Add         Pro           Add         Tot           Tot         Tot           C         Tot           C         Tot           C         Tot			Operation + Operation +	Operat Monty Monty Monty Monty	en Replicate Dekte Replicate Dekte Replicate Dekte Replicate Dekte	
						2

**Step 2** Create a security group for SAP S/4HANA ECSs.

- Choose Access Control > Security Groups in the navigation pane on the left of the VPC console. On the Security Groups page, click Create Security Group.
- 2. Set parameters required for creating a security group (sg-sap-s4) for SAP S/ 4HANA ECSs as prompted.

* Template	Custom -	
* Name	sg-sap-s4	
* Enterprise Project	SAP -	
	C Create Enterprise Pro	jec
Description	Inbound traffic is not allowed on any port. After the security group is created, you can add or modify security group rules as required.	
	0/255	
Show Default Rule -		

3. Locate the row that contains the newly created security group **sg-sap-s4**, click **Manage Rule** in the **Operation** column to switch to the page for managing inbound and outbound rules. On the **Inbound Rules** tab, click **Add Rule**. In the displayed dialog box, add the desired ports based on **Table 4-3**.

Summary   Inbound Rules   Associated Instances			Z Import Rule C Export Rule
Add Rule Fast-Add Rule Delete Allow Common Ports	Inbound Rules: 4 Learn more about security group configuration.		C
Protocol & Port V	Type Source ①	Description	Operation
	IPv4 sg-sap-s4 (t)	允许安全组内的弹性云服务器彼此遵信	Modify   Replicate   Delete
TCP: 3201	Add Inbound Rule Learn more about security group configuration.	×	Modify   Replicate   Delete
© TCP:3202	Add inbound Rule Learn more about security group comiguration.		Modify   Replicate   Delete
<ul> <li>↓</li> <li>↓</li></ul>	Inbound rules allow incoming traffic to instances associated with the security group.		Modify   Replicate   Delete
0	Security Group sg.sap.s4		
	You can import multiple rules in a batch.		
	Protocol & Port ⑦ Source ⑦ Description	Operation	
	TCP • IP address •	Operation -	
	22 0.0.000		
	123 0.0.0/0	Operation +	
	Add Rule		
	OK Cancel		
	UK Canter		

----End

### 4.4.3 Creating an SFS or SFS Turbo File System

Scalable File Service (SFS) is a network attached storage (NAS) service that provides scalable, high-performance file storage. With the service, shared file access can be achieved among multiple Elastic Cloud Servers (ECSs), Bare Metal Servers (BMSs), and containers created on Cloud Container Engine (CCE). For more information about SFS, see **SFS Overview**.

In the SAP HANA system, if the backup volume is provided by SFS, you can create an SFS file system to provide a shared path for SAP HANA ECSs.

Two SFS file systems are created and attached to the active and standby SAP HANA nodes, respectively. You need to create one SFS file system and mount it to **/sapcd** on the active and standby SAP S/4HANA nodes, and create two SFS Turbo file systems and respectively mount them to **/sapmnt** and **/usr/sap/trans** on the active and standby SAP S/4HANA nodes. For the details about the parameter configurations for creating SFS and SFS Turbo file systems, see **Getting Started with SFS**.

### Procedure

**Step 1** Click in the navigation pane on the left, and choose **Scalable File Service** under **Storage**.

=	Service List	Enter a service or function name.		Q			$\times$
>	Elastic Cloud Server	Recently Visited Services: Scalable File Service	Elastic IP Virtual Private Cloud Elastic	Cloud Server Object Storage Service	Elastic V	/olume Service	
0	Relational Database Service	Computing	Storage	Network		Database	1
	Auto Scaling	Elastic Cloud Server	Elastic Volume Service	Virtual Private Cloud		GaussDB	
		Halo ECS	Dedicated Distributed Storage Service	Elastic Load Balance		Relational Database Service	
)	Bare Metal Server	Bare Metal Server	Storage Disaster Recovery Service	Direct Connect		Document Database Service	
I.	Elastic Volume Service	Cloud Phone	Cloud Server Backup Service	Virtual Private Network		GautsDB NoSQL	
	Volume Backup Service	Image Management Service	Cloud Backup and Recovery	Domain Name Service		Distributed Database Middleware	
		FunctionGraph	Volume Backup Service	NAT Gateway		Data Replication Service	
2	Virtual Private Cloud	Auto Scaling	Object Storage Service	Elastic IP		Data Admin Service	
2	Elastic Load Balance	Dedicated Cloud	Data Express Service	Cloud Connect			
	Domain Registration	Dedicated Host	Scalable File Service 🛛 🖗	VPC Endpoint		Security	
~			CDN Scalable File Ser	vice		Anti-DDoS	
	Elastic IP	Application	Cloud Storage Gateway	Container		Advanced Anti-DDoS	
		AppCube		Cloud Container Engine		Web Application Firewall	
		ServiceStage	Management & Deployment	Cloud Container Instance		Vulnerability Scan Service	
		Cloud Service Engine	Cloud Trace Service	Software Repository for Container		Host Security Service	
		Cloud Service Engine ServiceComb	Cloud Eye	Multi-Cloud Container Platform		Container Guard Service	
		Distributed Cache Service Redis	Application Operations Management	CCE Agile		Database Security Service	
		Distributed Cache Service Memcached	Application Performance Management	Application Service Mesh		Data Encryption Workshop	
		Distributed Message Service	Identity and Access Management	Application Orchestration Service		Cloud Certificate Management Service	
		Distributed Message Service for Kafka	Log Tank Service			Security Expert Service	
		Distributed Message Service for Rabbit	Tag Management Service	Migration		Situation Awareness	
		Simple Message Notification		Server Migration Service		SSL Certificate Manager	
		Blockchain Service	EI Enterprise Intelligence	Object Storage Migration Service		Cloud Bastion Host	
		API Gateway	DAYU	Cloud Data Migration			
		Cloud Derformance Test Senilee	Data Lake Center			DevCloud	

Step 2 Click Create File System. Set required parameters on the displayed page based on Table 4-11.

Create File System @	< Back to File System List
<ul> <li>★ File System Type ⑦</li> <li>★ Region</li> </ul>	SFS SFS Urbo     CN East-Shanghai2     F     Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.
* AZ	AZ3 File systems and ECSs in different AZs in the same region can communicate with each other.
* Protocol Type	NFS  The NFS protocol is recommended for a Linux client and the CIFS protocol is recommended for a Windows client.
*VPC ③	vpc-hana-s4  C Create VPC An ECS cannot access file systems in a different VPC. Select the VPC where the ECS resides.
Auto Capacity Expansion	After auto capacity expansion is enabled, the capacity of a file system is unlimited and resizing the file system is not required.
Encryption	Enable static data encryption
* Enterprise Project 🍘	SAP   C Create Enterprise Project
Name	sfs-hana-backup001 If you create multiple SFS file systems at the same time, the system automatically populates an SFS name (editable) and adds an incremental number to the end of each SFS name. For example, if the first SFS's name is sfs-share-001, the second SFS's name will be sfs-share-002.
Quantity	- 1 + Create Now

Table 4-11 Parameter description

Parameter	Description
File System Type	Select the type of the file system to be created.
Region	Select the target region.
AZ	Specifies the AZ where the file system is located. Select your desired AZ.
Protocol Type	Specifies the protocol type. Select <b>NFS</b> .
VPC	Select <b>vpc-hana-s4</b> for SAP HANA.
Auto Capacity Expansion	This function is enabled by default. When it is enabled, you do not need to manually adjust the capacity of the file system. You can determine whether to enable the function based on the site requirements.

Parameter	Description
Maximum Capacity	This parameter shows after <b>Automatic</b> <b>Capacity Expansion</b> is disabled. Specifies the maximum capacity of a single file system.
Encryption	Optional. Specifies whether a file system is encrypted. You can create a file system that is encrypted or not, but you cannot change the encryption settings of an existing file system. If you select Enable static data encryption, follow the instructions described in Getting Started with SFS.
Enterprise Project	Select the target project.
Name	Specifies the file system name.
Quantity	Select the quantity based on the site requirements.

- **Step 3** Click **Create Now**. Confirm the file system information and click **Submit** on the displayed page. You can locate the created file system using its name in the file system list. In the **Shared Path** column, query the shared path.
- **Step 4** Repeat **Step 2** and **Step 3** to create other SFS file systems.
  - 1. Create an SFS file system sfs-hana-backup002 and mount it to the **/hana/ backup** directory on the standby SAP HANA node.

* File System Type	SFS SFS Turbo
+ Denier	
* Region	CN East-Shanghai2 *
	Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through inter network connections. For low network latency and quick resource access, select the nearest region.
* AZ	AZ3
	File systems and ECSs in different AZs in the same region can communicate with each other.
* Protocol Type	NFS *
	The NFS protocol is recommended for a Linux client and the CIFS protocol is recommended for a Windows client.
*VPC ⑦	vpc-hana-s4    C Create VPC
	An ECS cannot access file systems in a different VPC. Select the VPC where the ECS resides.
Auto Capacity Expansion	
	After auto capacity expansion is enabled, the capacity of a file system is unlimited and resizing the file system is not required.
Encryption	Enable static data encryption Ø
* Enterprise Project 🏼 🕢	SAP   C Create Enterprise Project
Name	sfs-hana-backup002
	If you create multiple SFS file systems at the same time, the system automatically populates an SFS name (editable) and adds an incremental number to the end of each SFS name. For example, if the first SFS's name is sfs-share-001, the second SFS's name will be sfs-share-002.
Quantity	- 1 +

2. Create a 40 GB SFS Turbo file system sfs-turbo-s4-sapmnt and mount it to the **/sapmnt** directory on the active and standby SAP S/4HANA nodes.

* File System Type 💿	• SFS O SFS Turbo
* Region	CN East-Shanghai2 👻
	Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through inter network connections. For low network latency and quick resource access, select the nearest region.
* AZ	AZ3
	File systems and ECSs in different AZs in the same region can communicate with each other.
* Protocol Type	NFS +
	The NFS protocol is recommended for a Linux client and the CIFS protocol is recommended for a Windows client.
* VPC ⑦	vpc-hana-s4  C Create VPC
	An ECS cannot access file systems in a different VPC. Select the VPC where the ECS resides.
Auto Capacity Expansion	
	After auto capacity expansion is enabled, the capacity of a file system is unlimited and resizing the file system is not required.
Encryption	Enable static data encryption @
* Enterprise Project 🏼 🕜	SAP   C Create Enterprise Project
Name	sfs-s4-sapmnt
	If you create multiple SFS file systems at the same time, the system automatically populates an SFS name (editable) and adds an incremental number to the end of each SFS name. For example, if the first SFS's name is sfs-share-001, the second SFS's name will be sfs-share-002.
Quantity	- 1 +

3. Create an SFS file system sfs-s4-sapcd and mount it to the **/sapcd** directory on the active and standby SAP S/4HANA nodes.

Create File System @	
* File System Type ③	SFS SFS Turbo     SFS Turbo     CN East-Shanghai2     Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.
*AZ	AZ3 File systems and ECSs in different AZs in the same region can communicate with each other.
* Protocol Type	NFS -
* VPC ⑦	vpc-hana-s4  The Create VPC
Auto Capacity Expansion	An ECS cannot access file systems in a different VPC. Select the VPC where the ECS resides.
Encryption	Enable static data encryption
*Enterprise Project 🕥	SAP   C Create Enterprise Project
Name	sfs-s4-sapcd If you create multiple SFS file systems at the same time, the system automatically populates an SFS name (editable) and adds an incremental number to the end of each SFS name. For example, if the first SFS's name is sfs-share-001, the second SFS's name will be sfs-share-002.
Quantity	- 1 +

4. Create a 60 GB SFS Turbo file system sfs-turbo-s4-trans and mount it to the **/usr/sap/trans** directory on the active and standby SAP S/4HANA nodes.

Create Now

Create File System ③	K Back to File System List
★File System Type ⑦ ★Region	SFS SFS Turbo     SFS SFS Turbo     CN East-Shanghai2      Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.
*AZ	AZ3 File systems and ECSs in different AZs in the same region can communicate with each other.
* Protocol Type	NFS  The NFS protocol is recommended for a Linux client and the CIFS protocol is recommended for a Windows client.
* VPC ()	vpo-hana-s4 - C Create VPC
Auto Capacity Expansion	An ECS cannot access file systems in a different VPC. Select the VPC where the ECS resides.
Encryption	Enable static data encryption @
* Enterprise Project 🍘	SAP   C Create Enterprise Project
Name	sfs-s4-trans If you create multiple SFS file systems at the same time, the system automatically populates an SFS name (editable) and adds an incremental number to the end of each SFS name. For example, if the first SFS's name is sfs-share-001, the second SFS's name will be sfs-share-002.
Quantity	- 1 +

Create Now

**Step 5** The following figure shows the details about the created SFS file systems.

Name	AZ	Status \$	Type 🗘	Protocol Type	Used Capacity (GB)	Encrypted \$	Enterprise Proj	Mount Address	Operation
sfs-s4-trans	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	0.0	0 No	SAP	sfs-nas3.cn-east-2.myhuaweicloud.c4	Resize More -
sfs-s4-sapcd	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	0.0	0 No	SAP	sfs-nas3.cn-east-2.myhuaweicloud.co	Resize More -
sfs-s4-sapmnt	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	0.0	0 No	SAP	sfs-nas3.cn-east-2.myhuaweicloud.co	Resize More -
sfs-hana-backup002	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	0.0	0 No	SAP	sfs-nas3.cn-east-2.myhuaweicloud.co	Resize More -
sfs-hana-backup001	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	0.0	0 No	SAP	sfs-nas3.cn-east-2.myhuaweicloud.co	Resize More -
******	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	147.8	1 No	SAP		Resize More -
	AZ3	<ul> <li>Available</li> </ul>	SFS Capacity-Ori	NFS	11.9	1 No	default		Resize More -
	-	Available	SFS Capacity-Ori	NFS	106.1	6 No	default		Resize More +

----End

# 4.4.4 Creating ECSs

#### 4.4.4.1 Creating SAP HANA ECSs

Two ECSs need to be created for installing the SAP HANA software.

#### Procedure

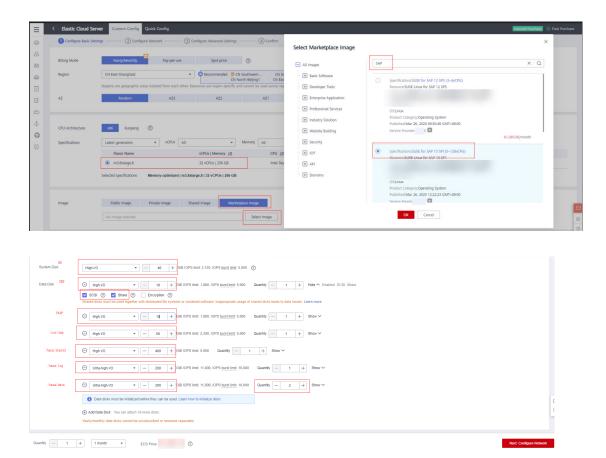
Step 1 Click in the navigation plane on the left, and choose Computing > Elastic Cloud Server.

=	Service List	Enter a service or function na	ne.			Q			$\times$	
٢	Elastic Cloud Server	Recently Visited Services: Elast	c Cloud Server							
3	Relational Database Service	Computing		Storage		Network		Database	i i	i.
X	Auto Scaling	2 Elastic Cloud Server	*	Elastic Volume Service	*	Virtual Private Cloud	*	GaussDB		
		Halo ECS		Dedicated Distributed Storage Service		Elastic Load Balance	*	Relational Database Service		
D	Bare Metal Server	Bare Metal Server		Storage Disaster Recovery Service		Direct Connect		Document Database Service		
1	Elastic Volume Service	Cloud Phone		Cloud Server Backup Service		Virtual Private Network		GaussDB NoSQL		
	Volume Backup Service	Image Management Service		Cloud Backup and Recovery		Domain Name Service		Distributed Database Middleware		
		FunctionGraph		Volume Backup Service		NAT Gateway		Data Replication Service		
	Virtual Private Cloud	Auto Scaling	*	Object Storage Service		Elastic IP		Data Admin Service		
2	Elastic Load Balance	Dedicated Cloud		Data Express Service		Cloud Connect				
5	Domain Registration	Dedicated Host		Scalable File Service		VPC Endpoint		Security		
347	-			CDN				Anti-DDoS		
0	Elastic IP	Application		Cloud Storage Gateway		Container		Advanced Anti-DDoS		
		AppCube				Cloud Container Engine		Web Application Firewall		
		ServiceStage		Management & Deployment		Cloud Container Instance		Vulnerability Scan Service		
		Cloud Service Engine		Cloud Trace Service		Software Repository for Container		Host Security Service		
		Cloud Service Engine ServiceCor	nb	Cloud Eye		Multi-Cloud Container Platform		Container Guard Service		
		Distributed Cache Service Redis		Application Operations Management		CCE Agile		Database Security Service		
		Distributed Cache Service Memo	ached	Application Performance Management		Application Service Mesh		Data Encryption Workshop		
		Distributed Message Service		Identity and Access Management		Application Orchestration Service		Cloud Certificate Management Service		
		Distributed Message Service for	Kafka	Log Tank Service				Security Expert Service		
		Distributed Message Service for	Rabbit	Tag Management Service		Migration		Situation Awareness		
		Simple Message Notification				Server Migration Service		SSL Certificate Manager		
		Blockchain Service		EI Enterprise Intelligence		Object Storage Migration Service		Cloud Bastion Host		
		API Gateway		DAYU		Cloud Data Migration				

**Step 2** Click **Buy ECS**. On the displayed page, configure basic settings of the ECS to be created for the active SAP HANA node. **Table 4-12** describes the parameters.

Parameter	Description
Billing Mode	Select <b>Yearly/Monthly</b> .
Region	Select the target region. For example, <b>CN East-Shanghai2</b> .
AZ	Specifies the AZ where ECSs are located. Choose an AZ as required.
CPU Architecture	Select <b>x86</b> .
Specifications	For details about SAP HANA ECS specifications, see <b>SAP</b> HANA ECS Planning.
	For example, select <b>m3.8xlarge.8</b> .
Image	Select Marketplace image. Click Select Image, enter SAP in the search box, and select SUSE for SAP 15 SP1.
	<b>NOTE</b> To use marketplace images, such as <b>SUSE for SAP 15 SP1</b> , ensure that your ECS is billed on a yearly/monthly basis.
System Disk	Set this parameter as required. If you need multiple data disks, click <b>Add Data Disk</b> to add more data disks.

Table 4-12 Basic settings of the active SAP HANA ECS



# **Step 3** Click **Next: Configure Network** and configure network information based on **Table 4-13**.

Table 4-13 Netwo	rk configuration	for the active	SAP HANA ECS

Parameter	Description
Network	Select the VPC and subnet created in Creating a VPC.
Extension NIC	If you need more NICs, click Add NIC.
Security Group	Select the security group created in <b>Step 1</b> .
EIP	Select Not required.

≡	< Elastic Cloud	Server Custom Carlig Quick Carlig Quick Carlig Devices © Roll Purchase
0	(1) Configure Basic	Setting 🚯 Configure Network 🚯 Configure Advanced Setting  🚯 Configure Network
8 M 0 0 0	Network Extension NIC	Impedants 44(08.06.016)       C       Solver-beamset/P(08.01.02.0)       C       Manually-specified # address       10       0       3       30       Vew In-Use # Address       Available private # address       20       Cester VPC. If LCs are created in a batch, the specified # address for the EQS.         Creater VPC. If LCs are created in a batch, the specified # address for the EAD.       Impedants 44(08.000)       I
0 4 6 0	Security Group	Ingrap have left field scha-skille 4315d skilleded (1) 🔹 🔹 C Create Security Comp 🔘 Ensure that the watched recardly group allows access to port 22 (504-based Linux login), 3389 (Windows login), and KUM (ping operation). Configure Security Group Rules Security Group Rules 🗸
	EIP	Auto assign Use entrong  in Not required  in a service ECS deployed in a cluster or on a private network.
	Quantity 1	+ 1 month v K5 Anc map Proc Market String: Process New Configure Advanced String:

**Step 4** Click **Next: Configure Advanced Settings**. On the displayed page, configure the advanced settings for the active SAP HANA ECS based on **Table 4-14**.

Parameter	Description
ECS Name	Enter <b>hana001</b> .
Login Mode	Select <b>Password</b> .
Cloud Backup and Recovery	Set it based on the site requirements, for example, <b>Not required</b> .
ECS Group (Optional)	Specifies a HANA ECS group. When you create ECSs, the system will allocate the HANA ECSs in the same server group to different physical servers to ensure the running reliability of these HANA ECSs.
	<b>NOTE</b> If no ECS group is available, perform the following operations to create one:
	Click <b>Create ECS Group</b> . On the displayed page, click <b>Create</b> <b>ECS Group</b> , specify the ECS group name, and click <b>OK</b> .
Advanced Options	Do not set this parameter.

**Table 4-14** Advanced settings for the active SAP HANA ECS

Ξ	< Elastic Cloud Se	erver Custom Config Quick Config Quick Config Part Automation (C Real Automation Config	ase
٢	(1) Configure Basic Set	tings (2) Configure Network (0) Configure Network Settings (0) Conf	
& M @	ECS Name	Nam2001         Allow depicate KCS names           If multiple (CCs are created at the care time, the system automatically adds a hyphen followed by a four-digit incremental number to the end of each ICS name. For example, if you enter sca and there is no existing ICS in the system, the first ICS's name will be ess 4001. If an ICS with the name eco 00010 always exist, the name of the lint new ICS will be ess 4001. If an ICS with the name eco 00010 always exist, the name of the lint new ICS will be ess 4001.	
0	Login Mode	Rey par	
0	Username	roe.	
0	Password	Keep the parsmost secure. If you forget the parsmost, you can log in to the ECS controls and change it.	
4			
0	Confirm Password		
	Cloud Backup and Recovery	To see CBR, you need to purchase a backup wait. A wait it is constance that stores backups for servers.           Auto assign         Use existing         Not Required         ①	
	ECS Group (Optional)	Axts attracty     ①      Select ICS gravp     •       Create ICS Graup	<b>Q</b> 0
	Advanced Options	Configure tour	ß
	Quantity 1	+ 1 month + ES New Weiter the many first weiter the first the firs	m

#### Step 5 Click Next: Confirm.

Check the ECS configurations and select I have read and agree to the Huawei Image Disclaimer. Click Next.

(1) Configure Basic 5 Note:	The primary network	% interface does not have an EIP bound, and the ECS cannot access	the Internet.				
Configuration	Basic 🖉						
	Billing Mode Specifications	Yearly/Monthly Memory-optimized   m3.8xlarge.8   32 vCPUs   256 GB	Region Image	Shanghai2 SUSE for SAP 15 SP1(5–128vCPU) (SUSE Linux for SAP 15 SP1)	AZ System Disk	AZ3 Ultra-high I/O,40 GB	
	Network 🖉 VPC Extension NIC	vpc-hana-s4(10.0.0.0/16) (10.0.4.130)	Security Group EIP	sg-tap-hana No EP bound to the primary network interface	Primary NIC	(10.0.3.30)	
	Advanced 🖉	hana001	Login Mode	Password	ECS Group		
Required Duration	1 2	3 4 5 6 7 8 9 mon	ths 1 year 2 year	a Jyear			
	Auto renew			- )			
Quantity Agreement	_	You can create 200 more ECSs. Learn how to increase quota.     dagree to the Huawel Image Disclaimec.					

# **Step 6** Repeat **Step 2** to **Step 5** to create the ECS hana002 for the standby SAP HANA node.

The procedure for creating the active and standby SAP HANA ECSs is similar. You do not need to create SBD shared volume when creating the standby SAP HANA ECS because you can mount the SBD shared volume created for the active SAP HANA ECS to the standby ECS.

----End

#### 4.4.4.2 Creating SAP S/4HANA ECSs

Two ECSs need to be created for installing the SAP S/4HANA software.

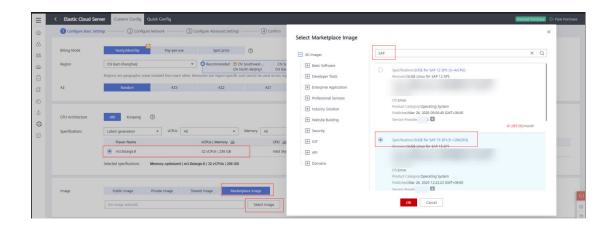
#### Procedure

**Step 1** On the public cloud management console, click = in the upper left corner and choose **Computing** > **Elastic Cloud Server**.

- Step 2 Click Buy ECS in the upper right corner. A page for creating ECSs is displayed.
- **Step 3** Ser parameters required for creating the ECS s4001 for the active SAP S/4HANA node based on Table 4-15.

Parameter	Description
Billing Mode	Select <b>Yearly/Monthly</b> .
Region	Select the target region.
	For example, CN East-Shanghai2.
AZ	Specifies the AZ where ECSs are located. Choose an AZ as required.
CPU Architecture	Select <b>x86</b> .
Specifications	For details about the SAP S/4HANA ECS specifications, see SAP S/4HANA ECS Planning.
	For example, select <b>c6.4xlarge.4</b> .
Image	Select Marketplace image. Click Select Image, enter SAP in the search box, and select SUSE for SAP 15 SP1.
	<b>NOTE</b> To use marketplace images, such as <b>SUSE for SAP 15 SP1</b> , ensure that your ECS is billed on a yearly/monthly basis.
System Disk	Set this parameter as required. If you need multiple data disks, click <b>Add Data Disk</b> to add more data disks.

#### Table 4-15 Basic settings of the active SAP S/4HANA ECS

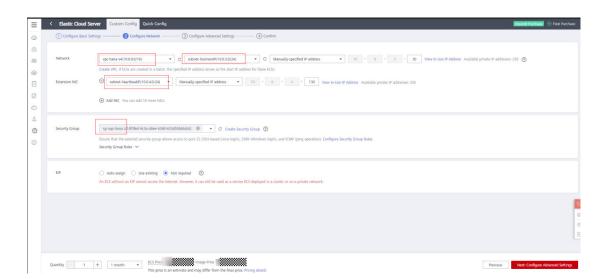




# **Step 4** Click **Next: Configure Network** and configure network information based on **Table 4-16**.

Table 4-16 Network configurations	for the active SAP S/4HANA ECS
-----------------------------------	--------------------------------

Parameter	Description
Network	Select the VPC and subnet created in Creating a VPC.
Extension NIC	If you need more NICs, click Add NIC.
Security Group	Select the security group created in <b>Step 2</b> .
EIP	Select <b>Not required</b> .



**Step 5** Click **Next: Configure Advanced Settings**. On the displayed page, configure the advanced settings for the active SAP S/4HANA ECS based on **Table 4-17**.

Parameter	Description
ECS Name	Enter <b>s4001</b> .
Login Mode	Select Password.
Cloud Backup and Recovery	Select Not required.
ECS Group (Optional)	Specifies a SAP S/4HANA ECS group. When you create ECSs, the system will allocate the ECSs in the same server group to different physical servers to ensure the running reliability of these SAP S/4HANA ECSs.
	<b>NOTE</b> If no ECS group is available, perform the following operations to create one:
	Click <b>Create ECS Group</b> . On the displayed page, click <b>Create ECS Group</b> , specify the ECS group name, and click <b>OK</b> .
Advanced Options	Do not set this parameter.

 Table 4-17 Advanced settings of the active SAP S/4HANA ECS

Ξ	< Elastic Cloud Sen	ver Casten Config Quick Config Quick Config	hurchase
0	(1) Configure Basic Setti	ing () Configur Network () Configur Advanced Settings () Confirm	
8 M	ECS Name	handot Allow deploce ES names If multiple CGs are created at the same time, the system advanced adds is higher for Biolosed by a four-digit incremental number to the end of each ES name. For example, if you enter ecs and there is no existing ES in the system, the Biot ESS name will be ecs-0001. If an ESS with the name ecs-0001 advanced, the name of the read-of-time estimates and there is no existing ES in the system, the Biot ESS name will be ecs-0001. If an ESS with the name ecs-0001 advanced adds, the name of the read-of-time estimates and there is no existing ES in the system, the Biot ESS name will be ecs-0001. If an ESS with the name estimates and the estimates and	e
0	Login Mode	Patieved Key pair	
Ø	Username	loot	
© 4	Password	Keep the password source. If you forget the password, you can log in to the ECS console and change it.	
0	Confirm Password		
Ø	Cloud Backup and Recovery	To use CBK, you need to purchase a backup walk. A walk is a container that stores backups for servers. Auto assign Use existing Net required ①	
	ECS Group (Optional)	Avd-affrety     ①      select ECS grap-     ▼       Create ECS Grap	<b>e</b> 0
	Advanced Options	Configue now	B
	Quantity 1	+ I mosth * ES hick for an estimate and may effer from the final price. Priced deals. Previous	onfirm

#### Step 6 Click Next: Confirm.

Check the ECS configurations and select I have read and agree to the Huawei Image Disclaimer. Click Next.

Configure Basic Se		Configure Network ——— ③ Configure Advanced Settings —	🕢 Confirm				
Note:	The primary network	k interface does not have an EIP bound, and the ECS cannot access th	e internet.				
Configuration	Basic 🖉						
	Billing Mode	Yearly/Monthly	Region	Shanohal2	AZ	AZ3	
	Specifications	Memory-optimized   m3.8xlarge.8   32 vCPUs   256 GB	Image	SUSE for SAP 15 SP1(5~128vCPU) (SUSE Linux for SAP 15 SP1)	System Disk	Ultra-high I/O,40 GB	
	Network 0						
	VPC	vpc-hana-s4(10.0.0/16)	Security Group	sg-sap-hana	Primary NIC	(10.0.3.30)	
	Extension NIC	(10.0.4.130)	EIP	No EIP bound to the primary network interface			
	Advanced 🖉						
	ECS Name	hana001	Login Mode	Password	ECS Group	(44)	
Required Duration	1 2	3 4 5 6 7 8 9 months	i 1 year 2 year	3 year			
	Auto renew	D					
Quantity	- 1 +	You can create 200 more ECSs. Learn how to increase quota.					
Agreement		agree to the Huawel Image Disclaimer.					
Agreement	I have read and	agree to the Huawei Image Disclaimer.					

**Step 7** Repeat **Step 2** to **Step 6** to create an ECS for the standby SAP S/4HANA node.

When creating the standby SAP S/4HANA ECS, you do not need to create a shared disk.

Configure Basic Set	tings ② Configure Network	Select Marketplace Image		×
Billing Mode	Yearly/Monthly Ray-per-use Spot price 🕥	All images	SAP	X Q
Region	CN East-Shanghai2	H Basic Software     H Developer Tools	SpecificationsSUSE for SAP 12 SP5 (3-4vCPU) ResourceSUSE Linux for SAP 12 SP5	
AZ	Random         A23         A22         A21	Enterprise Application     Professional Services	Version:V1.0 OSLinux	
CPU Architecture	sto Kunpeng 🕥	H Industry Solution     H Website Building	Product Category:Operating System Published:Mar 26, 2020 09:50:49 GMT-08:00 Service Provide	nth
Specifications	Latest generation         v         VCPUs         All         •         Memory         All           Flaver Name         vCPUs   Memory .4E         CPU .4E         CP	- + Security - + IOT	Specification:SUSE for SAP 15 SP1(5-128vCPU) ResourceSUSE Linux for SAP 15 SP1	
	Col-Adarge 4     To VCNs (6 GB     Intel Cascade     Selected specifications     General computing plans (c6.Astarpe 4) 59 VCNs (64 GB	- + API - Domains	Version:V1.0 OS.Lihust Product: Langury Operating System	
Image	Public image         Private image         Shared image         Multi-options image           SUSE for SAP 15 SP(6-128xGPU) (UME Unum for SAP 15 SP1)         Select image         Select image		Nutsinienskar 38, 2000 12222 GMT-0880 Service Prouder:	
System Disk 0	5 Uttra-high LO + GB (or5 limit: 1.500, LOP5 limit: 16.000 )			
Data Disk SWAF	O Ultra-high I/O      - 20 + GR I/OPS limit: 2,550, I/OPS burgt limit: 16,000 Quanti	Ity1 + Show~		
/usr/sap	O         Ultra-high I/O         •         -         50         +         GB         OPS limit: 4,000, IOPS burst limit: 16,000         Quanti	ity - 1 + Show~		
, 451, 542	Add Data Disk You can attach 21 more disks.			
,	Add Dela Dek. You can attach 21 more disk.     A non-shared disk added during the creation of a yearly/monthly ECS can only be attached to this ECS, and can only be	insubscribed or renewed along with the ECS. Da	ta disks added to a Linux ECS can be initialized using a witand script.	

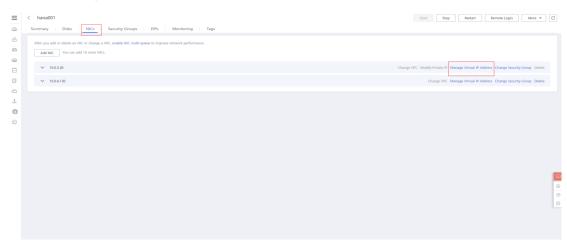
----End

# 4.4.5 Assigning a Virtual IP Address

Virtual IP addresses are used for active and standby switchover of ECSs to achieve high availability. If the active ECS becomes faulty and cannot provide services, the virtual IP address is dynamically re-assigned to the standby ECS so services can continue uninterrupted. For more information about virtual IP addresses, see **Virtual IP Address Overview**.

#### Procedure

- **Step 1** Click in the navigation plane on the left, and choose **Computing** > **Elastic Cloud Server**.
- **Step 2** In the Elastic Cloud Server list, locate the created active SAP HANA ECS and click the ECS name to view its details.
- **Step 3** Click the **NICs** tab and then **Manage Virtual IP Address** in the row of the ECS service/management plane NIC.



**Step 4** Click **Assign Virtual IP Address**. In the dialog box that is displayed, select **Manual** for **Assignment Mode**, and configure the IP address based on **ECS Planning**.

You need to assign three virtual IP addresses: 10.0.3.100, 10.0.3.110, and 10.0.3.120.

≡	< subnet-businessIP		C
٢	Summary IP Addresses Tags		
& 	Assign Virtual IP Address Unbind EIP		Virtual IP address + Q C
	Virtual IP Address Bound EIP	Bound Server (NIC)	Operation
() () () () () () () () () () () () () (		Assign Virtual IP Address Submit submit business# Coll Block: 18.3.024 • Assignment Mode Automatic Stand • #P Address • #P Address	Enter an Pradems. Q
	IP Address	OK Cancel	Operation
	10.0		Release
	10.0	ECS	Release
		ECS	Release
	10.0	System interface	Reloase
	10.0	DHCP	Release

Summy       PAddesses       Tags         Summy       PAddesses       Tags         M       Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes         Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes         Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes       Image Manuel PAddes         Image Manuel PAddes </th <th>Q C</th>	Q C
Asspective         Note of EP         Note of	Q C
Image: Second server (NC)         Board server (NC)         Operation           Image: Second server (NC)         Image:	
Image: Section of the section of t	
Image: 100 million     Image: 100 million       Image: 100 million     Image: 100 million <td></td>	
Image: 100 million         -         -         -         Bit di EP   Mon +           Image: 100 million         -         -         -         Bit di EP   Mon +           Image: 100 million         -         -         -         -         -           Image: 100 million         - <td></td>	
De la factoria de la construir	
Defer at 17 Address Used By Operation	
IP Address Used By Operation	
	QC
Outward         Cateward         Reference           10         ECS         Reference	
10.0 EC9 Reinane	
10. ECS Patrans	
10. E59 Patrans	
10 EC Related	
13 EC Relation	
10 System Interface Poincer	
10.0 CHCP Protected	

Step 5 Select a created virtual IP address and click More > Bind to Server in the Operation column. Bind 10.0.3.100 to the active and standby SAP HANA ECSs, and respectively bind 10.0.3.110 and 10.0.3.120 to the active and standby SAP S/ 4HANA ECSs.

Assign Virtual IP Address Unbind EIP					Virtual IP address		
Virtual IP Address	Bound EIP		Bound Server (NIC)			Operation 1	
10.0.3.100	DOUBLE F					Bind to EIP More +	
	Bind to Server			×			
10.0.3.120						Bind to EIP More •	
10.0.3.110	O Select Server					Bind to EIP More •	
		All statuses	• Nante •	Q C			
	Name	Type	Status Private IP Address	Enterprise Project			
	) sap-client	ECS	Running 10.0.3.240	-		Enler an IP address.	
IP Address	O 54002	ECS	Running 10.0.3.2	-	Operation		
		ECS	<ul> <li>Running 10.0.3.10</li> </ul>	-	Release		
	\$4001						
	hana002 🕑	ECS	Running 10.0.3.4	1.7	Release		
10.0	hana001	ECS	Running 10.0.3.30		Release		
10.0	O Select NIC ⑦				Release		
	NIC IP: 10.0.3.30,MA	C: fa:16:3	) 👻		Release		
10.0					Rolease		
10.0			OK Cancel				
·		DHCP					
subnet-businesstP iummary IPAddresses   Tags							
iummary   IP Addresses   Tags							
Assign Virtual IP Addresses Unbind EIP					Vitual IP address	• ]	
Asign Virtual IP Addresses Tags Unbind EIP Virtual IP Address	Bound EP		Bound Server (NIC)		Virtual IP address	Operation	
Assign Virtual IP Addresses Unbind EIP	Bound (1P -		Bound Server (BIC) harad91 (10.0.3.00) Vee AI (2)		Vetual IP address		
ummary IP Addresses Tags Assgn Vitual IP Address Vitual IP Address 10 8.3.100	Bound EP -		hana001 (10.0.3.30) View All (2) s4001 (10.0.3.10)		Vetuai IP address	Operation Bind to EIP   More •	
Asign Virtual IP Addresses Tags Unbind EIP Virtual IP Address	Bound EP - -		hana001 (10.0.3.30) View Al (2) \$4001 (10.0.3.10) View Al (2)		Votual IP address	Operation	
ummary IP Addresses Tags Assgn Vitual IP Address Vitual IP Address 10 8.3.100	Bound EIP - - -		hana001 (10.0.3.30) View All (2) s4001 (10.0.3.10)		Vetaal IP address	Operation Bind to EIP   More •	
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Immany         IP Addresses         Tags           Aragy Visual IP Address         Dated CIP           Visual IP Address         0           108.3.100         1           108.3.100         1           108.3.100         1	Dound LIP - - -		hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Virtual IP address	Operation Bind to EIP   More	
ummary PAddresses Tags           Assign Vibual IP Address         Using DP           Vehalf IP Address         Using DP           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100	Bound EP - - -	Uset By	hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Operation	Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	
ummary PAddresses Tags           Assign Vibual IP Address         Using DP           Vehalf IP Address         Using DP           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100	Bound EIP - - -	Used By Oddeway	hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)			Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	
ummary PAddresses Tags           Assign Vibual IP Address         Using DP           Vehalf IP Address         Using DP           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100	Bound EIP - - -		hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Operation	Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	
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ummary PAddresses Tags           Assign Vibual IP Address         Using DP           Vehalf IP Address         Using DP           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100	Bound EP - - -	Gateway ECS ECS ECS	hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Operation Release Release Release	Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	
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ummary PAddresses Tags           Assign Vibual IP Address         Using DP           Vehalf IP Address         Using DP           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100           10 8.3.100         10 8.3.100	Bound EIP - - -	Outerway ECS ECS ECS ECS ECS	hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Cyeration Distance Fishance Fishance Fishance Fishance Fishance Fishance	Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	
Immany         IP Addresses         Tags           Aragy Visual IP Address         Dated CIP           Visual IP Address         0           108.3.100         1           108.3.100         1           108.3.100         1	Bound EIP - - -	Gateway ECS ECS ECS ECS	hans001 (10.0.3.30)           View All (2)           \$4001 (10.0.3.10)           View All (2)           \$4001 (10.0.3.10)           \$4001 (10.0.3.10)		Operation Release Release Release Release	Operation Eind to EIP   More + Eind to EIP   More + Eind to EIP   More +	

## 4.4.6 Mounting Shared Volumes

Mount the SBD shared volume created during the creation of the active SAP HANA ECS to the standby SAP HANA ECS, and mount the three shared volumes created during the creation of the active SAP S/4HANA ECS to the standby SAP S/4HANA ECS.

#### Procedure

**Step 1** Bind the SBD shared volume to the standby SAP HANA ECS.

- 1. Click in the navigation plane on the left of the management console, and choose **Computing** > **Elastic Cloud Server**.
- 2. Locate the created active SAP HANA ECS **hana001** on the displayed page and click its name to view its details.
- 3. Click the **Disks** tab. Locate the disk of the SBD volume and click the target data disk to view its details.

≡	< ha	ina001					Start Stop	Restart Remote Login More	·C
6	Summ	nary Disks	NICs Security Groups EIPs	Monitoring Tags					
& m		w disks or disk additional o		the server to update disk information.   Operations on disks after attachment   more SCSI disks.	Operations on disks after o	apacity expansion			
6	`	<ul> <li>hana001   System Dis</li> </ul>	ik   40GB					View Monitoring Data Expand Capacity Deta	ch
Ø	1	hana001-volume-000	11   Data Disk   10GB					View Monitoring Data Expand Capacity Deta	kh
$\bigcirc$		ID	22cbd	]	Name	hana001-volume-0001 🖉			
4		Description	- 2		Bootable	No			
0		Obtained	Jul 20, 2020 10:56:59 GMT+08:00		Device Name (2)	/dev/sda			
0		Image Name			Capacity (GB)	10			
~		Туре	Ultra-high I/O		AZ	AZ3			
		Shared Disk	Yes		Billing Mode	Pay-per-use			
		Encrypted	No		Backups	0			
		Max. IOPS	IOPS limit: 2,000, IOPS burst limit: 16,000		Backup Tree				
		KMS Key Name			Device Type	SCSI			
		KMS Key ID			Device Identifier (?)	688860			
		<ul> <li>hana001-volume-000</li> </ul>	12   Data Disk   10GB					View Monitoring Data Expand Capacity Deta	kh 🖗
	`	✓ hana001-volume-000	13   Data Disk   50GB					View Monitoring Data Expand Capacity Deta	
	`	🗸 volume-9d08   Data (	Disk   200GB					View Monitoring Data Expand Capacity Deta	ich 🛛
	`	Volume-287b   Data (	Disk   400GB					View Monitoring Data Expand Capacity Deta	ĸh
		✓ volume-a21a   Data I	Disk   400GB					View Monitoring Data Expand Capacity Deta	ch

4. Click the data disk ID. On the displayed page, click **Attach Disk** in the **Servers** area. In the displayed dialog box, select the target ECS **hana002** (the standby SAP HANA node) and click **OK**.

< hana001-v	rolume-0001		Expand Capacity
Summary	Servers Backups Snapshots Tags		
Basic Informa	tion		
ID	22cbd5c1-9486-487f-951c+e648acd9ae79 🗇	- Servers 1 In-use - Backups 0	
Name	hana001-volume-0001 🖉	Snapshots 0	
Region	Guangzhou(ganyang_SAP)		
AZ	AZ3	Servers	Attach Disk
Disk Type	Ultra-high I/O	<ul> <li>hana001 View Metric S Running</li> </ul>	
Capacity (GB)	10	Backups	Create Backup
Max. IOPS	IOPS limit: 2,000, IOPS burst limit: 16,000	You have not created any backup yet.	
Function	Data disk	VBS allows you to create backups for EVS disks on the management console without stopping servers.	
		Snapshots	Create Snapshot
Image			Create snapsnot
Created	Jul 20, 2020 10:56:59 GMT+08:00	You have not created any snapshot yet. Snapshots can be created to quickly save disk data at specified time points.	
Configuration	Information.	sinaporioris can de createu to quickoj save cosk data as specimen time pontos.	
Disk Sharing	Enabled		
Device Type	SCSI		
www ⑦	6888603000011b03fa16f46e20747756		
Encrypted	No		
KMS Key Name	-		
KMS Key ID	-		
Source Backup ID			

< hana001-volur	ne-0001															Expand Capacity
Summary Serv	ers Backups														×	
Basic Information	0	Attac	h Dis	sk												
ID	22cbd5c1-9486-487	Diskihan	a001-\	volume-0001   G	uangzhou	i(ganyang_SA)	P)   AZ3   SCSI   Sha	reable Can be attach	ned to 15 more serv	815						
Name	hana001-volume-01	To imp Shared	prove sid disks	ervice reliability.	it is recom	nmended that	recautions for SCSI o you attach shared S file systems or cluste	CSI device type disks t	to ECSs in the same late use of shared d	ECS group. Learn sks leads to data	more losses	Learn m	ore about shared disk appl	ication scenarios and usage		
Region	Guangzhou(ganyar	instruc														Attach Disk
AZ	AZ3	EC	Ss	BMSs									Selected Servers: 1			
Disk Type	Ultra-high I/O							Name	¥	Q	С		hana002	Data disk 3	¢	
Capacity (GB)	10			Name	Mour	nt Point	Status 🖓	Private IP Add	EIP	ECS Group						Create Backup
Max. IOPS	IOPS limit: 2,000, K	~		sap-client			Running	10.0.3.107 (Prl.,		0						
Function	Data disk	~		54002			📀 Running	10.0.3.20 (Priv								Create Snapshot
Created	 Jul 20, 2020 10:56:5	~		\$4001			🔿 Running	10.0.3.10 (Priv	-			≒				Creace Snapshot
		~		hana002	Da	ita disk 👻	Running	10.0.3.40 (Priv		3						
Configuration Info	Enabled	~					Running									
Device Type	SCSI	~					Running									
WWN ⑦	6888603000011b03															
Encrypted	No							0	Cancel							
KMS Key Name	-							0	Cancer							
KMS Key ID																
Source Backup ID																

**Step 2** Bind the three shared volumes created to the standby SAP S/4HANA ECS.

- 1. Locate the created active SAP S/4HANA ECS **s4001** on the ECS list page and click its name to view its details.
- 2. Click the **Disks** tab. Locate the shared disk and click the target data disk to view its details.

Summary Disks	NICs Security Groups EIPs Monitoring Tags		Start	Stop Restart Remote Login More
	inter a standy stands a set a standard stands			
If new disks or disk additiona	capacities cannot be viewed on the server, restart the server to update disk information. $\parallel$ O	Operations on disks after attachment   Operations on disks after ca	pacity expansion	
Add Disk Attach	Disk You can attach 21 more VBD disks or 54 more SCSI disks.			
✓ s4001   System Disk	Lange			View Monitoring Data Expand Capacity De
	1			
A s4001-volume-0001	Data Disk   10G8			View Monitoring Data Expand Capacity De
ID	574469	Name	s4001-volume-0001 🖉	
Description	- 2	Bootable	No	
Obtained	Jul 20, 2020 14:26:55 GMT+08:00	Device Name (2)	/dev/sda	
Image Name	er.	Capacity (G8) AZ	10 AZ3	
Type Shared Disk	Ultra-high I/O Yes	AZ Billing Mode	AZ3 Pay-per-use	
Encrypted.	No	Backups	0	
Max. IOPS	IOPS limit: 2,000, IOPS burst limit: 16,000	Backup Tree	-	
KMS Key Name		Device Type	SCSI	
KMS Key ID		Device Identifier	68880 <b></b>	
✓ s4001-volume-0002	Data Disk   80GB			View Monitoring Data Expand Capacity De
✓ s4001-volume-0003	Data Disk   80G8			View Monitoring Data Expand Capacity Di
✓ s4001-volume-0004	Data Disk   20G8			View Monitoring Data Expand Capacity Di

3. Click the data disk ID. On the displayed page, click **Attach Disk** in the **Servers** area.

s4001-volum			Dipand Capacity C
Basic Informatio	on	· Servers 1	
ID	5744699e-a5ba-4446-b3b2-931f5e96f651 🗇	- Servers 1 In-use - Backups 0	
Name	s4001-volume-0001 🖉	• Snapshots	
Region	Guangzhou(ganyang_SAP)	Servers	Attach Disk
z	AZ3		Actach Disk
ik Type	Ultra-high I/O	<ul> <li>s4001 View Metric O Running</li> </ul>	
pacity (GB)	10	Backups	Create Backup
ax. IOPS	IOPS limit: 2,000, IOPS burst limit: 16,000	You have not created any backup yet.	
unction	Data disk	VBS allows you to create backups for EVS disks on the management console without stopping servers.	
age		Snapshots	Create Snapshot
reated	Jul 20, 2020 14:26:55 GMT+08:00		
Configuration I	nformation		
Disk Sharing	Enabled		
Device Type	SCSI		
www ⑦	688860300000617afa16f46e20747756		
incrypted	No		
MS Key Name	-		
KMS Key ID			
Source Backup ID			

4. In the displayed dialog box, select the target ECS **s4002** (the standby SAP S/ 4HANA node) and click **OK**.

•	< s4001-volume-	0001															Expand Capacity C
b	Summary Serv	ers Backups	1.11													×	
5	Basic Information		Attach	1 Dis	k												
	ID	5744000000044	Disk:s400	01-volu	me-0001   Guan	gzhou(ganyan	g_SAP)   A	AZ3   SCSI   Sharei	able Can be attached	to 15 more servers							
	Name	s4001-volume-0001	To impr	rove ser	rvice reliability. It	is recomment	fed that w	cautions for SCSI o ou attach shared S	CSI device type disks t	o ECSs in the same	ECS group. Learn	more	Learn m	ove shout shared disk a	oplication scenarios and usage		
	Region	Guangzhou(ganyar	instruct		an at and try			e grann or class	a sorrane anappropri						pproduction second to bind usage		Attach Disk
	AZ	AZ3	ECS	is –	BMSs									Selected Servers: 1			Attach Disk
	Disk Type	Ultra-high I/O							Name	•	Q	C		s4002	Data disk 🛛 🗙		
	Capacity (GB)	10			Name	Mount Poi	nt	Status 🖓	Private IP Add	EIP	ECS Group						Create Backup
	Max. IOPS	IOPS limit: 2,000, IC	~		sap-client			Running	10.0.3.107 (Prl.,	-	-						
	Function	Data disk	~	~	54002	Data dis	k •	🕤 Running	10.0.3.20 (Priv								
	Image		_	-				-									Create Snapshot
	Created	Jul 20, 2020 14:26:5	~		hana002			Running	10.0.3.40 (Priv			_	4				
			~		hana001			🕤 Running	10.0.3.30 (Priv								
	Configuration Info	ormation	~					Bunning									
	Disk Sharing	Enabled	×		******			<ul> <li>Kurring</li> </ul>	********								
	Device Type	SCSI	~					Running									
	WWN ③	688500000000000000000000000000000000000															
	Encrypted	No							OK	Cancel							
	KMS Key Name	-															
	KMS Key ID																
	Source Backup ID																

5. Repeat **Step 2.1** to **Step 2.4** to mount the rest two shared volumes to the standby SAP S/4HANA ECS.

----End

## 4.4.7 Formatting File Systems

#### 4.4.7.1 Formatting the File System for Active and Standby SAP HANA ECSs

The data volumes of SAP HANA nodes can be used only after they are formatted and then attached to required directories.

Log in to ECS **hana001** where SAP HANA is to be installed and check the unformatted disks. Determine the disks of the **/usr/sap** volume, data volume (two physical disks are used to make a data volume in using LVM), log volume, shared volume, and swap volume according to the disk capacity. For details about the disk capacity planning, see **Table 4-4**. Then, format the disks, create directories which disks are to be attached to, and attach the disks.

#### Procedure

Step 1 Log in to the active SAP HANA ECS, run the following commands shown in the following figure on CLI to query the disk size, determine mount points of disks based on the disk capacity, and format the disks. For the data volume, two physical disks are used to make a data volume in using LVM. For details about how to creating a logical volume using LVM, see Creating a Logical Volume Using LVM.

#### **NOTE**

There is no need to format the SBD volume attached to the active and standby SAP HANA ECSs.

```
hana001:~ # lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
      8:0 0 10G 0 disk
sda
vda 253:0 0 40G 0 disk
└_vdal 253:1 0 40G 0 part /
vdb 253:16 0 10G 0 disk SWAP
vdc 253:32 [þ 400G 0 disk /hana/shared
vdd 253:48 0 50G 0 disk /usr/sap
vde 253:64 0 200G 0 disk /hana/log
vdf 253:80 0 200G 0 di<u>sk /hana/data</u>
vdg 253:96 0 200G 0 disk
hana001:~ # mkswap /dev/vdb
Setting up swapspace version 1, size = 10 GiB (10737414144 bytes)
no label, UUID=47967aa7-105b-43a0-8532-9a2d1e42c2c2
hana001:~ # swapon /dev/vdb
hana001:~ # pvcreate /dev/vdf /dev/vdg
Physical volume "/dev/vdf" successfully created.
 Physical volume "/dev/vdg" successfully created.
hana001:~ # vgcreate vghana /dev/vdf /dev/vdg
 Volume group "vghana" successfully created
hana001:~ # lvcreate -i 2 -l 100%VG -n lvhanadata vghana
 Using default stripesize 64.00 KiB.
 Logical volume "lvhanadata" created.
hana001:~ # lvdisplay
 --- Logical volume ---
 LV Path
                        /dev/vghana/lvhanadata
 LV Name
                       lvhanadata
 VG Name
                       vghana
 LV UUID GyPOtn-Lfr1-9Lzz-xFvm-S7JJ-E9VW-6t4WGv
LV Write Access read/write
 LV Creation host, time hana001, 2023-01-30 11:14:50 +0800
 LV Status available
  # open
                       0
 LV Size
                      399.99 GiB
 Current LE
                      102398
 Segments
                      1
 Allocation
                     inherit
 Read ahead sectors auto
```

hana001:	⊷ # mkfs.xfs /dev/vdc		
meta-dat	ta=/dev/vdc	isize=512	agcount=4, agsize=26214400 blks
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1	finobt=1, sparse=0, rmapbt=0
	=	reflink=0	
data	=	bsize=4096	blocks=104857600, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0, ftype=1
log	=internal log	bsize=4096	blocks=51200, version=2
	=	sectsz=512	sunit=0 blks, lazy-count=1
realtime	e =none	extsz=4096	blocks=0, rtextents=0
hana001:	⊷ # mkfs.xfs /dev/vdd		
meta-dat	ta=/dev/vdd	isize=512	agcount=4, agsize=3276800 blks
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1	finobt=1, sparse=0, rmapbt=0
	=	reflink=0	
data	=	bsize=4096	blocks=13107200, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0, ftype=1
log	=internal log	bsize=4096	blocks=6400, version=2
	=	sectsz=512	sunit=0 blks, lazy-count=1
realtime		extsz=4096	blocks=0, rtextents=0
	⊷ # mkfs.xfs /dev/vde		
meta-dat	ta=/dev/vde	isize=512	agcount=4, agsize=13107200 blks
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1	finobt=1, sparse=0, rmapbt=0
	=	reflink=0	
data	=	bsize=4096	blocks=52428800, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0, ftype=1
log	=internal log	bsize=4096	blocks=25600, version=2
	=	sectsz=512	sunit=0 blks, lazy-count=1
realtime		extsz=4096	blocks=0, rtextents=0
	<pre># mkfs.xfs /dev/mapper</pre>		
meta-da1	ta=/dev/mapper/vghana-lvh		
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1 reflink=0	finobt=1, sparse=0, rmapbt=0
	=	retink=0	· · ·

**Step 2** Check the UUID of each disk and write mappings between UUIDs and mount points to the **/etc/fstab** file. Then, obtain the shared path of the created SFS file system and write the mapping between the shared path and the **backup** volume to the **/etc/fstab** file.

#### **NOTE**

UUID is the unique character string for disk partitions in a Linux system.

```
hana001:~ # lsblk
NAME
                                       MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
 sda
                                           8:0
                                                       0
                                                               10G 0 disk
vda
∟vda1
                                       253:0
                                                        0
                                                               40G 0 disk
                                       253:1
                                                               40G
                                                                         0 part
                                                                         0 disk [SWAP]
0 disk /hana/shared
vdb
                                       253:16
                                                        0
                                                               10G
                                       253:32
                                                        0 400G
 vdc
 vdd
                                      253:48
253:64
                                                        0
                                                               50G
                                                                         0 disk
 vde
                                                        0
                                                             200G
                                                                         0 disk
                                                                                        /hana/log
 vdf
                                       253:80
                                                        0
                                                             200G
                                                                         0 disk
   —vghana-lvhanadata 254:0
                                                             400G
                                                        0
                                                                         0 lvm
                                                                                       /hana/data
vdg 253:96
└vghana-lvhanadata 254:0
                                       253:96
                                                        0
                                                             200G
                                                                         0 disk
                                                        0 400G 0 lvm
hana001:~ # blkid
/dev/vda1: UUID="77fc659f-66a4-43d7-a210-2ddb7320f1a1" BLOCK_SIZE="4096" TYPE="ext4" PÄRTUUID="701f202e-01"
/dev/vdb: UUID="47967aa7-105b-43a0-8532-9a2d1e42c2c2" TYPE="swap"
/dev/vdc: UUID="a5ce503c-4e97-4e42-8891-841685a6b98f" BLOCK_SIZE="512" TYPE="xfs"
/dev/vdc. UUID="125232=1474-47ac=a091-7cb1d5f548bb" BLOCK_SIZE="512" TYPE="xfs"
/dev/vde: UUID="12522e1-4174-47ac=a091-7cb1d5f548bb" BLOCK_SIZE="512" TYPE="xfs"
/dev/vdf: UUID="zPlS7G-0jB3-ZPNQ-RkyW-tYhq-4jJt-qC4Hql" TYPE="LVM2_member"
/dev/vdg: UUID="4HCEwO-tMbw-TZBz-S4TK-OWND-sYN0-MHfSCc" TYPE="LVM2_member"
/dev/mapper/vghanal-uhanadata: UUID=ube8012c3-8226-4386-bbd8-537e9896dbd3" BLOCK_SIZE="512" TYPE="xfs"
hana001:- # echo "UUID=47967aa7-105b-43a0-8532-9a2d1e42c2c2 swap swap defaults 0 0" >> /etc/fstab
hana001:- # echo "UUID=35ce503c-4e97-4e42-8891-841685a6b98f /hana/shared xfs defaults 0 0" >> /etc/fstab
hana001:- # echo "UUID=132523e-147f-47ac-a007-7cbld5f348bb /usr/sap xfs defaults 0 0" >> /etc/fstab
hana001:- # echo "UUID=1252e44-b8e7-43f2-8cda-55f969ce3d99 /hana/log xfs defaults 0 0" >> /etc/fstab
hana001:- # echo "UUID=12252e44-b8e7-43f2-8cda-55f969ce3d99 /hana/log xfs defaults 0 0" >> /etc/fstab
hana001:- # echo "UUID=12252e44-b8e7-43f2-8cda-55f969ce3d99 /hana/log xfs defaults 0 0" >> /etc/fstab
hana001:~ # echo "sfs-nas1.cn-south-1c.myhuaweicloud.com: 🐲 🐲 /hana/backup nfs vers=3,timeo=600,nolock 0 0" >> /etc
/fstab
```



hana001:~ # mkdir -p /usr/sap /hana/shared /hana/log /	hana/data	/hana/	backup	)		
hana001:~ # mount -a						
hana001:~ # df -Th						
Filesystem	Туре	Size	Used	Avail	Use%	Mounted on
devtmpfs	devtmpfs	4.0M	8.0K	4.0M	1%	/dev
tmpfs	tmpfs	189G	Θ	189G	0%	/dev/shm
tmpfs	tmpfs	51G	9.8M	51G	1%	/run
tmpfs	tmpfs	4.0M	0	4.0M	0%	/sys/fs/cgroup
/dev/vdal	ext4	40G	4.4G	33G	12%	/
tmpfs	tmpfs	26G	56K	26G	1%	/run/user/466
tmpfs	tmpfs	26G	64K	26G	1%	/run/user/0
/dev/vdc	xfs	400G	441M	400G	1%	/hana/shared
/dev/vdd	xfs	50G	84M	50G	1%	/usr/sap
/dev/vde	xfs	200G	237M	200G	1%	/hana/log
/dev/mapper/vghana-lvhanadata	xfs	400G	441M	400G	1%	/hana/data
sfs-nasl.cn-south-1c.myhuaweicloud.com	nfs	10P	3.2T	10P	1%	/hana/backup
hana001:~ #						

#### Step 4 Repeat Step 1 to Step 3 to format the file system of the standby SAP HANA ECS.

----End

# 4.4.7.2 Formatting the File System for Active and Standby SAP S/4HANA ECSs

The data disks of SAP S/4HANA nodes can be used only after they are formatted and attached to required directories.

Log in to ECS **s4001** where SAP S/4HANA is to be installed and check the unformatted disks. Determine the disks of the /usr/sap volume, ASCS volume, ERS volume, SBD volume, and swap volume according to the disk capacity. Then, format the disks, create directories which disks are to be attached to, and attach the disks. For details about the disk capacity and mount point, see SAP S/4HANA File System Planning.

#### Procedure

**Step 1** Log in to the active SAP S/4HANA ECS, run the following commands shown in the following figure on CLI to query the disk size, determine mount points of disks based on the disk capacity, and format the disks.

#### **NOTE**

There is no need to format the SBD volume attached to the active and standby SAP S/ 4HANA ECSs.

	# lsblk		
NAME M	AJ:MIN RM SIZE RO TYPE	MOUNTPOINT	
sda	8:0 0 10G 0 disk		
	8:16 0 80G 0 disk		
	8:32 0 80G 0 disk	ERS	
vda 2	53:0 0 40G 0 disk		
└─vdal 2			
vdb 2	53:16 0 20G 0 disk	SWAP	
	53:32 0 50G∐ 0 disk	/usr/san	
s4001:~	<pre># mkfs.xfs /dev/sdb</pre>	/ db1/ bdp	
meta-dat	a=/dev/sdb	isize=512	agcount=4, agsize=5242880 blks
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1	finobt=1, sparse=0, rmapbt=0
	=	reflink=0	
data	=	bsize=4096	blocks=20971520, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0, ftype=1
log	=internal log	bsize=4096	blocks=10240, version=2
	=	sectsz=512	sunit=0 blks, lazy-count=1
realtime	=none	extsz=4096	blocks=0, rtextents=0
s4001:~	# mkfs.xfs /dev/sdc		
meta-dat	a=/dev/sdc	isize=512	agcount=4, agsize=5242880 blks
	=	sectsz=512	attr=2, projid32bit=1
	=	crc=1	finobt=1, sparse=0, rmapbt=0
	=	reflink=0	
data	=	bsize=4096	blocks=20971520, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0, ftype=1
log	=internal log	bsize=4096	
5	=	sectsz=512	sunit=0 blks, lazy-count=1
realtime	=none	extsz=4096	blocks=0, rtextents=0
	# mkswap /dev/vdb	cizo - 20 cir	(21474022204 butes)
Setting	up swapspace version 1,		
Setting no label	up swapspace version 1, , UUID=34cf0dff-f053-4		
Setting no label <mark>s4001:~</mark>	up swapspace version 1 , UUID=34cf0dff-f053-47 # swapon /dev/vdb		
Setting no label <b>s4001:~</b> <b>s4001:~</b>	up swapspace version 1 , UUID=34cf0dff-f053-4 # swapon /dev/vdb # mkfs.xfs /dev/vdc	703-91fc-ecd4c3	37a0bda
Setting no label <b>s4001:~</b> <b>s4001:~</b>	up swapspace version 1, , UUID=34cf0dff-f053-47 # swapon /dev/vdb # mkfs.xfs /dev/vdc @=/dev/vdc	703-91fc-ecd4c3 isize=512	37a0bda agcount=4, agsize=3276800 blks
Setting no label <b>s4001:~</b> <b>s4001:~</b>	up swapspace version 1 , UUID=34cf0dff-f053-4 # swapon /dev/vdb # mkfs.xfs /dev/vdc a=/dev/vdc =	703-91fc-ecd4c3 isize=512 sectsz=512	37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1
Setting no label <b>s4001:~</b> <b>s4001:~</b>	up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc a=/dev/vdc = =	703-91fc-ecd4c3 isize=512 sectsz=512 crc=1	37a0bda agcount=4, agsize=3276800 blks
Setting no label s4001:~ s4001:~ meta-dať	up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.rfs /dev/vdc a=/dev/vdc = =	703-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0	37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0
Setting no label s4001:~ s4001:~ meta-dať	up swapspace version 1 , UUID=34cf0dfff053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc a=/dev/vdc = = = = =	703-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0 bsize=4096	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25</pre>
Setting no label s4001:~ s4001:~ meta-dat data	up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc a=/dev/vdc = = = = = =	<pre>isize=512 sectsz=512 crc=1 reflink=0 bsize=4096 sunit=0</pre>	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25 swidth=0 blks</pre>
Setting no label s4001:~~ meta-daŭ data naming	up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc = - = - = - = - = - = - = - = - = - = -	703-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0 bsize=4096 sunit=0 bsize=4096	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25 swidth=0 blks ascii-ci=0, ftype=1</pre>
Setting no label s4001:~ meta-dat data naming	up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc a=/dev/vdc = = = = = =	<pre>/03-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0 bsize=4096 sunit=0 bsize=4096 bsize=4096</pre>	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25 swidth=0 blks ascii-ci=0, ftype=1 blocks=6400, version=2</pre>
Setting no label s4001:~ meta-dat data naming log	up swapspace version 1 , UUID=34cf0dfff053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc =	<pre>/03-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0 bsize=4096 sunit=0 bsize=4096 bsize=4096 bsize=4096 sectsz=512</pre>	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25 swidth=0 blks ascii-ci=0, ftype=1 blocks=6400, version=2 sunit=0 blks, lazy-count=1</pre>
Setting no label s4001:~ meta-dat data naming	<pre>up swapspace version 1 , UUID=34cf0dff-f053-4; # swapon /dev/vdb # mkfs.xfs /dev/vdc = -dev/vdc = = = = = = = = = = = =version 2 =internal log = =none</pre>	<pre>/03-91fc-ecd4c3 isize=512 sectsz=512 crc=1 reflink=0 bsize=4096 sunit=0 bsize=4096 bsize=4096</pre>	<pre>37a0bda agcount=4, agsize=3276800 blks attr=2, projid32bit=1 finobt=1, sparse=0, rmapbt=0 blocks=13107200, imaxpct=25 swidth=0 blks ascii-ci=0, ftype=1 blocks=6400, version=2</pre>

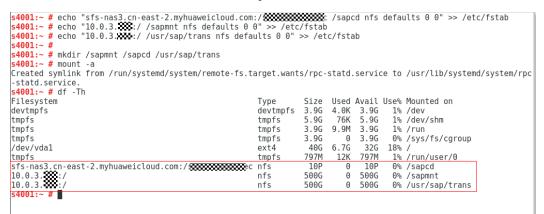
Step 2 Check the UUIDs of the disks and write them to the /etc/fstab file. The mounting information of ASCS and ERS volumes does not need to be written to the /etc/fstab file. You only need to run the commands to mount volumes.

**NOTE** 

- Do not write the attaching information of partitions **sda** and **sdb** to the **fstab** file because the two partitions will be automatically attached when the HA function of SAP S/4HANA is configured. Otherwise, the VM may fail to be restarted. Write the attaching information of other partitions to the **fstab** file.
- **S01** indicates the SID of SAP S/4HANA, and **01** is the instance number of ASCS.

```
s4001:~ # lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda
           8:0
                      10G 0 disk
                   0
sdb
           8:16
                    0
                      80G
                              0 disk
sdc
           8:32
                   0 80G
                              0 disk
vda
       253:0
                    Θ
                      40G
                              0 disk
└─vda1 253:1
                    0 40G
                              0 part
vdb
        253:16
                   0 20G
                              0 disk [SWAP]
        253:32
                   0 50G
vdc
                              0 disk
s4001:~ # blkid
/dev/vdal: UUID="71177627-4cbd-4b0a-8188-133a453214d2" TYPE="ext4" PARTUUID="45884f8c-01"
/dev/vdb: UUID="34cf0dff-f053-4703-91fc-ecd4c37a0bda" TYPE="swap"
/dev/vdc: UUID="5e962c31-5c34-4dd4-b407-6f03544257c7" TYPE="xfs"
/dev/sdb: UUID="197b2f51-dc7c-4436-9079-85d99ec0e906" TYPE="xfs"
/dev/sdc: UUID="a5f654f3-c28b-4f90-9bf5-f98f0ce6f637" TYPE="xfs"
s4001:~ # echo "UUID=34cf0dff-f053-4703-91fc-ecd4c37a0bda swap swap defaults 0 0" >> /etc/fstab
<mark>$4001:~ #</mark> echo "UUID=5e962c31-5c34-4dd4-b407-6f03544257c7 /usr/sap xfs defaults 0 0" >> /etc/fstab
s4001:~ #
s4001:~ # mkdir /usr/sap
s4001:~ # mount -a
s4001:~ # mkdir -p /usr/sap/S01/ASCS01
s4001:~ # mount /dev/sdb /usr/sap/S01/ASCS01/
s4001:~ # lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
        8:0 0 10G 0 disk
8:16 0 80G 0 disk
sda
sdb
                       80G 0 disk /usr/sap/S01/ASCS01
                                                                                              I
                   0 80G
           8:32
                              0 disk
sdc
        253:0
                   0 40G 0 disk
vda
└vda1 253:1
                   0 40G 0 part /
vdb
        253:16
                   0
                       20G
                              0 disk [SWAP]
        253:32
                   0 50G 0 disk /usr/sap
vdc
s4001:~ #
```

**Step 3** Mount the SFS file system. Obtain the three mounting addresses on the active SAP S/4HANA ECS and mount the SFS file system.



Step 4 Log in to the standby SAP S/4HANA ECS and initialize the file system. You only need to format the local swap and /usr/sap volumes. Follow the operations described in Step 1 and Step 2.

**NOTE** 

S01 indicates the SID of SAP S/4HANA, and 10 is the instance number of ERS.

```
s4002:~ # lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
                     0 10G 0 disk
sda
           8:0
                                           SBD
sdb
            8:16
                     0 80G
                                0 disk
                                            ASCS
sdc
            8:32
                     0 80G
                                0 disk
                                           ERS
vda
        253:0
                     0 40G
                                0 disk
└─vda1 253:1
                     0 40G
                                0 part /
                     0 20G 0 disk SWAP
vdb
         253:16
         253:32 0 50G 0 disk /usr/sap
vdc
s4002:~ # mkswap /dev/vdb
Setting up swapspace version 1, size = 20 GiB (21474832384 bytes)
no label, UUID=99989ee2-b20c-4382-8c7a-c3859a0610aa
s4002:~ # swapon /dev/vdb
s4002:~ # mkfs.xfs /dev/vdc
meta-data=/dev/vdc
                                            isize=512
                                                               agcount=4, agsize=3276800 blks
                                            sectsz=512
                                                             attr=2, projid32bit=1
                                                              finobt=1, sparse=0, rmapbt=0
                                             crc=1
                                             reflink=0
data
                                            bsize=4096
                                                              blocks=13107200, imaxpct=25
                                            sunit=0
bsize=4096
                                                              swidth=0 blks
                                                              ascii-ci=0, ftype=1
blocks=6400, version=2
sunit=0 blks, lazy-count=1
           =version 2
naming
log
            =internal log
                                            bsize=4096
                                             sectsz=512
                                            extsz=4096
                                                              blocks=0, rtextents=0
realtime =none
                                                                                                         I
<mark>s4002:~</mark> # lsblk
         MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
NAME
                     0 10G 0 disk
sda
            8:0
sdb
            8:16
                     0 80G
                                0 disk
sdc
            8:32
                     0 80G
                                0 disk
vda
         253:0
                     0 40G
                                0 disk
└─vda1 253:1
                     0 40G
                                0 part
         253:16
                     0 20G
                                0 disk [SWAP]
vdb
vdc
         253:32
                     0 50G
                                0 disk
s4002:~ # blkid
/dev/vda1: UUID="71177627-4cbd-4b0a-8188-133a453214d2" TYPE="ext4" PARTUUID="45884f8c-01"
/dev/vda1: UUID="71177627-4cbd-4b0a-8188-133a433214d2" TYPE="ext4" PARTUUID="45884f8c-01"
/dev/vdb: UUID="9989ee2-b20c-4382-8c7a-c3859a0610aa" TYPE="swap"
/dev/vdc: UUID="453a065d-36ab-4033-87c9-e3c7ea7db60a" TYPE="xfs"
/dev/sdb: UUID="197b2f51-de7c-4436-9079-85d90ec0e906" TYPE="xfs"
/dev/sdc: UUID="a5f654f3-c28b-4f90-9bf5-f98f0ce6f637" TYPE="xfs"
s4002:~ # echo "UUID=99989ee2-b20c-4382-8c7a-c3859a0610aa swap swap defaults 0 0" >> /etc/fstab
s4002:~ # echo "UUID=453a065d-36ab-4033-87c9-e3c7ea7db60a /usr/sap xfs defaults 0 0" >> /etc/fstab
s4002:~ #
s4002:~ # mkdir /usr/sap
s4002:~ # mount -a
                                                            I
s4002:~ # mkdir -p /usr/sap/S01/ERS10
s4002:~ # mount /dev/sdc /usr/sap/S01/ERS10/
s4002:~ # lsblk
        MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
NAME
                        10G 0 disk
sda
            8:0
                     0
            8:16
sdb
                     0 80G 0 disk
            8:32
                                0 disk /usr/sap/S01/ERS10
                     0 80G
sdc
vda 253:0
└─vda1 253:1
         253:0
                     0 40G
                                0 disk
                     0 40G 0 part /
0 20G 0 disk [SWAP]
         253:16
                        20G
vdb
vdc
         253:32
                     0
                        50G
                                0 disk /usr/sap
s4002:~ #
```

**Step 5** Mount the SFS file system. Obtain the three mounting addresses on the standby SAP S/4HANA ECS and mount the SFS file system.

#### **NOTE**

For details about the SFS mounting addresses, see Step 3.

<pre>\$4002:~ # echo "sfs-nas3.cn-east-2.myhuaweicloud.com \$4002:~ # echo "10.0.3. *********************************</pre>	0" >> /etc ults 0 0"	/fstab >> /et	c/fsta	ab			
Filesystem	Type	Size	Used	Avail	Use%	Mounted on	
devtmpfs	devtmpfs	3.9G		3.9G		/dev	
tmpfs	tmpfs	5.9G	76K	5.9G	1%	/dev/shm	
tmpfs	tmpfs	3.9G	9.9M	3.9G	1%	/run	
tmpfs	tmpfs	3.9G	0	3.9G	0%	/sys/fs/cgroup	
/dev/vdal	ext4	40G	6.7G	32G	18%	/	
tmpfs	tmpfs	797M	12K	797M	1%	/run/user/0	
sfs-nas3.cn-east-2.myhuaweicloud.com:/	nfs	10P	0	10P	0%	/sapcd	
10.0.3.	nfs	500G	0	500G	0%	/sapmnt	
10.0.3.	nfs	500G	Θ	500G	0%	/usr/sap/trans	
s4002:~ #							
Ic4002 ·~ #							

# 4.4.8 Configuring the Mappings Between IP Addresses and Hostnames

#### 4.4.8.1 SAP HANA ECS Configuration

During the SAP HANA installation, installation programs use ECS names for communication. Therefore, you must configure the mappings between ECS names and IP addresses.

#### Procedure

**Step 1** Log in to the active SAP HANA ECS **hana001**, edit the **/etc/hosts** file, and write the mappings between the names and IP addresses of all SAP HANA ECSs to the file.

#### **NOTE**

- If the mapping between 127.0.0.1 and the ECS name exists in the /etc/hosts file, delete it. For details, see What Should I Do If an SAP Application on an ECS Cannot Be Started?
- The IP address mentioned in this section is the IP address of the system replication/ heartbeat network plane.
- When configuring the mapping between the private IP address of the active node and the hostname, add a virtual hostname after the hostname. The virtual hostname will be used during SAP S/4HANA installation.

#				
# hosts	This file describes a number of hostname-to-address			
#	mappings for the TCP/IP subsystem. It is mostly			
#	used at boot time, when no name servers are running. On small systems, this file can be used instead of a			
#	"named" name server.			
# Syntax:				
#				
# IP-Address F	Full-Qualified-Hostname Short-Hostname			
#				
<pre># special IPv6</pre>				
::1 localho	ost ipv6-localhost ipv6-loopback			
fe00::0 ipv6-lo	ocalnet			
ff00::0 ipv6-mc				
ff02::1 ipv6-al ff02::2 ipv6-al				
ff02::3 ipv6-al				
pro at				
127.0.0.1	localhost			
127.0.0.1	localhost localhost			
#127.0.0.1	suse15 suse15			
#127.0.0.1	hana001 hana001	I		
10.0.3.30	hana001 hanaha			
10.0.3.40	hana002			
~				
~				
~				
"/etc/hosts" 32	L, 722C		31,19-32	All

**Step 2** Log in to the standby SAP HANA ECS **hana002**, edit the **/etc/hosts** file, and write the mappings between the names and IP addresses of all SAP HANA ECSs to the file.

#### 4.4.8.2 SAP S/4HANA ECS Configuration

During the SAP S/4HANA installation, installation programs use ECS names for communication. Therefore, you must configure the mappings between ECS names and IP addresses.

#### Procedure

**Step 1** Log in to the active SAP S/4HANA ECS **s4001** and write the mappings between IP addresses and names of all SAP S/4HANA ECSs to the **/etc/hosts** file.

The following uses the mappings between the IP addresses and names of the active and standby ASCS nodes as an example.

- **ascsha** indicates the virtual hostname of the active ASCS node and **ersha** indicates the virtual hostname of the standby ASCS node. Virtual hostnames can be customized.
- You do not need to write the mappings between the virtual IP addresses and virtual hostnames. The virtual IP addresses take effect only after the HA is configured. Do not bind virtual IP addresses to virtual hostnames before the virtual IP addresses take effect. After the ASCS and ERS instances are installed, write the mappings between the virtual IP addresses and virtual hostnames to the hosts file.
- Add the mapping between the private IP address and name of the active SAP HANA ECS. Then, change the private IP address to the virtual IP address of SAP HANA.

# r # t	This file describes a number of hostname-to-address mappings for the TCP/IP subsystem. It is mostly used at boot time, when no name servers are running. On small systems, this file ca¶ be used instead of a "named" name server.		
# IP-Address Fu #	ll-Qualified-Hostname Short-Hostname		
<pre># special IPv6 ac ::1 localhos</pre>			
fe00::0 ipv6-loca	alnet		
ff00::0 ipv6-mca: ff02::1 ipv6-all ff02::2 ipv6-all ff02::3 ipv6-all	nodes routers		
127.0.0.1 #127.0.0.1	localhost localhost localhost suse15 suse15 s4001 s4001		
10.0.3.20 10.0.3.10	s4001 s4002 ascsha ersha		
10.0.3.30 I	hanaha 35	5,16-22	All

**Step 2** Log in to the standby SAP S/4HANA ECS **s4002**, modify the **/etc/hosts** file, and write the mappings between IP addresses and names of all SAP S/4HANA ECSs to the file.

## 4.4.9 Configuring SSH Switching Permissions

To allow switching between active and standby SAP HANA ECSs as well as between active and standby SAP S/4HANA ECSs using SSH, you must configure the ECSs to be trusty. The following procedure applies to the scenario where password is used for login.

#### Procedure

**Step 1** Log in to the active SAP HANA ECS, generate a key pair, and write the public key information to the **authorized\_keys** file.

The command is in the following format:

#### ssh-keygen -t rsa

Press Enter for three consecutive times to generate a key pair.

Step 2 Configure the generated key pair on the standby SAP HANA ECS.

The command is in the following format:

**ssh-copy-id -i /root/.ssh/id\_rsa.pub root@***IP address of the standby SAP HANA ECS* 

Enter the password of the standby ECS.

For example, if the IP address of the standby ECS is **10.0.3.31**, run the following command:

#### ssh-copy-id -i /root/.ssh/id\_rsa.pub root@10.0.3.31

**Step 3** Run the following command to log in to the standby ECS without a password:

ssh root@IP address of the standby ECS

For example, if the IP address of the standby ECS is **10.0.3.31**, run the following command:

ssh root@10.0.3.31

```
hana01:~ # ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:DFscIo6P4z30DDFiPQgKj9KjGZj3roHh9h7Gkwku5bs root@hana01
The key's randomart image is:
+---[RSA 3072]----+
    . . .
   ο.ο.
0...0
                 ==00 =
X+@o. . S
=%oB+
|=+=B+
0 000.
                  | E==
+----[SHA256]----+
hana01:~ # ssh-copy-id -i /root/.ssh/id_rsa.pub root@hana02
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id
The authenticity of host 'hana02 (172.18.12.201)' can't be established.
ECDSA key fingerprint is SHA256:/IGFaljiwMtJ6pweTvmJsGk06vwQ+gLhlfhngWV7QhU
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to fi
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are pu
Password:
Number of key(s) added: 1
Now try logging into the machine, with: "ssh 'root@hana02'"
and check to make sure that only the key(s) you wanted were added.
```

hana01:~ # ssh root@hana02

Welcome to Elastic Cloud Service

**Step 4** Run the following command to generate a key pair for the standby ECS:

#### ssh-keygen -t rsa

Press Enter for three consecutive times to generate a key pair.

**Step 5** Run the following command to configure the generated key pair on the active SAP HANA ECS:

ssh-copy-id -i /root/.ssh/id\_rsa.pub root@IP address of the active SAP HANA ECS

Enter the password of the active ECS.

For example, if the IP address of the active ECS is **10.0.3.30**, run the following command:

#### ssh-copy-id -i /root/.ssh/id\_rsa.pub root@10.0.3.30

**Step 6** Run the following command to log in to the active ECS without a password:

ssh root@/P address of the active ECS

For example, if the IP address of the standby ECS is **10.0.3.30**, run the following command:

#### ssh root@10.0.3.30

```
hana02:~ # ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:PqIJIWz0+7TrI1GtedcUoqm02Vle7GJnF5V+/E3qryI root@hana02
The key's randomart image is:
+---[RSA 3072]----+
                 . |
               0 |
         . .
| .
      . . . . . . .
0.0+.+.+
|.o..o B S = .o+|
|.. o.* = = = .. o|
 ....o = + ...
   oo+.. .E . .
                - 1
L
    ==0 . ..0.
+----[SHA256]----+
hana02:~ # ssh-copy-id -i /root/.ssh/id_rsa.pub root@hana01
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id
The authenticity of host 'hana01 (172.18.12.200)' can't be established.
ECDSA key fingerprint is SHA256:R88arVmOx5XYUSBCDuyHSLIyt9mt7LDadrM2beH8flM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to fil
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are pr
```

Number of key(s) added: 1

Password:

Now try logging into the machine, with: "ssh 'root@hana01'" and check to make sure that only the key(s) you wanted were added.

hana02:~ # ssh root@hana01 Last login: Thu Aug 3 03:16:28 2023 from localhost The trust relationship between the active and standby SAP HANA ECSs has been configured.

```
hana01:~ # ssh root@hana02
Last login: Thu Aug 3 03:19:41 2023 from 172.18.12.200
Welcome to Elastic Cloud Service
hana02:~ # ssh root@hana01
Last login: Thu Aug 3 03:26:27 2023 from 172.18.12.201
Welcome to Elastic Cloud Service
hana01:~ #
```

- **Step 7** Repeat the preceding steps to configure the trust relationship between the active and standby SAP S/4HANA ECSs.
  - **NOTE**

After the switching, you must switch back to the NAT server. Then, verify the switching from the NAT server to other nodes.

During the first switching, the system displays the fingerprint as well as the message "Are you sure you want to continue connecting (yes/no)?". Enter **yes** and continue the switching.

----End

# 4.5 Software Installation

### 4.5.1 Installing SAP HANA

SAP HANA must be deployed on ECSs. This section uses the SAP HANA 2.0 installation package as an example. You can download the installation package from the official website and upload the installation package to the **/hana/shared** directory of ECSs **hana001** and **hana002** where SAP HANA is to be installed.

#### Procedure

**Step 1** Run the following commands to decompress the installation package:

```
hana001:~ # cd /hana/shared/
hana001:/hana/shared # ll
total 13308308
 rw-r--r-- 1 root root 4000000000 Feb 3 13:35 51053381_part3.rar
 rw-r--r-- 1 root root 1627698107 Feb
                                                           3 13:36 51053381 part4.rar
 nana001:/hana/shared # unrar x 51053381_part1.exe
                                     Copyright (c) 1993-2013 Alexander Roshal
UNRAR 5.00 freeware
Extracting from 51053381 part1.exe
                                                                                                          0K
Creating
                  51053381
Creating
                  51053381/DATA_UNITS
                                                                                                          0K
Creating
                  51053381/DATA_UNITS/HCO_INA_FILELOAD_10
51053381/DATA_UNITS/HCO_INA_FILELOAD_10/PD.XML
                                                                                                          0K
Extracting
                                                                                                          0K
                  51053381/DATA_UNITS/HCO_INA_FILELOAD_10/STACK.XML
Extracting
                                                                                                          0K
                  51053381/DATA_UNITS/HCO_INA_FILELOAD_10/HCOINAFILELOAD03_1.ZIP OK
51053381/DATA_UNITS/HCO_INA_FILELOAD_10/LABEL.ASC OK
Extracting
Extracting
                  S1053381/DATA_UNITS/HCO_INA_FILELOAD_10/LABEL.ASC OK
51053381/DATA_UNITS/HCO_INA_FILELOAD_10/SIGNATURE.SMF OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/LABEL.ASC OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/Licenses OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/Licenses/lz4.txt
Extracting
Creating
Extracting
Creating
Extracting
                                                                                                                  0K
                                                                                                                                                     I
                  51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/licenses/intel_bid.txt OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/hdbclientreg OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime OK
Extracting
Extracting
Creating
                  51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/Cwd.so OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/FCGI.so OK
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/fcm_pm_ext.tgz
Extracting
Extracting
Extracting
                                                                                                                                 0K
Extracting
                  51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/version.pm
51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/sdbrun OK
                                                                                                                           0K
Extracting
                  51053381/DATA_UNITS/HDB_CLIENT_SOLARIS_SPARC/instruntime/Carp.pm
Extracting
                                                                                                                      0K
                  51053381/DATA UNITS/HDB CLIENT SOLARIS SPARC/instructime/libperl.so OK
Extracting
```

**Step 2** Go to the directory where the installation package is stored and perform the installation.

```
hana001:/hana/shared # ll
total 13308308
drwxr-xr-x 3 root root 245 Sep 21 2018 51053381
-rw-r--r-- 1 root root 4000000000 Feb 3 13:35 51053381_part1.exe
rw-r--r-- 1 root root 4000000000 Feb
                                      3 13:35 51053381_part2.rar
rw-r--r-- 1 root root 4000000000 Feb 3 13:35 51053381 part3.rar
rw-r--r-- 1 root root 1627698107 Feb
                                      3 13:36 51053381_part4.rar
total 180
-rwxr-xr-x 1 root root
                          97 Jul 18 2018 LABEL.ASC
rwxr-xr-x 1 root root 36108 Sep 11 2018 SIGNATURE.SMF
                          55 Sep 4
56 Sep 4
drwxr-xr-x 2 root root
                                     2018 adapters.d
                                     2018 descriptors.d
drwxr-xr-x 2 root root
 rwxr-xr-x
                         602 Aug 31
                                     2018 filelist.hdbinst_remote_check
             root root
                                     2018 filelist.hdblcm_remote_check
2018 fileplist.install
rwxr-xr-x 1
             root root
                         601 Aug 31
                        1262 Aug 31
rwxr-xr-x
             root root
           1
                                     2018 filelist.resident
 rwxr-xr-x
                        2693 Aug 31
             root root
rwxr-xr-x 1 root root 14600 Aug 31
                                     2018 hdbinst
 rwxr-xr-x
             root root 14600 Aug 31
                                     2018 hdblcm
          1
rwxr-xr-x 1
             root root 14600 Aug 31
                                     2018 hdblcmqui
 rwxr-xr-x 1
                       14600 Aug 31
                                     2018 hdblcmweb
             root root
                       14600 Aug 31
 rwxr-xr-x
           1
             root root
                                     2018 hdbsetup
rwxr-xr-x 1 root root 14600 Aug 31
                                     2018 hdbuninst
 rwxr-xr-x 1
             root root 14600 Aug 31
                                     2018 hdbupd
drwxr-xr-x 7
             root root
                        4096 Sep
                                 4
4
                                     2018 instruntime
drwxr-xr-x 2 root root
                        4096 Sep
                                     2018 operations.d
                          92 Sep
drwxr-xr-x 6 root root
                                  4
                                     2018 resources
                        4096 Sep
drwxr-xr-x 3 root root
                                  4
                                     2018 serve
hana001:/hana/shared/51053381/DATA_UNITS/HDB_SERVER_LINUX_X86_64 # ./hdblcm
```

Choose an action Index | Action | Description . . . . . . . . . . . . . . . . . | Install new system install 1 extract\_components | Extract components 2 3 | Exit (do nothing) | Enter selected action index [3]: 1 SAP HANA Database version '2.00.033.00.1535711040' will be installed. Select additional components for installation: Index | Components | Description | all | All components 1 2 server No additional components | Install SAP HANA Database Client version 2.3.119.1535661774 | Install SAP HANA Studio version 2.3.41.000000 3 client 4 studio Install SAP HANA Studio VerSion 2.3.41.0000000 Install SAP HANA Smart Data Access version 2.00.3.000.0 Install SAP HANA XS Advanced Runtime version 1.0.88.12598 Install SAP HANA AFL (incl.PAL,BFL,OFL) version 2.00.033.0000.1535724035 Install SAP HANA EML AFL version 2.00.033.0000.1535724035 Install SAP HANA EPM-MDS version 2.00.033.0000.1535724035 5 smartda 6 XS afl 8 eml 9 epmmds T Enter comma-separated list of the selected indices [3]: 2 Enter Installation Path [/hana/shared]: Enter Local Host Name [hana001]: Do you want to add hosts to the system? (y/n) [n]: Enter SAP HANA System ID: S00 Enter Instance Number [00]: Enter Local Host Worker Group [default]: Index | System Usage | Description -----| production | System is used in a production environment 1 test | System is used for testing, not production development | System is used for development, not production custom | System usage is neither production, test nor development 2 3 4 custom Select System Usage / Enter Index [4]: Select System Usage / Enter Index [4]: Enter Location of Data Volumes [/hana/data/S00]: Enter Location of Log Volumes [/hana/log/S00]: Restrict maximum memory allocation? [n]: Enter Certificate Host Name For Host 'hana001' [hana001]: Enter SAP Host Agent User (sapadm) Password: Confirm SAP Host Agent User (sapadm) Password: Enter System Administrator (s00adm) Password: Confirm System Administrator Home Directory [/usr/san/S00/br Enter System Administrator Home Directory [/usr/sap/S00/home]: Enter System Administrator Login Shell [/bin/sh]: Enter System Administrator User ID [1000]: Enter ID of User Group (sapsys) [79]: Enter System Database User (SYSTEM) Password: Confirm System Database User (SYSTEM) Password: Restart system after machine reboot? [n]: Summary before execution:

```
SAP HANA Database System Installation
    Installation Parameters
        Remote Execution: ssh
        Database Isolation: low
        Installation Path: /hana/shared
        Local Host Name: hana001
        SAP HANA System ID: S00
        Instance Number: 00
        Local Host Worker Group: default
        System Usage: custom
Location of Data Volumes: /hana/data/S00
Location of Log Volumes: /hana/log/S00
Certificate Host Names: hana001 -> hana001
System Administrator Home Directory: /usr/sap/S00/home
        System Administrator Login Shell: /bin/sh
System Administrator User ID: 1000
        ID of User Group (sapsys): 79
    Software Components
SAP HANA Database
            Install version 2.00.033.00.1535711040
        Location: /hana/shared/51053381/DATA_UNITS/HDB_SERVER_LINUX_X86_64/server
SAP HANA AFL (incl.PAL,BFL,OFL)
        Do not install
SAP HANA EML AFL
            Do not install
        SAP HANA EPM-MDS
            Do not install
        SAP HANA Database Client
        Do not install
SAP HANA Studio
                                                                                                                   I
        Do not install
SAP HANA Smart Data Access
            Do not install
        SAP HANA XS Advanced Runtime
            Do not install
```

```
Do you want to continue? (y/n): y
```

#### Step 3 Verify the installation.

• Switch to the database system administrator. The administrator account is **s00adm** displayed on the page during the installation.

#### su - s00adm

• Query the database version.

If the version can be queried, the database software is installed.

#### **HDB** -version

Check whether the database process is running properly.

Run the following command to check whether the process is normal (**00** is the SAP HANA instance ID):

#### sapcontrol -nr 00 -function GetProcessList

In the command output, if the value of **dispstatus** is **GREEN**, the process is normal.

 Run the following command to return to user root: exit

```
hana001:/hana/shared/51053381/DATA UNITS/HDB SERVER LINUX X86 64 # su - s00adm
 s00adm@hana001:/usr/sap/S00/HDB00> HDB -version
 HDB version info:
                                        2.00.033.00.1535711040
   version:
   branch:
                                        fa/hana2sp03
   machine config:
                                        linuxx86 64
   git hash:
                                        83714f37479a86233127c092c9e295c72d727b8b
   git merge time:
                                        2018-08-31 12:24:00
   weekstone:
                                        0000.00.0
   cloud edition:
                                        0000.00.00
   compile date:
compile host:
                                        2018-08-31 12:31:44
                                        ld4550
   compile type:
                                        rel
 s00adm@hana001:/usr/sap/S00/HDB00> sapcontrol -nr 00 -function GetProcessList
21.07.2020 10:10:04
GetProcessList
oк
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
hdbdaemon, HDB Daemon, GREEN, Running, 2020 07 21 10:06:05, 0:03:59, 5402
hdbcompileserver, HDB Compileserver, GREEN, Running, 2020 07 21 10:06:05, 0:03:59, 5418
hdbpreprocessor, HDB Preprocessor, GREEN, Running, 2020 07 21 10:06:28, 0:03:36, 5595
hdbwebdispatcher, HDB Web Dispatcher, GREEN, Running, 2020 07 21 10:06:28, 0:03:36, 5595
hdbindexserver, HDB Indexserver-S00, GREEN, Running, 2020 07 21 10:07:10, 0:02:54, 5563
hdbindexserver, HDB Indexserver-S00, GREEN, Running, 2020 07 21 10:06:29, 0:03:35, 5634
hdbxengine, HDB XSEngine-S00, GREEN, Running, 2020 07 21 10:06:29, 0:03:35, 5636
 s00adm@hana001:/usr/sap/S00/HDB00> exit
                                                                                      T
logout
 hana001:/hana/shared/51053381/DATA_UNITS/HDB_SERVER_LINUX_X86_64 #
```

**Step 4** Log in to the other ECS where SAP HANA is to be installed, decompress the installation package, and install SAP HANA. The installation procedure is the same as the aforementioned. All parameters except ECS name must be consistent with preceding ones.

----End

## 4.5.2 Installing SAP S/4HANA

#### 4.5.2.1 Adding a Virtual IP Address

Download the SAP S/4HANA (1809) installation package to the shared directory / **sapcd** and perform the installation.

If you use the SAP ASCS HA script provided by HUAWEI CLOUD, the virtual IP address is automatically configured in the installation script. Before installing SAP ASCS and ERS, you need to manually add the virtual IP addresses of ASCS and ERS on the active and standby nodes.

Command for adding virtual IP address on the active node:

ip addr add <ASCS VIP>/24 broadcast dev eth0:0

Example: ip addr add 172.16.0.12/24 broadcast 172.16.0.255 dev eth0:0

Command for adding virtual IP address on the standby node:

ip addr add <ERS VIP>/24 broadcast dev eth0:1

Example: ip addr add 172.16.0.13/24 broadcast 172.16.0.255 dev eth0:1

#### 4.5.2.2 Installing ASCS Instance1

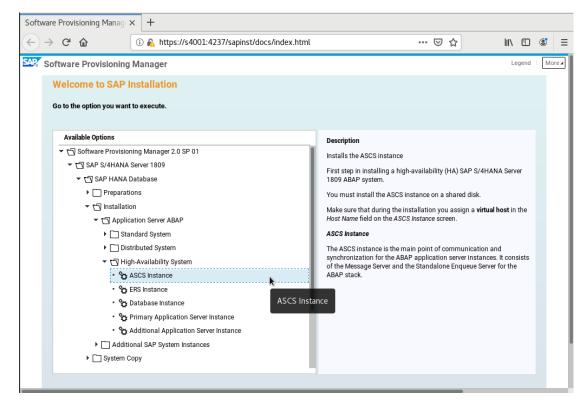
#### Procedure

**Step 1** Log in to the active SAP S/4HANA ECS **s4001**, and use Software Provisioning Manager (SWPM) to install ASCS Instance on the VM ascsha.

s4001:/sapcd/SWPM		
INF0 2020-0	==============]   extracting don 17-21 11:21:13.365 (mainThread) [sixx	create.cpp:347]
	******	****************
	tory: /root/.sapinst/s4001/4379 ************************************	*****
SAPinst build inf		
Version:	749.0.62 1875603	
Make type:	Oct 08 2018 - 14:01:31 optU	
Platform:	749_REL linuxx86_64 749, patch 611, changelist 1875937	
	SAP Java Server VM (build 8.1.044 9. 6 (mixed mode))	0.4+011, Sep 6 2018 16:58:06 - 81_REL - optU - linux amd64
SAP JC0 Bulld: SL-UI version:		
SAP UI5 version:		
Exe directory: /t	mp/sapinst_exe.4378.1595301670	
SAPinst process i	nformation:	I
Pid: 4379		-
	7-21 11:21:13.720 (root/sapinst) (st DNS configuration: could not determi	artInstallation) [CSiManagerInterfaces.cpp:2348] ne the DNS domain of host s4001
	7-21 11:21:13.722 (root/sapinst) (gu DNS configuration: could not determi	iWatchdog) [CSLPCommunicationServer.cpp:349] ne the DNS domain of host s4001
	7-21 11:21:15.749 (root/sapinst) (SL ************************************	PCommunicator) [SLPMonitoringStatemachine.cpp:1392] ************
https://s4001:423 Logon users: [roo	<u>and paste the following URL</u> address 7/sapinst/docs/index.html t]	
	lo Profile used. 'STEMNAME neither in Profile nor in C l /sapcd/SWPM/resourcepool.xml	ommandline

**Step 2** Enter **https://s4001:4237/sapinst/docs/index.html** in the address box of a browser, and then log in to the SWPM system as the **root** user and install ASCS Instance.

Select **ASCS Instance** and click **Next**.



Step 3 Enter the planned SID for SAP System ID and sapmnt for SAP Mount Directory.

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	https://s4001:4237/sapinst/docs/index.html	⊌ ☆	\ ⊡	۲
Software Provisioning Manag	jer		Legend	M
General SAP System Pa	rameters			
Enter the SAP system ID.				
SAP System				
*SAP System ID (SAPSID)	S01			
SAP Mount Directory	/sapmnt			
Additional Information				
The SAP System ID is an identifie The system is installed under /u	r for your SAP system. It must be unique throughout your system lands sr/sap/ <sapsid>/Common directories are linked to <sap moun<="" td=""><td>cape. t Directory&gt;/<sapsid>/</sapsid></td><td></td><td></td></sap></sapsid>	cape. t Directory>/ <sapsid>/</sapsid>		
		k		
Back Next	Cancel			

Step 4 Deselect Set FQDN for SAP System.

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Software Provisioning	Manager		Legend	Mor	re 🖌
	2 3 4 w Para Execute Serv Service Com				TASK LIST
DNS Domain Nam	e				LOG FILES
Enter the DNS domain nam	ne for the SAP system to calculate the fully qualified domain name (FQDN).				HELP
	ystem				P

**Step 5** Enter the master password for all users.

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Software Provisioning N	lanager		L	egend	Mo	ore 🔺
1 2 Define Para Review	Para Execute Serv Service Com					TASK LIST
Master Password						LOG FILES
Enter the master password for	r all users.					HELP
*Password for All Users	sed for all users that are created. Check the tool help for restrictions and dependencie					
*Confirm Additional Information	•••••	R-				
If you want to set an indiv screen. If you set individua	idual password for each user, you can do this in the corresponding parameter section I passwords, a new master password does not overwrite these individual settings.	n on the Parameter Summary				
Back Next	Cancel					

Step 6 Click Next.

ftware Provisioning Manage × +			
→ C' û ii 🔒 https://s4	001:4237/sapinst/docs/index.html	⊘ ☆	\ ⊡ 🤅
Software Provisioning Manager			Legend
1 2 3 Define Para Review Para Execute	4 Serv Service Com		
SAP System Administrator			
Enter the password of the SAP system administ	rator.		
SAP System Administrator Account: s01adm *Password of SAP System Administrator			
*Confirm	•••••		
User ID	I		
Group ID of sapsys			
Additional Information			
Additional Information The fields User ID and Group ID should norma	ally be left empty. Jure they do not conflict with other IDs you enter later in the i	installation.	
Additional Information The fields User ID and Group ID should norma	Ily be left empty. ure they do not conflict with other IDs you enter later in the l	installation.	

#### **Step 7** Select a package path.

	ioning Manage × +					
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Software	Provisioning Manager			L	egend	· (
Search	Location					
Specify	y the path to an archive, a download folder or	a media location as Package Path.				
Packa	ge Path					
Br	rowse					
Archiv	e Locations					
	an download the archives from the following lo	ocations on SAP Software Download Center:				
SAPHO	OSTAGENT.SAR 721 (Latest Patch)					
The ta	ble below is updated with all packages detect	ed at the specified <i>Package Path</i> when you cho	oose Next.			
	staying on this screen you can add or adjust p ou do not wish to make any further adjustmen					
Archiv	e Scanning Information					
archive	ormation file is written after the archives have e files. Iformation file contains only results of the late		formation about matching and non matching			
Detec	ted Packages		ľ			
	Package Name	Individual Package Location	Status			
	SAPHOSTAGENT.SAR 721 (Latest Patch)	/sapcd/Basket/SAPHOSTAGENT39_39-20	Available			

**Step 8** Enter and confirm the password.

Software Provisioning Manag	× +					
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Software Provisionir	ig Manager				Legend	More 4
1 Define Para Re	2 3 view Para Execute Se	erv Service Com				TASK LIST
SAP System Adr	ninistrator					LOG FILES
Enter the password of th	e SAP system administra	tor.				HELP
	ystem Administrator n i <i>Group ID</i> should normall	y be left empty. e they do not conflict with other IDs you enter later	r in the installation.	•		0
Back Nex	t Cancel					

**Step 9** Set **ASCS Instance Number** and **ASCS Instance Host Name** according to the installation planning. Enter the VM name (**ascsha**) of the active SAP S/4HANA ECS for **ASCS Instance Host Name**.

Software Provisioning Manag	× +					
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Software Provisioning	g Manager			Lege	nd   [1	Vlore <b>⊿</b>
Define Para Rev	2 3 lew Para Execute Serv					TASK LIST
ASCS Instance						LOG FILES
Enter the instance param	Enter the instance parameters for the ABAP central services (ASCS) instance.					HELP
ASCS Instance The following SAP sy	stem instances already exist	on this host:				
SAP System	D (SAPSID)	Instance Name	Instance Number			
		No data				
*ASCS Instance Numb *ASCS Instance Host Additional Information	Name as	[				
Host Name can be eith name.	The ASCS instance requires an <i>Instance Number</i> and a <i>Host Name</i> as a technical identifier for internal processes, such as assigned memory. The <i>Host Name</i> can be either the physical host name or one of the virtual host names. In a high-availability system installation, use a virtual host name. The instance number must be unique for this installation host.					
Back Next	Cancel					

Step 10 Click Next.

Software Provisioning Manage × +				
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Software Provisioning Manager			Legend	More 4
1 2 3 Define Para Review Para Execute Se				TASK LIST
ABAP Message Server Ports				LOG FILES
Enter the required message server ports.				HELP
ABAP Message Server Ports				0
*ABAP Message Server Port	3601			
*Internal ABAP Message Server Port	3901			
Additional Information				
The instance-specific Internal ABAP Message Ser communication channels.	rver Port for internal communication and the ABAP Mes	ssage Server Port are required as unique		
Back Next Cancel	•			

#### Step 11 Click Next.

Software Provisioning Manage	× +				
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SAR Software Provisioning	Manager		Legend	Μ	lore ₄
Choose the additional com Enable Additional Comp	enents to be Included in the ASCS Instance ponents you want to have installed in the ASCS instance. Honents Dispatcher integrated in the ASCS instance tegrated in the ASCS instance				TASK LIST LOG FILES HELP
If you choose Install an: separate SAP Web Disp ASCS instance belongs If you want to install an install SAP Web Dispat SAP NetWeaver 7.1 to 7 Manager -> Installation G If you choose Install a G instance is created. A G If the Gateway is require Installation of a Standal -> System Provisioning ->	SAP Web Dispatcher integrated in the ASCS instance, an SAP Web Dispatcher is installed atcher instance is created. This is recommended if you want to use the SAP Web Disp SAP Web Dispatcher for another system - that is, not for the system for which you use ther separately. See the documentation installation Guide – installation of SAP Web Disp 5x on <os> at https://support.sap.com/sitoolset -&gt; System Provisioning -&gt; installation uides - Standalone Engines and Clients. ateway integrated in the ASCS instance, a Gateway is installed in the ASCS instance. No takeway integrated in the ASCS Instance is recommended, for example, when you set u ed for other purposes, you can also install a standalone Gateway instance. See the doc ne Gateway instance for SAP Systems Based on SAP NetWeaver 7.1 to 7.5x on <os> at 1 - Installation Option of Software Provisioning Manager -&gt; installation Guides - Standalone lilover Cluster installations, do <b>not</b> install a standalone Gateway on cluster nodes. Inst</os></os>	atcher for the system to which the e the ASCS instance - you can also patcher for SAP Systems Based on Option of Software Provisioning o standalone SAP Gateway p a Microsoft Failover Cluster. cumentation Installation Guide – http://support.sap.com/sitoolset = Engines and Clients.			

Step 12 Click Next.

oftware Provisi	ioning Manage ×	+			
← → C <sup>i</sup> f	۵ ()	🔏 https://s4001:4237/sapinst/docs/index.html	⊌ ☆	\ ⊡	۲
🥸 Software	Provisioning Ma	nager		Legend	Μ
Define		a Execute Serv Service Com			
Clean	up of Operating	System Users			
		m users are to be removed from group'sapinst'on UNIX (the group'SAPINST' e Provisioning Manager has completed.	is to be removed from the operating system	m users on IBM	
The sa For sec SAPIN	curity reasons, SAP rec	ctory belongs to a group named sapinst. If this group is not available, it is i commends that you remove operating system users from group sapinst or system users on IBM i) after the execution of Software Provisioning Manage system users	n UNIX (respectively remove group		
	OS User				
1	s01adm				
Operat (respec	ctively the group SAPI	are created during the execution of Software Provisioning Manager are add NST is added to the operating system users on IBM i) as they need access to are not local, you either need the required administrator permissions or mus	the sapinst_instdir directory. For		
Bac	k Next	Cancel			

**Step 13** Check your parameter settings. If they are all correct, click **Next**.

Software Provisioning Manage	+							
$\leftrightarrow$ $\rightarrow$ C $\textcircled{a}$	i) 🔒 https://s4001:4	1237/sapinst/docs/index.html		⊠ ☆	lii\	•	٢	≡
Software Provisioning	Vanager				Le	egend	Mo	re 🔺
Define Para Revie	2 3 Para Execute Serv	4 Service Com						TASK LIST
Parameter Summ	ıry							LOG FILES
Choose 'Next' to start with change the parameter. You	ne values shown. Otherwis night be guided through o	e, select the parameters to be changed a ther screens that have so far been proce	nd choose 'Revise'. You are the ssed.	en taken to the scree	en where you ca	in	i	HELP
Parameter List								
General SAP System	Doromotoro				-			
SAP System ID (SAPSID	S	01						
SAP Mount Directory	/s	apmnt	•					
DNS Domain Name			1.2					
Set FQDN for SAP s	stem							
Master Password					-			
Password for All Users	•	0000						
					-			

**Step 14** The installation starts.

	tware Provisioning Manage × +			
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SAR	Software Provisioning Manager		Legend	More
	1     2     3     4       Define Para     Review Para     Execute Serv     Service Com       63%     Process is in running state       Extracting disp+work			TASK LIST LOG FILES
				HELP
	Cancel			
		₩.		
Soft	tware Provisioning Manage × +			
$\frown$	→ C <sup>a</sup> <b>d</b> (i) <b>e</b> https://s4001:4237/sapinst/c	iocs/index.html 🚥 🖂 ☆	III\ 🗊	: ۱
SAP	Software Provisioning Manager		Legend	More 4
	Define Para Review Para Execute Serv Service Com 100% Process is in dialog state Execution of Service has been completed successfully. Information	-1 		TASK LIST LOG FILES
	Execution of			HELP
	SAP S/4HANA Server 1809 > SAP HANA Database > Installation > A has completed.	pplication Server ABAP > High-Availability System > ASCS Instance		



## 4.5.2.3 Copying Files

After installing ASCS on the active SAP S/4HANA ECS **s4001**, you need to copy some files from **s4001** to the standby SAP S/4HANA ECS **s4002** where ERS is to be installed.

## Procedure

**Step 1** Log in to **s4001**, compress the SYS file of the **/usr/sap/S01** directory, and copy the file package to the **/usr/sap/S01** directory on **s4002**.

```
s4001:/sapcd/SWPM # cd /usr/sap/S01/
s4001:/usr/sap/S01 # ll
total 0
drwxr-xr-x 7 s0ladm sapsys 63 Jul 21 11:54 ASCS01
drwxr-xr-x 5 s0ladm sapsys 68 Jul 21 11:54 SYS
s4001:/usr/sap/S01 # tar -cvf SYS.tar SYS/
SYS/
SYS/exe/
SYS/exe/uc
SYS/exe/nuc
SYS/exe/opt/
SYS/exe/dbg
                                                                       I
SYS/exe/run
SYS/gen/
SYS/gen/dbg/
SYS/src/
SYS/profile
SYS/global
s4001:/usr/sap/S01 # scp SYS.tar s4002:/usr/sap/S01/
                                                                                      100% 20KB 7.6MB/s
SYS.tar
                                                                                                               00:00
s4001:/usr/sap/S01 #
s4001:/usr/sap/S01 #
```

Step 2 Log in to s4002 and decompress the SYS.tar file.

```
s4002:~ # cd /usr/sap/S01/
s4002:/usr/sap/S01 # ll
total 20
drwxr-xr-x 2 root root 6 Jul 20 15:55 ERS10
-rw-r--r-- 1 root root 20480 Jul 21 14:06 SYS.tar
drwxr-xr-x 2 root root
s4002:/usr/sap/S01 # tar -xvf SYS.tar
SYS/
SYS/exe/
SYS/exe/uc
SYS/exe/nuc
SYS/exe/opt/
SYS/exe/dbg
SYS/exe/run
SYS/gen/
SYS/gen/dbg/
SYS/src/
SYS/profile
SYS/global
s4002:/usr/sap/S01 # ll
total 20
drwxr-xr-x 2 root root
                                    6 Jul 20 15:55 ERS10
drwxr-xr-x 5 1000 1001 68 Jul 21 11:54 SYS
-rw-r--r-- 1 root roo<u>t</u> 20480 Jul 21 14:06 SYS.tar
s4002:/usr/sap/S01 #
```

Step 3 Install ERS.

----End

## 4.5.2.4 Installing ERS Instance

### Procedure

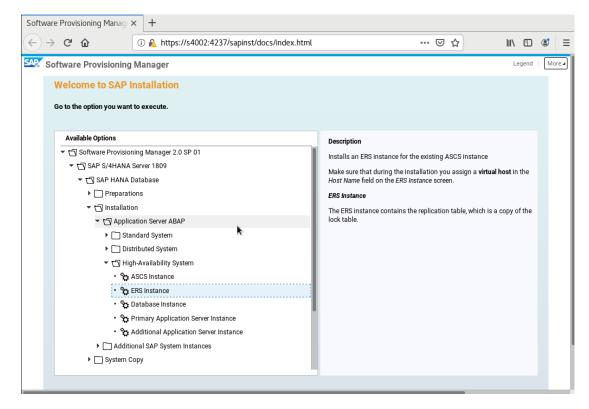
**Step 1** Log in to the standby SAP S/4HANA ECS s4002 and go to the directory where the ERS installation package is stored to install it.

```
s4002:~ # cd /sapcd/SWPM/
s4002:/sapcd/SWPM # ./sapinst

    ) 2020-07-21 14:10:33.597 (mainThread) [sixxcreate.cpp:347]
INFO
****
SAPinst build information:
Version:
                749.0.62
Build:
                1875603
                Oct 08 2018 - 14:01:31
optU
Compile time:
Make type:
Codeline:
                749_REL
                linuxx86_64
749, patch 611, changelist 1875937
SAP Java Server VM (build 8.1.044 9.0.4+011, Sep 6 2018 16:58:06 - 81_REL - optU - linux amd64
Platform:
Kernel build:
SAP JRE build:
 - 6 - bas2:309656 (mixed mode))
               3.0.18
SAP JCo build:
                                                                  T
SL-UI version:
                2.6.28
SAP UI5 version: 1.50.4
Exe directory: /tmp/sapinst_exe.4782.1595311831
SAPinst process information:
Pid:
           4783
INFO
          2020-07-21 14:10:33.959 (root/sapinst) (startInstallation) [CSiManagerInterfaces.cpp:2348]
Problem with the DNS configuration: could not determine the DNS domain of host s4002
INF0 2020-07-21 14:10:33.961 (root/sapinst) (guiWatchdog) [CSLPCommunicationServer.cpp:349]
Problem with the DNS configuration: could not determine the DNS domain of host s4002
INFO
          2020-07-21 14:10:36.188 (root/sapinst) (SLPCommunicator) [SLPMonitoringStatemachine.cpp:1392]
    <u>Open your browser and paste the following UR</u>L address to access the GUI
https://s4002:4237/sapinst/docs/index.html
=>sapparam(1c): No Profile used.
=>sapparam: SAPSYSTEMNAME neither in Profile nor in Commandline
load resource pool /sapcd/SWPM/resourcepool.xml
```

**Step 2** Enter **https://s4002:4237/sapinst/docs/index.html** in the address box of a browser, and then log in to the SWPM system as the **root** user and install ERS Instance.

Select ERS Instance and click Next.



Step 3 Enter the directory where the porfile file is stored.

Software Provisioning Manage × +	
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Software Provisioning Manager	Legend More 4
	TASK LIST
General SAP System Parameters	
Enter the profile directory of the SAP system.	06
	LOG FILES
SAP System Identification	HELP
Profile Directory /sapmnt/S01/profile ~ Additional Information	Ę
Existing parameters are retrieved from the SAP system profile directory. The location of your SAP system profile directory is as follows:	
<ul> <li>Windows: \\<sapglobalhost>\sapmnt\<sapsid>\SYS\profile</sapsid></sapglobalhost></li> <li>UNIX and IBM i: /<sap directory="" mount="">/<sapsid>/profile or /usr/sap/<sapsid>/SYS/profile</sapsid></sapsid></sap></li> </ul>	
Back Next Cancel	

**Step 4** Enter the password of the SAP system administrator.

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Software Provisioning Manager			Legend
1 2 3 Define Para Review Para Execute 5			
SAP System Administrator			
Enter the password of the SAP system administr	ator.		
SAP System Administrator Account: s01adm			
*Password of SAP System Administrator	•••••		
*Password of SAP System Administrator *Confirm	••••••		
	•••••• •••••• 1000		
*Confirm			
*Confirm User ID Group ID of sapsys Additional Information	1000		
*Confirm User ID Group ID of sapsys Additional Information The fields <i>User ID</i> and <i>Group ID</i> should norma	1000	installation.	
*Confirm User ID Group ID of sapsys Additional Information The fields <i>User ID</i> and <i>Group ID</i> should norma	1000 1001	t installation.	

Step 5 Deselect Set FQDN for SAP System.

Image: Software Provisioning Manager     Image: Software Provisioning Manager     Image: Image: Software Provisioning Manager     Image: Imag	Software Provisioning Manage × +	
befine Para 2   Bervice Com Comparine Para Review Para Execute Serv Service Com Service Com Comparine Para Bervice Para Bervice Com Comparine Para Bervice Para Bervice Com Comparine Para Bervice Com Bervice Com Bervice Com Comparine Para Bervice Com <	$\leftarrow \rightarrow \mathbb{C}$ <b>(a)</b> Ittps://s4002:4237/sapinst/docs/index.html $\cdots \boxtimes \mathbb{C}$	III\ 🗊 🗊 =
DNS Domain Name       Set FQDN for SAP system         Set FQDN for SAP system         *DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter         SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the application servers. For more information, see SAP Note 654982.	SAP Software Provisioning Manager	Legend More 4
DNS Domain Name       Figure 1         SAP System Domain Name       Set FQDN for SAP system         Set FQDN for SAP system       Set FQDN for SAP system         *DNS Domain Name for SAP system       Million         Additional Information       The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the application servers. For more information, see SAP Note 654982.		TASKLIST
SAP System Domain Name Set FQDN for SAP system TDNS Domain Name for SAP System Additional Information The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the application servers. For more information, see SAP Note 654982.	DNS Domain Name	LOG FILES
SAP System Domain Name         Set FQDN for SAP system         *DNS Domain Name for SAP System         Additional Information         The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter         SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the application servers. For more information, see SAP Note 654982.	Enter the DNS domain name for the SAP system to calculate the fully qualified domain name (FQDN).	HE
	Set FQDN for SAP system  DNS Domain Name for SAP System  Additional Information  The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the application servers. For more information, see SAP Note 654982.	Ţ

**Step 6** Select a package path.

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Software Provision	ig Manager		Legend	Mor
Define Para R	2 3 4 view Para Execute Serv Service Com			
Software Packa	ge Browser			
Specify the path to a de packages.	vnload folder containing all software packages, or the p	aths to media locations or to several individual download loca	ations of software	
Search Location Specify the path to a	archive, a download folder or a media location as Pack	kage Path.		
Package Path	/sapcd/Basket/SAPHOSTA	GENT39_39-201		
Browse				
Archive Locations				
You can download t SAPHOSTAGENT.SA	e archives from the following locations on SAP Softwar 721 (Latest Patch)	e Download Center:		
The table below is u	dated with all packages detected at the specified Packa	ge Path when you choose Next.		
While staying on thi and you do not wish	screen you can add or adjust paths for required packag to make any further adjustments, leave the above Packa	es by searching other locations. When all archives are specifie ge Path empty to continue.	ed	
Archive Scanning In	rmation			

**Step 7** Enter the password of the SAP system administrator.

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SAP	Soft	war	e Provisioning	Manager			Leg	jend   [	More 4
	ŀ	Def		2 3 w Para Execute S	4 Serv Service Com				TASK LIST
	S	AP	System Admi	inistrator					LOG FILES
	En	ter th	ne password of the S	SAP system administra	ator.				HELP
		Acco	System Administrat ount: sapadm ssword of SAP Syst		•••••	1			
		*Co	nfirm		•••••	]			
		User							
			ıp ID of sapsys itional Information		1001	•			
		The If yo	fields User ID and G u enter specific user	roup ID should normal r or group IDs, make su	lly be left empty. Ire they do not conflict with other IDs you ente	r later in the installation.			
		В	ack Next	Cancel					

**Step 8** Set **Number of the ERS Instance** and **ERS Instance Host** according to the installation planning. Enter the VM name (**ersha**) of the standby SAP S/4HANA node for **ERS Instance Host**.

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Software Provisioning Manager			Legend	More 4	
1 2 3 Define Para Review Para Execute Ser	v Service Com			TASK LIST	
ERS Instance				LOG FILES	
Enter the parameters for the ERS instance.				HELP	
ERS Instance The following instances were detected:		testers Marker			
SAP System ID	SAP System ID Instance Name Instance Number				
	No data				
Name of the ASCS Instance to be Replicated	ASCS01	*			
Number of the ASCS Instance to be Replicated	01				
*Number of the ERS Instance	10				
*ERS Instance Host	ersha				
Additional Information The ERS Instance requires an <i>Instance Number</i> an unique for this installation host. The <i>Host Name</i> UNIX only: In a high-availability system installat Windows only: In a Failover Cluster installation,	can be either the physical host name or one of ion, use a virtual host name for the ERS instanc	the virtual host names.			

### Step 9 Click Next.

Software Provisioning Manage × +						
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Software Provisioning Manager			Leç	jend	More	4
1 2 3 Define Para Review Para Execute Se	rv Service Com				TASK LIST	
Activate Changes					LOG FILES	
Restart the ASCS instance to activate the changes.					HELP	
Activation of Instance Changes In order to activate the changes a restart of the	ASCS instance is required.				0	
ASCS Instance Name	ASCS01					
ASCS Instance Host	ascsha					
Automatic Instance and Service Restart      Additional Information						
	ould restart your ASCS instance after you have installed	the last ERS instance.				
	nce and service) manually using SAP MMC to get the o					
Back Next Cancel						

Step 10 Click Next.

1		ioning Manage ×	+		has	
2	)→ C'1		https://s4002:4237/sapinst/docs/index.html	⊠ ☆	1111	
2	Software	Provisioning Ma	nager		Leg	end
	Define		3 4 arra Execute Serv Service Com			
	Cleanu	up of Operating	ı System Users			
			em users are to be removed from group'sapinst'on UNIX (the group'SAPINS e Provisioning Manager has completed.	ST'is to be removed from the operating syst	em users on l	BM
			ctory belongs to a group named sapinst. If this group is not available, it is			
	For sec SAPIN					
	For sec SAPIN	ST from the operating s, clean up operating	system users on IBM i) after the execution of Software Provisioning Mana system users	ger has completed.		
	For sec SAPIN	ST from the operating s, clean up operating ting System Users to	system users on IBM i) after the execution of Software Provisioning Manag system users be Cleaned Up:	ger has completed.		
	For sec SAPIN: Operat	ST from the operating s, clean up operating ting System Users to OS User s01adm onal Information ing system users that tively the group SAPI	system users on IBM i) after the execution of Software Provisioning Manag system users be Cleaned Up:	ger has completed. Ided to the group sapinst on UNIX to the sapinst instdir directory. For		

**Step 11** Check your parameter settings. If they are all correct, click **Next**.

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Software Provisioning Manager			Legend	More 4
Define Para Exec	3 4 ute Serv Service Com			TASK LIST
Parameter Summary				LOG FILES
Choose 'Next' to start with the values shorin change the parameter. You might be guided Parameter List	. Otherwise, select the parameters to be changed and choos through other screens that have so far been processed.	e 'Revise'. You are then taken to the screen v	vhere you can	HELP
General SAP System Parameters				
Profile Directory	/sapmnt/S01/profile 🗸			
SAP System Administrator				
Password of SAP System Administrator	0000			
DNS Domain Name				
Set FQDN for SAP system				
Software Package Browser				

**Step 12** The installation starts.

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SAP	Software	e Provisioning N	lanager		Legend	More
	Defin	1 2 te Para Review	Para Execute Serv Service Com			TASK LIST LOG FILES
	Са	incel				HELP
Soft	ware Provis	sioning Manage ×	+			
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$\langle \boldsymbol{\leftarrow} \rangle$	→ C Software Definition 100% Execution	Provisioning M     A	Image:         Image:	··· ♥ ✿		More TASK LIST LOG FILES
$\langle \boldsymbol{\leftarrow} \rangle$	→ C <sup>4</sup> Software Defin 100% Executi Inform Execut		https://s4002:4237/sapinst/docs/index.html  Anager  a a a a a a a a a a a a a a a a a a a			More 4
$\langle \boldsymbol{\leftarrow} \rangle$	→ C <sup>4</sup> Software Defin 100% Executi Inform Execut SAP S has co		https://s4002:4237/sapinst/docs/index.html   Anaager   Para   Execute Serv   Service Com   9 > SAP HANA Database > Installation > Application Server ABAP > High-Availability System > ER			More TASK LIST LOG FILES



## 4.5.2.5 Installing DB Instance

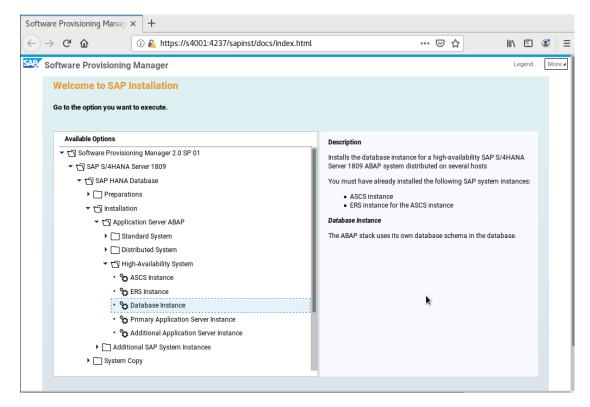
### Procedure

**Step 1** Log in to the active SAP S/4HANA ECS **s4001** and go to the directory where the DB Instance installation package is stored to install it.

<b>s4001:~</b> # cd /sa	
s4001:/sapcd/SWP	
	]   extracting done!
	07-21 14:35:21.276 (mainThread) [sixxcreate.cpp:347]
	***************************************
	ctory: /root/.sapinst/s4001/21815 ***********************************
SAPinst build in	iformation:
Version:	749.0.62
Build:	1875603
Compile time:	lor 08 2018 - 14:01:31
Make type:	optu
	749 REL I
	749, patch 611, changelist 1875937
SAP JRE build: - 6 - bas2:3096	SAP Java Server VM (build 8.1.044 9.0.4+011, Sep  6 2018 16:58:06 - 81_REL - optU - linux amd64 556 (mixed mode))
SAP JCo build:	3.0.18
SL-UI version:	2.6.28
SAP UI5 version:	
Exe directory: /	/tmp/sapinst_exe.21814.1595313318
SAPinst process	information:
Pid: 2181	.5
	07-21 14:35:21.579 (root/sapinst) (startInstallation) [CSiManagerInterfaces.cpp:2348] e DNS configuration: could not determine the DNS domain of host s4001
	07-21 14:35:21.581 (root/sapinst) (guiWatchdog) [CSLPCommunicationServer.cpp:349] 2 DNS configuration: could not determine the DNS domain of host s4001
	07-21 14:35:22.393 (root/sapinst) (SLPCommunicator) [SLPMonitoringStatemachine.cpp:1392]
	er and paste the following URL address to access the GUI 🛛 👖 237/sapinst/docs/index.html
Logon users: [ro *************	lot] ************************************
	No Profile used. SYSTEMNAME neither in Profile nor in Commandline ool /sapcd/SWPM/resourcepool.xml

**Step 2** Enter **https://s4002:4237/sapinst/docs/index.html** in the address box of a browser, and then log in to the SWPM system as the **root** user and install DB Instance.

Select Database Instance and click Next.



Step 3 Retain the default values, and click Next.

Software Provisioning Manage × +				
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SANT Software Provisioning Manager			Legend	More 4
General SAP System Paramete	rs			TASK LIST L
Enter the profile directory of the SAP system.				LOG FILES
SAP System Identification				
Profiles Available				HELP
Windows: \\ <sapgl0balh0st>\sa</sapgl0balh0st>	/usr/sap/S01/SYS/profile   AP system profile directory. The location of your SAP system omnt\ <sapsid>\SYS\profile ctory&gt;/<sapsid>/profile or /usr/sap/<sapsid>/SY</sapsid></sapsid></sapsid>			
Back Next Cancel	<b>k</b>			

Step 4 Enter the master password for all users.

oftware Provisioning Manage × +				
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🎖 Software Provisioning Manager			Legend	More <b>⊿</b>
1 2 3 Define Para Review Para Execute				TASK LIST
Master Password				LOG FILES
Enter the master password for all users.				HELP
Master Password The master password is used for all users tha *Password for All Users *Confirm	t are created. Check the tool help for restrictions and depe	ndencies.		
Additional Information				
	each user, you can do this in the corresponding parameter master password does not overwrite these individual sett			
Back Next Cancel				
	<b>X</b>			

Step 5 Deselect Set FQDN for SAP System.

Software Provis	sioning Manage ×	+									
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Software	e Provisioning M	anager						L	egend	Mo	ore 🖌
Defin		ara Execute Se	erv Service Com								TASK LIST
DNS	Domain Name										LOG FILES
Enter the	e DNS domain name f	or the SAP system to	o calculate the fully o	qualified domain i	name (FQDN).						HELP
₩DN ★DN Addit	System Domain Name et FQDN for SAP syste Set FCDDN for SA INS Domain Name is us OCALHOSTFULL. This p CALHOSTFULL.	AP System P system sed to calculate the I					4982.				0

Set required parameters such as **Database Host**, **Instance Number of the SAP HANA Database**, and **Database ID (DBSID)**. Set **Database Host** to the VM name of the active SAP HANA node.

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SAR So	oftware Provisioning Manager			Legend	M	ore 🖌
	1 2 3 Define Para Review Para Execute					TASK LIST
	Database for SAP System					LOG FILES
	Enter the database parameters.					HELP
	SAP HANA Database Tenant					-0
	*Database Host	hanaha				
	★Instance Number of the SAP HANA Database	00				
	*Database ID (DBSID)	\$00				
	*Password of the Database System	•••••				
	Administrator (User: SYSTEM) Additional Information					
	be installed. The parameter Database ID (DBSID) is the nar found but the DBSID does not exist, a <b>new da</b> Caution: If no active SAP HANA instance is fo	uber for your SAP HANA database host. If the instan ne of the database tenant and the <i>Password</i> is for it <b>tabase tenant will be created</b> . bund, a new one will be created. The system id and t nust not match the SAPSID used for the SAP System	is SYSTEM user. If an SAP HANA database is enant database will have the name given in			

Step 6 Enter the password of the SYSTEM user.

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Software Provisioning Manager			Legend More 4
1 2 3 Define Para Review Para Execute 5	4 Serv Service Com		TASK LIST
SAP HANA Multitenant Database	e Containers		LOG FILES
Enter the database parameters for the system da	tabase.		HELP
System Database			
*Database Host	hanaha		
*Instance Number of the SAP HANA Database	00		
System Database Name	SystemDB		
*Password of the System Database Admistrator (User: SYSTEM) Additional Information Enter the password for the SYSTEM user of the	System Database (SYSTEMDB).		
Back Next Cancel			

**Step 7** Select a package path.

Softwar	e Prov	risioning Manage>	< +								
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SAR So	oftwa	re Provisioning	Manager					L	.egend	Mo	ore 4
	De		2 3 w Para Execute S								TASK LIST
	Soft	ware Package	Browser								LOG FILES
	Specify packa		oad folder containing	all software packages, or the paths to media l	ocations or to several individ	lual downlo	oad location	s of softwar	e		HELP
		r <b>ch Location</b> cify the path to an ar	chive, a download fold	ler or a media location as Package Path.							
	Pac	kage Path		/sapcd/Basket	]						
	Arc	Browse			k						
			rchives from the follov n supporting your rele	ving locations on SAP Software Download Ce ase)	nter:						
	The	table below is updat	ed with all packages d	letected at the specified Package Path when yo	ou choose Next.						
				just paths for required packages by searching trments, leave the above <i>Package Path</i> empty t		chives are	specified				
	Arc	nive Scanning Inform	ation								

#### Step 8 Click Next.

Software Provisioning Managi × +					
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SARY Software Provisioning Manager		Le	gend	Mo	ore 🖌
1     2     3     4       Define Para     Review Para     Execute Serv     Service Com					TASK LIST
Upgrade SAP Host Agent					LOG FILES
Decide whether you want to upgrade the existing SAP Host Agent					HELP
Detected SAP Host Agent Upgrade SAP Host Agent to the version of the provided SAPHOSTAGENT.SAR archive Additional Information					
An SAP Host Agent is already installed on this host. You can upgrade it to a higher version if you provide a SAPHOSTAGENT.SA higher version. At the end of the upgrade the SAP Host Agent is restarted. If you provide a SAPHOSTAGENT.SAR archive that does not have a hi the SAP Host Agent remains unchanged.					
Back Next Cancel					

**Step 9** Select a package path.

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are Provisioning Manager			Leger	id   N
pecify the path to an archive, a download folder	or a media location as Package Path.			
ackage Path				
Browse				
rchive Locations				
	g locations on SAP Software Download Center:			
APHOSTAGENT.SAR 721 (Latest Patch)				
ne table below is updated with all packages det	ected at the specified Package Path when you cho	oose Next.		
id you do not wish to make any further adjustif	ents, leave the above Package Path empty to con	itinue.		
chive Scanning Information				
	ve been scanned. There you can find detailed inf	formation about matching and non matching		
	atest archive scan.			
etected Packages				
otootoaraonagoo				
Package Name	Individual Package Location	Status		
	becify the path to an archive, a download folder ackage Path Browse chive Locations but can download the archives from the following PHOSTAGENT.SAR 721 (Latest Patch) he table below is updated with all packages deter hile staying on this screen you can add or adjust d you do not wish to make any further adjustm chive Scanning Information h information file is written after the archives ha chive files.	beeify the path to an archive, a download folder or a media location as <i>Package Path</i> .  ackage Path Browse chive Locations but can download the archives from the following locations on SAP Software Download Center: APHOSTAGENT.SAR 721 (Latest Patch) the table below is updated with all packages detected at the specified <i>Package Path</i> when you che hile staying on this screen you can add or adjust paths for required packages by searching othe id you do not wish to make any further adjustments, leave the above <i>Package Path</i> empty to cor chive Scanning Information in formation file is written after the archives have been scanned. There you can find detailed information	becify the path to an archive, a download folder or a media location as <i>Package Path</i> .  ackage Path Browse  chive Locations but can download the archives from the following locations on SAP Software Download Center: APHOSTAGENT.SAR 721 (Latest Patch) be table below is updated with all packages detected at the specified <i>Package Path</i> when you choose <i>Next</i> .  hile staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are specified d you do not wish to make any further adjustments, leave the above <i>Package Path</i> empty to continue.  chive Scanning Information n information file is written after the archives have been scanned. There you can find detailed information about matching and non matching chive files.	beeify the path to an archive, a download folder or a media location as <i>Package Path</i> .  ackage Path Browse chive Locations but can download the archives from the following locations on SAP Software Download Center: APHOSTAGENT.SAR.721 (Latest Patch) be table below is updated with all packages detected at the specified <i>Package Path</i> when you choose <i>Next</i> .  hile staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are specified ad you do not wish to make any further adjustments, leave the above <i>Package Path</i> empty to continue.  chive Scanning Information but formation file is written after the archives have been scanned. There you can find detailed information about matching and non matching chive files.

**Step 10** Select a package path.

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SAP	Soft	ware	Provisioning M	anager			L	egend	M	ore 🛛
		Specif	y the path to an archi	ive, a download folder or	a media location as Package Path.					TASK
		Packa	ge Path							TASK LIST
	Browse									
	Archive Locations									LOG FI
	The table below is updated with all packages detected at the specified Package Path when you choose Next.									FILES
	While staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are specified and you do not wish to make any further adjustments, leave the above Package Path empty to continue.									HELP
		An inf archiv	e files.		been scanned. There you can find detailed inf ist archive scan.	ormation about matching and non matching				
		Detec	ted Packages							
			Package Name		Individual Package Location	Status				
		1	S4HANA1809COR	RE HANA DB Export 1	/sapcd/Basket/S4CORE103_INST_EXPOR	Available				
	1       S4HANA1809CORE HANA DB Export 1       /sapcd/Basket/S4CORE103_INST_EXPOR*       Available         Additional Information       SAP recommends that you use the latest released versions of the required software packages. You can download them either manually from the SAP Software Download Center or - if available - using the Maintenance Planner.       If you have DVDs or Blu-ray media containing the required packages, you can also use them for initial system provisioning and then - if applicable - update the software package later by using the appropriate tool from the Software Logistics Toolset.									

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Software	e Provisioning Manager			Legend
1	S4HANA1809CORE HANA DB Export 10	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
2	S4HANA1809CORE HANA DB Export 11	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
3	S4HANA1809CORE HANA DB Export 12	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
4	S4HANA1809CORE HANA DB Export 13	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
5	S4HANA1809CORE HANA DB Export 14	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
6	S4HANA1809CORE HANA DB Export 15	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
7	S4HANA1809CORE HANA DB Export 16	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	i
8	S4HANA1809CORE HANA DB Export 17	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
9	S4HANA1809CORE HANA DB Export 18	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
10	S4HANA1809CORE HANA DB Export 19	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	•
11	S4HANA1809CORE HANA DB Export 2	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
12	S4HANA1809CORE HANA DB Export 20	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
13	S4HANA1809CORE HANA DB Export 3	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
14	S4HANA1809CORE HANA DB Export 4	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
15	S4HANA1809CORE HANA DB Export 5	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
16	S4HANA1809CORE HANA DB Export 6	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
17	S4HANA1809CORE HANA DB Export 7	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	
18	S4HANA1809CORF HANA DB Export 8	/sapcd/Basket/S4CORE103_INST_EXPOR	Available	

### **Step 11** Confirm the configuration information.

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SAP S	oftware Provisioning	j Manager			Legend	More 4
		2 3 ew Para Execute Se	erv Service Com			TASK LIST
	SAP HANA Multit	enant Database	Containers			LOG FILES
	Enter the database parameters for the system database.					HELP
	System Database					P
	Database ID (DBSID)		SYSTEMDB			
	*Database Host		hanaha	R.		
	★Instance Number of t Database	he SAP HANA	00			
	*Password of the SAP Superuser	HANA Database	•••••			
	Tenant Database					
	Tenant ID		S00			
	Recreate Database	Tenant				
	Specify the connectivity all users, schemas, and	data. Choose Recreate roles. In addition, the te	enant-specific configuration is initialized.	delete all content of the database tenant including recreating the tenant database compared to 'drop		

Step 12 Click Next.

Software Provisioning Manage × +				
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Software Provisioning Manager			Legend	More <b>∡</b>
1     2       Define Para     Review Para     Exec   Database Schema Enter the database schema password.	3 4 ute Serv Service Com			TASK LIST LOG FILES HELP
Database Schema				P
Database ID	S00	•		
Database Host	hanaha			
Instance Number of the SAP HANA	00			
Database *Schema	DBACOCKPIT			
Drop Existing Schema	bhoodil II			
*Schema Password	•••••			
*Confirm	•••••			
Additional Information				
Software Provisioning Manage × +				
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	//s4001:4237/sapinst/docs/index.html	··· ତ ନ୍ର		
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<ul> <li>← → C ŵ î  https://i&gt;     <li>Software Provisioning Manager</li> <li>Define Para Review Para Exect</li> </li></ul>	3 4	v ☆		More TASK LIST LOG FILES
<ul> <li>← → C ŵ î ŵ https://</li> <li>Software Provisioning Manager</li> <li>Define Para Review Para Exec</li> <li>Database Schema</li> </ul>	3 4	v 公 ☆		More TASK LIST LOG FILES
<ul> <li>← → C ŵ î  https://i&gt;     <li>Software Provisioning Manager</li> <li>Define Para Review Para Exec</li> <li>Database Schema</li> <li>Enter the database schema password.</li> <li>Database Schema</li> </li></ul>	3 4 Jute Serv Service Com	v ☆		More TASK LIST
<ul> <li>← → C ŵ î Mttps://</li> <li>Software Provisioning Manager</li> <li>Define Para Review Para Exec</li> <li>Database Schema</li> <li>Enter the database schema password.</li> </ul>	3 4	v ☆		More TASK LIST LOG FILES
<ul> <li>← → C ŵ î  https://i&gt;     <li>Software Provisioning Manager</li> <li>Define Para Review Para Exect</li> <li>Database Schema</li> <li>Enter the database schema password.</li> <li>Database ID</li> <li>Database Host</li> <li>Instance Number of the SAP HANA</li> </li></ul>	3 4 Jute Serv Service Com	🛛 ☆		More TASK LIST LOG FILES
<ul> <li>← → C</li></ul>	3 4 uute Serv Service Com Soo hanaha	v 文		More TASK LIST LOG FILES
<ul> <li>← → C ŵ î  https://i&gt;     <li>Software Provisioning Manager</li> <li>Define Para Review Para Exect</li> <li>Database Schema</li> <li>Enter the database schema password.</li> <li>Database ID</li> <li>Database Host</li> <li>Instance Number of the SAP HANA</li> </li></ul>	3 4 Juste Serv Service Com	v ☆		More TASK LIST LOG FILES
<ul> <li>← → C ŵ î https://</li> <li>Software Provisioning Manager</li> <li>Define Para Review Para Exect</li> <li>Database Schema</li> <li>Database ID</li> <li>Database Host</li> <li>Instance Number of the SAP HANA</li> <li>Database</li> <li>*Schema</li> </ul>	3 4 Juste Serv Service Com			More TASK LIST LOG FILES
<ul> <li>← → C</li></ul>	3 4 4 Jute Serv Service Com			More TASK LIST LOG FILES
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<ul> <li>← → C</li></ul>	3 4 4 Jute Serv Service Com			More TASK LIST LOG FILES

Step 13 Click Next.

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🥸 Softw	vare Pro	visioning Manager					Le	gend	Mo
D	1 Define Para	2 Review Para Ex	3 4 ecute Serv Service Con	-					
SA	P HAN	A Import Paramete	ers						
Enter	er the impo	rt parameters.							
	SAP HANA I mport Para	•			B	Add 🛛 🖶 Remove	k		
		•	Section *	Parameter Name *	Eo Parameter Value *	Add 📑 Remove Keep after Import	×		
		imeters	Section * distribution	Parameter Name *		_	k		
	mport Para	Configuration File *			Parameter Value *	Keep after Import	k		
	mport Para	Configuration File *	distribution	client_distribution_mode	Parameter Value * statement	Keep after Import	•		
	mport Para	Configuration File * indexserver.ini global.ini	distribution table_placement	client_distribution_mode method	Parameter Value * statement 2	Keep after Import	k		
	mport Para 1 2 3	Configuration File * indexserver.ini global.ini global.ini	distribution table_placement table_placement	client_distribution_mode method prefix	Parameter Value * statement 2 /	Keep after Import	<b>k</b> ∙		
	mport Para 1 2 3 4	Configuration File * indexserver.ini global.ini global.ini indexserver.ini	distribution table_placement table_placement optimize_compression	client_distribution_mode method prefix min_hours_since_last_rr	Parameter Value * statement 2 / 0	Keep after Import	k		

**Step 14** Enter the password of **HANA<dbsid>admin**.

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SAP	Software Provisionin	g Manager			Legend	More <b>⊿</b>
	1 Define Para Rev	2 3 View Para Execute S	erv Service Com			TASK LIST
	Installation Expo	rt				LOG FILES
	Specify installation expor	rt load options and SAPC	Control connect data.			HELP
	Installation Export Loa	ad Options				Ð
	*Number of Parallel J	Jobs	19			
	SAP HANA Authentific	cation				
	*HANA <dbsid>adm</dbsid>		s00adm			
	*Password of HANA<	dbsid>adm	••••••	]		
	*SAPControl WSDL U	RL	http://hanaha:50013/SAPControl?wsdl	]		
	The password of user	obs you can specify the HANA <dbsid>adm is req URL usually has the follo</dbsid>	number of concurrent jobs to process the insta uired to connect to the SAPControl service. owing syntax: http:// <dbhost>:5<instand< th=""><th></th><th></th><th></th></instand<></dbhost>			

Step 15 Click Next.

Software Provisioning Manage	× +			
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Software Provisioning	g Manager		Legend M	lore ⊿
Define Para Revi	2 3 4 ew Para Execute Serv Service Com			TASK LIST
SAP HANA Client	t Software Installation Path			LOG FILES
Decide on the client path s	strategy.			HELP
Client Path Strategy Client Software Path Client Software Path Client Directo Central Client Directo Additional Information	tory			
Choose Central Client D	ectory for installing the client locally on each server to /usr/sap/ <sid>/hdbclien Directory to install into a central directory \$DIR_CT_RUN/hdbclient. mabled for the client software. During a restart the instance client is automatically ke</sid>			
Back Next	Cancel			

**Step 16** Select a package path.

	Provisioning Manag	× +				
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Soft	tware Provisionin	g Manager			Legend	N
	Specify the path to an	archive, a download folder	or a media location as Package Path.			
	Package Path	[				
	Browse Archive Locations					
You can download the archives from the following locations on SAP Software Download Center: SAP HANA CLIENT						
			ected at the specified Package Path when you cho			
			st paths for required packages by searching othe nents, leave the above <i>Package Path</i> empty to con			
	Archive Scanning Info	rmation				
		written after the archives ha	ave been scanned. There you can find detailed inf	formation about matching and non matching		
	archive files. This information file c	contains only results of the l	latest archive scan.			
	Detected Packages		Ť			
	Package Na	me	Individual Package Location	Status		
				Available		
	1 SAP HANA C	LIENT	/sapcd/Basket/IMDB_CLIENT20_003_123-	Available		
	1 SAP HANA C		/sapcd/Basket/IMDB_CLIEN120_003_123-	Available		

Step 17 Click Next.

oftware Provis	ioning Manage × +			
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🥸 Software	Provisioning Manager		Legend	Mo
Defin	1 2 3 4 e Para Review Para Execute Serv Service Com			
Clean	up of Operating System Users			
	whether operating system users are to be removed from group'sapinst'on UNIX (the group'SAPINST'is to be removed from the operati e execution of Software Provisioning Manager has completed.	ing system users	on IBM	
The sa For se	i <b>nstallation Directory Access</b> apinst_instdir directory belongs to a group named sapinst. If this group is not available, it is created automatically as a local g curity reasons, SAP r[commends that you remove operating system users from group sapinst on UNIX (respectively remove group IST from the operating system users on IBM I) after the execution of Software Provisioning Manager has completed.			
	es, clean up operating system users ting System Users to be Cleaned Up:			
	OS User			
1	s01adm			
Opera (respe	onal Information ting system users that are created during the execution of Software Provisioning Manager are added to the group sapinst on UNIX ctively the group SAPINST is added to the operating system users on IBM i) as they need access to the sapinst_instdir directory ting system users that are not local, you either need the required administrator permissions or must adjust the sapinst group man	. For		
Ba	k Next Cancel			

**Step 18** Check your parameter settings. If they are all correct, click **Next**.

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SAP	Soft	war	e Provisioning I	Manager							Legend	Μ	lore 🖌
	ŀ	Defi		2 3 v Para Execute Se	erv Service Com								TASK LIST
	Pa	araı	neter Summa	ary									LOG FILES
	Choose 'Next' to start with the values shown. Otherwise, select the parameters to be changed and choose 'Revise'. You are then taken to the screen where you can change the parameter. You might be guided through other screens that have so far been processed.								HELP				
		Para	neter List										0
			General SAP System	Parametera						-			
			Profiles Available	Falameters									
		Profi	le Directory		/usr/sap/S01/SYS/profile	v							
	i	<u> </u>	Aaster Password					)	6	_			
		Pass	word for All Users							_			
			NS Domain Name										
		<u> </u>	Set FQDN for SAP sys	stem						_			
_													

**Step 19** The installation starts.

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Software Provisionir	ng Manager		Legend	More ∡
				TASK LIST LOG FILES
	10 C			HELP
Cancel				
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Software Provisioning Manag	. V 1			
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SAR Software Provisionin	⑦ ▲ https://s4001:4237/sapinst/docs/index.html	₪ ☆		More 4
Software Provisionin 1 Define Para Re 100% Process is in d	A https://s4001:4237/sapinst/docs/index.html   Ing Manager     2   3   4   view Para   Execute Serv   Service Com	ତ ନ୍ମ		More TASK LIST
Software Provisionin 1 Define Para Re 100% Process is in d	A https://s4001:4237/sapinst/docs/index.html   Ing Manager     2   3   4   view Para   Execute Serv   Service Com	♡☆		More 4
Software Provisionin Define Para Re 100% Process is in d Execution of Service Information	A https://s4001:4237/sapinst/docs/index.html   Ing Manager     2   3   4   view Para   Execute Serv   Service Com	⊘ ☆		More TASK LIST LOG FILES
Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of	A https://s4001:4237/sapinst/docs/index.html   Ing Manager     2   3   4   view Para   Execute Serv   Service Com			More TASK LIST
Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of	A https://s4001:4237/sapinst/docs/index.html   ag Manager     2   3   4   view Para   Execute Serv   Service Com   Ialog state has been completed successfully.			More TASK LIST LOG FILES
SAX Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of SAP S/4HANA Server has completed.	A https://s4001:4237/sapinst/docs/index.html   ag Manager     2   3   4   view Para   Execute Serv   Service Com   Ialog state has been completed successfully.			TASK LIST LOG FILES
SAX Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of SAP S/4HANA Server has completed.	A https://s4001:4237/sapinst/docs/index.html   ing Manager     2   3   view Para   Execute Serv   Service Com     ialog state   has been completed successfully.     1809 > SAP HANA Database > Installation > Application Server ABAP > High-Availabil			More TASK LIST LOG FILES
SAX Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of SAP S/4HANA Server has completed.	A https://s4001:4237/sapinst/docs/index.html   ing Manager     2   3   view Para   Execute Serv   Service Com     ialog state   has been completed successfully.     1809 > SAP HANA Database > Installation > Application Server ABAP > High-Availabil			More TASK LIST LOG FILES
SAX Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of SAP S/4HANA Server has completed.	A https://s4001:4237/sapinst/docs/index.html   ing Manager     2   3   view Para   Execute Serv   Service Com     ialog state   has been completed successfully.     1809 > SAP HANA Database > Installation > Application Server ABAP > High-Availabil			More TASK LIST LOG FILES
SAX Software Provisionin Define Para Re 100% Process is in d Execution of Service Information Execution of SAP S/4HANA Server has completed.	A https://s4001:4237/sapinst/docs/index.html   ing Manager     2   3   view Para   Execute Serv   Service Com     ialog state   has been completed successfully.     1809 > SAP HANA Database > Installation > Application Server ABAP > High-Availabil			More TASK LIST LOG FILES

----End

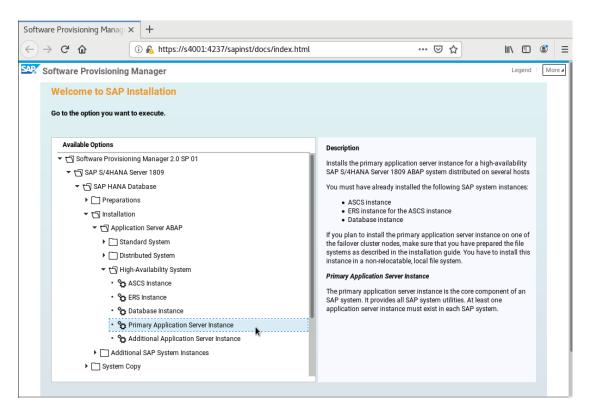
## 4.5.2.6 Installing Primary Application Server (PAS) Instance

### Procedure

**Step 1** Go to the directory where the PAS Instance installation package is stored and install it on the active SAP S/4HANA node.

INF0 2020- **********************************	<pre>M # ./sapinst ========]   extracting done! 07-21 16:57:17.209 (mainThread) [sixxcreate.cpp:347 ************************************</pre>	*****
SAPinst build in	formation:	
Make type: Codeline: Platform: Kernel build: SAP JRE build: - 6 - bas2:3096 SAP JCo build: SL-UI version: SAP UI5 version:	749_REL linuxx86_64 749, patch 611, changelist 1875937 SAP Java Server VM (build 8.1.044 9.0.4+011, Sep 956 (mixed mode)) 3.0.18 2.6.28 1.50.4 tmp/sapinst_exe.18979.1595321834	6 2018 16:58:06 - 81_REL - optU - linux amd64 I
Pid: 1898	0	
Problem with the	07-21 16:57:17.514 (root/sapinst) (startInstallations) (startInstallations) on figuration: could not determine the DNS dor	nain of host s4001
	07-21 16:57:17.516 (root/sapinst) (guiWatchdog) [C DNS configuration: could not determine the DNS dor	
********************* Open your browse https://s4001:42 Logon users: [ro	07-21 16:57:18.328 (root/sapinst) (SLPCommunicator ************************************	**************************************
	No Profile used. :YSTEMNAME neither in Profile nor in Commandline ol /sapcd/SWPM/resourcepool.xml	

**Step 2** Enter https://s4002:4237/sapinst/docs/index.html in the address box of a browser, and then log in to the SWPM system as the root user and install PAS Instance. Select Primary Application Server Instance and click Next.



#### Step 3 Click Next.

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Software Provisioning Manager	L	.egend	Mo	ore 🔺
1     2     3     4       Define Para     Review Para     Execute Serv     Service Com				TASK LIST LI
General SAP System Parameters				LOG FILES
Enter the profile directory of the SAP system.				HELP
SAP System Identification				0
Profile Directory /usr/sap/S01/SYS/profile ~ Additional Information				
Existing parameters are retrieved from the SAP system profile directory. The location of your SAP system profile directory is as follows: • Windows: \\ <sapglobalhost>\sapmnt\<sapsid>\SYS\profile • UNIX and IBM i: /<sap directory="" mount="">/<sapsid>/profile or /usr/sap/<sapsid>/SYS/profile</sapsid></sapsid></sap></sapsid></sapglobalhost>				
Back Next Cancel				
•				

Step 4 Enter the master password for all users.

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Software Pi	rovisioning Mar	nager				Ŀ	egend	Mo	re 🖌
1 Define Pa			erv Service Com						TASK LIST
Master I	Password								LOG FILES
Enter the ma	aster password for a	ll users.							HELP
	ter password is used ord for All Users	for all users that	are created. Check the tool help for restriction	is and dependencies.					0
	al Information								
screen. If	nt to set an individual pa you set individual pa	al password for e asswords, a new i	ach user, you can do this in the corresponding naster password does not overwrite these inc	) parameter section on the Pa lividual settings.	arameter Summary				
Back	Next	Cancel		<b>k</b>					

Step 5 Deselect Set FQDN for SAP System.

Softv	vare	e P	Provisio	ning Manage	×	+																									
$\langle \boldsymbol{\leftarrow} \rangle$	$\rightarrow$		C û	1	(	) 🔒 I	https://	s400	1:42	237/	sapi	inst/	/doc	cs/in	idex.	.htm	l					•••	⊌	☆		lii	١		٢		Ξ
SAP	So	oft	ware P	rovisionin	j Ma	anag	er																				Leç	gend	N	/lore	
		-	1 Define P	ara Revi	2 ew P		Execu	3 Ite Ser		Se		4 e Cor		1																I MON LIOI	TACKINCT
		DI	NS Do	main Nan	ne																										
	E	Ent	ter the DM	NS domain na	me fo	or the S	SAP syst	em to	calc	ulate	e the	fully	y qua	alified	d dom	nain r	name	(FQD	)N).											חבניי	5
		     	Set F *DNS Do Addition	tern Domain N GQDL for SAP omain Name f al Information Domain Name LHOSTFULL 1 Next	syste or SA is us	P Syst	calculate																te 6	54982	2.						2

Select a package path.

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SAR	Softwar	e Provisioning M	anager				Legend	M	ore ⊿
	Def	1	ara Execute						TASK LIST
	Soft	vare Package B	rowser						LOG FILES
	Specify packag		d folder containing	all software packages, or the paths to media l	ocations or to several indivi	dual download locations	of software		HELP
		<b>ch Location</b> ify the path to an archi	ive, a download fo	der or a media location as Package Path.		k			
	Pac	age Path		/sapcd/Basket					
		Browse							
	Arch	ive Locations							
				wing locations on SAP Software Download Ce ease), IGSEXE.SAR, IGSHELPER.SAR	nter:				
	The	table below is updated	with all packages	detected at the specified Package Path when yo	u choose Next.				
				djust paths for required packages by searching stments, leave the above <i>Package Path</i> empty t		rchives are specified			
	Arch	ive Scanning Informati	on						

### Step 6 Click Next.

Software Provisioning Managi × +	
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SAP Software Provisioning Manager	Legend   More 4
1     2     3     4       Define Para     Review Para     Execute Serv     Service Com	TASKLIST
Upgrade SAP Host Agent	LOG FILES
Decide whether you want to upgrade the existing SAP Host Agent	HELP
Detected SAP Host Agent	, i i i i i i i i i i i i i i i i i i i
☑ Upgrade SAP Host Agent to the version of the provided SAPHOSTAGENT.SAR archive	
Additional Information	h to south a
An SAP Host Agent is already installed on this host. You can upgrade it to a higher vergion if you provide a SAPHOSTAGENT.SAR archigher version.	nive with a
At the end of the upgrade the SAP Host Agent is restarted. If you provide a SAPHOSTAGENT.SAR archive that does not have a higher the SAP Host Agent remains unchanged.	version,
Back Next Cancel	

**Step 7** Select a package path.

	🖲 🕜 🕕 https://s400	1:4237/sapinst/docs/index.html	⊘ ☆	lii\ 🗊
oftw	are Provisioning Manager			Legend
S	pecify the path to an archive, a download folde	r or a media location as Package Path.		
Ρ	ackage Path			
	Browse			
A	rchive Locations			
		ng locations on SAP Software Download Center:		
т	ne table below is updated with all packages de	ected at the specified Package Path when you cho	oose Next.	
A a T	n information file is written after the archives h chive files. his information file contains only results of the		formation about matching and non matching	
	Tware Provisioning Manager         Specify the path to an archive, a download folder or a media location as Package Path.         Package Path         Browse         Archive Locations         You can download the archives from the following locations on SAP Software Download Center:         SAPHOSTAGENT.SAR 721 (Latest Patch)         The table below is updated with all packages detected at the specified Package Path when you choose Next.         While staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are speard you do not wish to make any further adjustments, leave the above Package Path empty to continue.         Archive Scanning Information         An information file is written after the archives have been scanned. There you can find detailed information about matching and non n archive files.         This information file contains only results of the latest archive scan.         Detected Packages         Veakage Name       Individual Package Location         1       SAPHOSTAGENT.SAR 721 (Latest Patch)         / saped/Basket/SAPHOSTAGENT39_39-20       Available         Additional Information       Status         A Precommends that you use the latest released versions of the required software packages. You can download them either manually the SAP Software Download Center or - if available - using the Maintenance Planner.         If you have DVDs or Blu-ray media containing the required packages, you can also use t			
		) /sapcd/Basket/SAPHOSTAGENT39_39-20	Available	
	1 SAPHOSTAGENT.SAR 721 (Latest Patc			

Step 8 Set Instance Number of the SAP HANA Database.

Software Provisioning Manage × +			
$\leftrightarrow \rightarrow \mathbf{C}$ <b>(a)</b> (b) <b>(b)</b> https://s	4001:4237/sapinst/docs/index.html	⊌ ☆	III\ 🗊 🔹
SAX Software Provisioning Manager			Legend More
	3 4 e Serv Service Com		TASK LIST
SAP HANA Database System A	dministrator		LOG FILES
Enter the password of the database system ad	ministrator.		HELP
SAP HANA Database System Administrator I	Password		<del>ن</del>
Database ID	S00		
Database Host	hanaha		
*Instance Number of the SAP HANA	00		
Database			
*Password of the Database System Administrator (User: SYSTEM)	•••••	•	
Initialize Database Tenant		24	
HANA content. Choose this option if you pe	ids to better performance during data import.	e including all users, schemas, roles, and SAP dvantage of 'initTopology' compared to 'drop user'	

Step 9 Enter the password of the SAP HANA database superuser.

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SAP	Softwa	re Provisioning M	anager			L	egend	Mo	ore 🖌
	Def	1 2 fine Para Review F							TASK LIST
	SAP	HANA Multiten	ant Database	Containers					LOG FILES
	Enter t	he database parameter	s for the system data	abase.					HELP
	Sys	tem Database							
	Dat	abase ID (DBSID)		SYSTEMDB					
	*Da	atabase Host		hanaha					
		stance Number of the S abase	AP HANA	00					
		assword of the SAP HAI eruser	NA Database	••••••	]				
		ant Database							
	Ten	ant ID		S00					
		Recreate Database Ten	ant						
	Not Spe all u	cify the connectivity dat users, schemas, and role	ta. Choose <i>Recreate I</i> es. In addition, the ter	nant-specific configuration is initialized.	elete all content of the database tenant including screating the tenant database compared to 'drop				

**Step 10** Enter the database schema password.

oftware Provisioning Manage × +			
- → C' û (i) & https://s	4001:4237/sapinst/docs/index.html	⊘ ☆	III\ 🗉 🔹 🗉
🎖 Software Provisioning Manager			Legend   More 4
Define Para Review Para Execut	3 4 e Serv Service Com		TASK LIST
Database Schema			LOG FILES
Enter the database schema password.			HELP
Database Schema			0
Database ID	S00		
Database Host	hanaha		
Instance Number of the SAP HANA	00		
Database *Schema	DBACOCKPIT	k	
Drop Existing Schema			
*Schema Password	•••••		
*Confirm	•••••		
Additional Information			
Follow the relevant instructions for your sce • New System Installation	mario:		

Software Provisioning Manage × +			
$\leftrightarrow$ $\rightarrow$ C' $\textcircled{a}$ (i) $\swarrow$ https://s	4001:4237/sapinst/docs/index.html	⊘ ☆	III\ 🗊 🤹 E
Software Provisioning Manager			Legend   More 4
	2 Serv Service Com		TASK LIST
Database Schema			LOG FILES
Enter the database schema password.			HELP
Database Schema			σ <sup>.</sup>
Database ID	S00		
Database Host	hanaha		
Instance Number of the SAP HANA Database	00		
*Schema	SAPHANADB		
Drop Existing Schema		R.	
*Schema Password	••••		
*Confirm	•••••		
Additional Information			
Follow the relevant instructions for your sce	nario:		
New System Installation     The schema is already available in th	e provided installation export media or will be cr	eated. Enter the new password.	

**Step 11** Set **PAS Instance Number** and **PAS Instance Host Name** based on the installation planning. Set **PAS Instance Host Name** to the physical hostname of the active node.

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← →	⑥ ▲ https://s400	1:4237/sapinst/docs/index.html	⊍ ☆	lii\ C	0 3	
SAP Softwa	re Provisioning Manager			Lege	nd   [1	vlore ∡
Enter	nary Application Server Instan the Instance parameters for the primary appl mary Application Server Instance					TASK LIST LOG FILES
Th	e following SAP system instances already				HELP	
	SAP System ID (SAPSID)	Instance Name	Instance Number			0
1	S01	ASCS01	01			
2	S01	D03	03			
*P Ad Th be Th		02 s4001				

Step 12 Click Next.

Software Provisioning Manage × +					
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Software Provisioning Manager			Legend	More 4	]
Define Para Review Para Execute Se				TASK LIST	
ABAP Message Server Ports				LOG FILES	
Enter the required message server ports.				HELP	
ABAP Message Server Ports				-0	
*ABAP Message Server Port	3601				
*Internal ABAP Message Server Port	3901				
Additional Information					
The instance-specific Internal ABAP Message Ser communication channels.	ver Port for internal communication and the ABAP	Message Server Port are required as unique			
Back Next Cancel					

**Step 13** Enter the password of the web administrator.

Soft	ware Provisioning Manag	× +					
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SAP	Software Provisionin	g Manager			Lege	nd   N	/lore ∡
	Define Para Revi	2 3 ew Para Execute Se	erv Service Com				TASK LIST
	ICM User Manage	ement for the SA	P Web Dispatcher				LOG FILES
	Enter the password for the	e web administration use	er'webadm'used by the SAP Web Dispatcher.				HELP
	*Password of 'webadr *Confirm Additional Information		······	ernet Communication Manager (ICM) and SAP			p

Step 14 Click Next.

Software Provisioning Manage × +		
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SAR Software Provisioning Manager		Legend More 4
1 2 3 4 Define Para Review Para Execute Serv Service Com		TASK LIST
SLD Destination for the SAP System OS Level	<b>b</b> -	LOG FILES
Enter the destination of the System Landscape Directory (SLD).		HELP
Register in System Landscape Directory         SLD Destination         Use existing SLD for registration         No SLD destination         Tonnect Data for Existing SLD         Use HTTPS         *SLD Host         *SLD DHTP(S) Port         *SLD Data Supplier User         Password of SLD Data Supplier User         Additional Information		
The System Landscape Directory (SLD) should register the installed software of your entire system landscape.	The SLD destination is	

### Step 15 Click Next.

Soft	Software Provisioning Manage × +					
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SAP	Software Provisioning Manager		Ŀ	egend	Mo	ore 🖌
	1     2     3     4       Define Para     Review Para     Execute Serv     Service Com					TASK LIST
	Message Server Access Control List					LOG FILES
	Specify if you want to have a message server Access Control List (ACL) created.					HELP
	Message Server Access Control List	*				0
	Create Message Server Access Control List     O not create Message Server Access Control List					
	Additional Information					
	The ACL is created as a file in the / <sapmnt>/<sapsid>/global directory. If it exists, it defines the hosts from which the requests.</sapsid></sapmnt>	message server accepts				
	Caution: Only trigger the creation of this file if you do not plan to install any additional instances for this system. With you overwrite existing settings and prevent instances from being installed on additional hosts.	the creation of this ACL,				
	If you decide to install an additional instance later, you need to remove this file manually before the installation and co- installation of the additional instance.	eate it again after the				
	For more information, see the information about ms/acl_info in SAP Notes 1495075 and 826779					
	Back Next Cancel					

Step 16 Click Next.

Softw	vare Prov	risioning Manage>	< +							
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SAP	Softwa	re Provisioning	Manager					Lege	nd   [	More 🖌
	Defi		2 3 Para Execute Se	erv Service Com						TASK LIST
	SAP	System DDIC	Users							LOG FILES
	Enter th	e password of DDIC	user.							HELP
		<b>: User</b> DDIC User Has a Pas	sword Different From	Default	k					0
	Acco	<b>Password</b> ount: <i>DDIC</i> , client 000 sword of DDIC in Clier								
	Addi An R data If yo A SA	tional Information FC connection needs base load and differ u are not sure, do not	to be created to the s from the default pass specify the password	words, you have to specif Is. You will be prompted f	lling. Only if the password fy them here. for them again if they are r rate master records and it	needed.	-			
	B	ack Next	Cancel							

Step 17 Select Default Key and click Next.

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SAP :	Softwa	re Provisioning	Manager		L	egend	M	ore 🖌
	Def		2 3 4 w Para Execute Serv Service Com					TASK LIST
	Secu	re Storage Ke	y Generation					LOG FILES
	Decide	whether you want to	generate an individual key for the secure storage of the SAP system.					HELP
	Secu	ıre Storage Indvidual	Key Information					0
		Individual Key (Reco Defau <mark>lt Key</mark>	mmended for Productive Systems)					
	Add	itional Information						
	You only		using an Individual Key for the encryption of confidential data or keeping the Default key, v	which provides obfuscation				
		If you choose Ind. before it is used t • New installation	from scratch, target system installation for system copy, or system rename: ividual Key (Recommended for Productive Systems), you must back up the displayed key in o encrypt the secure storage in the file system. from scratch: sed to encrypt the secure storage in the database.	the upcoming message				
			e the installation, system copy, system rename guides for SAP systems based on SAP Net n platform at: https://support.sap.com/sltoolset -> System Provisioning	tWeaver 7.1 and higher ABAP				
	В	ack Next	Cancel					

Step 18 Click Next.

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Softwa	are Provisioning	Manager		Legend	
Defir		3 4 Para Execute Serv Service Com			
Clean	up of Operati	ng System Users			
		stem users are to be removed from group'sapinst'on UNIX (the group'SAPINST'is to b are Provisioning Manager has completed.	e removed from the operating sys	stem users on IBM	
		are ritorisioning managerinas completed.			
Limit The s For se SAPI	Installation Director sapinst_instdir d ecurity reasons, SAP	Access rectory belongs to a group named sapinst. If this group is not available, it is created ecommends that you remove operating system users from group sapinst on UNIX ig system users on IBM I) after the execution of Software Provisioning Manager has a g system users	(respectively remove group		
Limit The s For se SAPI	Installation Director sapinst_instdir d ecurity reasons, SAP NST from the operat 'es, clean up operatir	Access rectory belongs to a group named sapinst. If this group is not available, it is created ecommends that you remove operating system users from group sapinst on UNIX ig system users on IBM I) after the execution of Software Provisioning Manager has a g system users	(respectively remove group		
Limit The s For se SAPI	Installation Director sapinst_instdir d ecurity reasons, SAP NST from the operat Yes, clean up operatir ating System Users	Access rectory belongs to a group named sapinst. If this group is not available, it is created ecommends that you remove operating system users from group sapinst on UNIX ig system users on IBM I) after the execution of Software Provisioning Manager has a g system users	(respectively remove group	k	

**Step 19** Check your parameter settings. If they are all correct, click **Next**.

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SAX Software Provisioning Manager			Lege	nd	More <b>⊿</b>
Define Para Review Para Execute S					TASK LIST
Parameter Summary		k			LOG FILES
	erwise, select the parameters to be changed and choose 'Revis ugh other screens that have so far been processed.	e'. You are then taken to the screen w	/here you can		HELP
Parameter List					
General SAP System Parameters					
Profile Directory	/usr/sap/S01/SYS/profile				
Master Password					
Password for All Users	0000				
DNS Domain Name					
Set FQDN for SAP system					
Software Package Browser					

**Step 20** The installation starts.

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SAP	Software Provisioning	Manager	Legend	More 4
	Define Para Review F 25% Process is in running Extracting libSQLDBCHDE	para Execute Serv Service Com		TASK LIST LOG FILES HELP
				Ū
	Cancel			
		₩.		
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	ware Provisioning Manage >			
$\sim$	$ ightarrow$ C' $ m \widehat{m}$ Software Provisioning	() A https://s4001:4237/sapinst/docs/index.html ···· ☑ ☆	Legend	More 4
	Software Provisioning	wanager	Logend	
	Define Para Review	2 3 4 4 W Para Execute Serv Service Com		TASK LIST LOG FILES
	100% Process is in dialo			ST LO
	Execution of Service ha	s been completed successfully.		GFILE
				SHELP
	Server Instance	09 > SAP HANA Database > Installation > Application Server ABAP > High-Availability System > Primary Application		ď
		r with SAP S/4HANA, the installation of additional ABAP Add-Ons might be required. For more information, see		
		ana → <release> → Product Documentation → UI Technology Guide. configuration tasks by using the ABAP task manager for lifecycle management automation. For more information, see</release>		
	Ok Cance	1		



# 4.5.2.7 Installing Additional Application Server (AAS) Instance

### Procedure

**Step 1** Go to the directory where the AAS Instance installation package is stored and install it on the standby SAP S/4HANA node.

<pre>s4002:~ # cd /sapcd/SWPM/ s4002:/sapcd/SWPM # ./sapinst</pre>
[=========================]   extracting done! INFO 2020-07-21 19:13:00.706 (mainThread) [sixxcreate.cpp:347]
Initial log directory: /root/.sapinst/s4002/13913 **********************************
SAPinst build information:
Version: 749.0.62 Build: 1875603 Compile time: Oct 08 2018 - 14:01:31 Make type: optU Codeline: 749 REL
Platform: linuxx86_64 Kernel build: 749, patch 611, changelist 1875937 SAP JRE build: SAP Java Server VM (build 8.1.044 9.0.4+011, Sep 6 2018 16:58:06 - 81_REL - optU - linux amd6 - 6 - bas2:309656 (mixed mode)) SAP JCo build: 3.0.18
SL-UI version: 2.6.28 SAP UI5 version: 1.50.4 Exe directory: /tmp/sapinst_exe.13912.1595329978 SAPinst process information:
Pid: 13913
INFO 2020-07-21 19:13:01.041 (root/sapinst) (startInstallation) [CSiManagerInterfaces.cpp:2348] Problem with the DNS configuration: could not determine the DNS domain of host s4002
INF0 2020-07-21 19:13:01.043 (root/sapinst) (guiWatchdog) [CSLPCommunicationServer.cpp:349] Problem with the DNS configuration: could not determine the DNS domain of host s4002
INFO 2020-07-21 19:13:01.855 (root/sapinst) (SLPCommunicator) [SLPMonitoringStatemachine.cpp:1392] ************************************
=>sapparam(lc): No Profile used. =>sapparam: SAPSYSTEMNAME neither in Profile nor in Commandline load resource pool /sapcd/SWPM/resourcepool.xml

**Step 2** Select **Additional Application Server Instance** and click **Next**.

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SAN So	oftware	Provisioning	Manager			Le	egend	Mo	ore 🖌		
	Welco	me to SAP I	nstallation								
	<b>.</b>										
	Go to the	e option you want	to execute.								
	Avail	able Options		Bernsteller							
		•	ning Manager 2.0 SP 01	Description							
	_	√ SAP S/4HANA		Installs an additional applications SAP system	n server instan	ice for a high-availa	ibility				
		- T 🗇 SAP HANA I	Database								
		🕨 🗋 Preparati	ons								
		🕶 🗂 Installatio	on								
		🖛 🗂 Applic	ation Server ABAP	•							
		🕨 🗋 Sta	ndard System								
		Dis	tributed System								
		🖛 🔂 Hig	h-Availability System								
		°°.	ASCS Instance								
		ô	ERS Instance								
		°°	Database Instance								
			Primary Application Server Instance								
		• °0	Additional Application Server Instance								
		Additi	onal SAP System Instances								
		System C	сору								

#### Step 3 Click Next.

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SAP Software Provisioning Manager	Legend   More 4
	TASK LIST
General SAP System Parameters	
Enter the profile directory of the SAP system.	LOG F
	FILES
SAP System Identification	HELP
Profile Directory /usr/sap/S01/SYS/profile ~ Additional Information	q
Existing parameters are retrieved from the SAP system profile directory. The location of your SAP system profile directory is as follows:	
<ul> <li>Windows: \\<sapglobalhost>\sapmnt\<sapsid>\SYS\profile</sapsid></sapglobalhost></li> <li>UNIX and IBM I: /<sap directory="" mount="">/<sapsid>/profile or /usr/sap/<sapsid>/SYS/profile</sapsid></sapsid></sap></li> </ul>	
Back Next Cancel	



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SAP	Software Pro	ovisioning M	anager									Legend	Mo	re 🖌
	Define Par	a Review P	ara Execute		om									TASK LIST
	ABAP Me	ABAP Message Server												LOG FILES
	Provide the AB	Provide the ABAP message server port												HELP
	Connection	n to Message Ser	ver											0
	Message Se Additional	erver Port Information												
	default por	t which is resolve	ed from the defau	ssage server of the s It profile parameter e installation of the s	rdisp/msserv.					ct to the				
	Back	Next	Cancel											
						k								

#### Enter the master password fo all users.

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SAR	Softwa	are Provisioning	Manager				l	.egend	Mo	ore 🖌
	De		2 3 v Para Execute Se	rv Service Com						TASK LIST
	Mas	ster Password								LOG FILES
	Enter	the master password i	for all users.							HELP
	The *P *C Ad	assword for All Users confirm ditional Information ou want to set an indi een. If you set individu	vidual password for ea	are created. Check the tool help for restriction	parameter section on the Param	neter Summary				
		Back Next	Cancel							

Step 5 Click Next.

SAP	Software Provisioning Manager	Legend	More 4
	1     2     3     4       Define Para     Review Para     Execute Serv     Service Com		TASK LIST
	Upgrade SAP Host Agent		LOG FILES
	Decide whether you want to upgrade the existing SAP Host Agent		HELP
	Detected SAP Host Agent         Image: Provide SAP Host Agent to the version of the provided SAPHOSTAGENT.SAR archive         Additional Information         An SAP Host Agent is already installed on this host. You can upgrade it to a higher version if you provide a SAPH I STAGENT.SAR archive with a higher version.         At the end of the upgrade the SAP Host Agent is restarted. If you provide a SAPHOSTAGENT.SAR archive that does not have a higher version, the SAP Host Agent remains unchanged.         Back       Next		5

**Step 6** Select a package path.

tware	Provisioning Mana	age 🗙 🕂			
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Sof	tware Provision	ing Manager			Legend
	-				
	Search Location				
	Specify the path to	an archive, a download folder o	r a media location as Package Path.		
	Package Path	19	sapcd/Basket		
	Browse	1			
	Archive Locations				
	SAPHOSTAGENT.SA	AR 721 (Latest Patch)	locations on SAP Software Download Center:		
	While staying on th	is screen you can add or adjust	ted at the specified <i>Package Path</i> when you cho paths for required packages by searching othe nts, leave the above <i>Package Path</i> empty to cor	er locations. When all archives are specified	
	Archive Scanning In	nformation		×	
	archive files.	is written after the archives have e contains only results of the lat		formation about matching and non matching	
	Detected Package	15			
	Package N	Name	Individual Package Location	Status	

**Step 7** Set the instance number and enter the password of the **SYSTEM** user.

Softw	vare Prov	visioning Manage $ imes$	+					
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SAP	Softwa	re Provisioning N	lanager			Lege	nd   Mo	re ∡
	De		Para Execute	4 Serv Service Com				TASK LIST
	SAP			LOG FILES				
	Enter t			HELP				
	SAF	P HANA Database Syste	em Administrator P	assword				0
	Dat	abase ID		S00				
	Dat	abase Host		hanaha				
		stance Number of the	SAP HANA	00				
	*P;	abase assword of the Databa ninistrator (User: SYST	,	•••••	k			
		Initialize Database Ter	nant					
	Cho HAI is th	NA content. Choose th	is option if you pe nstantly, which lea	form a reinstall or a refresh of the system. The ds to better performance during data import.	ase including all users, schemas, roles, and SAP advantage of "initTopology" compared to 'drop user	,		

**Step 8** Enter the password of SAP HANA database superuser.

Softwar	re F	Provi	sioning Manage:	× +						
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SAP So	oft	war	e Provisioning	Manager			I	Legend	M	ore 🖌
	ŀ	Defi	1 ne Para Revie	2 3 ew Para Execute	4 Serv Service Com					TASK LIST
	SI					LOG FILES				
	Ent				HELP					
		Syste	em Database							0
		Data	base ID (DBSID)		SYSTEMDB					
		*Dat	abase Host		hanaha					
		*Insi Data	tance Number of th base	ne SAP HANA	00					
			ssword of the SAP I	HANA Database	•••••					
		Supe	ruser nt Database							
		Tena			S00					
		E F	lecreate Database '	Tenant						
		Note Spec all us	ify the connectivity sers, schemas, and	data. Choose Recreat	tenant-specific configuration is initialized.	delete all content of the database tenant including recreating the tenant database compared to 'drop				

**Step 9** Enter the database schema password.

Software Provisioning Manage × +												
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Software Provisioning Manager			Legend   More 4									
	3 4 e Serv Service Com		TASK LIST									
Database Schema	Database Schema Enter the database schema password.											
Enter the database schema password.	Enter the database schema password.											
Database Schema			HELP									
Database ID	S00											
Database Host	hanaha											
Instance Number of the SAP HANA	00	N.										
Database *Schema	SAPHANADB											
Drop Existing Schema												
*Schema Password	•••••											
*Confirm	•••••											
Additional Information												
Follow the relevant instructions for your sce	enario:											
New System Installation The schema is already available in t	he provided installation export media or will be created. Ente	er the new password.										

**Step 10** Select a package path.

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		e Locations								
	You can download the archives from the following locations on SAP Software Download Center: SAP HANA CLIENT The table below is updated with all packages detected at the specified <i>Package Path</i> when you choose <i>Next</i> .									
	and yo	ou do not wish to make any further adjustr	ist paths for required packages by searching othe nents, leave the above <i>Package Path</i> empty to con							
	An info archive		ave been scanned. There you can find detailed inf latest archive scan.	ormation about matching and non matching						
		ted Backages								
	Detect	ted Packages								
	Detect	Package Name	Individual Package Location	Status						

**Step 11** Set **AAS Instance Number** and **AAS Instance Host Name** based on the installation planning. Set **AAS Instance Host Name** to the physical hostname of the standby node.

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	T	he Inst issigne	ance Number and Host Name for the a d memory. The Host Name can be eith ance Number must be unique for this i	pplication server instance are technical er the physical host name or one of the nstallation host.		processes, such as							

#### Step 12 Click Next.

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			<b>tion:</b> Only trigger t overwrite existing								s for this sy	rstem. With	h the crea	ition of	this A	ICL,				
			u decide to install allation of the add			e later, you	need to r	remove thi	is file man	ually before	the installa	ation and c	create it a	igain af	fter the	e				
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Step 13 Click Next.

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	fy whether operating system users are to be removed from group'sapinst'on UNIX (the group'SAPINST'is to be removed from the operati er the execution of Software Provisioning Manager has completed.	ing system users o	n IBM	
	h			
T	nit Installation Directory Access e sapinst_instdir directory belongs to a group named sapinst. If this group is not available, it is created automatically as a local gr security reasons, SAP recommends that you remove operating system users from group sapinst on UNIX (respectively remove group PINST from the operating system users on IBM) after the execution of Software Provisioning Manager has completed.			
[	Yes, clean up operating system users			
0	perating System Users to be Cleaned Up:			
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(	<b>Iditional Information</b> erating system users that are created during the execution of Software Provisioning Manager are added to the group sapinst on UNIX spectively the group SAPINST is added to the operating system users on IBM i) as they need access to the sapinst_instdir directory erating system users that are not local, you either need the required administrator permissions or must adjust the sapinst group man	. For		
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**Step 14** Check your parameter settings. If they are all correct, click **Next**.

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	Choose 'Next' to start with the values shown. Othenwise, select the parameters to be changed and choose 'Revise'. You are then taken to the screen w change the parameter. You might be guided through other screens that have so far been processed.									HELP
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**Step 15** The installation starts.

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# 4.6 High Availability Configuration

# 4.6.1 SAP HANA HA Configurations

# 4.6.1.1 Configuring the Backup Path

A path is required for backing up SAP HANA data. This section uses SAP HANA Studio deployed on a Windows ECS as an example to describe how to configure backup settings and perform backup when SAP HANA 2.0 is used.

# Procedure

- **Step 1** Start SAP HANA Studio.
- **Step 2** In the **System** area on the left, right-click the database node **hana001** and choose **Backup and Recovery > Open Backup Console**.

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Step 3 Click the Configuration tab in the right pane and configure the backup paths.Note: The backup paths are /hana/backup/data and /hana/backup/log.Click the save icon in the upper right corner to save the configuration.

hdbstudio - SAP HANA Administration Con <u>File</u> <u>Edit</u> <u>Navigate</u> <u>Project</u> <u>Run</u> <u>Windo</u>	sole - System: SYSTEMDB@S00 Host: 10.0.3.30 Ins <sup>.</sup> w <u>H</u> elp	ance: 00 Connected User: S	YSTEM System Usage: Cu — 🗇 🗙
🖬 🕶 🔚 🔞 . 1 🖢 🖛 🖗 🔶 🗸 d	> ▼		Quick Access
Po Systems ⊠ □	Ana001 (SYSTEMDB@S00 (SYSTEM) hana001	x	- 8
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	Destination: /hana/backup/data	Backup Interval: <sup>8</sup> 15	
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**Step 4** In the **System** area on the left, right-click the database node and choose **Backup and Recovery** > **Back Up System Database...** to back up the system database.

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	omplete Data Backup 🗸					• • • • • •
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Backup Destination	/hana/backup/data/SYSTEMDB			destination.	Backup Interva	l: <sup>0</sup> 15
i Note that custor saved as part of	Backup Prefix         COMPLETE_DATA_BACKUP           i         Note that customer-specific changes to the SAP HANA database configuration are not saved as part of the data backup. More Information: SAP HANA Administration Guide				A full log ar	ole automatic log backup, t ea will cause the database matic Log Backup
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- **Step 5** Use default settings and click **Next**. The **Review Backup Settings** page is displayed. Confirm configurations and click **Finish**. The system starts the backup task.
- **Step 6** In the **System** area on the left, right-click the database node and choose **Backup and Recovery** > **Back Up Tenant Database...** to back up the tenant database.

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		Properties	Alt+Enter	-	tes sequentially. By default, data bac files.	kups	🗹 Enable Automatic Log B	ackup			
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**Step 7** Select the tenant database and click **Next**.

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			A full log area will cause the database
			Enable Automatic Log Backup
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**Step 8** Use default settings and click **Next**. The **Review Backup Settings** page is displayed. Confirm configurations and click **Finish**. The system starts the backup task.

9 ▼       @:.:坎/ ▼ 4	📓 Backup of Tenant Database in S00 - 🗆 X	Quick Access
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	new destination, ensure that the directory already exists. For improved data safety, we	Destination: /hana/backup/log
	recommend that you specify an external backup destination.	/nana/backup/log
	Backup Destination /hana/backup/data/DB_S00	Backup Interval: <sup>8</sup> 15
	Backup Prefix COMPLETE_DATA_BACKUP	
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	i Note that customer-specific changes to the SAP HANA database configuration are not	A full log area will cause the databas
	saved as part of the data backup.	Enable Automatic Log Backup
	More Information: SAP HANA Administration Guide	
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**Step 9** Repeat the preceding procedure to configure backup settings and perform backup for the database node **hana002**.

----End

# 4.6.1.2 Configuring the System Replication

## Prerequisites

- Before configuring HA, make sure that you have enabled data backup and backed up the database on the two SAP HANA nodes. For details, see section **Configuring the Backup Path**.
- Before configuring HA, make sure that you have written the mappings between the IP addresses and names of the two SAP HANA ECSs to the /etc/ hosts files of the two ECSs in Configuring the Mappings Between IP Addresses and Hostnames.

## Procedure

**Step 1** Configure the System Replication for the active SAP HANA node.

- 1. Log in to the active SAP HANA ECS hana001.
- 2. Run the following command to set the node as the active node:

#### hdbnsutil -sr\_enable --name=siteA

In the preceding command, *siteA* indicates the node name, which can be customized.

Example: hdbnsutil -sr\_enable --name=hana001



**Step 2** Copy the files on the active node to the standby node.

- 1. Log in to the active SAP HANA ECS hana001.
- Run the following commands to copy the /usr/sap/S00/SYS/global/security/ rsecssfs/data/SSFS\_S00.DAT and /usr/sap/S00/SYS/global/security/ rsecssfs/key/SSFS\_S00.KEY files from the active node to the standby node. Ensure that the user group and user to which the copied file belongs are the same as those of the original file. If they are not consistent, make a manual adjustment.

scp hana001:/usr/sap/S00/SYS/global/security/rsecssfs/data/SSFS\_S00.DAT
scp hana001:/usr/sap/S00/SYS/global/security/rsecssfs/key/SSFS\_S00.KEY

```
nana002:~ # scp hana001:/usr/sap/S00/SYS/global/security/rsecssfs/data/SSFS S00.DAT /usr/sap/S00/SYS/global/secu
rity/rsecssfs/data/SSFS_S00.DAT
SSFS S00.DAT
                                                             100% 2960
                                                                        9.8MB/s
                                                                                00:00
hana002:~ # scp hana001:/usr/sap/S00/SYS/global/security/rsecssfs/key/SSFS S00.KEY /usr/sap/S00/SYS/global/secur
ity/rsecssfs/key/SSFS_S00.KEY
                                                             100% 187 719.0KB/s 00:00
SSFS S00.KEY
ana002:~ # <u>ll</u>
           /usr/sap/S00/SYS/global/security/rsecssfs/data/SSFS_S00.DAT
rw-r---- 1 s00adm sapsys 187 Jul 22 09:49 /usr/sap/S00/SYS/global/security/rsecssfs/key/SSFS_S00.KEY
hana001:~ #
hana001:~ # ll /usr/sap/S00/SYS/global/security/rsecssfs/data/SSFS_S00.DAT
s00adm sapsys 187 Jul 21 10:05 /usr/sap/S00/SYS/global/security/rsecssfs/key/SSFS_S00.KEY
hana001:~ # 📕
```

- **Step 3** Configure the System Replication for the standby HANA node.
  - 1. Run the following command to enter the administrator mode:

su – s00adm

- 2. Run the following command to stop the SAP HANA database: **HDB stop**
- 3. Run the following command to enable System Replication:

hdbnsutil -sr\_register --remoteHost=remoteHostName -remoteInstance=remoteInstanceNumber --replicationMode=sync -name=siteB

In the preceding command, *remoteHostName* indicates the hostname of the active node, **remoteInstanceNumber** indicates the instance ID of the active node, and **SiteB** indicates the name of the standby node, which can be customized.

```
ana002:~ # su - s00adm
soladm@hana002:/wisr/sap/S00/HDB00≻ HDB stop
hdbdaemon will wait maximal 300 seconds for NewDB services finishing.
Stopping instance using: /usr/sap/S00/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function Stop 400
22.07.2020 09:55:09
Stop
οĸ
Waiting for stopped instance using: /usr/sap/S00/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function WaitforSt
000 d boged 600 2
22.07.2020 09:55:41
WaitforStopped
ΟK
hdbdaemon is stopped.
s00adm@hana002:/usr/sap/S00/HDB00> hdbnsutil -sr register --remoteHost=hana001 --remoteInstance=00 --replication
Mode=sync --name=hana002
adding site .
--operationMode not set; using default from global.ini/[system replication]/operation mode: logreplay
nameserver hana002:30001 not responding.
collecting information ..
updating local ini files ...
                                                                             I
done
s00adm@hana002:/usr/sap/S00/HDB00>
```

4. Run the following command to start the SAP HANA database: **HDB start** 

```
s00adm@hana002:/usr/sap/S00/HDB00> HDB start

StartService

Impromptu CCC initialization by 'rscpCInit'.

See SAP note 1266393.

OK

OK

Starting instance using: /usr/sap/S00/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function StartWait 2700 2

22.07.2020 09:57:26

Start

OK

22.07.2020 09:57:53

StartWait

OK

StartWait

OK
```

#### Step 4 Query the System Replication status in the SAP HANA system.

Run the following command in the administrator mode on the active node:

#### hdbnsutil -sr\_state

Information similar to the following is displayed:

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```
hana001:~ # su - s00adm
s00adm@hana001:/usr/sap/S00/HDB00> hdbnsutil -sr_state
System Replication State
online: true
mode: primary
operation mode: primary
site id: 1
site name: hana001
is source system: true
is secondary/consumer system: false
has secondaries/consumers attached: true
is a takeover active: false
Host Mappings:
hana001 -> [hana002] hana002
hana001 -> [hana001] hana001
Site Mappings:
hana001 (primary/primary)
|---hana002 (sync/logreplay)
Tier of hana001: 1
Tier of hana002: 2
Replication mode of hana001: primary
Replication mode of hana002: sync
Operation mode of hana001: primary
Operation mode of hana002: logreplay
Mapping: hana001 -> hana002
s00adm@hana001:/usr/sap/S00/HDB00>
```

----End

# 4.6.1.3 Configuring HA on SAP HANA Nodes

Use scripts (HAE) to configure HA on SAP HANA nodes, improving SAP HANA node reliability. This only applies to SAP HANA nodes running SUSE Linux Enterprise Server (SLES) 12 SP1 for SAP or later for automatic active/standby switchovers.

# Prerequisites

- SSH switching between SAP HANA nodes has been allowed.
- The SBD volume has been mounted to the two SAP HANA ECSs.
- A floating IP address has been created and bound to the two SAP HANA ECSs.

## Procedure

- **Step 1** Log in to the active SAP HANA ECS hana001.
- **Step 2** Run the following commands to check whether the dependency packages **patterns-ha-ha\_sles** and **sap-suse-cluster-connector** have been installed:

rpm -qa | grep patterns-ha-ha\_sles

rpm -qa | grep sap-suse-cluster-connector

```
hana001:~ # rpm -qa | grep patterns-ha-ha_sles
patterns-ha-ha_sles.12-15.7.x86_64
hana001:~ # rpm -qa | grep sap-suse-cluster-connector
sap-suse-cluster-connector-3.0.1-5.1.noarch
hana001:~ #
```

- If yes, skip this step.
- If no, run the following commands to install the dependency packages:

zypper in -y patterns-ha-ha\_sles zypper in -y sap-suse-cluster-connector

#### **Step 3** Download scripts and configure the file.

1. Select the region where the SAP HANA software is installed and download the script.

The following uses CN-Hong Kong as an example:

#### wget https://obs-sap-ap-southeast-1.obs.apsoutheast-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip -P / hana/shared

The script download addresses for different regions are as follows:

- CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.apsoutheast-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- AP-Bangkok: https://obs-sap-ap-southeast-2.obs.apsoutheast-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- AF-Johannesburg: https://obs-sap-af-south-1.obs.afsouth-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Santiago: https://obs-sap-la-south-2.obs.lasouth-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sabrazil-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Mexico City1: https://obs-sap-na-mexico-1.obs.namexico-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Mexico City2: https://obs-sap-la-north-2.obs.lanorth-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- 2. Run the following commands to decompress the script package.

# cd /hana/shared unzip ha\_auto\_script.zip

ana001:~ # wget https://obs-sap-cn-south-1.obs.myhwclouds.com/ha\_auto\_script/ha\_auto\_script.zip -P /hana/shared -2020-07-22 16:06:42-- https://obs-sap-cn-south-1.obs.myhwclouds.com/ha\_auto\_script/ha\_auto\_script.zip Resolving obs-sap-cn-south-1.obs.myhwclouds.com (obs-sap-cn-south-1.obs.myhwclouds.com)... 100.125.24.34, 100.12 5.24.91, 100.125.24.3 Connecting to obs-sap-cn-south-1.obs.myhwclouds.com (obs-sap-cn-south-1.obs.myhwclouds.com)|100.125.24.34|:443.. connected. HTTP request sent, awaiting response... 200 OK Length: 23657 (23K) [application/zip] Saving to: '/hana/shared/ha\_auto\_script.zip' ======>] 23,657 --.-K/s in 0.001s 100% 2020-07-22 16:06:42 (21.1 MB/s) - '/hana/shared/ha auto\_script.zip' saved [23657/23657] hana001:~ # cd /hana/shared/ hana001:/hana/shared # ll total 13308332 drwxr-xr-x 3 root 245 Sep 21 2018 51053381 root 4000000000 Feb 3 13:35 51053381\_part1.exe 4000000000 Feb 3 13:35 51053381\_part2.rar 4000000000 Feb 3 13:35 51053381\_part3.rar 1627698107 Feb 3 13:36 51053381\_part4.rar 117 Jul 22 11:56 500 rw-r--r-- 1 root root rw-r--r-- 1 root root rw-r--r-- 1 root root -rw-r--r-- 1 root root drwxr-xr-x 9 s00adm sapsys I 23657 Jan 22 12:06 ha\_auto\_script.zip -rw-r--r-- 1 root root hana001:/hana/shared # unzip ha auto script.zip Archive: ha\_auto\_script.zip creating: ha\_auto\_script/ inflating: ha\_auto\_script/basic\_ha.cfg Inflating: ha\_auto\_script/basic\_ha.crg creating: ha\_auto\_script/templates/ inflating: ha\_auto\_script/templates/scs\_res.template inflating: ha\_auto\_script/templates/ascs\_col.template inflating: ha\_auto\_script/templates/scs\_col.template inflating: ha\_auto\_script/templates/corosync\_template inflating: ha\_auto\_script/templates/corosync\_template inflating: ha\_auto\_script/templates/corosync\_template inflating: ha\_auto\_script/templates/corosync\_2heartbeat\_template inflating: ha\_auto\_script/templates/ascs\_res.template inflating: ha\_auto\_script/templates/sbd\_res.template inflating: ha\_auto\_script/templates/ses\_res.template inflating: ha\_auto\_script/templates/ses\_res.template inflating: ha\_auto\_script/ascs\_ha.cfg inflating: ha\_auto\_script/hana\_ha.cfg inflating: ha\_auto\_script/helper.sh inflating: ha\_auto\_script/basic\_auto\_ha.sh outpacting: ha\_auto\_script/basic\_auto\_ha.sh Ī extracting: ha\_auto\_script/version inflating: ha\_auto\_script/version inflating: ha\_auto\_script/ascs\_auto\_ha.sh inflating: ha\_auto\_script/hana\_auto\_ha.sh hana001:/hana/shared #

**Step 4** Run the following command to modify the configuration file:

#### vi /hana/shared/ha\_auto\_script/hana\_ha.cfg

Set the parameters in the configuration file based on the site requirements.

```
25,17 All
```

#### **NOTE**

This script supports the configuration of the two heartbeat network planes. During the configuration, you need to add the IP addresses of the server or client plane after **masterHeartbeatIP2** and **slaveHeartbeatIP2** parameters respectively in the script.

I

#### **Step 5** Run the following command to execute the script:

#### sh hana\_auto\_ha.sh

<pre>hana001:/hana/shared # sh ha_auto_script/hana_auto_ha.sh Running on SLES 12. ssh to slave node from master node. ssh to master node from slave node. s00adm exists. SID: S00, Instnace Number: 00 are valid.</pre>				
HANA is running on both nodes.				
HANA system replication configured.				
corosync.conf	100%	2690	2.6KB/s	00:00
Configure softdog on master node success				
softdog.conf	100%	8	0.0KB/s	00:00
Configuring csync2				
Generating csync2 shared key (this may take a while)done				
csync2 checking filesdone				
Done (log saved to /var/log/ha-cluster-bootstrap.log)				
Hawk cluster interface is now running. To see cluster status, open: https://10.0.3.30:7630/				
Log in with username 'hacluster', password 'linux'				
WARNING: You should change the hacluster password to something more secure!				
Waiting for clusterdone				
Loading initial cluster configuration				
Done (log saved to /var/log/ha-cluster-bootstrap.log)				
Master node ha-cluster-init successfully.				
Removed symlink /etc/systemd/system/multi-user.target.wants/pacemaker.service				
Successfully calling ha-cluster-init in master node.				
# 10.0.4.130:22 SSH-2.0-0penSSH_7.2				
# 10.0.4.130:22 SSH-2.0-0penSSH_7.2				
# 10.0.4.130:22 SSH-2.0-OpenSSH 7.2				

Created symlink from /etc/systemd/system/corosync.service.requires/sbd.service to /usr/lib/systemd/system/sbd.se rvice. Created symlink from /etc/systemd/system/pacemaker.service.requires/sbd.service to /usr/lib/systemd/system/sbd.s ervice. Created symlink from /etc/systemd/system/dlm.service.requires/sbd.service to /usr/lib/systemd/system/sbd.service Waiting for cluster...done Stack: corosync Current DC: hana001 (version 1.1.19+20181105.ccd6b5b10-3.10.1-1.1.19+20181105.ccd6b5b10) - partition with quorum Last updated: Wed Jul 22 16:14:08 2020 Last change: Wed Jul 22 16:14:08 2020 by root via crm\_attribute on hana002 2 nodes configured 6 resources configured Online: [ hana001 hana002 ] Full list of resources: stonith-sbd (stonith:external/sbd): Starting hana001
rsc\_ip\_SLE\_HDB (ocf::heartbeat:IPaddr2): Started hana002
Master/Slave Set: msl\_SAPHana\_SLE\_HDB [rsc\_SAPHana\_SLE\_HDB]
Slaves: [ hana001 hana002 ]
Clone Set: cln\_SAPHanaTopology\_SLE\_HDB [rsc\_SAPHanaTopology\_SLE\_HDB]
Stopped: [ hana001 hana002 ]
Successfully configure HA.
hana001:/hana/shared # ■ I

## 

- If the script execution fails, you have to run the command **sh hana\_auto\_ha.sh unconf** to manually perform rollback before executing the script again. In addition, configure the **ha\_auto.cfg** file based on the latest drive letter of the SBD volume.
- After the switchover between active and standby nodes is complete, configure the new standby node to make HA take effect. Perform the operations described as follows:
- 1. Run the following command on the standby node to switch to the administrator mode:

su - <SID>adm

2. Run the following command to stop the database of standby node.

#### HDB stop

3. Register the hostname of the standby node to the active node.

```
Set secondary to the hostname of the new active node. Set site_name to the original active node name defined when configuring System Replication.
```

```
hdbnsutil -sr_register --remoteHost=<secondary> --
remoteInstance=<instance_number> --replicationMode=sync --
name=<site_name>
```

4. Run the following commands to start the database of the standby node and exit the administrator mode:

## HDB start

exit

5. Run the following command on both the active and standby nodes to start the HAE service:

#### systemctl start pacemaker

6. Clear resources on the original active node (current standby node).

**rsc\_SAPHana\_SLE\_HDB00** is an example resource name, which can be obtained by running the **crm\_mon - r1** command. Set **primary** to the hostname of the current standby node.

#### crm resource cleanup <rsc\_SAPHana\_SLE\_HDB00> <primary>

#### **Step 6** Connect SAP HANA nodes to the SAP HANA Studio again.

On the SAP HANA Studio, delete the two connected SAP HANA nodes. Then, use the floating IP address of the SAP HANA nodes to connect them to the SAP HANA Studio again and configure the backup path.

盾 hdbstudio - SAP HANA Administration (	📓 System		_		×	_	đ	$\times$
File Edit Navigate Project Run Wir							(	
📑 🕶 🔚 🐚 . 🖢 🖛 🖓 🖛 🌾 🔶 🦷	Specify System					Quick Acce	ess 🖪	3   🛸
🔓 Systems 🕱 📃 🗖	Specify the host n	ame and instance number of the system.					,	- 8
	Host Name:	<sup>6</sup> 10.0.3.100						
	Instance Number	: 00						
	Mode:	⊖ Single container						
		<ul> <li>Multiple containers</li> </ul>						
		⊖ Tenant database						
		Name:						
		System database						
	Description:	<b>.</b>						
	Description.	hana_ha						
	Locale:	中文 (中国)	~					
				_				
	Folder:			Brows				
	rolder:	/		brows				
	?	< Back Next > Finish	1	Cance	I.	E	<b>*</b> •	
	Properties are r	ot available.						
0 items selected					1			

# **NOTE**

After the HA function is configured, HAE manages resources. Do not start or stop resources in other modes. If you need to manually perform test or modification operations, switch the cluster to the maintenance mode first.

#### crm configure property maintenance-mode=true

Exit the maintenance mode after the modification is complete.

crm configure property maintenance-mode=false

If you need to stop or restart the node, manually stop the cluster service.

#### systemctl stop pacemaker

After the ECS is started or restarted, run the following command to start the cluster service: **systemctl start pacemaker** 

----End

# 4.6.1.4 Configuring SAP HANA Storage Parameters

Configure SAP HANA storage parameters based on SAP's requirements.

Only SAP HANA 1.0 needs to be configured because the default configurations of SAP HANA 2.0 meet the specified requirements.

For more information, see as follows:

- SAP Note 2186744 FAQ: SAP HANA Parameters
- SAP Note 2267798 Configuration of the SAP HANA Database during Installation Using hdbparam
- SAP\_HANA\_Administration\_Guide

- SAP Note 2156526 Parameter constraint validation on section indicies does not work correctly with hdbparam
- SAP Note 2399079 Elimination of hdbparam in HANA 2

## Procedure

- **Step 1** Log in to an SAP HANA node.
- **Step 2** Run the following command to switch to the SAP HANA administrator:

#### su - *s00*adm

Step 3 Configure SAP HANA storage parameters.

hdbparam --paramset fileio.async\_read\_submit=on

hdbparam --paramset fileio.async\_write\_submit\_active=on

hdbparam --paramset fileio.async\_write\_submit\_blocks=all

**Step 4** (Optional) Configure storage parameters on other SAP HANA nodes according to the preceding steps.

If multiple SAP HANA nodes exist, perform the same configuration for these parameters on other SAP HANA nodes.

----End

# 4.6.2 SAP S/4HANA HA Configurations

# 4.6.2.1 Modifying the Hosts Configuration File

To ensure that the communication between the active and standby ASCS nodes is normal, add the mappings between the virtual IP addresses and virtual hostnames to the hosts file after installing the SAP S/4HANA instance.

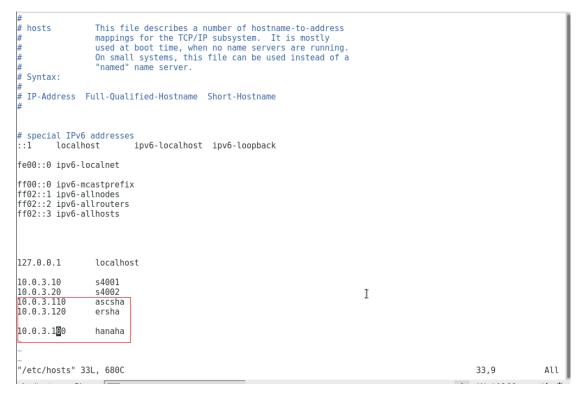
# Procedure

- **Step 1** Log in to the active and standby SAP S/4HANA nodes and modify the **/etc/hosts** file.
  - Change the physical IP address of the active ASCS node to virtual IP address of the active node.
  - Change the physical IP address of the standby ASCS node to virtual IP address of the standby node.
  - Change the physical IP address of the active SAP HANA node to the virtual IP address shared by the active and standby SAP HANA nodes.

The hosts file before the modification is as follows:

<pre># # hosts This file describes a number of hostname-to-address # mappings for the TCP/IP subsystem. It is mostly # used at boot time, when no name servers are running. # On small systems, this file can be used instead of a # "named" name server. # Syntax: # IP-Address Full-Qualified-Hostname Short-Hostname #</pre>		
# special IPv6 addresses ::1 localhost ipv6-localhost ipv6-loopback		
fe00::0 ipv6-localnet		
ff00::0 ipv6-mcastprefix ff02::1 ipv6-allnodes ff02::2 ipv6-allrouters ff02::3 ipv6-allhosts		
127.0.0.1 localhost		
10.0.3.10 s4001 10.0.3.20 s4002 10.0.3.10 ascsha 10.0.3.20 ersha		
10.0.3.30 hanaha ~		
~ "/etc/hosts" 33L, 677C	27,0-1	Αιι

Change the physical IP addresses to the virtual IP addresses.



#### **NOTE**

**ascsha** indicates the virtual hostname of the active ASCS node and **ersha** indicates the virtual hostname of the standby ASCS node. Virtual hostnames can be customized.

**Step 2** Log in to the standby SAP S/4HANA node and modify the /etc/hosts file to be the same as that of the active node.

----End

# 4.6.2.2 Checking the Directory

Check whether the **/var/log/cluster** directory exists on the active and standby ASCS nodes. If it does not exist, run the following command to create it:

#### mkdir /var/log/cluster

```
s4001:~ # ll /var/log/ | grep cluster
drwxr-xr-x 2 root root  4096 Apr 17  2018 <mark>cluster</mark>
s4001:~ # ■
```

# 4.6.2.3 Installing SAP Resource Agents

Install SAP resource agents on the active and standby SAP S/4HANA nodes.

## Procedure

**Step 1** Run the following command to check whether the **resource-agents** package has been installed:

sudo grep 'parameter name="IS\_ERS"' /usr/lib/ocf/resource.d/heartbeat/ SAPInstance

• If the information similar to the following is displayed, the patch package has been installed. No further action is required.

\$4001:~ # sudo grep 'parameter name="IS\_ERS"' /usr/lib/ocf/resource.d/heartbeat/SAPInstance
<parameter name="IS\_ERS" unique="0" required="0">
\$4001:~ # ■

• If no command output is displayed, go to **Step 2** to install the patch package.

#### Step 2 Install the resource-agents package.

- If the image is SLES 12 SP1, run the following command: sudo zypper in -t patch SUSE-SLE-HA-12-SP1-2017-885=1
- If the image is SLES 12 SP2, run the following command: sudo zypper in -t patch SUSE-SLE-HA-12-SP2-2018-1923=1
- If the image is SLES 12 SP3, run the following command: sudo zypper in -t patch SUSE-SLE-HA-12-SP3-2018-1922=1

----End

# 4.6.2.4 Updating sap\_suse\_cluster\_connector

Update sap\_suse\_cluster\_connector on the active and standby SAP S/4HANA nodes.

# Procedure

**Step 1** Run the following command to uninstall sap\_suse\_cluster\_connector of the earlier version. The software package name uses underscores (\_).

#### zypper remove sap\_suse\_cluster\_connector

**Step 2** Run the following command to install sap\_suse\_cluster\_connector of the latest version. The software package name uses hyphens (-):

#### zypper install sap-suse-cluster-connector

**Step 3** Run the following command to obtain the version information about the newly installed **sap-suse-cluster-connector**:

#### /usr/bin/sap\_suse\_cluster\_connector gvi --out version

**Step 4** Run the following command to check the **version** file and verify that the sap\_suse\_cluster\_connector version is 3.1.0 or later:

#### cat /usr/bin/version

```
s4001:~ # /usr/bin/sap_suse_cluster_connector gvi --out version
s4001:~ # cat /usr/bin/version
3
SUSE Linux Enterprise Server for SAP Applications 12 SP4
SUSE Linux Enterprise Server for SAP Applications 12 SP4
(sap_suse_cluster_connector 3.0.1)
https://www.suse.com/products/sles-for-sap/resource-library/sap-best-practices/
s4001:~ # ■
```

----End

# 4.6.2.5 Configuring the HA Function for SAP S/4HANA Nodes

## Procedure

- **Step 1** Log in to the active SAP S/4HANA node, obtain the **ha\_auto\_script.zip** package, and decompress it to any directory.
  - 1. Select the region where SAP S/4HANA is to be installed and download the script.

Select the region where SAP S/4HANA is to be installed and download the script. The following uses CN-Hong Kong as an example:

wget https://obs-sap-ap-southeast-1.obs.apsoutheast-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip -P / sapcd

The script download addresses for different regions are as follows:

- CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.apsoutheast-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- AP-Bangkok: https://obs-sap-ap-southeast-2.obs.apsoutheast-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- AF-Johannesburg: https://obs-sap-af-south-1.obs.afsouth-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Santiago: https://obs-sap-la-south-2.obs.lasouth-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip

- LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sabrazil-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Mexico City1: https://obs-sap-na-mexico-1.obs.namexico-1.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- LA-Mexico City2: https://obs-sap-la-north-2.obs.lanorth-2.myhuaweicloud.com/ha\_auto\_script/ha\_auto\_script.zip
- 2. Run the following commands to decompress the obtained script package:

#### cd /sapcd

#### unzip ha\_auto\_script.zip

<pre>s4001:~ # wget https://obs-sap.obs.myhwclouds.com/ha_auto_script/ha_auto_script.zip -P 2020-07-22 16:50:59 https://obs-sap.obs.myhwclouds.com/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script/ha_auto_script.com (obs-sap.obs.myhwclouds.com) 122.112.208.64, 12 Connecting to obs-sap.obs.myhwclouds.com (obs-sap.obs.myhwclouds.com) 122.112.208.64 : HTTP request sent, awaiting response 200 0K Length: 23657 (23K) [application/zip] Saving to: '/sapcd/ha_auto_script.zip'</pre>	ipt.zip 22.112.208.67
100%[=====>] 23,657	K/s in 0.03s
2020-07-22 16:50:59 (798 KB/s) - '/sapcd/ha_auto_script.zip' saved [23657/23657]	
s4001:~ # cd /sapcd/	
s4001:/sapcd # ll	
total 36	
drwxrwxrwx 2 root root 4096 Jul 22 14:22 Dasker	
drwxrwxrwx 14 root root 4096 Jul 22 15:35 burg	
drwxrwxrwx 2 root root 4096 Jul 22 16:46 cluster rpm	
-rwxrwxrwx 1 root root 23657 Jan 22 12:12 ha_auto_script.zip	
<pre>s4001:/sapcd # unzip ha auto script.zip</pre>	
Archive: ha auto script.zip	
creating: ha_auto_script/	
inflating: ha_auto_script/basic_ha.cfg	
<pre>creating: ha_auto_script/templates/</pre>	
inflating: ha_auto_script/templates/scs_res.template	
inflating: ha_auto_script/templates/ascs_col.template	
inflating: ha_auto_script/templates/scs_col.template	
inflating: ha_auto_script/templates/hana_rsc.template inflating: ha_auto_script/templates/corosync_template	
inflating: ha auto script/templates/properties.template	
inflating: ha auto script/templates/corosync 2heartbeat template	
inflating: ha auto script/templates/ascs res.template	
inflating: ha auto script/templates/sbd res.template	
inflating: ha_auto_script/templates/ers_res.template	
inflating: ha_auto_script/ascs ha.cfg	
inflating: ha_auto_script/hana_ha.cfg	
inflating: ha_auto_script/helper.sh	
inflating: ha_auto_script/basic_auto_ha.sh	
extracting: ha_auto_script/version	
inflating: ha_auto_script/ascs_auto_ha.sh	
inflating: ha_auto_script/hana_auto_ha.sh	
<pre>s4001:/sapcd # cd ha_auto_script/ s4001:/sapcd/ha_auto_script # ll</pre>	I
total 92	2
-rw-rr 1 root root 24661 Dec 23 2019 ascs auto ha.sh	
-rw-rr 1 root root 869 Dec 23 2019 ascs ha.cfg	
-rw-rr 1 root root 3940 Dec 23 2019 basic auto ha.sh	
-rw-rr 1 root root 381 Dec 23 2019 basic_ha.cfg	
-rw-rr 1 root root 7687 Dec 23 2019 hana_auto_ha.sh	
-rw-rr 1 root root 546 Dec 23 2019 hana_ha.cfg	
-rw-rr 1 root root 29157 Dec 23 2019 helper.sh	
drwxr-xr-x 2 root root 4096 Dec 23 2019 templates -rw-rr 1 root root 5 Dec 23 2019 version	
<pre>-rw-rr 1 root root 5 Dec 23 2019 version s4001:/sapcd/ha auto script #</pre>	
24001:/ Sahra/Ha_anro_Scithr #	

**Step 2** Set parameters in the **ascs\_ha.cfg** file based on the site requirements. **Table 4-18** describes the parameters in the file.

Туре	Name	Description		
masterNode	masterName	ASCS instance node name		

Table 4-18 Parameters in the ascs\_ha.cfg file

Туре	Name	Description
	masterHeartbeatIP1	Heartbeat plane IP address 1 of the ASCS instance node
	masterHeartbeatIP2	Service plane IP address of the ASCS instance node
slaveNode	slaveName	ERS instance node name
	slaveHeartbeatIP1	Heartbeat plane IP address 1 of the ERS instance node
	slaveHeartbeatIP2	Service plane IP address of the ERS instance node
ASCSInstance	ASCSFloatIP	Service IP address of the ASCS instance node
	ASCSInstanceDir	Directory of the ASCS instance
	ASCSDevice	Disk partition used by the ASCS instance directory
	ASCSProfile	Profile file of the ASCS instance
ERSInstance NOTE	ERSFloatIP	Service IP address of the ERS instance node
You need to log in to the ERS instance node to obtain the information about the <b>ERSInstanceDir</b> , <b>ERSDevice</b> , and <b>ERSProfile</b> parameters.	ERSInstanceDir	Directory of the ERS instance
	ERSDevice	Disk partition used by the ERS instance directory
	ERSProfile	Profile file of the ERS instance
trunkInfo	SBDDevice	Independent disk used by the SBD. One or three disks are supported. Every two disks are separated by a comma (,), for example, /dev/ sda, /dev/sdb, /dev/sdc.

[masterNode]
# Host name of the active node
masterName=s4001
# Heartbeat IP address of the active node
masterHeartbeatIP1=10.0.4.110
masterHeartbeatIP2=10.0.3.10
[slaveNode]
# Host name of the standby node
slaveName=s4002
# Heartbeat IP address of the standby node
slaveHeartbeatIP1=10.0.4.120
slaveHeartbeatIP2=10.0.3.20
[ASCSInstance]
# Float IP for ASCS instance or SCS instance
ASCSFloatIP=10.0.3.110
# Instance directory of ASCS instance or SCS isntance
ASCSInstanceDir=/usr/sap/S01/ASCS01
# Profile of ASCS or SCS
ASCSDevice=/dev/sdb
# Float IP for ERS instance
ERSFloatIP=10.0.3.120
[ERSInstance]
UseERS=True
# Float IP for ERS instance
ERSFloatIP=10.0.3.120
ERSInstanceDir=/usr/sap/S01/ERS10
ERSDevice=/dev/sdc
ERSProfile=/usr/sap/S01/SYS/profile/S01\_ERS10\_ersha
[trunkInf0]

# disk or partition for SBD
SBDDevice=/dev/sda
"ascs\_ha.cfg" 36L, 864C

36,18 All

#### **Step 3** Run the following command to perform automatic HA deployment:

#### sh ascs\_auto\_ha.sh

<pre>s4001:/sapcd/ha_auto_script # sh ascs_auto_ha.sh Running on SLES 12. ssh to slave node from master node. ssh to master node from slave node. 10.0.3.110 ascsha 10.0.3.120 ersha Resource-agents installed on both nodes. ASCS/SCS disk attached to both nodes. Appending ERS entry to sapservices Appending ASCS/SCS entry to sapservices in salve node.</pre>				
Setting Start_Program for Enqueue Server.				
Restarting ASCS/SCS instance.				
Restarting ERS instance. corosync.conf	100%	2690	2.6KB/s	00:00
Configure softdog on master node success	100%	2090	2.010/3	00.00
softdog.conf	100%	8	0.0KB/s	00:00
Configuring csync2				
Generating csync2 shared key (this may take a while)done				
csync2 checking filesdone				
Done (log saved to /var/log/ha-cluster-bootstrap.log)				
Hawk cluster interface is now running. To see cluster status, open:				
https://10.0.3.10:7630/				
Log in with username 'hacluster', password 'linux' WARNING: You should change the hacluster password to something more secure!				
Waiting for clusterdone				
Loading initial cluster configuration				
Done (log saved to /var/log/ha-cluster-bootstrap.log)			I	
Master node ha-cluster-init successfully.			T	
Removed symlink /etc/systemd/system/multi-user.target.wants/pacemaker.service				
Successfully calling ha_cluster_init in master node.				
# 10.0.4.110:22 SSH-2.0-OpenSSH_7.2				
# 10.0.4.110:22 SSH-2.0-OpenSSH 7.2				
# 10.0.4.110:22 SSH-2.0-OpenSSH 7.2				
Calling 'ha-cluster-join -y -c 10.0.4.110 csync2' in slave node. Configuring csync2done				
contrigating coynezuone				

Lreated symlink trom /etc/systemd/system/pacemaker.service.requires/sbd.service to /usr/lib/systemd/system/sbd.s ervice Created symlink from /etc/systemd/system/dlm.service.requires/sbd.service to /usr/lib/systemd/system/sbd.service . INSTANCE\_NAME = ASCS01 INSTANCE\_NAME = ASCS01 Waiting for cluster...done Stack: corosync Current DC: ś4001 (version 1.1.19+20181105.ccd6b5b10-3.10.1-1.1.19+20181105.ccd6b5b10) - partition with quorum Last updated: Wed Jul 22 17:01:16 2020 Last change: Wed Jul 22 17:01:03 2020 by root via cibadmin on s4001 2 nodes configured 7 resources configured Online: [ s4001 s4002 ] Full list of resources: stonith-sbd (stonith:external/sbd): Started s4001
Resource Group: grp\_ASCS
 rsc\_ip\_ASCS (ocf::heartbeat:IPaddr2):
 rsc\_fs\_ASCS (ocf::heartbeat:Filesystem):
 rsc\_sap\_ASCS (ocf::heartbeat:SAPInstance):
 Paceure: grp\_FDC Stopped I (ocf::heartbeat:Filesystem): (ocf::heartbeat:SAPInstance): Started s4001 Stopping s4001 Resource Group: grp\_ERS rsc\_ip\_ERS (ocf::heartbeat:IPaddr2): rsc\_fs\_ERS (ocf::heartbeat:Filesystem): Stopped Started s4002 rsc\_sap\_ERS (ocf::h Successfully configure HA. s4001:/sapcd/ha\_auto\_script # (ocf::heartbeat:SAPInstance): Started s4002

#### **Step 4** Run the following command to check the resource status:

#### crm status

```
s4001:/sapcd/ha_auto_script # crm status
Stack: corosync
Current DC: s4001 (version 1.1.19+20181105.ccd6b5b10-3.10.1-1.1.19+20181105.ccd6b5b10) - partition with quorum
Last updated: Wed Jul 22 17:03:52 2020
Last change: Wed Jul 22 17:01:03 2020 by root via cibadmin on s4001
2 nodes configured
7 resources configured
Online: [ s4001 s4002 ]
Full list of resources:
 stonith-sbd
                   (stonith:external/sbd): Started s4001
 Resource Group: grp_ASCS
rsc_ip_ASCS (0
rsc_fs_ASCS (0
                             (ocf::heartbeat:IPaddr2):
                                                                      Started s4001
                             (ocf::heartbeat:Filesystem):
                                                                     Started s4001
      rsc_sap_ASCS
                              (ocf::heartbeat:SAPInstance):
                                                                     Started s4001
 Resource Group: grp_ERS
rsc_ip_ERS (ocf::heartbeat:IPaddr2):
rsc_fs_ERS (ocf::heartbeat:Filesystem):
                                                           Started s4002
                                                           Started s4002
      rsc_sap_ERS
                             (ocf::heartbeat:SAPInstance):
                                                                    Started s4002
s4001:/sapcd/ha_auto_script # 🚪
                                                                                        I
```

#### D NOTE

After the HA function is configured, HAE manages resources. Do not start or stop resources in other modes. If you need to manually perform test or modification operations, switch the cluster to the maintenance mode first.

#### crm configure property maintenance-mode=true

Exit the maintenance mode after the modification is complete.

#### crm configure property maintenance-mode=false

If you need to stop or restart the node, manually stop the cluster service.

#### systemctl stop pacemaker

After the ECS is started or restarted, run the following command to start the cluster service:

#### systemctl start pacemaker

To clear the HA configuration, run the following command on the active node for which HA is configured (Roll back to the initial status if the active and standby nodes are switched over.):

sh ascs\_auto\_ha.sh unconf

----End

# 4.6.2.6 Verifying the Configuration

#### Prerequisites

Open a browser and ensure that JavaScript and Cookie are enabled.

## Procedure

**Step 1** Enter the IP address or hostname of the active or standby node as the URL. The login port is 7630.

Example: https://s4001:7630/

#### **NOTE**

If a certificate warning is displayed when you attempt to access the URL for the first time, it indicates that a self-signed certificate is used. By default, the self-signed certificate is not considered as a trusted certificate.

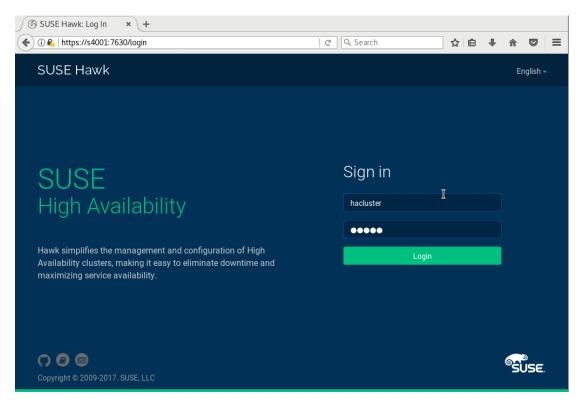
Click **Continue to this website (not recommended)** or add an exception in the browser to eliminate the warning message.

#### Remarks:

**Step 2** On the login page, enter the username and password of user **hacluster** or any other user who belongs to the haclient group.

**NOTE** 

The username is **hacluster** and the initial password is **linux**. Change the password after the first login.



**Step 3** Click **Login**. You can view the statuses of cluster nodes and resources on the displayed page.

) 🛈 🗞   https://s4001:7630/ci	Druve			C Q Search		
SUSE Hawk	🤜 View (	Cluster Det	ails	B	atch 🛈 hacluster 🛔 🛛 H	Help ? Logo
MANAGE Status	💎 S	tatus ha	cluster			
Dashboard History	Res	ources 7	Nodes 2			
		Status	Name	Location	Туре	Operations
Add Resource	+	•	grp_ASCS	s4001	Group (3)	<b>.</b> • Q
Add Constraint	+	•	grp_ERS	s4002	Group (3)	<b>.</b> • Q
Wizards Edit Configuration	+	•	stonith-sbd	s4001	stonith:external/sbd	<b>• • •</b>
Cluster Configuration						
Command Log			k			
CCESS CONTROL			76			
Roles						
Targets						
copyright © 2009-2017						

----End

# 4.7 Change History

Description	Released On
This issue is the first official release.	2020-10-30
This issue is the second official release, which incorporates the following change: Added section "5.2.1 Adding a Virtual IP Address".	2022-12-05
This issue is the third official release. which incorporates the following change: Modified sections "3.3 File System Planning" and "4.7.1 Formatting the File System for Active and Standby SAP HANA ECSs".	2023-03-01

# **5** HUAWEI CLOUD SAP Business One on HANA Installation Best Practice

Introduction Pre-installation Preparations Resource Planning Preparing for the Installation Installing Software FAQs Change History

# 5.1 Introduction

This document provides guidance for preparing resources (such as cloud servers and network resources) on the HUAWEI CLOUD platform and installing SAP Business One on HANA. SAP is authorized in Bring Your Own License (BYOL) mode. You need to log in at SAP Support Portal to purchase licenses.

The document conventions are as follows:

This document describes how to install and deploy SAP Business One (SAP HANA as the database).

This document cannot replace the standard SAP document. If you have any trouble in installing and using SAP Business One due to its own problems, contact the SAP technical support.

This document is written based on the OS SUSE Linux Enterprise Server. The deployment modes mentioned in the document are only for reference. Install SAP Business One by referring to the standard SAP installation manual or based on sizing results and site requirements.

For details about the official SAP installation guide and related notes, see the following documents:

- SAP Installation Guides
- SAP Library
- https://partneredge.sap.com

For details about SAP Business One, see SAP Business One User Guide.

# **5.2 Pre-installation Preparations**

# Logging in to Huawei Cloud

Before deploying the SAP system on Huawei Cloud, register a HUAWEI ID and enable Huawei Cloud services. Through this account, you can use Huawei Cloud services and pay only for the services you use.

For details, see Registering a HUAWEI ID and Enabling Huawei Cloud Services.

You can log in to Huawei Cloud using any of the methods described in **Logging In** to Huawei Cloud.

# SAP License

SAP is authorized in Bring Your Own License (BYOL) mode. In this mode, you need to log in to the **SAP Support Portal** and apply for a license.

## **NAT Server**

Prepare a Network Address Translation (NAT) server on which SAP HANA and SAP Business One clients and SAP HANA Studio are installed.

# 5.3 Resource Planning

# 5.3.1 Network Planning

The network information needs to be planned based on application scenarios and SAP planning. The following table lists the network segments and IP addresses required for installing standard standalone SAP Business One on HANA. You can configure it based on site requirements.

Parameter	Description	Example Value
IP address of the server/client plane	Specifies the IP address of the primary NIC plane. The SAP Business One node communicates communicate with the SAP HANA and SAP Business One clients and the SAP databases using this IP address.	SAP Business One node: 10.10.1.178 SAP HANA node: 10.10.1.178

# 5.3.2 Security Group Planning

# SAP Security Group Planning

The security group planning needs to meet the requirements for communication between SAP nodes over the management plane and internal communication plane. You need to configure the security group together with the network department. For details about SAP's requirements for security group rules, see **TCP/IP ports used by SAP applications**.

You can configure the security group by referring to the following table.

#### **NOTE**

- Plan the network segments and IP addresses based on the site requirements. The following security group rules are for reference only. You can configure your own security group rules as needed.
- In the following table, ## stands for the SAP instance number, which must be consistent with the instance number specified when the SAP software is installed. If there are multiple instance numbers, enter them in sequence.

Source	Protocol	Port Range	Description
Inbound	·	·	
10.10.1.0/24	ТСР	1-65535	Allows instances to communicate with each other in the subnet.
10.10.1.0/24	ТСР	5##13 to 5##14	Allows the SAP HANA Studio to access SAP HANA.
10.10.1.0/24	ТСР	3##00 to 3##10	Communication in the database
10.10.1.0/24	ТСР	3##15 and 3##17	DB Client access port
10.10.1.0/24	ТСР	111,2049,4000-40 02	For NFS communication
10.10.1.0/24	ТСР	40000~40001	SAP Business One server port
10.10.1.0/24	ТСР	22	Allows SAP to be accessed using SSH.
10.10.1.0/24	ТСР	43##	Allows access to XS Engine from the 10.0.0.0/24 subnet using HTTPS.

Source	Protocol	Port Range	Description
10.10.1.0/24	ТСР	80##	Allows access to XS Engine from the 10.0.0.0/24 subnet using HTTP.
10.10.1.0/24	ТСР	8080 (HTTP)	Allows Software Update Manager (SUM) to access SAP HANA using HTTP.
10.10.1.0/24	ТСР	8443 (HTTPS)	Allows Software Update Manager (SUM) to access SAP HANA using HTTPS.
10.10.1.0/24	ТСР	1128-1129	Allows access to SAP Host Agent using SOAP/HTTP.
Automatically specified by the system	ANY ANY		Security group rule created by the system by default Allows ECSs in the same security group to communicate with each other.
Outbound			
ANY	ANY	ANY	Security group rule created by the system by default Allows SAP HANA to access all peers.

## 5.3.3 File System Planning

The following table describes the specifications of the file system planned for SAP Business One.

Mount Point	File System Size	File System Type	Shared	Description
/	40 GB	-	No	OS volume
/hana/data	400 GB	xfs	No	Data volume. Use two physical disks to make a data volume in using Logical Volume Manager (LVM).
/hana/log	## GB	xfs	No	Log volume. When the memory is less than or equal to 512 GB, the log volume capacity is half of the memory and rounded up for decimal places. When the memory is greater than 512 GB, the log volume capacity is 512 GB.
/hana/shared	## GB	xfs	No	Shared volume. It is recommended that the capacity of the Shared volume be at least 1.2 times the size of the memory.
/hana/ backup	Auto capacity expansion	SFS	No	Create an SFS file system as the backup volume.
/usr/sap	50 GB	xfs	No	/usr/sap volume
/sapcd	Auto capacity expansion	SFS	Yes	Stores the SAP installation package, which is shared to all nodes in the SAP system.
-	20 GB	swap	No	Swap volume

# 5.3.4 ECS Planning

• SAP ECS specifications

Before applying for SAP ECSs, evaluate the SAP Application Performance Standard (SAPS) value based on the standard SAP Sizing method. Then apply for the ECSs based on the evaluation results. For details, see **SAP Quick Sizer**. For details about the minimum disk space, RAM, and software requirements of each SAP component, see the **SAP Installation Guides**.

SAP-certified ECSs must be used for installing the SAP application. For details, see **SAP Notes**.

• OS

The following table lists the OS required for SAP ECSs. This document uses SAP Business One 9.3 as an example.

SAP ECS OS

Name	Specifications
OS	SUSE Linux Enterprise Server 12 SP4

• SAP node planning

ECS Name	Server/ Client IP Address	Flavor	Туре	lmage
b123	10.10.1.178 m6.2xlarge.8 Business One		One E	
			HANA	Server 12 SP4
ecswindows	10.10.1.176	c6.4xlarge.2	Business One/HANA Client	Windows Server 2016 Standard 64bit Chinese

# 5.4 Preparing for the Installation

## 5.4.1 Creating a VPC

A VPC is logically isolated, configurable, and manageable virtual network for cloud servers, cloud containers, and cloud databases. It improves resource security and simplifies network deployment on the cloud. With a VPC, you can configure and manage the networks in the VPC, and make changes to these networks as needed, quickly and securely. For more information about VPC, see VPC Overview.

When creating a VPC, create the subnet 10.10.1.0 and use it as the server/client plane IP address of SAP Business One.

### Procedure

**Step 1** Log in to the management console.

- **Step 2** Click <sup>(1)</sup> in the upper left corner and select the desired region and project.
- **Step 3** In the navigation pane on the left, click = and choose **Networking** > **Virtual Private Cloud**.

HJAWE	HUAWEI CLOUD Conso	le 🔍 Hong-Kong 🗸 🗸					Search		Q Billing Center
≡	Service List	Enter a service or function name.				Q			
٢	Elastic Cloud Server	No Recently Visited Services							
	Bare Metal Server	Compute Elastic Cloud Server		Storage Elastic Volume Service		Networking Virtual Private Cloud			Databases GaussDB
100	Auto Scaling	Bare Metal Server		Dedicated Distributed Storage Service		Elastic Load Balance			Relational Database Service
0	Elastic Volume Service	Cloud Phone		Storage Disaster Recovery Service		Direct Connect			Document Database Service
តា	Volume Backup Service	Image Management Service		Cloud Server Backup Service		Virtual Private Network			GaussDB NoSQL
		FunctionGraph		Cloud Backup and Recovery		Domain Name Service			Distributed Database Middlewar
Ð	Virtual Private Cloud	Auto Scaling	¥.	Volume Backup Service		NAT Gateway			Data Replication Service
$\oplus$	Elastic Load Balance	Dedicated Cloud		Object Storage Service		Elastic IP		¥.	Data Admin Service
P	Elastic IP	Dedicated Host		Data Express Service		Cloud Connect			
0	Relational Database Service			Scalable File Service	<b></b>	VPC Endpoint			Security & Compliance
ŝ	Relational Database Service			CDN					DDoS Mitigation
$\oplus$	Domain Registration			Cloud Storage Gateway		Middleware			Web Application Firewall
		Containers				ServiceStage			Cloud Firewall
		Cloud Container Engine		Management & Governance		Cloud Service Engine			Application Trust Center
		Cloud Container Instance		OneAccess		Cloud Service Engine Servic	eComb		Vulnerability Scan Service
		Software Repository for Container		Cloud Trace Service		Distributed Cache Service R	ledis		Host Security Service
		Multi-Cloud Container Platform		Cloud Eye		Distributed Cache Service N	/lemcached		Container Guard Service
		CCE Agile		Application Operations Management		Distributed Message Service	e		Data Security Center
		Container Insight Engine		Application Performance Management		Distributed Message Service	e for Kafka		Database Security Service
		Cloud Native Service Center		Identity and Access Management		Distributed Message Service	e for Rabbit		Data Encryption Workshop

#### **Step 4** Click **Create VPC** on the right of the page.

**Step 5** Configure required parameters as prompted based on **Table 5-1**.

2	HUAWEI CLOUD   Consol	łe		Search Q Billing Center Resources Service Tickets Enterprise Develop Tools ICP License	Support	English	ganyang   E fuchuandong   E
Ξ		<	Create VPC ⑦				
			Basic Information Region Name IPv4 CIDR Block	Ar-Stangisk      Participate      Pages are geographic areas loaded from each other. Besources are region-specific and cannot be used across regions through internal network connections. For low network      and an operation of the second sec			
9			Advanced Settings v	Tag   Description			
			Default Subnet AZ Name IPv4 CIDR Block IPv6 CIDR Block	A21         •			
		I	Free	Create Now			

Table 5-1 VPC configuration parameters

ltem	Parameter	Description
Basic Information	Region	A region is a geographical area where you can run your VPC service. Each region comprises one or more AZs and is completely isolated from other regions. Only AZs in the same region can communicate with one another through an internal network. You can use the region selector on the upper left of the page to change the region.

ltem	Parameter	Description
	Name	VPC name.
	CIDR Block	CIDR block of the VPC. The CIDR block of a subnet can be the same as the CIDR block for the VPC (for a single subnet in the VPC) or a subset of the CIDR block for the VPC (for multiple subnets in the VPC).
		Choose one from the following CIDR blocks:
		10.0.0/8~24
		172.16.0.0/12~24
		192.168.0.0/16~24
		Configure the CIDR block based on the subnet information provided in <b>Network Planning</b> .
	Enterprise Project	Enterprise project to which the VPC belongs.
		An enterprise project facilitates project- level management and grouping of cloud resources and users. The name of the default project is <b>default</b> . For details about creating and
		managing enterprise projects, see the Enterprise Management User Guide.
	Тад	VPC tag, which consists of a key and value pair. You can create 10 tags for a VPC. This parameter is optional. Click <b>Advanced Settings</b> to configure it.
		For details about the tag naming rules, see VPC Tag Naming Rules.
Default Subnet	AZ	An AZ is a geographic location with independent power supply and network facilities in a region. AZs are physically isolated, and AZs in the same VPC are interconnected through private networks.
	Name	Subnet name
	CIDR Block	CIDR block for the subnet. This value must be within the VPC CIDR block. Configure the subnet CIDR block based on the information provided in <b>Network Planning</b> .

ltem	Parameter	Description			
	Advanced Settings	Click <b>Advanced Settings</b> to set parameters such as <b>Gateway</b> and <b>DNS</b> <b>Server Address</b> .			
	Gateway	Gateway address of the subnet.			
	DNS Server Address	External DNS server addresses are used by default. To change the DNS server address, ensure that the DNS server addresses you configured are available.			
	DHCP Lease Time	Period during which a client can use an IP address automatically assigned by the DHCP server. After the lease time expires, a new IP address will be assigned to the client. The unit is day.			
	Tag	Subnet tag, which consists of a key and value pair. You can add 10 tags for a subnet. This parameter is optional.			
		For details about the tag naming rules, see <b>VPC Tag Naming Rules</b> .			
Add Subnet	You can click <b>Add Subnet</b> to add a subnet.				

#### **Step 6** Click **Create Now**.

----End

## 5.4.2 Creating a Security Group

A security group is a collection of access control rules for ECSs that have the same security protection requirements and are mutually trusted. You can define inbound and outbound rules to control traffic to and from the ECSs in a security group, making your VPC more secure. For more information about security groups, see **Security Group Overview**.

### Procedure

**Step 1** Create a SAP security group.

Choose **Access Control** > **Security Groups** in the navigation pane on the left of the VPC console. On the **Security Groups** page, click **Create Security Group**.

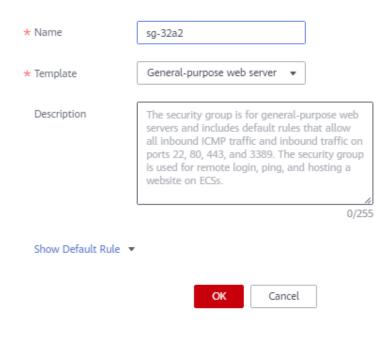
						se Support English ganyang fuchuandong
letwork Console	Security Groups ③					Quick Links Create Security
shboard	A security group implements access control for server	s (such as BMSs and ECSs) that have the same security protec	tion requirements in a VPC. You ca	in define inbound and outbi	und rules to control traffic to and from the servers in	a security group, making your VPC more secure.
irtual Private Cloud		ned Sys-default, which has default security group rules. The d also create new security groups based on your requirements. I			it inbound rule denies all inbound traffic. All servers	within a security group can access each other. Le
Subnets Route Tables						
iccess Control					All projects	* Q
Security Groups	Name	Security Group Rules	Associated Instances	Description	Enterprise Project	Operation
Network ACLs	default	15	36	default	default	Manage Rule   More 💌
PC Flow Logs						
astic IP and Bandwidth 🔻						
NAT Gateway						
lastic Load Balance 💌						
PC Peering						
PC Endpoint •						
irtual Private Network 🖉						
Direct Connect de						
oud Connect d <sup>e</sup>						
Elastic Cloud Server 🖉						

**Step 2** Set required parameters to create a security group.

- **Template**: The template contains security group rules, which help you quickly create a security group. The following templates are provided:
  - **Custom**: This template allows you to create security groups with custom security group rules.
  - General-purpose web server: The security group that you create using this template is for general-purpose web servers and includes default rules that allow all inbound ICMP traffic and allow inbound traffic on ports 22, 80, 443, and 3389.
  - **All ports open**: The security group that you create using this template includes default rules that allow inbound traffic on any port. Note that allowing inbound traffic on any port poses security risks.
- **Name**: specifies the name of the security group. Name the security group that is easy to identify, for example, **sg\_sap\_**.
- **Enterprise Project**: You can add the security group to an enabled enterprise project. You can select an enterprise project from the drop-down list, for example, **SAP**.

 $\times$ 

### Create Security Group



#### Step 3 Click OK.

Locate the row that contains the newly created security group, and click **Manage Rule** in the **Operation** column to switch to the page for managing inbound and outbound rules. On the **Inbound Rules** tab, click **Add Rule**. In the displayed dialog box, add the desired ports listed in **Security Group Planning**.

detail: ammary   <u>Hobund Rules</u>   Outbound Rules   Associated Instances								
Add Rule Delete Allow Common Forts Isboard Rules 4 Law more about security group configuration.								С
Priority (2)	Action (2)	Protocol & Port 😨 💮	Type	Source (2)	Description	Last Modified	Operation	
1	Allow	TCP : 3389	IPv4	0.0.0.00 (2)	Permit default Windows remote desktop port.	Jan 10, 2020 14:50:47 GMT+08:00	Modify   Repli	cate   Delete
	Allow	TCP : 22	IPv4	0.0.0.00	Permit default Linux SSH port.	Jan 10, 2020 14:50:46 GMT+08:00	Modify   Repli	cate   Delete
100	Allow	All	IPv6	default 🕥		Jan 03, 2019 18:04:50 GMT+08:00	Modify   Repli	cate   Delete
100	Allow	All	1Pv4	default 🕤		Jan 03, 2019 18:04:50 GMT+08:00	Modify   Repli	cate   Delete

----End

### 5.4.3 Creating ECSs

You need to create two ECSs. One is used to install SAP Business One and HANA, and the other is used to install the clients of SAP Business One and SAP HANA. The ECS specifications shown in the following table and figure are just for reference. Configure the specifications based on the site requirements.

ECS Name	Server/Client IP Address	Flavor	Туре	Image
b123	10.10.1.178	m6.2xlarge.8	Business One	SUSE Enterprise 12 SP4

ECS Name	Server/Client IP Address	Flavor	Туре	Image
			HANA	
ecswindows	10.10.1.176	c6.4xlarge.2	Business One/HANA Client	Windows Server 2016 Standard 64bit Chinese

ECS Flavor	Specifica tions	File Syste m Size (GB)			Stora ge Class	OS
m6.2xlarg e.8	12 vCPUs,	1049	System disk	100	High I/O	SUSE Enterprise 12
	24 GB		/usr/sap 80		High I/O	SP4
			/hana/ data	200 * 2	Ultra- high I/O	
					High I/O	
			/hana/log	'hana/log 252		
			/hana/ shared	300	High I/O	
			/sapcd	N/A	SFS	
c6.4xlarg e.2	16 vCPUs			200	High I/O	Windows Server 2016
	32 GB		D:	500	High I/O	Standard 64bit Chinese

**Step 1** Log in to the HUAWEI CLOUD management console, click the service list icon, and choose **Compute** > **Elastic Cloud Server**.

HUAWE	HUAWEI CLOUD   Console	• Hong-Kong	T				Search	Q Billing C
≡	Service List >	Enter a service or fu	nction name.			Q		
6	Elastic Cloud Server	Recently Visited Servic	es: Virtual Private Clo	oud				
ക	Relational Database Service	Compute	]		Storage	Networking		Databases
00	Auto Scaling	Elastic Cloud Server	1	K.	Elastic Volume Service	Virtual Private Cloud		GaussDB
	-	Bare Metal Server	1	R.	Dedicated Distributed Storage Service	Elastic Load Balance		Relational Database Service
	Bare Metal Server	Cloud Phone			Storage Disaster Recovery Service	Direct Connect		Document Database Service
	Elastic Volume Service	Image Management S	ervice		Cloud Server Backup Service	Virtual Private Network		GaussDB NoSQL
3	Volume Backup Service	FunctionGraph			Cloud Backup and Recovery	Domain Name Service		Distributed Database Middleware
	votume backup service	Auto Scaling		R.	Volume Backup Service	NAT Gateway		Data Replication Service
Ó	Virtual Private Cloud	Dedicated Cloud			Object Storage Service	Elastic IP		Data Admin Service
$\Phi$	Elastic Load Balance	Dedicated Host			Data Express Service	Cloud Connect		
$\frown$	Domain Registration				Scalable File Service	VPC Endpoint		Security & Compliance
	Domain Registration	Middleware			CDN			DDoS Mitigation
P	Elastic IP	ServiceStage			Cloud Storage Gateway	Containers		Web Application Firewall
		Cloud Service Engine				Cloud Container Engine		Cloud Firewall
		Cloud Service Engine S	ServiceComb		Management & Governance	Cloud Container Instance		Application Trust Center
		Distributed Cache Sen	vice Redis		OneAccess	Software Repository for Container		Vulnerability Scan Service
		Distributed Cache Sen	vice Memcached		Cloud Trace Service	Multi-Cloud Container Platform		Host Security Service
		Distributed Message S	ervice		Cloud Eye	CCE Agile		Container Guard Service
		Distributed Message S	ervice for Kafka		Application Operations Management	Container Insight Engine		Data Security Center
		Distributed Message S	ervice for Rabbit		Application Performance Management	Cloud Native Service Center		Database Security Service
		Distributed Message S	ervice for High R		Identity and Access Management	Application Service Mesh		Data Encryption Workshop
		API Gateway			Simple Message Notification	Application Orchestration Service		Cloud Certificate Management Servic
					Log Tank Service			Managed Detection Response

#### Step 2 Click Buy ECS.

Service       Image: Constraint of the const	Cloud Server Console		Elastic Cloud Server ②							Feedback	A ECS News	19 Quick Links	Bu
I Ratic Class Savet       Non-*       C C O C       C       C C O C       C       C C O C       C C O C       C C O C       C C O C       C C O C       C C O C       C C O C C C       C C O C C C      C C O C C C      C C O C C C								Quickly learn login metho	ods and security group configura	tions. View more.	Do not show th	is again.	
Defaulted Not.         Int	Dashboard		We would much appreciate if you could complet	te our questionnaire o	n Elastic Cloud Serv	er. Your feedback will help u	is provide a better user experier	nce.					
Rate Match Same         Sectional synamic by states         Sectional	Elastic Cloud Server												
Battix Values Sarvice     Image: Massagement       Room     Image: Massagement       Image: Massagement     Image: Massagement       Room     Image: Massagement       Image: Massagement     Image: Massagemen	Dedicated Host		Start Stop Reset Password	More *								C 🛞 🖸	88
Image Massement Service	Bare Metal Server		Searched by name by default.										
Service     L     L     ALC     ID     Service     L     ALC     ID     Service     L     ALC     ID     Service     ALC     ALC     ID     Service     ALC     ID     Service     ID     ALC     ID     Service     ID     ID     ID     ID     Service     ID     ID <td< td=""><td>Elastic Volume Service</td><td>*</td><td></td><td>Monitoring</td><td>AZ 🏹</td><td>Status 🍞</td><td>Specifications/Image</td><td>IP Address</td><td>Billing Mode 🛛</td><td>Enterprise Project</td><td>Tag</td><td>Operation</td><td></td></td<>	Elastic Volume Service	*		Monitoring	AZ 🏹	Status 🍞	Specifications/Image	IP Address	Billing Mode 🛛	Enterprise Project	Tag	Operation	
Important     Impor				Ø	AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	Mon
Sid Group       Image:		•		Ø	AZ1	Stopped			Pay-per-use Created on May 24,	SAP		Remote Login	Mor
Recory     Image: Subject of				2	AZ1	Stopped Stopped			Pay-per-use Created on May 24,	SAP	-	Remote Login	Mor
Gender         Image: Subject of the subject of t		ø		₩	AZ1	Stopped				SAP		Remote Login	Mon
Exets: Load balances         #         Image: Constraint of the section of the sectio		ø		Ø	AZ2	Stopped			Pay-per-use Created on May 20,	SAP		Remote Login	Mor
AZ2 <sup>(i)</sup> Stopped Stopp				Ø	AZ2	Stopped			Pay-per-use Created on May 18,	SAP		Remote Login	Mor
Security Group d'				۵	AZ2				Pay-per-use Created on May 17,	default		Remote Login	Mor
A22     Stopped Lucidad by 5.	Security Group	ø		國	AZ2	Stopped				default		Remote Login	Mor

**Step 3** Select the ECS flavor, image, and disk size based on #EN-US\_TOPIC\_0000001143628972/table127451133151718.

	m6.large.8	2 vCPUs   16GIB	Intel Cascade Lake 3.0GHz	1.2 / 4 Gbit/s	400,000	No	¥1.03/hour			
	O mő.xlarge.8	4 vCPUs   32GIB	Intel Cascade Lake 3.0GHz	2.4 / 8 Gbit/s	800,000	No	¥1.99/hour			
	m6.2xlarge.8	8 vCPUs   64GIB	Intel Cascade Lake 3.0GHz	4.5 / 15 Gbit/s	1,500,000	No	¥4.05/hour			
	m6.3xlarge.8	12 vCPUs   96GIB	Intel Cascade Lake 3.0GHz	7 / 17 Gbit/s	2,000,000	No	¥6.04/hour			
	m6.4xlarge.8	16 vCPUs   128GIB	Intel Cascade Lake 3.0GHz	9 / 20 Gbit/s	2,800,000	No	¥8.03/hour			
	M6.6xlarge.8 (Sold Out) Available Regions/AZs	24 vCPUs   192GI8	Intel Cascade Lake 3.0GHz	14 / 25 Gbit/s	4,000,000	No	¥12.08/hour			
	M6.8xlarge.8 (Sold Out) Available Regions/AZs	32 vCPUs   256GIB	Intel Cascade Lake 3.0GHz	18 / 30 Gbit/s	5,500,000	No	¥16.13/hour			
	Selected specifications Memory-opti	mized   m6.2xlarge.8   8 vCPUs	64GiB							
Host Security	Windows      Windows Server 2012 R2 Standard 64bit Olineve(46Gb)       C      Select the OS language.  r/y      Solution:      Basic									
System Disk										
Data Disk	Data Disk \ominus High I/O • - 259 + GIB I/OPS limit: 3,000, I/OPS bars1, limit: 5,000 Quantity - 1 + Show >									
	· · · · · · · · · · · · · · · · · · ·									

**Step 4** Click **Next: Configure Network**. Select the created VPC and security group, confirm the configuration, and click **Next: Configure Advanced Settings**.

1 Configure Basic !	Settings (2) Configure Network	(3) Configure Advanced Settings	(4) Confirm						
() compare cone :	Compact Action	O compact wanted standy							
Network	vpc-sap(10.10.0.0/16) Create VPC	C subnet-hana(10.10.2.0/24)	C Automatically-assigned	IP address   Available private IP as	ldresses: 240				
Extension NIC	Add NIC You can add 3 more NICs.								
Security Group default (417)1556-8789-4537 6845 708103 14220) 🛛 🔹 C Create Security Group 🛈									
Similar to a flewall, a security group logically controls network access.									
	Security Group Rules								
	Inbound Rules Outbound R	ules							
	Inbound Rules Outbound R Security Group Name	Protocol & Port ②	Туре	Source (2)		Description			
			Type IPv4	Source ⑦ 0.0.0.0/0		Description Create by sfs turbo			
		Protocol & Port ③							
		Protocol & Port ⑦ TCP: 2049	1Pv4	0.0.0.0/0		Create by sfs turbo			
		Protocol & Port ① TCP: 2049 UDP: 111	1Pv4 1Pv4	0.0.0.0/0		Create by sfs turbo Create by sfs turbo			
		Protocol & Part	19v4 19v4 19v4	0.00.0/0		Create by sfs turbo Create by sfs turbo Create by sfs turbo			
		Protocol & Port ① TCP: 2049 UDP: 111 TCP: 445 TCP: 2051	1944 1944 1944 1944	0.0.0.0,0 0.0.0.0,0 0.0.0.0,0 0.0.0.0,0		Create by sfs turbo Create by sfs turbo Create by sfs turbo Create by sfs turbo			

**Step 5** Enter the ECS name and password of the **root** user, and click **Next: Confirm**.

2	HUAWEI CLOUD			: English gariyang   🛃	94
:	< Elastic Cloud S	Gerver		Assured Purchase 🔗 Flexi Purchase	
Ð	(1) Configure Basic Se	Settings ——— (2) Configure Network ———— (3) Configure Advanced Settings ———— (4) Confirm			
5 1 2	ECS Name	encap1         Allow diplicate name           If multiple ECS are created at the same time, the system and contractualy adds. hyperin followed by a four digit incremental number to the end of each ECS name. For example, if you enter ecs and there is no existing E name ecs of all alrandy entits, the name of the inter example. If you enter ecs and there is no existing E	ECS in the system, the first ECS's name	will be ecs-0001. If an ECS with the	
1	Login Mode	Password Key pair Set password later			
ß	Username	Administrator			
5	Password	Reap the parsmoot secure. If you longet the parameter, you can log in to the ECS console and change 4.			
÷ )	Confirm Password				
	Cloud Backup and Recovery	To use CER, you need to purchase a backup walk. A walk is a container that stores backups for servers.           Auto assign         Use existing         Not required         To			
	ECS Group (Optional)	Arel alfordy			
		Select ECS group			Ę
		Create ECS Group			6
			_		ĺ
	Quantity 1	+ to prote a unitative and may differ from the final prote. Pricety details		Previous Next: Confirm	1

**Step 6** Select an enterprise project and click **Next**.

NGARES .	HUAWEI CLOUD	Console		Search	Q	Billing Center	Resources	Service Tickets	Enterprise	Develop Tools	ICP License	Support	English	ganyang fuchuandong	I 🗠
≡	< Elastic Clo	ud Server											Assured Pun	chase 🕝 Flexi Pu	rchase
0	(1) Configure B	asic Settings (2) (	onfigure Network ③ Configure Advanced Settings	d Confirm											
es m	Note:	The primary network	Interface does not have an EIP bound, and the ECS cannot access	the Internet.											
0	Configuration	Basic 🖉 Billing Mode Specifications	Pay-per-use Memory-optimized   m6.2xlarge.8   8 vCPUs   64GI8	Region Image	Bangkok Windows Server 2		64bit Chinese		AZ Host Security	AZ1 Basic					
© 4		System Disk	High UO, 100GIB	Data Disk	1 disks   High I/O	1, 250GIB									
@ ©		VPC EIP	vpc-sap(10.10.0.0/16) No EIP bound to the primary network interface	Security Group	default				Primary NIC	subne	-hana (10.10.2.0)	(24)			
		Advanced 🖉	ecssap2	Login Mode	Password				ECS Group	~					
	Enterprise Projec		C Create Enterprise Project ⑦												¢
	Quantity	- 1 +	You can create a maximum of 980 ECSs. You can create a maxi	imum of 500 ECSs at a time. Lear	m how to increase qu	ota.									0
	Agreement I have need and agree to the Image Disclames:											0			
	ECS Price This price is an estima	te and may differ from the fina	l price. Pricing details											Previors	Next

**Step 7** Create and purchase a Windows jump server.

****	IUAWEI CLOUD	Console 🖉 Guangzhou 🔹	Sauch 🛛 Billing Center Resources Service Tickels Enterprise Develop Tools KP License Support English buchwandoog   🗗							
Ξ	< ecs-windowsh	ana-fcd	Feedback Remote Login Start Stop Restart More      C							
0	Summary Dis	ks NICs Security Groups EIPs Monitoring Tags								
& M	ECS Information	32a11779-98c0-4048-a974-80ba8f1311e	Stopped Montering © Montering Hist Security ● East   Enabled							
000.000.0000.0000.00000.0000.00000.00000	Name Description Region AZ Specifications Image	esc-anticoloura-let d - d' Cangthou A2 General Computing plan   di-Alarga 2  16 XCNA   32GB Windows Serve 2012 D2 Standard 6005 Chimese   Malic Lange	Disks     System Disk     ex-sentosedanas. High (JO   200 GB     Data Disk     volume=t/db     Utbs-4righ (JO   500 GB							
4 (†)	VPC Billing Information	vpc fottest	✓ NICs Prinary NC submet-hans 10.10.2.40							
	Billing Mode Obtained Launched	Pay-per-use Jan 27, 2021 20 20:40 GMT-08:00 Jan 27, 2021 20 21:00 GMT-08:00	<ul> <li>Security Groups         default</li> </ul>							
	Management Information Enterprise Project IS Group Create IKS Group		EPS     No DP are bound to the ECS.     In other the ECS accessible from the Internet, apply for an EPF and level it to the ECS. Bind							
	Agency	🖉 🕐 Cinate Agency	Cloud Backup and Recovery     Indextup, for image, IZ741984-9011-4 Mar 68, 2021 09:27:08 GMT-08:00							

**Step 8** After ECSs are created, locate the created ECSs in the ECS list and click **Remote Login** in the **Operation** column. Log in to the ECSs as user **root** using VNC.

HUAWEI CLOUD	Console	Q Beljing4 v			Search	Q. Billing Center	Resources	Service Tickets	Enterprise Develop	Tools ICP License	Support English	hwstaff_pub_Sech	fanage
Cloud Server Console		Elastic Cloud Server ③								G Fee	dback 🚿 ECS News	🛛 🗗 Quick Links	Buy
Deshboard		We would much appreciate if you could complete	ete our questionnaire on Ela	ptic Cloud Server Your feedback will bein	us provide a better user experienc			-					
Elastic Cloud Server				Landan in ta a Linux P	~			×					
Dedicated Host		Start Stop Reset Password	More *	Logging In to a Linux E	:05							C 🛛 🖸	88
Bare Metal Server		Searched by name by default.		CloudShell-based Login New	1		Failed to log i	12					۲
Elastic Volume Service		Name/ID	Monitoring						Billing Mode 🍞	Enterprise Proj	ect Tag	Operation	
Dedicated Distributed Storage Service	•	ecs-a855-h00536693-SA业务制成用-不能 c0d4c10c-a624-4552-8125-35849645906	<sup>#</sup>	group.	CloudShell-based logins (port 22 by		ccess in the securit	y n	Pay-per-use Created on Jun 29, 21	12 default		Remote Login	More +
image Management Service		mtd_test2_sunhamwu-0001 e8ce2a1e-490f-491d-9460-c11cc001846f	۲	Log in				M ')	Pay-per-use Created on May 11, 2	10 default		Remote Login	More •
Auto Scaling Key Pair	•	mtd_test2_sunhamwu-0002 9892a25e-a8e3-47d2-a7eb-b51c60e63db	2	Bind an EIP				sit/s (P)	Pay-per-use Created on May 11, 2	10 default		Remote Login	More +
ECS Group		<ul> <li>mtd_test1_sunhamwu-0002</li> <li>b7fabf0c-edd1-4bb7-8e23-cba8adb15608</li> </ul>		Other Login Modes				i (P)	Pay-per-use Created on May 11, 2	10 default		Remote Login	More +
Hyper Elastic Cloud Server NUW	ø	mtd_test1_sunhanwu-0003 46133b6a-acbf-491f-8a32-9c3a5807b926	۲	Log in using Remote Login o	mothe management console.			M	Pay-per-use Created on May 11, 2	10 default		Remote Login	More *
Cloud Backup and Recovery Cloud Server Backup	8	mtd_test1_sunhamwu-0004 3f71f7ec-df37-4915-9e91-673f8bo479d0	ø	<ul> <li>Log in using a tool, such as it</li> <li>a) Download the remote</li> </ul>	PuTTY or Xshell. Learn more access tool, such as PuTTY.			tbi (P)	Pay-per-use Created on May 11, 2	10 default		Remote Login	More +
Service Volume Backup Service	8	mtd_test1_sunhanwu-0001 9ef08ae1-11a9-44f6-b56d-9f1f0ceb8a0d	8	<ul><li>b) Enter the EIP.</li><li>c) Enter username root an</li></ul>				M IP)	Pay-per-use Created on May 11, 2	10 default		Remote Login	More +
Elastic Load Balance	ø	ecs-menpolangyong-test-0603 e07b6c58-4635-461F-911e-8b142f22910c	ø	- Log in from a Linux PC or M a) Run the following com	iec. mand to set up the connection:			IP)	Pay-per-use Created on Apr 16, 2	02 default		Remote Login	More +
Elastic IP	ø												
Security Group	ø							_					

## 5.4.4 Purchasing and Mounting an SFS Disk

**Step 1** Log in to the HUAWEI CLOUD management console, click the service list icon, and choose **Storage** > **Scalable File Service**.

HUAWES	HUAWEI CLOUD Conso	ole 🛇 Shanghai1 🗸				Search
≡	Service List	Enter a service or function name.				Q
6	Elastic Cloud Server	No Recently Visited Services				
&	Relational Database Service	Compute Elastic Cloud Server		Storage Elastic Volume Service		Networking Virtual Private Cloud
,000.	Auto Scaling	Bare Metal Server	÷.	Dedicated Distributed Storage Service		Elastic Load Balance
	Bare Metal Server	Cloud Phone		Storage Disaster Recovery Service		Direct Connect
$\bigcirc$	Elastic Volume Service	Image Management Service		Cloud Server Backup Service		Virtual Private Network
ð	Volume Backup Service	FunctionGraph		Cloud Backup and Recovery		Domain Name Service
Ô	Virtual Private Cloud	Auto Scaling Dedicated Cloud		Volume Backup Service Object Storage Service	*	NAT Gateway Elastic IP
$\triangle$	Elastic Load Balance	Dedicated Host		Data Express Service		Cloud Connect
0	Domain Registration			Scalable File Service		VPC Endpoint
	-			CDN		
Ð	Elastic IP			Cloud Storage Gateway		Middleware
0	Situation Awareness	Containers Cloud Container Engine				ServiceStage Cloud Service Engine
9	Managed Threat Detection	Cloud Container Instance		Management & Governance OneAccess		Cloud Service Engine ServiceComb
		Software Repository for Container		Cloud Trace Service		Distributed Cache Service Redis
		Multi-Cloud Container Platform		Cloud Eye		Distributed Cache Service Memcached
		CCE Agile		Application Operations Management		Distributed Message Service
		Container Insight Engine		Application Performance Management		Distributed Message Service for Kafka
		Cloud Native Service Center		Identity and Access Management		Distributed Message Service for Rabbit
		Application Service Mesh		Simple Message Notification		Distributed Message Service for High R
		Application Orchestration Service		Log Tank Service		API Gateway

Step 2 Create a file system and record the mount address.

-	HUAWEI CLOUD   Conso	ole 🗴 Guangzhou 👻 Se	sarch Q Billing Center Resources	Service Tickets Enterprise Develop Tools ICP License Support	English ganyang I S
=		Available file system capacity-406.44 TB Refresh the page to update the SFS file system status.			
ය	Scalable File Service	Service Overview			×
.00.	SFS Turbo	Scalable File Service (SFS) is a network-attached storage (NAS) service that provides scalable, high spanning multiple Elastic Cloud Servers (ECSs), Bare Metal Servers (BMSs), and containers created		The Azi Azi Azi	
۲	SFS Capacity-Oriented	SFS service provides two types of file systems: SFS Capacity-Oriented and SFS Turbo. Learn more			
0					ncurrent access by abiple compute nodes ier monaling
Ð		SFS Capacity-Oriented Only for HUAWEI CLOUD Intranet access			w mounting
G		SFS Capacity-Oriented provides up to petabytes of shared file storage hosted on the cloud. With high availability and			
Φ		durability, it can seamlessly handle data-intensive and bandwidth-intensive applications.			
$\odot$		- Scenarios		Scalable File Service	
®		High-performance computing (HPC), media processing, file sharing, content management, and web services			
		Process	yptem is created, you need to mount it to ECSs to that they come.		×
		Delete	All project	ts • All statuses • Name •	Q C U
		Name AZ Status J≣ Protocol Ty J≣ Used Ci	apacity ( ↓	Mount Point	Operation
		sfs-hana AZ3 Available NFS	274.48 Auto Capacity Expansion No	sfs-nas1.cn-south-1c.myhuaweicloud.com;/share-1d592326	Resize   More 🕶

	Details			
	Product Name	Configuration		Quantity
		Region	CN South-Guangzhou	
		Name	sfs-turbo-5fb4	
		Specifications	Standard	
	SFS Turbo	Capacity (GB)		1
		Encryption	No	
		Enterprise Project	default	
		AZ	AZ2	
		VPC	vpc-gl	
	Network	Subnet	subnet-gl(192.168.0.0/24)	-
		Security Group	sg-qlusl1	
	Automatic Backup	Do not use		
6			_	
	this price is an estimate and may differ fro content management, and we		Predus	Submit
T			Preve	Sdomt
	content management, and we	b services	Prevents Prevents Mount Affer a file system is crusted, you need to mount it to ECSs so that they can share acces. Learn how	Sdmt
ice	content management, and we Process 1 Create Select a configuration and cre	b services	2 Mount After a file system is created, you need to mount it to ECSs so that they can share acces.	Sdoret
ice	Content management, and we Process  Treate Select a configuration and cre Create Now	b services eate a file system.	(2)     Mount     An area acces.     Learn how     All projects     v     All statuses     v     Name Used Capaci. JE Maximum Cap. JE Encrypt. JE Mount Point	Operation
ice	Content management, and we Process 1 Create Select a configuration and cre Create Now Delete	b sarvices eate a file system. 2 Status 4ੁ≣ Protoco 43	Q         Mount         After a file system is created, you need to mount it to ECSs so that they can share access.         Learn how         All projects       •         All statuses       •	Operation
ice	Content management, and we Process	b sarvices eate a file system. 2 Status 4ੁ≣ Protoco 43	O     Mount     After a file system is created, you need to mount it to ECSs so that they     can share access.     Learn how     All projects      v     All statuses     v     Name     Used Capace.      JE Maximum Cap.      JE Encrypt.      JE Mount Point     Learner Point	Operation

**Step 3** Log in to an ECS and create a folder.

#### mkdir /sapcd

Step 4 Mount the /db2sfs directory to SFS.

echo "sfs-nas1.\*\*\*:/share-cd3dc3c2 /sapcd nfs vers=3,timeo=600,nolock 1 2" >>/etc/fstab

Run the **mount -a** command to mount the directory.

**Step 5** Run the **df -h** command to view the mounting result.

5	b122:~ #						
5	b122:~ #						
5	b122:~ # df -h	- ·					
3	Filesystem	Size	Used	Avail	Use‰	Mounted o	on
3	/dev/vdal	99G	11G	84G	12%		
1	devtmpfs	32G	0	32G	<u>0</u> %	/dev	
5	tmpfs	48G	84K	48G	1%	/dev/shm	
4	tmpfs	32G	11M	32G	1%	/run	
- 3	tmpfs	32G	0	32G	<u>0</u> %	/sys/fs/c	group
- 3	/dev/vdb	2006	216	1806	11%	/hana	
5	s is-nas1.cr/ <i>d/2012.d/2012.d/2012.d/2012.d/2012</i> .re-1d592326	10P	573G	10P	1%	/sapcd	
5	b <sup>122#</sup>						
5							

----End

### 5.4.5 Creating a File System

Step 1 Run the fdisk -l command to check the unformatted disks.

Step 2 Format disks and logical volumes.

mkfs.xfs /dev/vdb

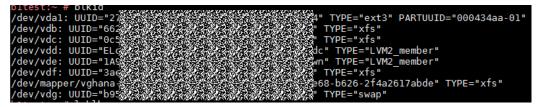
mkfs.xfs /dev/vdc

mkfs.xfs /dev/vde

Create a file system directory.

mkdir -p /usr/sap /hana/log /hana/data /hana/share

Run the **blkid** command to obtain the UUID of the disk.



Create mount points in /etc/fstab.

echo "UUID=662\*\*\*\*\*81dbf9783 /usr/sap xfs defaults 0 0" >>/etc/fstab echo "UUID=0c5\*\*\*\*\*\*19734f /hana/log xfs defaults 0 0" >>/etc/fstab echo "UUID=3ae\*\*\*\*\*05166 /hana/share xfs defaults 0 0" >>/etc/fstab

Step 3 Create LVM volumes.

Run the following commands:

pvcreate /dev/vdd /dev/vde

vgcreate vghana /dev/vdd /dev/vde

vgdisplay vghana

bltest:~ # vgdisplay vg	nana
Volume group	
VG Name	vghana
System ID	
Format	lvm2
Metadata Areas	2
Metadata Sequence No	4
VG Access	read/write
VG Status	resizable
MAX LV	Θ
Cur LV	1
Open LV	1
Max PV	Θ
Cur PV	2
Act PV	2
VG Size	399.99 GiB
PE Size	4.00 MiB
Total PE	102398
Alloc PE / Size	102398 / 399.99 GiB
Free PE / Size	0/0
VG UUID	YN762R-0o0S-gl8F-w42n-Jf07-UM2m-MkMnA2

#### lvcreate -i 2 -l 100%VG -n lvhanadata vghana

mkfs.xfs /dev/mapper/vghana-lvhanadata

uuid3=`blkid /dev/mapper/vghana-lvhanadata | awk '{print \$2}'|awk -F"\"" '{print \$2}'`

echo "UUID=\$uuid3 /hana/data xfs defaults 0 0" >> /etc/fstab

Run the **mount** -a command to mount all disks and run the **df** -h command to check the disk mounting results.

3	/dev/vda: UUID="b95	o3d83-7a0	6-4	44d-90	cf2	-1fee	92fbc49f" TYPE="s
3	🖉 🖉 🖉 # lsblk						
3	NAME	MAJ:MIN	RM	SIZE	R0	TYPE	MOUNTPOINT
3	vda	254:0	Θ	100G	Θ	disk	
3	L_vda1	254:1	Θ	100G	Θ	part	
3	vdb	254:16	Θ	80G			/usr/sap
2	vdc	254:32	Θ	252G	Θ	disk	/hana/log
3	vdd	254:48	Θ	200G	Θ	disk	
	└-vghana-lvhanadata	253:0	Θ	400G	Θ	lvm	/hana/data
3	vde	254:64	Θ	200G	Θ	disk	
3	└-vghana-lvhanadata	253:0	Θ	400G	Θ	lvm	/hana/data
3	vdf	254:80	Θ	300G	Θ	disk	/hana/shared
3	vdg	254:96	Θ	17G	Θ	disk	[SWAP]
- 1	bltoctte # vadieplay	,					

----End

### 5.4.6 Creating a SWAP Partition

**Step 1** Use partitions/disks as the swap partition.

Run the following command to configure the swap partition.

#### mkswap /dev/vdg

**Step 2** Run the following command to enable the swap partition.

#### swapon /dev/vdg

**Step 3** Write the following information to **/etc/fstab**.

echo "UUID=43a73\*\*\*\*\*\*\*d1f433 swap swap defaults 0 0" >> /etc/fstab

**Step 4** Run the following command to check the size of the current memory and swap space. The default unit is KB, and the unit of **-m** is MB

#### free -m

vag		254:96 0	1/6 0 019	SK [SWAP]		
65. A.	free -m					
	total	used	free	shared	buffers	cached
Mem:	64559	1227	63331	49	27	532
-/+ buffer	s/cache:	667	63892			
Swap:	17407	Θ	17407			

**Step 5** Run the following command to check swap information, including detailed information about files and partitions.

swapon -s

3	0	11-01		
asa,at;∼ # swapon -s Filename		Туре	Size Used	Priority
/dev/vdg		partition	17825788	0 -1
bltest:~ #		•		

----End

# 5.4.7 Configuring the hosts File

Configure the **hosts** file. During SAP software installation, the SAP software automatically maps host names to IP addresses.

**Step 1** Run the **vi /etc/hosts** command to add the IP addresses mapped to the host names.

3 3	127.0.0.1	localhost
3	# special IPv6	addresses localhost ipv6-localhost ipv6-loopback
3	fe00::0	ipv6-localnet
3	ff00::0	ipv6-mcastprefix
5	ff02::1 ff02::2	ipv6-allnodes ipv6-allrouters
3	ff02::3 10.10.1.178	ipv6-allhosts b122
2	10.10.1.178	0122

----End

# 5.5 Installing Software

## 5.5.1 Installing SAP HANA

For details about how to install and deploy SAP HANA, see the SAP standard documents and **SAP HANA User Guide (Single-Node Deployment)**.

Note: The client, server, and afl components need to be installed during SAP HANA installation.

**Step 1** Install the server component.

Download the SAP HANA installation package from the official website and decompress it. Go to the DATA\_UNITS/HDB\_SERVER\_LINUX\_X86\_64 directory, and run the ./hdblcm --ignore=check\_signature\_file command. During the installation, configure required parameters.

D122:/sapcd/B1/HAMA/S1050929/DATA_UNITS/SAPHAMADATABASE1.0FURB1/LINX645USE/SAP_HAMA_UATABASE # v1_/etc/hosts b122:/sapcd/B1/HANA/S1050929/DATA_UNITS/SAPHANADATABASE1.0FORB1/LINX64SUSE/SAP_HAMA_DATABASE # ./hdblcmignore=check_signature_file
SAP HANA Lifecycle Management - SAP HANA 1.00.122.03.1475845474
Scanning Software Locations Detected components: SAP HANA Database (1.00.122.03.1475845474) in /sapcd/B1/HANA/S1050929/DATA_UNITS/SAPHANADATABASE1.0FORB1/LINX64SUSE/SAP_HANA_DATABASE/server
Choose installation
Index   System   Database Properties
1   Install new system
2   Extract components   3   Exit (do nothing)
Enter selected system index [3]: 1
Enter Installation Path [/hana/shared]: Enter Local Host Name [bl22]: Do you want to add additional hosts to the system? (y/n) [n]: Enter SAP HANA System ID: HDX Enter Instance Number [00]:
Index   Database Mode   Description
1   single_container   The system contains one database 2   multiple_containers   The system contains one system database and 1n tenant databases
Select Database Mode / Enter Index [1]: 1
Index   System Usage   Description
1         production       System is used in a production environment         2         test         System is used for testing, not production         3         development         System is used for development, not production         4         custom         System usage is neither production, test nor development
Select System Usage / Enter Index [4]: 1 Enter Location of Data Volumes [/hana/data/HDX]: Enter Location of Log Volumes [/hana/Log/HDX]:
Enter Location of Log Volumes [/hana/log/HDX]:
<pre>Select System Usage / Enter Index [4]: 1 Enter Location of Data Volumes [/hana/data/HX]: Enter cortain of Log Volumes [/hana/log/HDX]: Restrict maximum memory allocation? [n]: Enter Certificate Host Name For Host 'b122' [b122]: Enter Certificate Host Name For Host 'b122' [b122]: Enter SAP Host Agent User (sapadm) Password: Confirm SAP Host Agent User (sapadm) Password: Enter System Administrator (hdxadm) Password: Confirm System Administrator (hdxadm) Password: Enter System Administrator User ID [1001]: Enter System Administrator Login Shell [/bin/sh]: Enter System Administrator User ID [1001]: Enter System Administrator User ID [1001]: Enter System Administrator (sapsys) [79]: Enter D of User Group (sapsys) [79]: Enter Database User (SYSTEM) Password: Confirm Database User (SYSTEM) Password: Restart system after machine reboot? [n]: Summary before execution: ====================================</pre>
Certificate Host Names: Di22 -> Di22 System Administrator Home Directory: /usr/sap/HDX/home System Administrator Login Shell: /bin/sh System Administrator User ID: 1001 ID of User Group (sapsys): 79 Software Components SAP HANA Database Install version 1.00.122.03.1475845474 Location: /sapcd/B1/HANA/51050929/DATA_UNITS/SAPHANADATABASE1.0FORB1/LINX64SUSE/SAP_HANA_DATABASE/server Do you want to continue? (y/n): y

Installing package 'Krps kuntime'
Installing package 'Installer'
Installing package 'Ini Files'
Installing package 'HWCT'
Installing package 'Emergency Support Package'
Installing package 'EPM'
Installing package 'Documentation'
Installing package 'Delivery Units'
Installing package 'DAT Languages'
Installing package 'DAT Configfiles'
Creating instance
Starting SAP HANA Database system
Starting 7 processes on host 'b122' (worker):
Starting on 'b122': hdbcompileserver, hdbdaemon, hdbindexserver, hdbnameserver, hdbpreprocessor, hdbwebdispatcher, hdbxsengine
Starting on 'b122': hdbdaemon, hdbindexserver, hdbwebdispatcher, hdbxsengine
Starting on 'b122': hdbdaemon, hdbwebdispatcher, hdbxsengine
Starting on 'b122': hdbdaemon, hdbwebdispatcher
All server processes started on host 'b122' (worker).
Importing delivery units
Importing delivery unit HCO INA SERVICE
Importing delivery unit HANA DT BASE
Importing delivery unit HANA IDE CORE
Importing delivery unit HANA TA CONFIG
Importing delivery unit HANA_UI_INTEGRATION_SVC
Importing delivery unit HANA_UI_INTEGRATION_CONTENT
Importing delivery unit HANA_XS_BASE
Importing delivery unit HANA_XS_DBUTILS
Importing delivery unit HANA_XS_EDITOR
Importing delivery unit HANA_XS_IDE
Importing delivery unit HANA_XS_LM
Importing delivery unit HDC_ADMIN
Importing delivery unit HDC_BACKUP
Importing delivery unit HDC_IDE_CORE
Importing delivery unit HDC_SEC_CP
Importing delivery unit HDC_XS_BASE
Importing delivery unit HDC_XS_LM
Importing delivery unit SAPUIS 1
Importing delivery unit SAP WATT Importing delivery unit HANB BACKUP
Importing delivery unit HANA_BALKUP Importing delivery unit HANA HOBLCM
Importing delivery unit HANA SEC BASE
Importing delivery unit HAWA_SEC_DASE
Importing delivery unit HANA ADMIN
Importing delivery unit HANA WKLD ANLZ
Importing devider y dnic name mice and 2 Installing Resident Hoblem
Instance Appendix Not Contract in the provide the state of the state o
Requertating SL certification on Excel nost
Deploying SAP Host Agent configurations
Creating Component List
SAP HANA system installed
You can send feedback to SAP with this form: https://bl22:ll29/lmsl/HDBLCM/HDX/feedback/feedback.html
og file written to '/var/tmp/hdb HDX hdblcm install 2021-08-06 09.43.07/hdblcm.log' on host 'b122'.

**Step 2** Install the client component.

Run the ./hdbinst command in the installation directory.

	Management - Client Instal ********		
nter Installation necking installat	Path [/usr/sap/hdbclient]:		
	on Python Runtime'		
reparing package	Product Manifest'		
eparing package	SQLDBC'		
eparing package			
reparing package	Python DB API'		
reparing package			
reparing package			
reparing package	Client Installer'		
nstalling SAP HAN	Database Client to /usr/s	ap/hdbclient	
	'Python Runtime'		
	'Product Manifest'		
nstalling package nstalling package			
	'Python DB API'		
istalling package			
stalling package			
nstalling package	'HALM Client'		
	'Client Installer'		

**Step 3** Install the afl component.

In the installation directory, run the **./hdbinst** command and enter **SID**.

bl22:/sapcd/81/HAMA/51050929/DATA UNITS/SAP HANA AFL 1.0 FOR B1/LINX64SUSE/SAP HANA AFL # ./hdbinst
SAP Application Function Libraries installation kit detected.
SAP HANA Lifecycle Management - SAP AFL Installation 1.00.122.30.1475860525
Enter SAP HANA System ID: HDX Checking installation Preparing package 'AFL' Installing SAP Application Function Libraries to /hana/shared/HDX/exe/linuxx86_64/plugins/afl_1.00.122.30.1475860525_3243689 Installing package 'AFL' Stopping system Stopping 7 processes on host 'b122' (worker): Stopping 7 b122': hdbcompileserver, hdbdaemon, hdbindexserver, hdbnameserver, hdbpreprocessor, hdbwebdispatcher, hdbxsengine All server processes stopped on host 'b122' (worker). Starting plugin
Starting or 'b122': hdbcompileserver, hdbdaemon, hdbindexserver, hdbnameserver, hdbpreprocessor, hdbwebdispatcher, hdbxsengine Starting on 'b122': hdbcompileserver, hdbdaemon, hdbindexserver, hdbpreprocessor, hdbwebdispatcher, hdbxsengine Starting on 'b122': hdbdaemon, hdbindexserver, hdbwebdispatcher, hdbxsengine Starting on 'b122': hdbdaemon, hdbwebdispatcher, hdbxsengine Starting on 'b122': hdbdaemon, hdbwebdispatcher, hdbxsengine Starting on 'b122': hdbdaemon, hdbwebdispatcher All server processes started on host 'b122' (worker). Installation done Log file written to '/var/tmp/hdb afl 2021-08-06 09.56.41 5221/hdbinst afl.log' on host 'b122'.

----End

### 5.5.2 Installing SAP Business One

Before installing SAP Business One, modify the configurations on the target server. For details, see **What Should I Do If a SAP Application on an ECS Cannot Be Started**?.

For details about how to install SAP Business One, see standard SAP documents. For more information, visit https://support.sap.com/en/offerings-programs/ support-small-medium-enterprises/business-one.html.

Step 1 Download the installation package from the SAP official website, decompress the package, go to the Packages.Linux/ServerComponents directory, and run the ./ install command to install SAP Business One.

b122:/sapcd/B1/51053060/Packages.Linux/ServerComponents # ./install TEMP\_DIR set to /tmp/B1ServerTools.vT01sms6Af Log File Path:/var/log/SAPBusiness0ne/B1Installer\_202108061000.log

**Step 2** The graphical installation interface is displayed. Configure the required parameter based on the site requirements.

🛐 SAP Business One Server (	Components - 9.30.140 PL04@b122			—		х
				Setu	p Wiz	ard
11	Welcome to the setup wizard for S Please select your setup type:	AP Business One	server componer	nts.		
	Installation and Upgrade					
	Install new components and up	ograde existing c	omponents on th	is mach	ine.	
	SAP Business One Administrator's	Guide				
Cancel					Next	
🚺 SAP Business One Server (	Components - 9.30.140 PL04@b122			_		×
			Specify Inst	allatio	n Fol	der
Specify a folder where y	ou want to install SAP Business One s	erver tools, versi	on for SAP HANA.			_
/usr/sap/SAPBusinessOr	ne					
		Restore Def	fault Folder	Brow	se	
Cancel			Previous		Next	

		·	
		Sel	ect Fea
Component Name	Installed Version	New Version	Action
Server Tools	Installed Version	New Version	Action
Landscape Management			
System Landscape Directory		9.30.140 PL04	Install
Extension Manager		9.30.140 PL04	Install
License Manager		9.30.140 PL04	Install
Job Service		9.30.140 PL04	Install
Mobile Service		9.30.140 PL04	Install
App Framework			
App Framework		9.30.140 PL04	Install
SLD Agent		9.30.140 PL04	Install
Backup Service			
Cancel		Previous	Nex
Cancel		Previous	Nex
AP Business One Server Components - 9.30.140 PL0	4@b122		
AP Business One Server Components - 9.30.140 PL0	4@b122		
			work Ad
AP Business One Server Components - 9.30.140 PLO This computer is represented either by an IP add IP Address 10.10.2.211 Hostname			work Ad

🚺 SAP Business One Server Components - 9.30.140 PL04@b122		-		×
		Serv	rice Po	ort
Specify a port number which will be used by the services to be installed.				
Port Number 40000 Restore Default Port	]			
Cancel	Previous	1	lext	
SAP Business One Server Components - 9.30.140 PL04@b122		-		×
	Lands	cape S	Select	ion
Specify a landscape for this new System Landscape Directory installation.				
New landscape				
<ul> <li>Existing landscape</li> </ul>				
Cancel	Previous	[	Next	

SAP Business One Server Co	mponents - 9.30.140 PL04@b122			-		$\times$
			Site l	Jser F	assw	ord
Enter and confirm the pas Note: For more informatio	ssword for the site user. In about the role of the site user, set	e the <u>Administr</u>	ator's Guide.			
Site User ID	BlSiteUser	]				
Password	•••••					
Confirm Password		į				
Cancel			Previous		Next	
Cancel			Previous		Next	
	mponents - 9.30.140 PL04@b122		Previous	_	Next	×
	mponents - 9.30.140 PL04@b122		Previous Specify Secu	_ rity Co		
SAP Business One Server Cor	TTPS encryption is required by some		Specify Secu		ertific	
SAP Business One Server Cor A secure connection via H	TTPS encryption is required by some Layer.		Specify Secu		ertific	
SAP Business One Server Cor A secure connection via H <sup>-</sup> Directory(SLD) and Service	TTPS encryption is required by some Layer. thentication:		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication:		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	
SAP Business One Server Con A secure connection via H <sup>-</sup> Directory(SLD) and Service Specify a certificate for au © Use a self-signed certif	TTPS encryption is required by some Layer. thentication: iicate		Specify Secu		ertific	

SAP Business One Se	erver Components - 9.30.140 PL04@b122	-	_		×
		Land	scap	e Serv	er
	ess will be used by all other components as SLD address for componer d to use High Availability mode or reverse proxy or virtual address for SI				
You can update SL which SLD is being	D address. Ensure that your network routing will forward the address t installed.	o the lo	cal ma	achine o	n
Landscape Server	10.10.2.211 Port 40000				
					_
Cancel	Previou	ls		Next	
SAP Business One S	erver Components - 9.30.140 PL04@b122		-		×
	Shared folders for System L	andsc	ape l	Directo	ory
such as the remot CD repository and	perform the administrative tasks from the System Landscape Directory e deployment of the system database. To use this functionality, you m central log directory. You can create and register these folders in the	ust crea	ate bo	th the	_
later manually; or	create the default instances now by selecting the following settings.				
🗹 Create a defau	It CD repository based on the installation media currently running.				
🗹 Create a centra	al log directory under the installation folder on the local machine.				
CD Repository					
Local Path	/sapcd/B1/51053060				
Network Path	\\10.10.2.211\B1_DEFAULT_REPOSITORY				
User	b1RepositoryUser				
Central Log					
Local Path	/usr/sap/SAPBusinessOne/ServerTools/SLD/CentralLogFolder				
Network Path	\\10.10.2.211\B1_CENTRAL_LOG_REPOSITORY				
User	blLogUser				
Cancel	Previo	us		Next	

Previous

Next

SAP Business One Serve	er Components - 9.30.140	) PL04@b122				-	-		×
					License	Serve	er N	ode T	ype
	r this new license serve ver as either a standald		ailability no	de if you	require mu	ltiple ho	osts f	or high	
Standalone Node	e								
🔵 High Availability F	Primary Node								
🔵 High Availability 🤅	Secondary Node								
	Conversione Custom Low	- deceme Divert							
Register Licerise	Server into System Lar	idscape Direct	ory						
Cancel					Previou	IS		Next	
	- C				Previou	IS		Next	
Cancel	r Components - 9.30.140	) PL04@b122			Previou	IS	_	Next	×
	r Components - 9.30.140		e Serve	r for Sy	Previou /stem La		- ape l		
SAP Business One Serve	·	Databas			/stem La		- ape l		
SAP Business One Serve	rr Components - 9.30.140 rmation for the new Sys	Databas			/stem La		- ape l		
SAP Business One Serve	·	Databas			/stem La		- ape l		
SAP Business One Serve	·	Databas			<b>∕stem La</b> ∷hema.		- ape l		
SAP Business One Serve	rmation for the new Sys	Databas	e Directory	/ (SLD) sc	<b>∕stem La</b> ∷hema.		- ape l		
SAP Business One Serve	rmation for the new Sys	Databas	e Directory	/ (SLD) sc	<b>∕stem La</b> ∷hema.		- ape l		
SAP Business One Server Specify database infor SAP HANA Server SLD Schema Name	mation for the new Sys	Databas	e Directory	/ (SLD) sc	<b>∕stem La</b> ∷hema.		- ape l		
SAP Business One Serve Specify database infor SAP HANA Server	mation for the new Sys	Databas	e Directory	/ (SLD) sc	<b>∕stem La</b> ∷hema.		ape I		
SAP Business One Server Specify database infor SAP HANA Server SLD Schema Name	mation for the new Sys	Databas	e Directory	/ (SLD) sc	<b>∕stem La</b> ∷hema.		- ape l		

The specified database user requires privileges according to the <u>Administrator's Guide</u> .

Cancel

🛐 SAP Business One Serve	r Components - 9.30.14	0 PL04@b122			-		$\times$
				Backup	Service	e Setti	ings
You can set an upper	ackup service setting: limit on the backup fo written, depending on y	lder size; if there is not	enough sp	ace for a new	backup, t	he olde:	st
Backup Folder	/hana/shared/backuj	p_service/backups		Brow			
Log File Folder	/var/log/SAPBusiness	:One/BackupService/log	s	Brow			
Working Folder	/tmp/backup_service			Brow			
Maximum Backup Fold	er Size (MB)						
Compress company so	chema exports 🗌						
Cancel				Previous		Next	
🚺 SAP Business One Serve	r Components - 9.30.14(	0 PL04@b122			-		×
Add or delete SAP HAN	NA databases for back		SAP H	ANA Databa	ases fo	r Back	up —
Add of delete SAF HA	IA databases for back	ар.					
SAP HAN, 10.10.2.211:30015	A Address	Location Local		Credentials Needed	A	dd	
						lit	
					Del	ete	
Cancel			[	Previous		Next	

			D - I - I D		_
			Restart Da	atabas	se Se
To apply changes made for the a have the server restart automati yourself. For a remote server, you	cally after the setup proces	s is complete or	restart the server		
🔾 Manual Restart					
Automatic Restart					
Cancel			Bravious	]	Next
Cancel			Previous		Next
Cancel SAP Business One Server Componen	nts - 9.30.140 PL04@b122		Previous		Next
	nts - 9.30.140 PL04@b122	Share	Previous	SAP B	
SAP Business One Server Component			d Folders for	– SAP E	
SAP Business One Server Component	SAP Business One Server s	nared folder B1_S	ed Folders for	– SAP E	
SAP Business One Server Component Review the following settings for the Schared Folder	SAP Business One Server s		ed Folders for SHF. One/B1_SHF	SAP E	
SAP Business One Server Component Review the following settings for the following settings for the folder Shared Folder Local Path Network Path Log Folder	SAP Business One Server s	nared folder B1_S	ed Folders for SHF. One/B1_SHF	SAP E	
SAP Business One Server Componen Review the following settings for t Shared Folder Local Path	SAP Business One Server si /usr/ /\ll 0. /\usr/ /usr/	nared folder B1_S	one/B1_LOG	SAP E	

🚺 SAP Business One Server Components - 9.30.140 PL04@b122		-		×
	Samba Se	rvice	Setti	ngs
The shared folder is required for the selected components. To access the share Samba component. You can set Samba to automatically start upon boot.	ed folder, you m	ust sta	rt the	
Enable autostart for Samba service				
Cancel	Previous		Next	
SAP Business One Server Components - 9.30.140 PL04@b122		-		Х
Windows Domain User Authe	ntication (Si	ngle	Sign-(	Dn)
The System Landscape Directory supports Windows domain user authentication client.	for the SAP Bus	iness	One	
If you need this feature, specify a valid domain user and password. Then the domain administrator must use the SetSPN tool to register a Service P Note: For more information about Service Principal Name, see the <u>Administrator</u>				
Do not need domain user authentication				
Use domain user authentication				
Cancel	Previous	[	Next	

Service Layer         Install an Apache load balancer and several load balancer members for the Service Layer.         Installation of all components must be performed locally and separately on respective machines. When installing the load balancer, you must specify the addresses and ports for all load balancer members.         Image: Install Service Layer Load Balancer       Port       50000         Service Layer Load Balance Members       +       -         Maximum Threads per Load Balancer Member       24       -         Maximum Threads per Load Balancer Member       24       -       ×         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×       ×         Review your settings carefully before starting the setup process:
Installation of all components must be performed locally and separately on respective machines. When installing the load balancer, you must specify the addresses and ports for all load balancer members.         ✓ Install Service Layer Load Balancer       Port       50000         Service Layer Load Balance Members       +       -         127.0.0.1       50002       Local         Local       Cancel       Previous       Next         Maximum Threads per Load Balancer Member       24       -       ×         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×       Review Settings         Review your settings carefully before starting the setup process:       Review Settings       -       ×
Service Layer Load Balance Members       +         Service Name / IP Add       Port       Local / Remote         127.0.0.1       50001       Local         Local       Creates a load balancer member on the current machine.         Maximum Threads per Load Balancer Member       24         Maximum Threads per Load Balancer Member       24         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×         Review your settings carefully before starting the setup process:       Review:       Service Settings
Server Name / IP Add       Port       Local / Remote         127.0.0.1       50001       Local         127.0.0.1       50002       Local         127.0.0.1       50003       Local         127.0.0.1       50004       Local         Local       Cancel       Previous         Maximum Threads per Load Balancer Member       24         Cancel       Previous       Next         Review Source Components - 9.30.140 PL04@b122       -       ×         Review your settings carefully before starting the setup process:       Review settings carefully before starting the setup process:
127.0.0.1       50001       Local         127.0.0.1       50002       Local         127.0.0.1       50003       Local         127.0.0.1       50004       Local         Maximum Threads per Load Balancer Member       24         Next         Cancel         Previous       Next         Review Sone Server Components - 9.30.140 PL04@b122         Previous       X         Review your settings carefully before starting the setup process:
127.0.0.1       50002       Local         127.0.0.1       50003       Local         127.0.0.1       50004       Local         127.0.0.1       50004       Local         Maximum Threads per Load Balancer Member       24         Next         Cancel         Previous       Next         Review Some Server Components - 9.30.140 PL04@b122         Previous       Next         Review your settings carefully before starting the setup process:
127.0.0.1       50002       Local         127.0.0.1       50003       Local         127.0.0.1       50004       Local         Maximum Threads per Load Balancer Member       24 <b>Previous Next SAP Business One Server Components - 9.30.140 PL04@b122 Review Settings Review Settings Review your settings carefully before starting the setup process:</b>
127.0.0.1       50004       Local         Maximum Threads per Load Balancer Member       24         Cancel       Previous       Next         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×         Review Settings       Review Settings         Review your settings carefully before starting the setup process:       -       ×
127.0.0.1       50004       Local         Maximum Threads per Load Balancer Member       24         Cancel       Previous       Next         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×         Review Settings       Review Settings         Review your settings carefully before starting the setup process:       -       ×
Maximum Threads per Load Balancer Member       24         Cancel       Previous         Next       Next         SAP Business One Server Components - 9.30.140 PL04@b122       -         Review Settings       Review Settings         Review your settings carefully before starting the setup process:
Cancel       Previous       Next         SAP Business One Server Components - 9.30.140 PL04@b122       -       ×         Review Settings       Review Settings         Review your settings carefully before starting the setup process:       -
SAP Business One Server Components - 9.30.140 PL04@b122 — X Review Settings Review your settings carefully before starting the setup process:
SAP Business One Server Components - 9.30.140 PL04@b122       —       ×         Review Settings         Review your settings carefully before starting the setup process:
Review Settings Review your settings carefully before starting the setup process:
Review Settings Review your settings carefully before starting the setup process:
Review Settings Review your settings carefully before starting the setup process:
Review your settings carefully before starting the setup process:
Review your settings carefully before starting the setup process:
Parameter Value
Installation
Service Port 40000
Network Address 10.10.2.211
Landscape Server
Protocol https
Server Address 10.10.2.211
Server Address 10.10.2.211
Site User 4000
You can save current settings in a property file for future use.       Save Settings         Caution: Passwords will also be saved in the property file.       Save Settings
Cancel Previous Start

- 🗆
Setup Progre
Next
Setup Progre

SAP Business One Server Components - 9.30.140 PL04@b122

Setup Process Completed

\_

 $\times$ 

Component	Action	Result	
Server Tools			-
Landscape Management			
System Landscape Directory	Install	Successful	
Extension Manager	Install	Successful	
License Manager	Install	Successful	
Job Service	Install	Successful	
Mobile Service	Install	Successful	
App Framework			
App Framework	Install	Successful	
SLD Agent	Install	Successful	
Backup Service			
Backup Service	Install	Successful	
SAP Business One Server			
System Components	Install	Successful	
System Database	Install	Successful	-

			Wa	nni
			wa	
Problems were encountered.				
Description	Result	SAP N	lote	
B1AnalyticsPlatformCommon				1
Common database registration check.	Passed			E
Backup Service				
Backup folder check. Backup folder belongs to the correct owner group sapsys.	Passed	2304	314	
Backup folder check. Backup folder has correct access permissions 770.	Passed	2304	314	1
Backup working folder check. Backup working folder belongs to the correct owner group sapsys.	Passed	2304	314	
Backup working folder check. Backup working folder has correct access permissions 770.	Passed	2304	314	
Rackup log folder check. Rackup log folder belongs to the correct owner				-
✓ I confirm that I have read and understood the information in the SAP Note:	в.			
Cancel	Previous		Next	
Cancel	Previous		Next	
	Previous			
	Previous	_	Next	
		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
Cancel SAP Business One Server Components - 9.30.140 PL04@b122 The setup process has been successfully completed.		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122 The setup process has been successfully completed.		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122 The setup process has been successfully completed.		- Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122		- Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122 The setup process has been successfully completed.		– Setup C		
SAP Business One Server Components - 9.30.140 PL04@b122 The setup process has been successfully completed. More Details		- Setup C		et

----End

## 5.5.3 Installing the SAP HANA and SAP Business One Clients

**Step 1** Install the SAP HANA client.

On the Windows client, go to the **SAP\_HANA\_CLIENT** directory and double-click **hdbsetup** to start the installation.

B1 > HANA > 51050929 > DATA_UNIT	S > SAPHANACLIENT1.	0FORB1 → NT_X64	> SAP_HANA_CI	LIENT
^ ^	++			
client	2021/8/5 14:41			
* instruntime	2021/8/5 14:41	+ + + +		
* hdbclientreg	2016/10/7 21:23	÷	39 KB	
* 📑 hdbinst	2016/10/7 21:23	+ + + +	39 KB	
* 🚯 hdbsetup	2016/10/7 21:23		39 KB	
a hdbuninst	2016/10/7 21:23		39 KB	
LABEL.ASC	2016/10/7 21:23	TTT	1 KB	
imsvcr100.dll	2016/10/7 21:23		810 KB	
ा अन्नमा अन्नमा अन्नमा अन्नमा अन्नमा	0.042 1474657934		- 0	×
I 2	3			
Define Client Review & Confirm Properties Choose an installation to update, or cho	Install Software	Finish		
🔿 Update SAP HANA Database Client	Installation	Details		
~	Version: 1.	o be installed 00.120.042.1474657934 4bit		
◉Install new SAP HANA Database Client				
C:\Program Files\sap\hdbclie 📔				
	Installatio	n path: C:\Program Fil	es\sap\hdbclient	
		< Previous	Next > Ca	ancel

	-	×
SAP HANA		
Lifecycle Management		
Define Client <b>Review &amp; Confirm</b> Install Software Finish Froperties		
Sunnary		
SAP HAWA Database Client Installation		
- Installation Path: C:\Program Files\sap\hdbclient - ODBC Driver Name: HDBODBC - Software Components (151 71 MB)		
- ODBC Driver Name: HDBODBC		
- ODBC Driver Name: HDBODBC		
- ODBC Driver Name: HDBODBC		

🔯 SAP	HANA Database Cl	ient Installation 1.00.120.	042.1474657934		-		×
	AP HANA						
LIT	ecycle Man	agement					
I+	1	2	3	4			
	Define Client Properties	Review & Confirm	Install Software	Finish			
		Install	ation finished succ	essfully.			
					View Log	Fir	nish

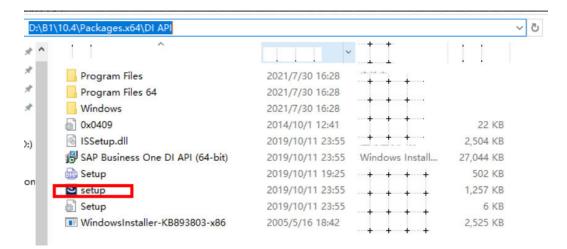
**Step 2** Install the SAP Business One client.

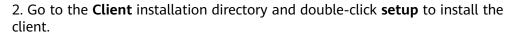
1. Install Prerequisites and DI API (optional and required for SAP Business One 10.0).

Go to the **Prerequisites** directory and double-click **Prerequisites** to start the installation.

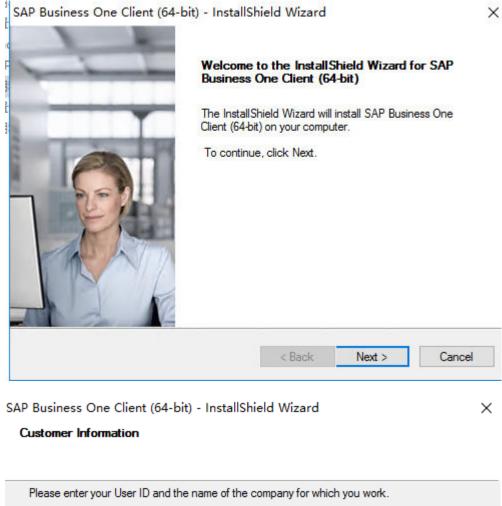
^ ·		1	
ISSetupPrerequisites	2021/7/30 16:30		
🗟 0x0409	2014/10/1 12:41		22 KB
Prerequisites	2019/10/11 23:55		1,573 KB
🔁 Prerequisites	2019/10/11 23:50	Windows Install	2,370 KB
Setup	2019/10/11 23:50		8 KB

Go to the **DI API** directory and double-click **setup** to start the installation.





^			
CRRuntime	2021/8/5 14:50		
GlobalAssemblyCache	2021/8/5 14:50		
Program Files	2021/8/5 14:51		
Program Files 64	2021/8/5 14:50	100000 <b>1</b> 00000 <b>1</b> 0000 <b>1</b> 0000	
SAP B1ClientAgent Installation	2021/8/5 14:52		
Support	2021/8/5 14:51		
Windows	2021/8/5 14:51		
🗟 0x0409	2014/10/1 8:11		22 KB
ISSetup.dll	2018/4/27 22:16	· ·	2,526 KB
arams	2018/4/27 15:35		1 KE
🕞 SAP Business One Client (64-bit)	2018/4/27 22:17	Windows Install	27,811 KE
📾 Setup	2018/4/27 15:44		502 KE
🐸 setup	2018/4/27 22:19		1,257 KB
Setup	2018/4/27 22:17	•·····•	6 KE
WindowsInstaller-KB893803-x86	2005/5/16 14:12		2,525 KB



User ID				
Windows 用户				
Company Name				
hw				
		< Back	Next >	Cancel

SAP Business One Client (64-bit) - InstallShield Wizard	
Select Destination Folder	

×

Specify a folder where you want to install SAP Business One Client (64-bit).
Destination Folder C:\Program Files\SAP\SAP Business One\ Browse
InstallShield
SAP Business One Client (64-bit) - InstallShield Wizard × Select Program Folder Setup will add program icons to the selected program folder. You can type a new folder name or select an existing folder from the list.
Program Folder
SAP Business One
Existing Folders
Accessibility Accessories Administrative Tools Maintenance Start Up System Tools
< Back Next > Cancel

System Landscape Direc	(64-bit) - InstallShield Wizard <b>tory Server Details</b>	
Specify the name and port of location of a shared folder.	of the System Landscape Directory Server, or enter the	
SLD Server Name	Port 40000	
O Shared Folder Location	Browse	
	< Back Next > Cano	el
	<b>Installation Complete</b> The InstallShield Wizard has successfully installed SAP Business One Client (64-bit). To exit the wizard, choose the Finish button.	
0	TO EXICUTE WIZIN, CHOOSE THE FINISH DUILON.	



1. Add the mapping between the SAP Business One ECS and its EIP to the local hosts file in the **C:/Windows/system32/drivers/etc/** directory.

# Copyright (c) 1993-2009 Microsoft Corp. # # This is a sample HOSTS file used by Microsoft TCP/IP for Windows. # # This file contains the mappings of IP addresses to host names. Each # entry should be kept on an individual line. The IP address should # be placed in the first column followed by the corresponding host name. # The IP address and the host name should be separated by at least one # space. # # Additionally, comments (such as these) may be inserted on individual # lines or following the machine name denoted by a '#' symbol. # # For example: # # # source server me.com # # x client host :om localhost name resolution is handled within DNS itself. # # 127.0.0.1 localhost · · 1 localhost 10.10.2.211 ь122 

2. Run the SAP Business One client, enter the name of the SAP Business One ECS, and click **OK**.

- 3. Enter the username **manager** and password **manager**.
- 4. Click Refresh, or click Create to create a company as required,
- 5. Select the created company and click **OK**.

Company connected



----End

### **5.6 FAQs**

# 5.6.1 What Should I Do If a SAP Application on an ECS Cannot Be Started?

#### Symptom

The **/etc/hosts** file contains "**127.0.0.1** *host name host name*". As a result, the SAP application installed on the ECS cannot be started. You need to log in to the ECS where the SAP application is deployed to modify the configurations.

#### 

You only need to perform this operation on the ECS where the SAP application software is deployed.

#### Procedure

- **Step 1** Log in to the ECS where the SAP application software is deployed as user **root**.
- **Step 2** Comment out **manage\_etc\_hosts: localhost** in the configuration file.
  - Run the following command to open the Cloud-Init configuration file /etc/ cloud/cloud.cfg:

vi /etc/cloud/cloud.cfg

2. Comment out **manage\_etc\_hosts: localhost** in the configuration file and save the modification.

Example: #manage\_etc\_hosts: localhost

datasource_list: ['OpenStack'] manage_etc_hosts: localhost
<pre>datasource: OpenStack: # timeout: the timeout value for a request at metadata service timeout : 50 # The length in seconds to wait before giving up on the metadata # service. The actual total wait could be up to # len(resolvable_metadata_urls)*timeout max wait : 120</pre>

Step 3 Delete "127.0.0.1 host name host name" from the /etc/hosts file.

1. Run the following command to open the **/etc/hosts** file:

```
vi /etc/hosts
```

2. Delete "**127.0.0.1** *host name host name*" from the **/etc/hosts** file and save the modification.

```
#
 hosts
                This file describes a number of hostname-to-address
#
                mappings for the TCP/IP subsystem. It is mostly
#
                used at boot time, when no name servers are running.
                On small systems, this file can be used instead of a
#
                "named" name server.
#
# Syntax:
#
# IP-Address Full-Qualified-Hostname Short-Hostname
#
# special IPv6 addresses
::1
       localhost
                        ipv6-localhost ipv6-loopback
fe00::0 ipv6-localnet
ff00::0 ipv6-mcastprefix
ff02::1 ipv6-allnodes
ff02::2 ipv6-allrouters
ff02::3 ipv6-allhosts
127.0.0.1
                localhost
127.0.0.1
                localhost
                                localhost
127.0.0.1
                test-xiongp
                                test-xiongp
```

**Step 4** Restart the SAP application on the ECS where the SAP application has been installed. If the SAP application has not been installed on the ECS, perform the preceding operations and install the SAP software.

----End

### 5.6.2 What Should I Do If a Message Indicating System Landscape Directory (SLD) Failed To Be Connected Is Displayed During the Connection to SAP Business One?

#### Symptom

After the node is restarted, a message indicating System Landscape Directory (SLD) failed to be connected is displayed during the connection to SAP Business One.

After the node is restarted, you need to manually start SAP HANA and SLD. To start SLD, perform the following operation:

Run the following commands:

/etc/init.d/sapb1servertools restart

#### /etc/init.d/b1s restart

bltest:/etc/init.d # cd sapblservertools
<pre>-bash: cd: sapblservertools: Not a directory</pre>
<pre>bltest:/etc/init.d # /etc/init.d/sapblservertools restart</pre>
redirecting to systemctl restart sapblservertools.service
<pre>bltest:/etc/init.d # /etc/init.d/bls restart</pre>
Restarting Service Layer
Stopping service with port 50001.
Stopping service with port 50002.
Stopping service with port 50003.
Stopping service with port 50004.
Stopping service with port 50000.
Starting service with port 50001.
Starting service with port 50002.
Starting service with port 50003.
Starting service with port 50004.
Starting service with port 50000.
Restarted.
hltpst://otc/ipit_d_#

Connect to SAP Business One again.

### 5.7 Change History

#### Table 5-2

Description	Date	Prepared By
This issue is the first official release.	2021-08-30	Fu Chuandong/00469497

# **6** SAP Monitoring Best Practices

Overview

Installing the Monitoring Agent

(Optional) Upgrading the Monitoring Agent

**Viewing Monitoring Metrics** 

Configuring Grafana SAP Full Screen Monitoring

Alarm Configuration

FAQs

### 6.1 Overview

SAP full-screen monitoring developed based on Enterprise Project Management Service (EPS) has been brought offline. SAP full-screen monitoring 2.0 with more powerful capabilities is provided. If you are now using the EPS-based SAP fullscreen monitoring, you need to follow the instructions described in **(Optional) Upgrading the Monitoring Agent** to upgrade the monitoring plug-in accordingly. The SAP full screen monitoring 2.0 provides functions such as SAP system monitoring, alarm statistics, application overview, and overview of CPU usage, memory usage, disk I/O, and network traffic. The SAP full screen monitoring helps you better understand the application resource usage, alarms, and SAP system running status in real time.

**Table 6-1** lists the OSs and product versions supported by the Agent used for collecting monitoring metrics. **Table 6-2** describes the system resource usage of the Agent.

Туре	Version		
OS	• SUSE Linux Enterprise Server (SLES) 12 SP3 for SAP		
	• SUSE Linux Enterprise Server (SLES) 12 SP4 for SAP		
	• SUSE Linux Enterprise Server (SLES) 12 SP5 for SAP		
	SUSE Linux Enterprise Server (SLES) 15 for SAP		
	• SUSE Linux Enterprise Server (SLES) 15 SP1 for SAP		
	• SUSE Linux Enterprise Server (SLES) 15 SP2 for SAP		
SAP HANA	SAP HANA 1.0 SP12 or later and SAP HANA 2.0		
SAP S/4HANA	SAP S/4HANA 1709, SAP S/4HANA 1809, and SAP S/4HANA 1909		
SAP NetWeaver	SAP NetWeaver 7.4 or later		
SAP ECC	EHP7 FOR SAP ERP 6.0 or later		

Table 6-1	Supported	OSs and	product versions
-----------	-----------	---------	------------------

Table 6-2 System resource usage

Resource Type	Usage
Memory	The memory usage of the monitoring metric collecting Agent is from 30 MB to 35 MB.
CPU	The CPU usage of the monitoring metric collecting Agent is from 0.03% to 2.3%.

### 6.2 Installing the Monitoring Agent

# 6.2.1 SAP HANA (Single-Node Deployment Without High Availability Required)

To view the SAP full screen monitoring, the SAP monitoring agent must be installed. In the SAP HANA (single-node deployment without high availability required) scenario, the SAP monitoring agent must be installed on the HANA nodes.

#### Prerequisites

# Ensure that Application Operations Management (AOM) ICAgent has been installed.

 AOM ICAgent is used to collect host OS metrics, such as CPU, memory, and disk. If it has not been installed, install it by referring to Installing an ICAgent.

# Ensure that the AOM FullAccess permission has been assigned to the agency created for the host.

- AOM FullAccess is used for the authentication of AOM metric reporting API. The following describes the procedure to configure the permission.
- **Step 1** Log in to the management console.
- **Step 2** In the navigation pane on the left, click and choose **Identity Access Management** under **Management & Governance**.
- **Step 3** Click **Agencies** in the left pane, and then click **Create Agency** in the upper right corner. The **Create Agency** page is displayed.
- **Step 4** Set agency parameters.
  - **Agency Name**: AOMFullAccess (this name is only for reference)
  - Agency Type: Select Cloud service.
  - Cloud Service: Select Elastic Cloud Server (ECS) and Bare Metal Server (BMS).
  - Validity Period: Retain the default setting.
  - Click **Next** to configure the permission:
    - a. Select **Region-specific projects** for **Scope**.
    - b. Select the region where the cloud server is located.
    - c. Enter AOM FullAccess in the search box and select it in the search result.
    - d. Click OK.
- **Step 5** Configure the agency created in the previous step for the ECS.
  - 1. In the left navigation pane, click and choose **Computing** > **Elastic Cloud Server**.
  - 2. Select the ECS for which you want to configure the agency and click its name to switch to the basic information page.
  - 3. Click the edit button next to **Agency** in the **Management Information** area, select the agency created in **Step 4**, and save the modification.

----End

#### 

AOM 2.0 is now available in the CN-Hong Kong, AP-Bangkok, AP-Singapore, AF-Johannesburg, TR-Istanbul, LA-Mexico City1, LA-Mexico City2, LA-Sao Paulo1, and LA-Santiago regions. **Subscribe to AOM 2.0** and **Upgrade ICAgent** before installing the SAP full screen monitoring for these regions.

#### Procedure

#### Installing and Configuring the Monitoring Agent

**Step 1** Run the following commands to obtain the installation script to install the monitoring agent:

#### cd /tmp

The download paths of the script vary depending on regions. For details about how to obtain the path, see **Table 6-3**. The following commands show the download path in AP-Bangkok.

#### cd /tmp

#### curl https://obs-sap-ap-southeast-2.obs.ap-southeast-2.myhuaweicloud.com/ sapmon/install.sh | sh

Script Name	Descr iptio n	Download Link
install. sh ation script	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/install.sh	
	script	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/install.sh
		CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/install.sh
	SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/install.sh	
	TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/install.sh	
		LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/install.sh
		LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/install.sh
		LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/install.sh
		LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/install.sh

Table 6-3 Links to obtain the installation script

#### **Step 2** Modify the configuration.

- Run the following command to encrypt the password: /usr/local/sapmon/bin/ktool -e
- 2. Enter the password.
- 3. Run the following command to modify the configuration file: vim /usr/local/sapmon/config/sapmon.ini

**Table 6-4** lists the parameters. Set the parameters based on the actual situation. Change the password to the encrypted password obtained in **Step 2.1**.

Туре	Name	Description	Example Value
DEFAULT	log_level	Log level	INFO
	log_file	Log file name. The log file path is <b>/var/log/huawei/</b> <b>sapmon/</b> .	sap_metrics.log
	hostname	OS hostname	hana-1709
database.ha na	enable	Whether to obtain database metrics. The value can be <b>true</b> or <b>false</b> .	true
		NOTE In the SAP HANA (single-node deployment with high availability required) scenario, the parameter is set to <b>true</b> for the active node and to <b>false</b> for the standby node.	
	ha_mode	Whether the database is deployed in high availability (HA) mode. If yes, set this parameter to <b>true</b> . If no, set it to <b>false</b> .	false
	sid	Database SID	S00
	instance_nu mber	Database instance number	00
	tenant_data base_name	Name of the tenant database. This parameter is used in the multi-tenant scenario.	-
		<ul> <li>If the HANA database is for single tenant, you do not need to set this parameter.</li> </ul>	
		<ul> <li>If the HANA database is for multiple tenants, enter the name of the tenant database.</li> </ul>	

Table 6-4 Configuration parameters	Table	6-4	Configuration	parameters
------------------------------------	-------	-----	---------------	------------

Туре	Name	Description	Example Value
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	username	SAP HANA username NOTE You need to use the following SQL statements to grant required permissions to this user: CREATE USER <username> PASSWORD <password> NO FORCE_FIRST_PASSWORD_CH ANGE; GRANT CATALOG READ to <username>; GRANT SELECT on SCHEMA SYS STATISTICS to</username></password></username>	-
	password	<username> SAP HANA user password</username>	-

#### 

If you need to monitor multiple tenant databases, copy and paste parameters under **database.hana**, and change **database.hana** to **database.hana**.<*tenantdb\_name>*.

Replace *<tenantdb\_name>* with the tenant database name, and change values of **username**, **password**, and other required parameters. **username** and **password** indicate the username and password for logging in to the tenant database.

4. Run the following command to restart the monitoring agent.

#### systemctl restart sapmon

----End

#### (Optional) Uninstalling the Monitoring Agent

**Step 1** Run the following command to uninstall the monitoring agent.

rpm -e sapmon

----End

# 6.2.2 SAP HANA (Single-Node Deployment With High Availability Required)

In the SAP HANA (single-node deployment with high availability required) scenario, you need to deploy the monitoring agent on both the active and standby nodes. For details, see **SAP HANA (Single-Node Deployment Without High Availability Required)**.

#### 

- Set **hostname** to the names of hosts of active and standby nodes. On the active node, set the value of **enable** of **database.hana** to **true** to enable the monitoring function.
- After the HA switchover, set the value of **enable** of **database.hana** on the original active node to **false** to stop the monitoring for the original active node. On the original standby node, set the value of **enable** of **database.hana** to **true** to enable the monitoring for it (the new active node after HA switchover).

# 6.2.3 SAP S/4HANA (Single-Node Deployment Without High Availability Required)

In the SAP S/4HANA (single-node deployment without high availability required) scenario, you need to install the SAP monitoring agent on the node where both ASCS and PAS instances are deployed.

#### Prerequisites

# Ensure that Application Operations Management (AOM) ICAgent has been installed.

 AOM ICAgent is used to collect host OS metrics, such as CPU, memory, and disk. If it has not been installed, install it by referring to Installing an ICAgent.

# Ensure that the AOM FullAccess permission has been assigned to the agency created for the host.

- AOM FullAccess is used for the authentication of AOM metric reporting API. The following describes the procedure to configure the permission.
- **Step 1** Log in to the management console.
- **Step 2** In the navigation pane on the left, click and choose **Identity Access Management** under **Management & Governance**.
- **Step 3** Click **Agencies** in the left pane, and then click **Create Agency** in the upper right corner. The **Create Agency** page is displayed.
- **Step 4** Set agency parameters.
  - Agency Name: AOMFullAccess (this name is only for reference)
  - Agency Type: Select Cloud service.
  - Cloud Service: Select Elastic Cloud Server (ECS) and Bare Metal Server (BMS).
  - Validity Period: Retain the default setting.
  - Click **Next** to configure the permission:
    - a. Select **Region-specific projects** for **Scope**.
    - b. Select the region where the cloud server is located.
    - c. Enter AOM FullAccess in the search box and select it in the search result.
    - d. Click **OK**.

#### **Step 5** Configure the agency created in the previous step for the ECS.

- 1. In the left navigation pane, click = and choose **Computing** > **Elastic Cloud Server**.
- 2. Select the ECS for which you want to configure the agency and click its name to switch to the basic information page.
- 3. Click the edit button next to **Agency** in the **Management Information** area, select the agency created in **Step 4**, and save the modification.

----End

#### Procedure

#### Preparations

**Step 1** Obtain SAP NW RFC SDK.

**NOTE** 

To obtain SAP NW RFC SDK, log in at https://support.sap.com/en/my-support/softwaredownloads.html, access downloads of Support Packages & Patches, search for SAP NW RFC SDK 7.50, and download it.

- Step 2 Log in to the cloud server as user root.
- **Step 3** Upload the obtained SAP NW RFC SDK installation package to the **/usr/sap** directory.
- **Step 4** Run the following commands to decompress the SAP NW RFC SDK package to the **/usr/sap** directory:

#### unzip nwrfc750P\_7-70002752.zip

#### mv nwrfcsdk /usr/sap/

----End

#### Installing the Monitoring Agent

**Step 1** Run the following commands to obtain the installation script to install the monitoring agent.

The download paths of the script vary depending on regions. For details about how to obtain the path, see **Table 6-5**. The following commands show the download path in AP-Bangkok.

cd /tmp

wget https://obs-sap-ap-southeast-2.obs.ap-southeast-2.myhuaweicloud.com/ sapmon/install.sh&& sh install.sh --nwrfcsdk-path /usr/sap/nwrfcsdk

/usr/sap/nwrfcsdk is the decompression path in Step 4.

Script Name	Descr iptio n	Download Link
install. sh	Install ation	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/install.sh
	script	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/install.sh
		CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/install.sh
		SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/install.sh
		TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/install.sh
		LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/install.sh
		LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/install.sh
		LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/install.sh
		LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/install.sh

**Table 6-5** Link to obtain the installation script

**Step 2** Modify the configuration.

1. Run the following command to encrypt the password:

#### /usr/local/sapmon/bin/ktool -e

- 2. Enter the password.
- 3. Run the following command to enter the edit mode of the configuration file. Modify the file according to **Table 6-6**, save the file, and exit.

#### vim /usr/local/sapmon/config/sapmon.ini

Modify the parameters based on the actual situation. Change the password to the return code obtained in **Step 2.1**.

Parameter Type	Name	Description	Example Value
DEFAULT	log_level	Log level	INFO
	log_file	Log file name. The log file path is <b>/var/log/huawei/</b> sapmon/.	sap_metrics.log
	hostname	OS hostname	s4hana-1709

 Table 6-6 Configuration parameters

Parameter Type	Name	Description	Example Value
application. netweaver	enable	Whether to obtain the application metrics. The value can be <b>true</b> or <b>false</b> . <b>NOTE</b> In the SAP S/4HANA (single- node deployment with HA required) scenario, set this parameter to <b>true</b> for the active node and to <b>false</b> for the standby node.	true
	ha_mode	Whether to deploy the application in high availability mode. If yes, set this parameter to <b>true</b> . If no, set this parameter to <b>false</b> .	true
	sid	Application SID	S4H
	instance_nu mber	PAS instance ID	10
	client	SAP system ID	000
	username	Application username	ddic
	password	Application password. Enter the encrypted password.	-

#### 

If you need to monitor multiple applications, copy and paste parameters under **application.netweaver**, and change **application.netweaver** to **application.netweaver**.<*sid*>.

sid indicates the application system ID.

4. Run the following command to restart the monitoring agent. **systemctl restart sapmon** 

----End

#### (Optional) Uninstalling the Monitoring Agent

**Step 1** Run the following command to uninstall the monitoring agent.

rpm -e sapmon

----End

# 6.2.4 SAP S/4HANA (Single-Node Deployment With High Availability Required)

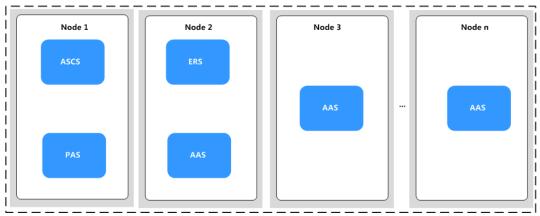
In the SAP S/4HANA (with HA required) scenario, ASCS is deployed on the active node and ERS is deployed on the standby node. You need to deploy the monitoring agent on both the active and standby nodes. For details, see SAP S/ 4HANA (Single-Node Deployment Without High Availability Required).

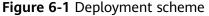
#### 

- Set **hostname** to the names of hosts of active and standby nodes. On the active and standby nodes, set the value of **instance\_number** to the PAS or AAS instance number. On the active node, set **enable** of **application.netweaver** to **true** to enable the monitoring function.
- AAS and PAS must be installed on both the active and standby nodes, and their processes must be started.
- After the HA switchover, set the value of **enable** of **application.netweaver** on the original active node to **false** to stop the monitoring for the original active node. On the original standby node, set the value of **enable** of **application.netweaver** to **true** to enable the monitoring for it (the new active node after HA switchover).

# 6.2.5 SAP S/4HANA (Distributed Deployment with High Availability Required)

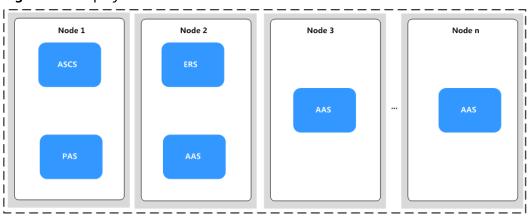
In the SAP S/4HANA (distributed deployment with high availability required) scenario, you need to deploy the monitoring agent on node 1 and node 2, as shown in Figure 6-1. For details about the deployment of the monitoring agent, see SAP S/4HANA (Single-Node Deployment With High Availability Required).





# 6.2.6 SAP S/4HANA (Distributed Deployment Without High Availability Required)

In the SAP S/4HANA (distributed deployment without high availability required) scenario, you need to deploy the monitoring agent on the node where ASCS is located (node 1 in Figure 6-2). For details about the deployment of the monitoring agent, see SAP S/4HANA (Single-Node Deployment Without High Availability Required).



#### Figure 6-2 Deployment scheme

### 6.2.7 SAP ECC

To monitor SAP ECC metrics, you need to follow the operations descried in SAP S/ 4HANA (Single-Node Deployment Without High Availability Required) to deploy and configure the monitoring agent on the node where SAP ECC is located.

# 6.3 (Optional) Upgrading the Monitoring Agent

# Uninstalling the EPS-based SAP Monitoring Plug-in and Installing the Monitoring Agent of the Latest Version

If the ERP-based SAP monitoring plug-in has been installed in your hosts, uninstall it and install the monitoring agent of the latest version.

- **Step 1** Log in to the node where the SAP monitoring plug-in is installed.
- **Step 2** Run the following command to uninstall the EPS-based monitoring plug-in:

#### rpm -e sapmon

**Step 3** Follow the instructions described in **Installing Agent** to install the monitoring agent of the latest version.

----End

#### Upgrading the Monitoring Agent

If the ERP-based SAP monitoring plug-in has not been installed in your hosts, upgrade the monitoring agent due to updated monitoring metrics or monitoring agent optimization requirement to better monitoring the SAP metrics.

- **Step 1** Log in to the node where the monitoring agent is installed.
- **Step 2** Run the following command to upgrade the monitoring agent.

#### /usr/local/sapmon/upgrade.sh

----End

### **6.4 Viewing Monitoring Metrics**

You can view the host OS metrics and SAP system metrics reported to AOM.

#### Procedure

- **Step 1** Log in to the management console.
- **Step 2** In the navigation pane on the left, click and choose **Management &** Governance > Application Operations Management.
- **Step 3** In the navigation pane on the left on the displayed page, choose **Monitoring** > **Metric Monitoring** to view the SAP system metrics and host OS metrics.

----End

#### **Host OS Metrics**

For details about the host OS metrics of AOM, see Metric Overview.

#### **SAP System Metrics**

SAP system metrics are classified into SAP HANA metrics as well as SAP NetWeaver ABAP and SAP NetWeaver Java application metrics, as shown in:

Table 6-7

Table 6-8

Table 6	<b>5-7</b> SAP	HANA	metrics
---------	----------------	------	---------

Metric Group	Metric Name	Description	Unit
database_vers ion	sap_hanadb_database_versio n_info	Database version	
service_quant ity	sap_hanadb_service_quantity _count	Total number of instance processes	coun t
	<pre>sap_hanadb_active_service_q uantity_count</pre>	Number of active processes in an instance	coun t
database_ha_ active	sap_hanadb_database_ha_ac tive_status	Database HA status	stat us
sr_active	sap_hanadb_sr_active_status	Database system replication status	stat us
threads	sap_hanadb_all_threads_cou nt	Total number of threads	coun t
	sap_hanadb_active_threads_ count	Number of active threads	coun t

Metric Group	Metric Name	Description	Unit
	sap_hanadb_blocked_threads _count	Number of blocked threads	coun t
	sap_hanadb_sqlexecutor_thr eads_count	Number of SQL execution threads	coun t
	sap_hanadb_sqlexecutor_thr eads_active_count	Number of active SQL execution threads	coun t
	sap_hanadb_jobworker_thre ads_count	Total number of job threads	coun t
	sap_hanadb_jobworker_thre ads_active_count	Number of active job threads	coun t
recent_data_b ackup	sap_hanadb_age_of_recent_d ata_backup_hours	Number of hours since the last successful full data backup If the backup fails, the value is -1.	hour s
recent_savepo int	sap_hanadb_age_of_recent_s avepoint_minutes	Number of minutes since last SAVEPOINT If the SAVEPOINT does not exist, the value is <b>-1</b> .	min utes
	sap_hanadb_recent_savepoin t_duration_seconds	Duration (in seconds) of the last SAVEPOINT If the SAVEPOINT does not exist, the value is <b>-1</b> .	seco nds
column_table s_used_memo ry	sap_hanadb_column_tables_ used_memory_mb	Memory usage of the data table	mb
schema_used _memory	sap_hanadb_schema_used_m emory_mb	Database schema memory usage	mb
disk_data_file s	sap_hanadb_disk_data_files_ used_size_mb	Used space per file and file type (in MB)	mb
	sap_hanadb_disk_data_files_ total_size_mb	Total space per file and file type (in MB)	mb
	sap_hanadb_disk_data_files_ available_size_mb	Available space per file and file type (in MB)	mb
	sap_hanadb_disk_data_files_f ragmentation_percent	Percentage of unused space compared to total space in file	perc ent

Metric Group	Metric Name	Description	Unit
disk_usage	sap_hanadb_disk_total_devic e_size_mb	Total device size returned by the operating system (in MB). It will be repeated if the device is shared between usages_types.	mb
	sap_hanadb_disk_total_size_ mb	Volume size in MB. It will be repeated if the volume is shared between usages_types.	mb
	sap_hanadb_disk_total_used _size_mb	Used volume size in MB. It will be repeated if the volume is shared between usages_types.	mb
	sap_hanadb_disk_used_size_ mb	Used disk size calculated for each usage type (such as DATA and LOG)	mb
service_memo ry	sap_hanadb_memory_service _shared_allocated_mb	Shared memory in MB allocated from the memory pool to the service	mb
	sap_hanadb_memory_service _shared_used_size_mb	Used Shared Memory part of the memory pool per service in MB	mb
	sap_hanadb_memory_service _shared_used_percent	Percentage of used Shared Memory from the memory pool per service	perc ent
	sap_hanadb_memory_service _heap_allocated_mb	Heap memory allocated from the memory pool to the service	mb
	sap_hanadb_memory_service _heap_used_size_mb	Used Heap Memory part of the memory pool per service in MB	mb
	sap_hanadb_memory_service _heap_used_percent	Percentage of used Heap Memory part of the memory pool per service	perc ent
	sap_hanadb_memory_service _total_used_mb	Total memory that has been applied for from the memory pool for the service	mb
	sap_hanadb_memory_service _physical_total_mb	Total physical memory used by the service	mb

Metric Group	Metric Name	Description	Unit
	sap_hanadb_memory_service _virtual_total_mb	Total virtual memory used by the service	mb
	sap_hanadb_memory_service _code_size_mb	Size of the code snippet used by the service (including the dynamic link library)	mb
	sap_hanadb_memory_service _stack_size_mb	Size of the stack used by the service	mb
	sap_hanadb_memory_service _compactors_freeable_size_ mb	Memory that can be freed during a memory shortage per service in MB	mb
	sap_hanadb_memory_service _compactors_allocated_size_ mb	Potential memory that can be released by the memory pool when the memory is insufficient for the service	mb
	sap_hanadb_memory_service _alloc_limit_mb	Maximum size of the memory pool for the service	mb
	sap_hanadb_memory_service _effective_alloc_limit_mb	Maximum valid memory pool size for the service (calculated by taking other processes into account)	mb
host_memory	sap_hanadb_host_memory_p hysical_total_mb	Total physical memory of the host	mb
	sap_hanadb_host_memory_r esident_mb	Physical memory used by processes on a host	mb
	sap_hanadb_host_memory_p hysical_free_mb	Idle physical memory of a host	mb
	sap_hanadb_host_memory_s wap_free_mb	Idle swap memory of the host	mb
	sap_hanadb_host_memory_s wap_used_mb	Used swap memory of the host	mb
	sap_hanadb_host_memory_a lloc_limit_mb	Maximum memory in MB that can be allocated to all processes on a host	mb

Metric Group	Metric Name	Description	Unit
	sap_hanadb_host_memory_u sed_total_mb	Total memory size occupied by the SAP HANA process in the memory pool	mb
	sap_hanadb_host_memory_u sed_peak_mb	Maximum memory that can be occupied by the SAP HANA process in the memory pool after the instance is started	mb
	sap_hanadb_host_memory_p ool_size_mb	Total memory pool size for the SAP HANA process	mb
	sap_hanadb_host_memory_c ode_size_mb	Total code snippet size of the SAP HANA process, including the dynamic link library	mb
	sap_hanadb_host_memory_s hared_alloc_mb	Total shared memory size of the SAP HANA process	mb
sql_service	sap_hanadb_sql_service_exec utions_count	Total number of execution times of different types of SQL statements	coun t
	sap_hanadb_sql_service_elap sed_time_ms	Total execution time of different types of SQL statements	ms
	sap_hanadb_sql_service_elap _per_exec_avg_ms	Average execution time of different types of SQL statements	ms
	sap_hanadb_sql_service_lock _per_exec_ms	Average lock wait time for executing different types of SQL statements	ms
	sap_hanadb_sql_service_max _ela_time_ms	Maximum time required for executing different types of SQL statements	ms
sql_top_time	sap_hanadb_sql_top_time_co nsumers_execution_time_mu	Top 10 SQL statements with the longest execution duration	mu
	sap_hanadb_sql_top_time_co nsumers_execution_count	Total number of execution times of top 10 SQL statements with the longest execution duration	coun t

Metric Group	Metric Name	Description	Unit
sql_top_mem	sap_hanadb_sql_top_mem_c onsumers_total_execution_m emory_size_byte	Top 10 SQL statements with the largest memory usage	byte
	sap_hanadb_sql_top_mem_c onsumers_execution_count	Total number of execution times of top 10 SQL statements with the largest memory usage	coun t
connections_t otal	sap_hanadb_connections_tot al_count	Total number of connections of different types	coun t
table_cs_top_ mem	sap_hanadb_table_cs_top_m em_total_mb	Top 10 database tables with the largest memory usage	mb
	sap_hanadb_table_cs_top_m em_estimated_max_mb	Estimated maximum memory usage for the top 10 database tables with the largest memory usage	mb
	sap_hanadb_table_cs_top_m em_record_count	Number of data rows in the top 10 database tables with the largest memory usage	coun t
	sap_hanadb_table_cs_top_m em_disk_size_mb	Disk usage of the top 10 database tables with largest memory usage	mb
alerts	sap_hanadb_alerts_current_r ating	Database alarm	ratin g

Table 6-8 SAP NetWeaver A	BAP and SAP NetWeaver	Java application metrics
		Juvu upplication metrics

Metric Group	Metric Name	Description	Unit
application_v ersion	sap_netweaver_application_ver sion_info	Application version	
instance_qua ntity	sap_netweaver_instance_quanti ty_count	Total number of instances in the application system	cou nt
	sap_netweaver_active_instance _quantity_count	Number of active instances in the application system	cou nt
application_h a_active	sap_netweaver_application_ha_ active_status	Application HA status	stat us

Metric Group	Metric Name	Description	Unit
abap_short_d umps	sap_netweaver_abap_short_du mps_count	Number of ABAP Dumps in the last one hour	cou nt
abap_short_d umps_5m	sap_netweaver_abap_short_du mps_5m_count	Number of ABAP Dumps in the last five minutes	cou nt
jobs	sap_netweaver_canceled_jobs_c ount	Number of jobs deleted (canceled) in the last one hour	cou nt
	sap_netweaver_finished_jobs_c ount	Number of jobs completed in the last one hour	cou nt
logged_in_us ers	sap_netweaver_logged_in_users _count	Number of users who have logged in to the SAP application	cou nt
lock_entries_ usage	sap_netweaver_lock_entries_us age_percent	Lock entries usage	perc ent
extended_me mory_utilizati on	sap_netweaver_extended_mem ory_utilization_percent	Extended memory usage (%)	perc ent
heap_memor y_utilization	sap_netweaver_heap_memory_ utilization_percent	Heap memory usage (%)	perc ent
dialog_respon se_time	sap_netweaver_dialog_response _time_ms	Dialog response duration	ms
dialog_db_req uest_time	sap_netweaver_dialog_db_requ est_time_ms	Time required for processing a request from Dialog to the database	ms
work_process es	sap_netweaver_work_processes _utilization_percent	Process usage (%). The types of processes are dialog, background, spool, update 1, and update 2.	perc ent
	sap_netweaver_number_of_tota l_work_processes_count	Total number of processes. The types of processes are dialog, background, spool, update 1, and update 2.	cou nt

Metric Group	Metric Name	Description	Unit
	sap_netweaver_number_of_free _work_processes_count	Number of idle processes. The types of processes are dialog, background, spool, update 1, and update 2.	cou nt
jobs	sap_netweaver_running_jobs_c ount	Number of running jobs	cou nt
failed_idocs	sap_netweaver_failed_idocs_co unt	Number of failed Intermediate Documents (IDocs)	cou nt
update_recor ds	sap_netweaver_update_records _count	Number of update records in the last one minute	cou nt
	sap_netweaver_failed_updates_ count	Number of failed update records in the last one minute	cou nt
rfc_ping	sap_netweaver_rfc_ping_ms	RFC ping latency from each instance to the PAS node	ms
j2ee_running_ process	sap_netweaver_j2ee_running_pr ocess_count	Number of running Java processes	cou nt
j2ee_thread	sap_netweaver_j2ee_thread_co unt	Number of Java threads	cou nt
j2ee_session	sap_netweaver_j2ee_session_co unt	Number of Java sessions	cou nt
j2ee_websessi on	sap_netweaver_j2ee_websessio n_count	Number of Java web sessions	cou nt
j2ee_ejbsessio n	sap_netweaver_j2ee_ejbsession _count	Number of Java EJB sessions	cou nt
j2ee_vm_hea p_size	sap_netweaver_j2eevmheap_siz e_mb	Size of the <b>local</b> classes or local objects heap in the Java process	mb
	sap_netweaver_j2eevmheap_co mmitSize_mb	Commit size of the <b>local classes</b> or <b>local</b> <b>objects</b> heap in the Java process	mb

Metric Group	Metric Name	Description	Unit
	sap_netweaver_j2eevmheap_m axUsedSize_mb	Maximum used size of the <b>local classes</b> or <b>local objects</b> heap in the Java process	mb
	sap_netweaver_j2eevmheap_ini tialSize_mb	Initial size of the <b>local</b> classes or local objects heap in the Java process	mb
	sap_netweaver_j2eevmheap_m axSize_mb	Maximum size of the local classes or local objects heap in the Java process	mb

# 6.5 Configuring Grafana SAP Full Screen Monitoring

By configuring the Grafana SAP full screen monitoring, you can learn about the application resource usage, alarms, and SAP system running status in real time.

#### Prerequisites

- The monitoring agent has been installed. If it has not been installed, follow the instructions described in **Installing the Agent** to install it.
- Grafana has been installed and started. The SAP full screen monitoring is implemented based on Grafana. You need to prepare a host for running Grafana and install and start Grafana on the host. For details about how to install Grafana, see Installing Grafana. During the installation, you are directed to start the Grafana service.

#### Procedure

**Step 1** Log in to Grafana and create an AOM data source on Grafana. For details, see **Viewing Metric Data in AOM Using Grafana**.

#### **NOTE**

If you have upgraded to AOM 2.0, create an AOM data source on Grafana. For details, see **Viewing Metric Data in AOM 2.0 Using Grafana**.

#### 

After Grafana has been installed and started, use a browser to access *Host IP address.Port number* to log in to Grafana. The default port number is **3000**. The default username for first-time login is **admin**. Change the password upon the first-time login. Grafana 9.0.0 is recommended.

**Step 2** Download the Grafana full-screen monitoring template.

Use the following links to download the Grafana full-screen monitoring templates. Download all of the following templates that display system metrics from different dimensions.

#### Table 6-9

Template Name	Description
Overview of SAP System Metrics	Provides an overview of the SAP system metrics.
SAP HANA Metrics	Displays detailed information about SAP HANA metrics.
SAP NetWeaver Metrics	Displays detailed information about SAP NetWeaver metrics.
AOM Host Metrics	Displays details about host OS metrics collected by AOM.

The download path varies depending on the region. For details, see **Table 6-10**.

Template	Download Link
Overview of SAP System Metrics	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview
	LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/templates/en/SAP- Systems-Overview

#### Table 6-10 Links to obtain the templates

Template	Download Link
SAP HANA Metrics	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/templates/en/SAP- HANA
	LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/templates/en/SAP- HANA

Template	Download Link
SAP NetWeaver Metrics	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver
	LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/templates/en/SAP- NetWeaver

Template	Download Link
AOM Host Metrics	AP-Bangkok: https://obs-sap-ap-southeast-2.obs.ap- southeast-2.myhuaweicloud.com/sapmon/templates/en/ AOM-Hosts
	AP-Singapore: https://obs-sap-ap-southeast-3.obs.ap- southeast-3.myhuaweicloud.com/sapmon/templates/en/ AOM-Hosts
	CN-Hong Kong: https://obs-sap-ap-southeast-1.obs.ap- southeast-1.myhuaweicloud.com/sapmon/templates/en/ AOM-Hosts
	SA-Johannesburg: https://obs-sap-af-south-1.obs.af- south-1.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts
	TR-Istanbul: https://obs-sap-tr-west-1.obs.tr- west-1.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts
	LA-Santiago: https://obs-sap-la-south-2.obs.la- south-2.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts
	LA-Sao Paulo1: https://obs-sap-sa-brazil-11.obs.sa- brazil-1.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts
	LA-Mexico City1: https://obs-sap-na-mexico-1.obs.na- mexico-1.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts
	LA-Mexico City2: https://obs-sap-la-north-2.obs.la- north-2.myhuaweicloud.com/sapmon/templates/en/AOM- Hosts

**Step 3** Log in to Grafana and import the downloaded template to Grafana. Hover the

cursor over **Definition** in the upper right corner of the page, click **Import > Upload .json File**, and select the template file to be uploaded. The import details page is displayed.

- **Step 4** Configure import parameters.
  - Prometheus: Select the AOM data source created in enus\_topic\_0000001165750083.xml#EN-US\_TOPIC\_0000001165750083/ li4243935211186.
- **Step 5** After the import parameters are configured, click **Import**.
- **Step 6** Check whether any data reported to AOM exists in the imported template.

----End

# 6.6 Alarm Configuration

After SAP monitoring metrics are reported to AOM, you can use the alarm management function of AOM to notify you of abnormal metrics by email or SMS. For details, see **Alarm Management Usage Description**.

# 6.7 FAQs

### 6.7.1 Why No Data Is Available After I Configured Application Monitoring Successfully on the SAP Full Screen Monitoring Page?

Rectify the fault based on the causes listed in Table 6-11.

Possible Cause	Solution
The SAP full screen configuration is incorrect or the configured application has been deleted.	Enter the edit mode and check whether the application, application SID, database, and database SID are configured as required. If they are incorrect, correct them and update the configuration.
The Agent has not been installed on the cloud server in the application.	Install the Agent and wait for several minutes.
The Agent data is still within the reporting cycle.	The minimum reporting cycle of the SAP monitoring agent is one minute. Wait for one minute and then refresh the data.
The cloud server meta information is incorrectly modified.	Enter the edit mode, update the monitoring configuration, and wait for several minutes.
The parameters in the <b>metrics.ini</b> configuration file are incorrect.	Check whether the configuration file is consistent with the actual application parameters.
The Agent and daemon processes are abnormal.	Check whether the Agent process is normal.
The Agent has not obtained data.	Check <b>/var/log/huawei/sapmon/sap_metrics.log</b> and see whether an error is reported when metrics are obtained.

#### Table 6-11 Troubleshooting

# 6.7.2 How Do I Change the Collection Period of SAP Monitoring Metrics?

- 1. Log in to the node where the monitoring agent is installed.
- 2. Run the following command to open the **metrics.ini** file:

#### vim /usr/local/sapmon/config/metrics.ini

```
[interval]
# unit is minute 1,5,15
database_version = 1
service_quantity = 1
database_ha_active = 1
sr_active = 1
threads = 1
recent_data_backup = 5
recent_savepoint = 1
column_tables_used_memory = 15
schema_used_memory = 15
disk_data_files = 1
disk_usage = 1
service memory = 1
host_memory = 1
sql_service = 1
sql_top_time = 1
sql_top_mem = 1
connections_total = 1
table_cs_top_mem = 15
system_replication = 1
system_replication_takeover = 1
alerts = 1
# FOR APPLICATION
logged_in_users = 1
application_version = 1
instance_quantity = 1
application_ha_active = 1
abap_short_dumps = 1
abap_short_dumps_5m = 5
iobs = 1
lock_entries_usage = 1
extended_memory_utilization = 1
heap_memory_utilization = 1
work_processes = 1
update_records = 1
rfc_ping = 1
failed idocs = 1
dialog_response_time = 1
dialog_db_request_time = 1
j2ee_running_process = 1
j2ee_thread = 1
j2ee_session = 1
j2ee_websession = 1
j2ee_ejbsession = 1
j2ee_vm_heap_size = 1
```

3. Press i to enter the edit mode. Change the collection period of the monitoring metric group.

Example command:

database\_ha\_active = 5

#### **NOTE**

The collection periods of metrics in the same group are managed uniformly. The unit of the collection period is minute, and the collection period can be 1 minute, 5 minutes, or 15 minutes.

4. Press **Esc** and run the **wq!** command to save and exit.

# Best Practices of SAP Migration to HUAWEI CLOUD

#### Overview

**Migration Procedure** 

Migrating the SAP System from the x86 Platform to HUAWEI CLOUD

Migrating from a Third-Party Cloud to HUAWEI CLOUD

Migrating from IBM or HP Midrange Computers to HUAWEI CLOUD

Migrating SAP Applications Running on a Non-HANA Database to HUAWEI CLOUD SAP HANA

Appendix

# 7.1 Overview

# 7.1.1 Migration Scenarios

If your SAP system uses old version software whose performance is poor, or the system is deployed on cloud servers of small specifications with an inflexible architecture, you are suffering from slow system running and high O&M costs, especially when the businesses running on the system are growing. An increasing number of customers are choosing to migrate SAP systems to HUAWEI CLOUD to reduce costs and improve efficiency. HUAWEI CLOUD SAP on Cloud solution provides comprehensive cloud deployment schemes, improving the efficiency and reducing costs.

SAP migration projects are much more complex than traditional IT migration projects. An SAP migration project involves hardware migration, software upgrade, service and interface testing, project management, and risk control. In addition, a SAP migration project involves personnel and organizations from multiple parties, including customer's IT team, service team, migration implementor, and infrastructure provider. A successful migration project requires close collaboration among all the parties. During the migration, HUAWEI CLOUD provides infrastructure and assistants the migration. In addition, HUAWEI CLOUD platform will facilitate the project implementation.

This document is not a replacement of SAP's or database vendor's official documents. This document is intended for SAP migration consultants and SAP practitioners. The restrictions and specifications of SAP software and databases in this document are subject to the official documents.

This document assumes that you are familiar with SAP system deployment and operations on HUAWEI CLOUD. If you are new to HUAWEI CLOUD SAP on Cloud solution, read the following documents:

- SAP Deployment Guide
- SAP S/4HANA Quick Deployment Guide
- SAP HANA User Guide (Single Node)
- SAP NetWeaver User Guide

This document describes how to migrate SAP systems from on-premises or other cloud platforms to HUAWEI CLOUD in four typical migration scenarios, as described in **Table 7-1**. You can select a suitable migration solution based on the actual requirements.

Scenario	Description	Solution
Migrating SAP systems from x86 platform to HUAWEI CLOUD	In this scenario, you migrate an SAP system that is deployed on an x86 physical machine in your on-premises data center or a VMWare virtual machine (VM). The supported operating systems (OSs) of servers are listed in OSs Supported by Different Types of ECSs. There is no restriction on the database. After the migration to HUAWEI CLOUD, the database and OSs remain unchanged.	<ul> <li>Use the following services and tools to migrate the system:</li> <li>Use HUAWEI CLOUD Server Migration Service (SMS) to migrate SAP application servers without service interruption, replicating off-cloud servers to HUAWEI CLOUD.</li> <li>If there is no requirement on database downtime, use the SMS to migrate the database of a non-production system.</li> <li>To reduce the service downtime, use the native database to the cloud. For example, use SystemReplication, Oracle DataGuard, or SQL Logging Shipping migrate HANA.</li> </ul>

Table 7-1 Migration scenarios

Scenario	Description	Solution	
Migrating SAP systems form a third-party cloud to HUAWEI CLOUD	In this scenario, you migrate an SAP system that is deployed on a third-party cloud. The supported server OSs are listed in OSs Supported by Different Types of ECSs. There is no restriction on the database. In addition, other cloud services, such as object storage service, can be involved in. After the migration to HUAWEI CLOUD, the database, OSs, and system architecture remain unchanged. The involved cloud services of other cloud vendors will be changed to those of HUAWEI CLOUD.	<ul> <li>The solution is similar to that of the previous scenario. However, there are some differences:</li> <li>You can easily adjust the network bandwidth between the third-party cloud platform and HUAWEI CLOUD. The maximum bandwidth can be hundreds of Mbit/s.</li> <li>Generally, the system architecture does not need adjustment. If the on-premises system architecture is complex, you need to replan the deployment architecture of the system on the cloud.</li> <li>Generally, an on-premises system contains only physical servers or VMs. A system on a third-party cloud may contain cloud service resources.</li> </ul>	
Migrating SAP systems from IBM or HP midrange computers to HUAWEI CLOUD	In this scenario, you migrate an SAP system deployed on IBM or HP midrange computers. The OSs are not supported by HUAWEI CLOUD. There is no restriction on the database. After the migration, the OSs are changed to those supported by HUAWEI CLOUD, and the database remains unchanged.	<ul> <li>You need to deployed application servers and the database server of the system on HUAWEI CLOUD. The target system is redeployed of HUAWEI CLOUD ECSs or BMSs. Solutions for database migration are as follows:</li> <li>Use the SAP R3load Export/Import function to migrate the database.</li> <li>Or use some native database tools, such as Oracle GoldenGate or Oracle XTTS, to back up databases.</li> </ul>	

Scenario	Description	Solution
Migrating SAP application s running on a non- HANA database to HUAWEI CLOUD SAP HANA	In this scenario, you migrate an SAP system deployed in the local data center. The database is a non-HANA database (such as Sybase, Oracle, and DB2). The target end is HUAWEI CLOUD SAP HANA system. The server OSs may change.	<ul> <li>The project includes system migration, software upgrade, and database and OS change.</li> <li>Use the database migration option (DMO) of SAP SUM to upgrade and migrate the SAP system to HUAWEI CLOUD SAP HANA system.</li> <li>Use the Classical Migration to SAP HANA solution. Use SUM to upgrade the system to a supported version, and then use the System Copy function of SWPM to migrate the system onto the HANA database.</li> </ul>

Due to the complexity of a migration project, this section will not include the detailed migration processes, but only focuses on the part related to HUAWEI CLOUD. There are two types of migration:

- Homogeneous migration: The databases and OSs of the source and destination servers remain unchanged, and the software can be upgraded in the homogeneous migration.
- Heterogeneous migration: Either of databases and OSs are changed.

You can view the following examples:

- Homogeneous migration:
  - Migrating the SAP System from the x86 Platform to HUAWEI CLOUD
  - Migrating from a Third-Party Cloud to HUAWEI CLOUD
- Heterogeneous migration:
  - Migrating from IBM or HP Midrange Computers to HUAWEI CLOUD
  - Migrating SAP Applications Running on a Non-HANA Database to HUAWEI CLOUD SAP HANA

# 7.1.2 Migration Solutions

Table **Migration services and tools** describes the services and tools recommended by HUAWEI CLOUD to migrate an SAP system. The table compares the application scopes, downtime, and migration complexity of the solutions. You can select a solution that meets your requirements. For details about migration operations of each solution, see **Migration Solution Details**.

Service/ Tool	Advantage s and Disadvant ages	Applicati on Scope	Databas Interrup Duratio (Bandw 100 Mb	otion n idth:	Tech nical Supp ort	Scenarios
			500 GB datab ase	2 TB databa se		
Server Migration Service or Server Migration Tool (P2V and V2V migration tools)	Advantage s: The migration of SAP application servers and database servers is easy. Disadvant ages: The downtime is long. Only the X86 platform is supported.	Applies to homogene ous x86 platform migration. The service and tool can migrate SAP applicatio ns and databases. Interrupt the database service when you migrate the database using SMS.	About 18 hours	About 65 hours	HUA WEI CLO UD Serv er Migr ation Servi ce	Migrating an SAP system from the X86 platform to HUAWEI CLOUD Migrating an SAP system from a third-party cloud to HUAWEI CLOUD
Database backup and restoration function	Advantage s: Short downtime Disadvant ages: Only homogene ous migration is supported.	Applies to the migration between databases of the same type.	Full migra tion: About 20 hours Incre ment migra tion: About 2 hours	Full migrati on: About 70 hours Increm ent migrati on: About 2 hours	Data base provi der	Migrating an SAP system from the X86 platform to HUAWEI CLOUD Migrating an SAP system from a third-party cloud to HUAWEI CLOUD

 Table 7-2 Migration services and tools

Service/ Tool	Advantage s and Disadvant ages	Applicati on Scope	Databas Interrup Duratio (Bandw 100 Mb	otion n ridth:	Tech nical Supp ort	Scenarios
Database replication (including HANA SR and Oracle Data Guard)	Advantage s: The downtime is shortened to minutes. Disadvant ages: The operations are complex and require expertise.	Applies to the migration between databases of the same type.	Within 1 hour	Within 1 hour	Data base provi der	Migrating an SAP system from the X86 platform to HUAWEI CLOUD Migrating an SAP system from a third-party cloud to HUAWEI CLOUD Migrating an SAP system from IBM midrange computers to HUAWEI CLOUD (with database restrictions)

Service/ Tool	Advantage s and Disadvant ages	Applicati on Scope	Databas Interrup Duratio (Bandw 100 Mb	otion n ridth:	Tech nical Supp ort	Scenarios
DMO of SAP SUM	Advantage s: You can upgrade the SAP system while migrating the database. Disadvant ages: The operations are complex and require expertise.	Applies to homogene ous and heterogen eous migration and supports SAP upgrade during the database migration. Migrates data from other databases to the HANA database.	About 10 hours	About 45 hours	SAP	Migrating an SAP system from the x86 platform to HUAWEI CLOUD Migrating an SAP system from a third-party cloud to HUAWEI CLOUD Migrating an SAP system from IBM midrange computers to HUAWEI CLOUD Migrating an SAP system running on a non-HANA database to HUAWEI CLOUD SAP HANA database

Service/ Tool	Advantage s and Disadvant ages	Applicati on Scope	Databas Interrup Duratio (Bandw 100 Mb	otion n ridth:	Tech nical Supp ort	Scenarios
R3load (parallel import and export function)	Advantage s: a standard SAP tool that is easy to use Disadvant ages: The downtime is long, which depends on the database size.	Supports homogene ous and heterogen eous migration.	About 24 hours	About 48 hours	SAP	Migrating an SAP system from the x86 platform to HUAWEI CLOUD Migrating an SAP system from a third-party cloud to HUAWEI CLOUD Migrating an SAP system from IBM midrange computers to HUAWEI CLOUD Migrating an SAP system running on a non-HANA database to HUAWEI CLOUD SAP HANA database

# 7.1.3 Related Cloud Services

Public cloud refers to a cloud based on the standard cloud computing model, in which service providers make resources available to the general public over the Internet. The core attribute of a public cloud is its shared resources. HUAWEI CLOUD is a public cloud and provides the following cloud services to implement SAP system migration. You can use HUAWEI CLOUD services independently or together to meet your migration requirements. Table 7-3 lists the cloud services that can be used during the migration.

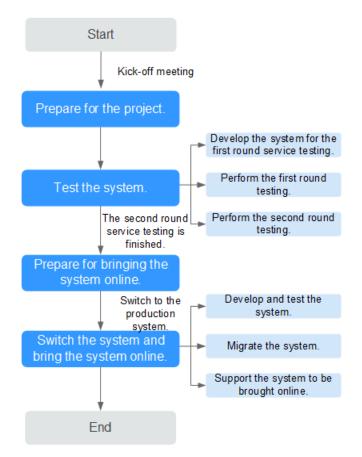
Table 7-3 HUAWEI CLOUD	services
------------------------	----------

Service	Features
SMS	Server Migration Service provides P2V and V2V migration services to help you migrate applications and data from on-premises X86 physical servers or VMs on private or public clouds to HUAWEI CLOUD Elastic Cloud Servers (ECSs).
	SMS migrates SAP application servers while the applications are running, and migrates database servers after the database service is stopped. You can use SMS to migrate incremental data.
	For more information about SMS, see <b>What is Server Migration</b> Service.
IMS	If your SAP application servers can be converted into image files, and the types and OSs of the image files are listed in
	Formats and OSs Supported for External Image Files, you can create the SAP application server image files as private images on HUAWEI CLOUD, and use the images to quickly deploy new application servers.
	For details, see <b>Creating a Linux System Disk Image from an</b> <b>External Image File and Creating a Windows System Disk Image</b> <b>from an External Image File</b> .
OMS	Object Storage Migration Service is an online data migration service. If the source SAP system has object storage data (such as database backup files and software installation media) stored on a third-party cloud, the OMS can smoothly migrate the data from the third-party cloud to the HUAWEI CLOUD.
	Note: This service applies only to migrate objects storage from a third-party cloud.
	For details about how to use the OMS, see <b>Object Storage</b> <b>Migration Service Introduction</b> .
DES	Data Express Service is a massive data transmission solution. It allows transmitting a large amount of data using Teleport devices or disks (with external USB interfaces, SATA interfaces, or SAS interfaces) to HUAWEI CLOUD. DES helps to address issues facing massive data transmission such as high network costs and long transmission time.
	If the source SAP system has storage devices with a large amount of data, for example, the storage device where the database backup directory resides, you can use DES for migration. Whether to use DES depends on the amount of data and the network bandwidth. For details, see <b>DES Application Scenarios</b> .
	For more information about DES, see the <b>DES Product Overview</b> .

# 7.2 Migration Procedure

**Figure 7-1** shows the implementation procedure of a typical SAP migration project.

#### Figure 7-1 Migration procedure



The implementation phases are as follows:

1. Project Preparation

Based on specific requirements and application system information, assess the risks and feasibility of the cloud migration. Collect information and assessment results to plan the project and design the solution. Manage the project, for example, establish a project team and formulate team management regulations.

HUAWEI CLOUD provides a system deployment solution and offers migration suggestions. The solution includes computing, network, and security resources on the cloud, and account systems.

2. Tests and Drills

Set up the migration environment to ensure that the system will meet the requirements after the migration to HUAWEI CLOUD. Ensure that no problem remains unsolved in each phase of the migration project.

HUAWEI CLOUD provides a series of user and deployment guides to help you migrate the system:

- SAP HANA User Guide (Single Node)
- SAP NetWeaver User Guide
- SAP Business One User Guide
- SAP S/4HANA Quick Deployment Guide
- SAP Business One Quick Deployment Guide
- SAP Deployment Guide
- 3. Preparations for Bringing the System Online

Optimize the migration solution based on the drill and test results and determine the final solution. List known issues and transmission items. Test HA, switchover, and shutdown solutions, and decide the switchover and shutdown plan. Design and verify the rollback solution.

This task is performed by the migration implementor and supported by HUAWEI CLOUD.

4. System Switchover

Migrate the workload according to the final switchover plan and solution determined based on the system tests.

This task is performed by the migration implementor and supported by HUAWEI CLOUD.

5. Bringing the System Online

Continuously monitor the system after it is brought online and optimize the cloud architecture if necessary.

This task is performed by the migration implementor and supported by HUAWEI CLOUD.

# 7.3 Migrating the SAP System from the x86 Platform to HUAWEI CLOUD

# 7.3.1 Description

In this scenario, you migrate an SAP system that is deployed on an X86 physical machine in your on-premises data center or VMWare VM. The supported OSs of servers are listed in **OSs Supported by Different Types of ECSs**. There is no restriction on the database. After the migration to HUAWEI CLOUD, the database and OS remain unchanged.

Use HUAWEI CLOUD Server Migration Service to migrate SAP application servers without service interruption, replicating off-cloud servers to HUAWEI CLOUD. For database migration:

- Non-production system database: If there is no requirement on database downtime, use Server Migration Service to migrate the database offline.
- Production system database: To reduce the service downtime, use the native database migration tool to migrate the database.

Figure 7-2 shows the migration plan.

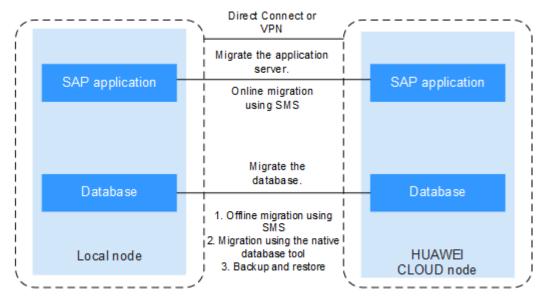


Figure 7-2 Migrating the SAP system from the x86 platform to HUAWEI CLOUD

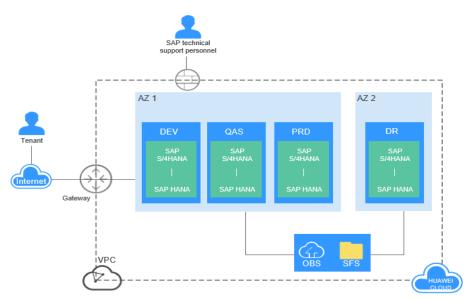
# 7.3.2 Solution Design

## Deployment Plan

Use HUAWEI CLOUD services for the deployment. Specifically, use ECS or BMS for server computing resources, and EVS and SFS for storage.

Migrate Object	Source	Target
Application server	Physical server	ECS
Database server	Physical server	ECS or BMS
Storage	Physical hard disk	EVS

**Figure 7-3** shows a typical SAP system deployment architecture on HUAWEI CLOUD. The architecture of a new deployment or that used in a migration to HUAWEI CLOUD is similar to this one.



#### Figure 7-3 SAP deployment architecture

For more features and details, see **SAP Deployment Guide**.

You can also visit the SAP official website to learn more about the SAP products related to HUAWEI CLOUD. **Table 7-5** lists the SAP notes.

SAP Note #	Title
258229 6	SAP Applications on Huawei Cloud: Supported Products and Huawei Cloud VM types
258230 5	SAP on Huawei Cloud: Support prerequisites
257021 4	Linux on Huawei Cloud: Adaption of your SAP License
257019 8	SAP on Linux with Huawei Cloud: Enhanced Monitoring
264432 2	SAP Adaptive Server Enterprise (ASE) 16.0 Certification Report for Huawei Cloud

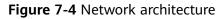
Table 7-5 HUAWEI CLOUD-related SAP notes

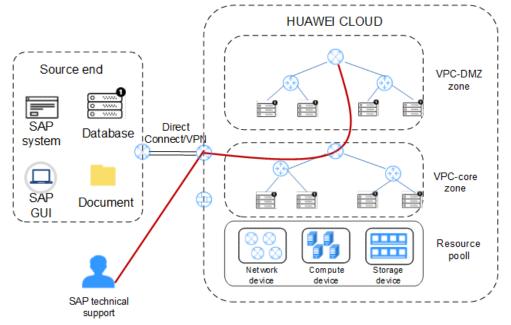
Determine the number and specifications of servers deployed on HUAWEI CLOUD based on the source system status, service requirements, and the preceding information. Then, design the HUAWEI CLOUD deployment plan. The deployment plan needs to contain the detailed information about cloud product selection and networking plan to guide subsequent resource provisioning.

## **Networking Plan**

After the migration, a VPC is used on the cloud. For details about subnet planning, see the VPC User Guide. HUAWEI CLOUD is connected with the on-premises IDC using EIP, VPN, or Direct Connect.

HUAWEI CLOUD VPC is an isolated and private virtual network environment that users apply for on the HUAWEI CLOUD. You can configure IP address segments, subnets, and security groups, assign EIPs, and allocate bandwidths in a VPC. **Figure 7-4** shows the network architecture.





VPC provides multiple connections between the local system of a user and the SAP system running on HUAWEI CLOUD. You can select a connection type as required.

Direct Internet Connection

You can configure a public EIP address on the cloud server to connect it to the public network through the EIP service. The SAP technical support personnel can access the system deployed on HUAWEI CLOUD using the public IP address.

Direct Connect

Direct Connect helps you establish a dedicated network that connects your local data center to the public cloud. Direct Connect sets up dedicated connections between the Direct Connect gateway and a VPC on the public cloud. With Direct Connect, you can establish network circuits between the cloud and your data center, office, or collocation environment. Direct Connect can effectively reduce network latency and improve network experience.

• VPN

VPN establishes a secure, encrypted communication tunnel between the VPN gateway of the VPC on HUAWEI CLOUD and the VPN gateway of your local data center, allowing you to directly use resources in the VPC through the VPN.

By default, cloud servers in a VPC cannot communicate with your data center or private network. To enable communication between them, you can create a VPN.

## Security Design

Enterprises store core data in the SAP system. HUAWEI CLOUD ensures the security of the SAP system based on the cloud platform security and network configurations.

You are recommended to divide the cloud-based system (production environment and development and test environment) into zones of different security levels, including the management, application, SAP DB, and demilitarized zones (DMZ). The zones are isolated from each other using VPCs or subnets.

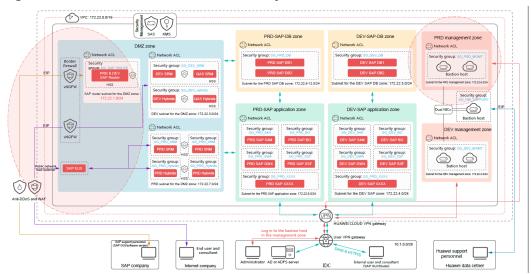
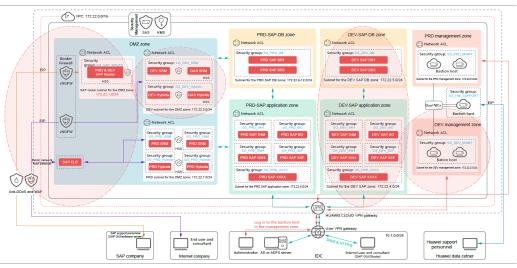


Figure 7-5 Production environment security solution

Figure 7-6 Development and test environment security solution

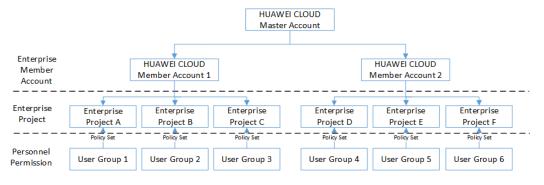


For details, see SAP Security White Paper.

## Service Account System Design

After the system is deployed on the cloud, HUAWEI CLOUD provides enterprise management services for enterprise group uses to manage the employees, finance, and materials in multi-level organizations and multi-project mode and to standardize enterprise operation requirements on HUAWEI CLOUD. Figure 7-7 shows the HUAWEI CLOUD enterprise accounts. For details, see Enterprise Management.

#### Figure 7-7 Enterprise accounts



# **Migration Solution**

**Table 7-6** lists the recommended migration solution. For details about the migration methods, see **Migration Solution Details**.

Migrate Object	Migration Plan	Description
Application server	SMS or SMT <b>NOTE</b> If the source server cannot access SMS, use SMT.	SMS supports online and incremental migration. You are recommended to migrate SAP application servers online in incremental mode for multiple times.
		Data transmission time = Actual data volume/Actual network bandwidth
		<b>Table 7-7</b> lists the estimated time for transmitting 1 TB data. Estimate the time required for transmitting data based on the actual data volume. If the data cannot be transmitted within the estimated time, increase the network bandwidth.

Table 7-6 Migration Solution

Migrate Object	Migration Plan	Description
Database server	<ul> <li>The non-production system database can be migrated offline using SMS.</li> <li>The production system database is migrated using the native database tool, such as the database backup and restore tool.</li> </ul>	If you use SMS to migrate the database, SMS performs online clone of the OS. All the data on the OS, such as the application software and system configurations, is replicated to the target system. Generally, the application software can be started at the target system. However, if the database is migrated when it is running, the database may fail to start after the migration. Therefore, you need to migrate the database offline when you use SMS.

Table 7-7 Theoretical time for transmitting 1 TB data

Network Bandwidth	2 Mbit/s	10 Mbit/s	50 Mbit/s	100 Mbit/s
Theoretical time (80% network utilization rate)	106 days	13 days	60 hours	30 hours
NOTE Transmission time (days) = [Total capacity (KB)]/[Bandwidth (Mbit/s) x 125 x Network utilization rate x 60 (seconds) x 60 (minutes) x 24 (hours)]				

# Service Switchover Plan

The owner of the service switchover plan is the migration implementor. This section provides an example of the service switchover plan.

Migration Plan	Switchover Plan	Impact
Use SMS to migrate application servers online, and use SMT to migrate database servers offline.	<ol> <li>After using SMS to migrate the application servers to HUAWEI CLOUD, use incremental replication to synchronize the source end server changes to HUAWEI CLOUD online.</li> <li>After stopping the database, use SMS to migrate the database servers to HUAWEI CLOUD.</li> </ol>	The database servers are migrated offline, so the interruption will be long. This plan applies to the non- production system. Interruption duration = Data transmission time for the database server + Commissioning time after the migration
Deploy application servers on the cloud, and use the backup and restore plan for database servers.	<ol> <li>Commission the application servers after the deployment.</li> <li>Restore the database servers using full backup.</li> <li>Stop the database at the source end. Upload the incremental data and necessary log files to the database on the cloud. Restore the database using the incremental data.</li> </ol>	Stop the servers at the source end before the incremental backup of the last time. Compared with the offline migration plan, this plan causes shorter interruption, so it applies to the production system. Interruption duration = <b>Time for</b> <b>incremental backup + Time for</b> <b>transmitting incremental data</b> <b>+ Time for restoring the</b> <b>incremental data</b>

#### Table 7-8 Switchover plan example

# 7.3.3 Preparing the Migration Environment

# 7.3.3.1 Preparing Resources

To ensure smooth migration, you need to perform the following operations:

- 1. Prepare the network environment.
  - a. Follow the descriptions in **Networking Plan** to interconnect the source server with HUAWEI CLOUD, establish network connectivity using Cloud Connect, and configure VPN. For details, see **SAP Deployment Guide**.
  - b. Set up the HUAWEI CLOUD network environment, including creating VPCs, subnets, and security groups. For details, see the related section in the **SAP Deployment Guide**.
- 2. Prepare software tools required for the migration, such as SAP migration software and specific database migration tool.

- 3. Prepare resources at the source end.
  - a. Back up the data at the source end, including important files and software installation packages. You are advised to back up the data to HUAWEI CLOUD OBS.
  - b. Check the source server settings. Check whether the source server OS meets migration requirements by referring to OSs Supported by Different Types of ECSs, and check the data volume on the source server.
- 4. Prepare resources at the target end.
  - a. Provision HUAWEI CLOUD server resources based on **Deployment Plan**.
  - b. Set the security parameters based on **Security Design**.
  - c. Purchase OBS, SFS, OMS, and DES on HUAWEI CLOUD as required.

#### 7.3.3.2 Migrating Application Servers to HUAWEI CLOUD

You can migrate SAP application servers to HUAWEI CLOUD using either of the following methods:

- Method 1: Using SMS
- Method 2: Importing Images

**Method 1: Using SMS** is recommended. If VMs are at the source end, you can use **Method 2: Importing Images**.

#### Method 1: Using SMS

If you use SMS for migration, the systems at the source end and target end are basically the same. For details about the changes, see **What Are the Differences Between Target ECSs and Source Servers After the Migration?**.

The following uses an SAP HANA database server as an example to describe the migration procedure.

- **Step 1** Back up the source-end data and software.
- **Step 2** Obtain the AK/SK of the account to which the target server belongs.
  - If you need to use an account to migrate servers, see **How Do I Obtain the AK and SK of an Account?**.
  - If you have created an IAM user under this account, grant the permission to the IAM user and use the IAM user to create the AK/SK. For details, see How Do I Obtain the AK and SK of an IAM User?.
- Step 3 Install the migration Agent on the source server. For details, see How Can I Install the Migration Agent on Source Servers?. Enter the AK/SK obtained in Step 2 when they are required by SMS-Agent.
- **Step 4** After the migration Agent is started successfully, it automatically collects information about the source server and sends collected information to SMS. SMS automatically checks whether the source server information is valid and whether the source server can be migrated. After the migration Agent uploads source server information to SMS, you can log in to the HUAWEI CLOUD management console at any time to view information about the source server using the HUAWEI CLOUD account of the target server. For details, see Viewing Check Results.

**Step 5** Start the migration task. For details, see **Creating and Starting a Migration Task**.

**NOTE** 

- Ensure that source servers are on during the migration.
- When you migrate the database, stop the database before the last time synchronization and then migrate it offline.
- **Step 6** After the migration task is complete, log in to the target server using the source server login mode. Check whether the basic functions are normal, including the network and storage.
- **Step 7** Modify the basic OS settings of the target server to adapt to HUAWEI CLOUD.
  - Modify the DNS and NTP configurations. For details, see How Can I Configure the NTP and DNS Servers for an ECS?.
  - 2. (Optional) Install and configure Cloud-Init. For details, see Installing Cloud-Init and Configuring Cloud-Init.

For more about Cloud-Init, see **Cloud-init**.

- 3. (Optional) Install the HUAWEI CLOUD one-click password reset plug-in. For details, see (Optional) Installing the One-Click Password Reset Plug-in.
- 4. Modify the host name and the **hosts** file as required. For details, see **Changing Host Name**.
- 5. Install Data Provider.

Data Provider is the SAP metric collector on HUAWEI CLOUD. For details about how to install and configure Data Provider, see **Data Provider for SAP User Guide**.

6. Restart the server and check whether other OS errors occur.

Step 8 Check whether the SAP HANA database can start properly.

- 1. Switch to user *{\$SID}*ADM and run the HDB start command to start the database.
- 2. Run the **sapcontrol -nr 00 -function GetProcessList** command to query the status of all SAP HANA processes. The command output shows that all SAP HANA processes are in the GREEN state.

hanaprd01:HDB:s00adm /usr/sap/S00/HDB00 13> sapcontrol -nr 00 -function GetProcessList 02.11.2018 15:39:22 GetProcessList 0K OK name, description, dispstatus, textstatus, starttime, elapsedtime, pid hdbdaemon, HDB Daemon, GREEN, Running, 2018 11 02 15:34:30, 0:04:52, 29652 hdbcompileserver, HDB Compileserver, GREEN, Running, 2018 11 02 15:34:37, 0:04:46, 29875 hdbindexserver, HDB Indexserver-S00, GREEN, Running, 2018 11 02 15:34:37, 0:04:45, 29918 hdbnameserver, HDB Nameserver, GREEN, Running, 2018 11 02 15:34:31, 0:04:51, 29679 hdbpreprocessor, HDB Preprocessor, GREEN, Running, 2018 11 02 15:34:36, 0:04:46, 29877 hdbwebdispatcher, HDB Web Dispatcher, GREEN, Running, 2018 11 02 15:34:51, 0:04:31, 30300 hdbxsengine, HDB XSEngine-S00, GREEN, Running, 2018 11 02 15:34:37, 0:04:45, 29920 0:04:46, 29877 51, 0:04:31, 30300

3. Use SAP HANA Studio to connect to the SAP HANA database and check whether the connection is successful and whether all processes are in the normal state.

SYS	TEMDBO	@S00	(SYSTEM)	S00	192.168.0.9 00			Last Update:	2018-11-2 15#4:02 🔗 🕪	Interval: 60 🗸
Overview	Landscape	Alerts	Performance V	olumes	Configuration System	n Information	Diagnosis Files		and the second se	
Services	Hosts Red	istributio	on System Repli	cation	Host: «All»	~ Se	ervice: <all></all>	v ¥		
Active	Host	Port	Service	Detail	Start Time	Process ID	CPU	Memory	Used Memory (MB)	Peak Used Memo
	hanaprd01	30010	compileserver		2018-11-2 15:40:41	31608			1,381	
8	hanaprd01	30000	daemon		2018-11-2 15:40:35	31412			0	
	hanaprd01	30001	nameserver	master	2018-11-2 15:40:36	31428			3,935	
	hanaprd01	30002	preprocessor		2018-11-2 15:40:41	31610			1,575	
	hanaprd01		sapstartsrv							
			webdispatcher		2018-11-2 15:40:54			1	1,623	

Step 9 (Optional) After a migration task is complete, you can use SMS to synchronize the incremental data from the source servers to the target servers as needed. For details about how to perform the incremental synchronization, see Synchronizing Data After a Migration Task Is Complete.

#### **NOTE**

After the incremental synchronization, the status of the target server becomes consistent with the source server. Perform **Step 6** to **Step 8** after the synchronization is complete.

**Step 10** Connect the application with the database to test whether the system is functional.

----End

#### Method 2: Importing Images

If your source servers can be converted into image files, and the type and OS of the image files are listed in **Formats and OSs Supported for External Image Files**, you can create the source server image files as private images on HUAWEI CLOUD, and use the images to quickly deploy new servers on HUAWEI CLOUD.

- Step 1 Export the source server as images of formats supported by HUAWEI CLOUD. You can use the recommended tool to convert the image format. For details, see Converting the Image Format Using qemu-img.
- **Step 2** Upload the external image file to the OBS bucket. For details, see **Uploading an External Image File**.
- Step 3 Select the uploaded image file on the management console and register the image file as a private image. For details, see Creating a Linux System Disk Image from an External Image File and Creating a Windows System Disk Image from an External Image File.
- **Step 4** Use the created image to provision new servers in the planned environment based on the design.

----End

# 7.3.3.3 Migrating the Database to HUAWEI CLOUD

You can use either of the following methods to migrate the database:

- You can use SMS to migrate the database, but the migration must be performed offline. For details, see **Method 1: Using SMS**.
- If you have high database downtime requirements, you can use the database backup and restoration function or database synchronization technology to migrate the database.

This document uses the SAP HANA database as an example to describe how to reduce migration RTO. For details, see **Method 2: Using the Database Backup and Restore Function** and **Method 3: Using the Database Synchronization Technology**.

## Method 1: Using SMS

To ensure data consistency between the target system and the source system, you need to stop services at the source end before the last time incremental synchronization. Then, repeat procedures in **Method 1: Using SMS**.

## Method 2: Using the Database Backup and Restore Function

The database backup and restoration function uses the backup of the source system data and restore it in the target system.

The following uses the SAP HANA database as an example to describe how to use method to migrate the database to HUAWEI CLOUD.

- **Step 1** Migrate the source database to HUAWEI CLOUD by performing steps provided in Migrating Application Servers to HUAWEI CLOUD. Alternatively, deploy SAP HANA servers on HUAWEI CLOUD. For details, see SAP HANA User Guide.
- **Step 2** Stop the database service at the source end and perform a full backup for the database. Ensure that the necessary logs are retained. Transfer the backup file to the target server on HUAWEI CLOUD.

You can also use OBS to transfer files. OBS provides multiple tools to accelerate the file upload. For details, see **OBS Tools**.

**Step 3** Log in to the target server and use HANA Studio or run the hdbsql command to restore the backup data to the database. For details, see **SAP HANA** Administration Guide.

**NOTE** 

- If the size of a full backup file is large, data transmission and restoration will take a long time. To reduce the downtime, you can restore the data on the target system using a full backup without stopping services on the source system. After you stop the services at the source end, perform a differential or incremental backup and then restore the differential or incremental backup to the target system.
- Alternatively, you can use SMS to migrate source servers to HUAWEI CLOUD so that you do not need to deploy the system again, and part of the backup data can be migrated to the target server. You only need to perform a differential or incremental backup and then restore it to the target system.
- **Step 4** Start the SAP HANA database on the cloud and verify that the database is functional and the data is intact.
- **Step 5** Connect the application with the database to test whether the system is functional.

----End

## Method 3: Using the Database Synchronization Technology

Databases have their native tools to support synchronous data replication, such as HANA System Replication, Oracle Data Guard, On Availability Groups (SQL Server), and Q Replication of DB2.

The following uses the SAP HANA database as an example to describe how to use HANA System Replication to migrate the database to HUAWEI CLOUD.

- Step 1 Migrate the source database to HUAWEI CLOUD by performing steps provided in Migrating Application Servers to HUAWEI CLOUD. Alternatively, you can deploy SAP HANA servers at HUAWEI CLOUD. For details, see SAP HANA User Guide.
- **Step 2** Configure asynchronous system replication from the source SAP HANA database to the target SAP HANA database. For details, see **SAP HANA Administration Guide**.
- **Step 3** Before the system switchover, check HANA System Replication to ensure that the data replication status is normal, and then stop the source SAP application system.
- **Step 4** Run the SAP HANA takeover command on the target database to check the database running status. For details, see **SAP HANA Administration Guide**.
- **Step 5** Start the target SAP application system on the cloud and ensure that the connection between the application system and HANA database is normal.
- **Step 6** Check the system availability and service data integrity on the service side.

----End

# 7.3.4 Tests and Drills

After setting up the environment required for the migration, you can perform tests on target system service functions and service migration drills.

## **Migration Drills**

Use the designed service switchover plan to perform a drill to ensure that the plan meets the requirements. For details about the service switchover plan, see **Service Switchover Plan**.

## **Service Tests**

Check the target system on the cloud and perform complete verification on key service processes. Ensure that the system after the migration can meet service requirements.

# 7.3.5 Switchover and Go-Live

Perform the official system migration according to the plan specified in the migration drill. You can switch over services of the development and test system first, verify that the development and test system is running properly, and then cut over services of the production system.

# 7.4 Migrating from a Third-Party Cloud to HUAWEI CLOUD

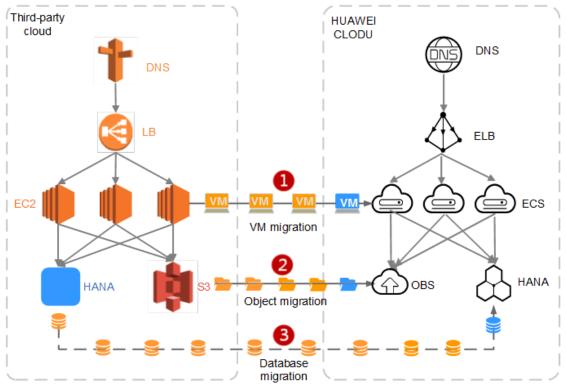
# 7.4.1 Scenario Description

In this scenario, you migrate the SAP system that is deployed on a third-party cloud. The supported server OSs are listed in **OSs Supported by Different Types of ECSs**. There is no restriction on the database. In addition, other cloud services, such as object storage service, can be involved in. After the migration to HUAWEI CLOUD, the database, OS, and system architecture remain unchanged. The involved cloud services of other cloud vendors will be changed to those of HUAWEI CLOUD.

This scenario is similar to the previous one. However, there are some differences:

- You can easily adjust the network bandwidth between the third-party cloud platform and HUAWEI CLOUD. The maximum bandwidth can be hundreds of Mbit/s.
- Generally, the system architecture does not need adjustment. If the onpremises system architecture is complex, you need to replan the deployment architecture of the system on the cloud.
- Generally, an on-premises system contains only physical servers or VMs. A system on a third-party cloud may contain cloud service resources.

**Figure 7-8** shows an example. You can use the same system architecture as the third-party cloud to reduce migration complexity.



#### Figure 7-8 Migrating from a third-party cloud

# 7.4.2 Solution Design

## **Deployment Plan**

To deploy the system on HUAWEI CLOUD, keep the application architecture unchanged and replace third-party cloud services with HUAWEI CLOUD services.

For details about the deployment solution design, refer to section **Deployment Plan**.

## **Networking Plan**

The system networking on HUAWEI CLOUD is the same as that of the source end. The system connects to a third-party cloud through EIP and VPN or Direct Connect.

For details, see **Networking Plan**.

#### **Security Design**

- For details, see **Security Design**. Find more information in the **SAP Security** White Paper.
- For details about permission management, see Service Account System Design.

# **Migration Plan**

Table 7-9 lists the recommended migration solutions.

Object	Solution	Description
Application servers	Server Migration Service <b>NOTE</b> The source server must access HUAWEI CLOUD SMS. Bind a public IP address to the source server.	SMS supports online and incremental migration. You can migrate SAP application servers while the applications are running, and synchronize incremental data several times.
		Data transmission time = Actual data volume/Actual network bandwidth
		<b>Table 7-10</b> lists the estimated time for transmitting 1 TB data. Estimate the time required for transmitting data based on the actual data volume. If the data cannot be transmitted within the estimated time, increase the network bandwidth.
Database	• You can migrate a non- production system database after stop the database service using SMS.	When using SMS, you need to stop the database servcie before the migration to ensure data consistency.
	<ul> <li>You can use the database backup and restoration function or other native database tools to migration the production system database.</li> </ul>	The service interruption duration of using native database tool is shorter than that of using the SMS. For details about the estimated interruption duration, see section <b>Table 7-2</b> .

Network Bandwidth	2 Mbit/s	10 Mbit/s	50 Mbit/s	100 Mbit/s
Theoretical time (80% network utilization rate)	106 days	13 days	60 hours	30 hours
<b>NOTE</b> Transmission time (days) = [Total capacity (KB)]/[Bandwidth (Mbit/s) x 125 x Network utilization rate x 60 (seconds) x 60 (minutes) x 24 (hours)]				

# Service Switchover Plan

The owner of the service switchover plan is the migration implementor. This section provides an example of the service switchover plan.

Table 7-11	Switchover	plan	example
------------	------------	------	---------

Migration Solution	Switchover Plan	Impact
The application servers are redeployed on or migrated to HUAWEI CLOUD by importing images. The database is restored using backup data.	<ol> <li>Redeploy and commission the application servers on HUAWEI CLOUD.</li> <li>Back up the entire source database server and upload full backups to the target system to restore data to the target database.</li> <li>Stop the source database, upload the incremental or differential data and required log files to HUAWEI CLOUD, and restore the backup data to the target database.</li> </ol>	The service interruption duration = the incremental backup duration + the incremental backup transmission duration + the incremental data restoration duration
Use SMS to migrate the application servers, and the database replication function to synchronize database.	<ol> <li>After the application servers are migrated to HUAWEI CLOUD using SMS, use incremental replication to synchronize the servers.</li> <li>Configure synchronous replication from the on- premises database to the cloud database. Stop the services on the source end and perform the service takeover on the cloud database.</li> </ol>	Stop source end services only after the last incremental synchronization is performed using SMS. After the cloud database takes over the services, the service switchover is complete. The service interruption duration is the <b>database switchover</b> <b>duration</b> .

# 7.4.3 Preparing the Migration Environment

# 7.4.3.1 Preparing Resources

For details, see **Preparing Resources**.

# 7.4.3.2 Migrating Application Servers to HUAWEI CLOUD

Perform operations provided in **Method 1: Using SMS** to migrate the application servers. You can also use the method described in **Method 2: Importing Images**.

The procedure is the same as that described in **Migrating Application Servers to HUAWEI CLOUD**.

# 7.4.3.3 Migrating the Database to HUAWEI CLOUD

The migration method is the same as that of scenario 1. For details, see **Migrating the Database to HUAWEI CLOUD**.

# 7.4.4 Tests and Drills

For details, see **Tests and Drills**.

# 7.4.5 Switchover and Go-Live

For details, see **Switchover and Go-Live**.

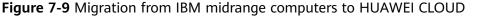
# 7.5 Migrating from IBM or HP Midrange Computers to HUAWEI CLOUD

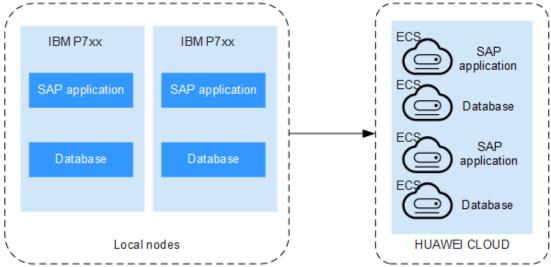
# 7.5.1 Scenario Description

In this scenario, you migrate the SAP system deployed on IBM or HP midrange computers. The OSs are not supported by HUAWEI CLOUD. After the migration, the OSs are changed to those supported by HUAWEI CLOUD, and the database remains unchanged.

You need to deployed application servers and the database servers of the system on HUAWEI CLOUD. The target system is redeployed on HUAWEI CLOUD ECSs or BMSs. Use the export and import functions of R3load to migrate database data. You can also use some native database tools, such as Oracle GoldenGate.

Figure 7-9 shows an example. For details, see section Migrating from IBM or HP Midrange Computers to HUAWEI CLOUD.





# 7.5.2 Solution Design

## **Deployment Plan**

Use HUAWEI CLOUD services for the deployment. Specifically, use ECS or BMS for server computing resources, and EVS and SFS for storage.

For the deployment solution design, refer to section **Deployment Plan**.

## **Networking Plan**

A VPC is used on HUAWEI CLOUD, and subnets are created according to the networking best practices on HUAWEI CLOUD. On-premises IDC connects to HUAWEI CLOUD through EIP and VPN or Direct Connect.

For details, see **Networking Plan**.

#### **Security Design**

For details, see **Security Design**. Find more information in the **SAP Security White Paper**.

For details about permission management, see Service Account System Design.

## **Migration Solution**

Table 7-12 shows the recommended solutions.

Object	Migration Solution	Description
Application servers	Redeployment	If the application servers running OSs that are not supported by HUAWEI CLOUD, you need to deploy the source system on the HUAWEI CLOUD.
Database	<ul> <li>System Copy option of SWPM (R3load import and export functions)</li> <li>Heterogeneous database migration provided by a native database tool, such as Oracle GoldenGate and Oracle XTTS offline database data Export/ Import function</li> </ul>	The R3load export and import function is used in a standard SAP migration solution. If any problem occurs during the migration, you can visit SAP official website to seek for SAP technical support. When using R3load, you need to shut down the servers before exporting the data, and the service interruption duration is long. If you requires shorter service interruption period, use heterogeneous migration provided by the database. For example, Oracle GoldeGate supports to reduce the downtime to almost zero. For more information, see Oracle GoldeGate technical details.

#### Table 7-12 Migration solutions

# Service Switchover Plan

Table 7-13 shows an example.

Migration Solution	Switchover Plan	Impact
The application servers and database server are redeployed on HUAWEI CLOUD. The database is migrated using the SWPM import and export function (R3load).	<ol> <li>After the system is deployed on HUAWEI CLOUD, stop services on the source end and use the SWPM to export the source system.</li> <li>Upload the exported files to the destination system through a private line, and then import the files to the destination system using SWPM.</li> </ol>	The downtime is long, and the system needs to be shut down from the beginning. The service interruption duration = Data exporting duration + File transferring duration+ Data importing duration
The application servers and database server are redeployed on HUAWEI CLOUD. The Oracle database is migrated using the Oracle GoldeGate.	<ol> <li>After the system is deployed on HUAWEI CLOUD, use the Oracle GoldeGate to configure data synchronization from the source to the destination.</li> <li>Stop the services on the source end and perform the service takeover on the cloud database.</li> </ol>	After the cloud database takes over the services, the service switchover is complete. The service interruption duration is the <b>database switchover</b> <b>duration</b> .

#### Table 7-13 Switchover plan example

Migration Solution	Switchover Plan	Impact
The application servers and database server are redeployed on HUAWEI CLOUD. The Oracle database is migrated using Oracle XTTS.	<ol> <li>After the system is successfully deployed on HUAWEI CLOUD, cross-platform transportable tablespaces (XTTS) and multiple incremental backups are used to synchronize data with the cloud.</li> <li>After services on the source end are stopped, perform the data synchronization, and then the database on the cloud takes over the services. This greatly shortens the downtime.</li> </ol>	After the cloud database takes over the services, the service switchover is complete. The service interruption duration is the time of the last incremental synchronization of the database.

# 7.5.3 Preparing the Migration Environment

# 7.5.3.1 Preparing Resources

For details, see **Preparing Resources**.

# 7.5.3.2 Migrating Application Servers to HUAWEI CLOUD

You need to redeploy the system on HUAWEI CLOUD because the OSs running on IBM Power midrange computers are not supported by HUAWEI CLOUD.

## **Redeploying the System**

Deploy the servers on HUAWEI CLOUD. Redeploy the system on HUAWEI CLOUD. For details, see **SAP Deployment Guide**, **SAP HANA User Guide**, and **SAP NetWeaver User Guide**.

# 7.5.3.3 Migrating the Database to HUAWEI CLOUD

Heterogeneous migration may involve replication operations, such as data table splitting and ABAP code modification. These operations require SAP system and database management experience. You may spend more time adjusting the system and planning the migration. Do not change the database type. The following solutions are available:

- Method 1: Use SAP System Copy that is a standard migration solution provided by SAP. If you have any questions during the migration, contact SAP technical support. For details, see Method 1: Using SAP System Copy (R3load).
- Method 2: Use a database native tool. Different databases have their own heterogeneous migration solutions, for example, offline data Export/Import.

# Method 1: Using SAP System Copy (R3load)

SAP System Copy is a standard migration solution supported by SAP's technical personnel. It can migrate data from your database to the HANA database (System Copy - Target Database SAP HANA) and other databases (System Copy - Target Databases Other than SAP HANA).

When using System Copy, stop the services before you start the export. The service interruption duration depends on the database size. Importing and exporting of over 1 TB data takes a long time, which has a great impact on services. Figure 7-10 shows the procedure.

System Migration Procedure



Figure 7-10 System migration

The procedure is described as follows:

- **Step 1** On HUAWEI CLOUD, create the a subnet, configure security group policies, and build the target system, including the database and application servers.
- **Step 2** Stop the source system services. Run the SWPM tool on the source server and use System Copy to export data. For details, see **SAP System Copy**.
- **Step 3** Upload the exported data to the file system of the target system.
- **Step 4** Run the SWPM tool in the target system and use System Copy to import data.
- **Step 5** Verify the system availability and data integrity.

----End

# Method 2: Using the native migration function of your Products and installation programs required for Q Replication and SQL Replication on Linux, UNIX, and Windows - IBM DocumentationProducts and installation programs required for Q Replication and SQL Replication on Linux, UNIX, and Windows - IBM Documentationdatabase.

Databases have their own heterogeneous migration solutions. For example, the Oracle database has **Oracle GoldenGate**, and the DB2 has **Q Replication**, and the offline data Export/Import function. However, heterogeneous migration requires more careful planning and design. Consultants who are familiar with database migration tools are needed for implementing the migration.

# 7.5.4 Tests and Drills

For details, see Tests and Drills.

# 7.5.5 Switchover and Go-Live

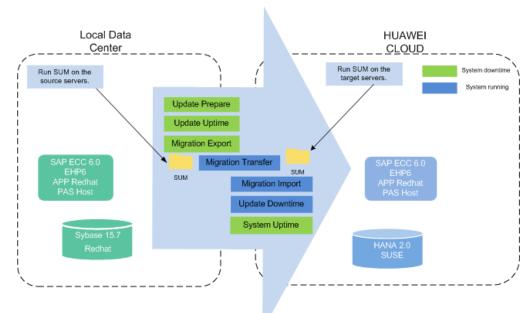
For details, see **Switchover and Go-Live**.

# 7.6 Migrating SAP Applications Running on a Non-HANA Database to HUAWEI CLOUD SAP HANA

# 7.6.1 Scenario Description

In this scenario, you migrate the source SAP system deployed in the local data center. The database is a non-HANA database (such as Sybase, Oracle, and DB2). The target end is HUAWEI CLOUD SAP HANA system. The server OSs may change.

The project includes system migration, software upgrade, database migration, and OS change. Use the DMO of SAP SUM to upgrade and migrate the SAP system to HUAWEI CLOUD SAP HANA system. Alternatively, use the **Classical Migration to SAP HANA** solution. Use SUM to upgrade the system to a supported version, and then use System Copy of SWPM to migrate the system onto the HANA database.



#### Figure 7-11 DMO Migration

# 7.6.2 Solution Design

#### **Deployment Plan**

Use HUAWEI CLOUD services for the deployment. Specifically, use ECS or BMS for server computing resources, and EVS and SFS for storage.

For the deployment solution design, refer to section **Deployment Plan**.

#### **Networking Plan**

A VPC is used on HUAWEI CLOUD, and subnets are created according to the networking best practices on HUAWEI CLOUD. On-premises IDC connects to HUAWEI CLOUD through EIP and VPN or Direct Connect.

For details, see **Networking Plan**.

#### **Security Design**

For details, see **Security Design**. Find more information in the **SAP Security White Paper**.

For details about permission management, see Service Account System Design.

## **Migration Solution**

Redeploy the application servers and database server on HUAWEI CLOUD. For database migration, use the SAP solutions. **Table 7-14** describes the recommended solutions.

Object	Migration Solution	Description
Application servers	Redeployment	Redeployment on HUAWEI CLOUD
Database	<ul> <li>DMO in SUM</li> <li>Classic migration of SAP HANA (only applicable to Java systems)</li> </ul>	<ul> <li>SAP provides the DMO in SUM to upgrade and migrate the SAP system to HUAWEI CLOUD SAP HANA. For details, see Database Migration Option (DMO) of SUM.</li> </ul>
		<ul> <li>Alternatively, use the Classical Migration to SAP HANA solution.</li> <li>Use SUM to upgrade the system to a supported version, and then use System Copy of SWPM to migrate the system onto the HANA database. For details, see Classical Migration to SAP HANA.</li> </ul>

#### Table 7-14 Migration solutions

Generally, data is transmitted over the network. The optimal network bandwidth is higher than 50 Mbit/s.

## Service Switchover Plan

The migration implementor is responsible for the service switchover plan. **Table 7-15** shows an example plan.

Table 7-15 Switchover plan example	Table 1	7-15	Switchover	plan	example
------------------------------------	---------	------	------------	------	---------

Migration Solution	Switchover Plan	Impact
Application servers are newly deployed, and database servers are migrated using DMO.	<ol> <li>Deploy and commission the new system.</li> <li>Stop source database services and use DMO to migrate data to the target system.</li> </ol>	The downtime relates to the service data volume and network bandwidth. The service interruption time of this plan is long.

## 7.6.3 Preparing the Migration Environment

## 7.6.3.1 Preparing Resources

For details, see **Preparing Resources**.

## 7.6.3.2 Migrating Application Servers to HUAWEI CLOUD

You need to redeploy SAP application servers on HUAWEI CLOUD.

### **Redeploying the System**

Redeploy the system on HUAWEI CLOUD. For details, see **SAP Deployment Guide**, **SAP HANA User Guide**, and **SAP NetWeaver User Guide**.

## 7.6.3.3 Migrating the Database to HUAWEI CLOUD

SAP provides the DMO in SUM and typical SAP migration methods to help you migrate data from non-HANA databases to the HANA database. If you are an experienced SAP migration consultants, use these methods to migrate your SAP system to HUAWEI CLOUD.

For details, see the official SAP documents **Classical Migration to SAP HANA** and **Database Migration Option (DMO) of SUM**.

## 7.6.4 Tests and Drills

For details, see Tests and Drills.

## 7.6.5 Switchover and Go-Live

For details, see **Switchover and Go-Live**.

## 7.7 Appendix

## 7.7.1 Migration Solution Details

Table 7-16 describes common SAP system migration methods.

Tool/Method	Description					
Server Migration Service	SMS provides P2V and V2V migration services to help you migrate applications and data from on-premises X86 physical servers or VMs on private or public clouds to ECSs on HUAWEI CLOUD.					
	For details about how to use SMS, see the <b>Server Migration</b> Service Quick Guide.					
	<b>NOTE</b> HUAWEI CLOUD also provides the Server Migration Tool (SMT). The Server Migration Service is the SMT provided as a service, but the SMT has more powerful functions. If the SMS cannot meet your requirements, contact HUAWEI CLOUD technical support.					
	The differences between the SMS and SMT are as follows:					
	<ul> <li>Supported OSs: SMT supports more types and versions. For those supported by SMS, see Supported Source Server OSs.</li> </ul>					
	<ul> <li>Connections: For SMS, source servers need to access HUAWEI CLOUD SMS server through the Internet. If a source server and a target ECS are connected through Direct Connect or VPN, ensure that the source server to be migrated can access the SMS.</li> </ul>					
Image Export/ Import	If your servers can be converted into image files, and the type and OS of the image files are listed in Formats and OSs <b>Supported for External Image Files</b> , you can create server image files as private images on HUAWEI CLOUD, and use the images to quickly deploy new servers.					
	For details, see Creating a Linux System Disk Image from an External Image File and Creating a Windows System Disk Image from an External Image File.					
Database Backup and Restoration	This method uses the database backup function to export data from the source system, transfer the backup files to the destination system, and then use the database restoration function to restore the data.					
	Proper use of the database backup and restoration feature reduces the migration downtime.					
Database Synchronization and Replication	Database replication functions include HANA System Replication, Oracle Data Guard, Always On Availability Groups (SQL Server), and DB2 Q Replication. They all have similar features that allow you to copy a database from one node to another. If you require shorter downtime, use database replication as the data migration tool.					
SAP System Copy (R3load)	The System Copy in SAP Software Provisioning Manager (SWPM) can replicate the SAP system to a new system through the Export/Import function. This document does not describe this tool in detail. However, this is a solution to migrate the SAP system to HUAWEI CLOUD. You can visit SASP official website to find details about					
	System Copy and System Copy and Migration.					

#### Table 7-16 Migration tools and methods

Tool/Method	Description
DMO	Data Migration Option (DMO) is integrated in SAP Software Update Manager (SUM), which upgrades SAP systems and migrate SAP databases. This document does not describe this tool in detail. However, this is a solution to migrate an SAP system to HUAWEI CLOUD. For details, visit the SAP website at Database Migration Option (DMO) of SUM.
Classic migration to SAP HANA	This solution uses a series of processes and tools including heterogeneous System Copy to migrate data from a database to the HANA database. This document does not describe this solution in detail. However, you can use this solution to migrate the SAP system to HUAWEI CLOUD. For details about the solution, see <b>Classical Migration to</b> <b>SAP HANA</b> .
Object Storage Migration Service	OMS is an online data migration service that helps users easily and smoothly migrate object storage data from other public clouds to HUAWEI CLOUD. For details about how to use OMS, see the <b>Object Storage</b> <b>Migration Service Quick Start</b> .
Data Express Service	DES is a massive data transmission solution. It allows transmitting a large amount of data using Teleport devices or disks (with external USB interfaces, SATA interfaces, or SAS interfaces) to HUAWEI CLOUD. DES helps to address issues facing massive data transmission such as high network costs and long transmission time. For details about how to use DES, see <b>Data Express Service</b> <b>Quick Start</b> .

## **8** Best Practice of Using Block-Level Migration of SMS to Migrate SAP Applications and Databases Running on Linux Servers

Block-Level Migration of SMS Preparing for the Migration Performing the Migration Change History

## 8.1 Block-Level Migration of SMS

In block-level migrations, a block refers to a disk block. A disk block is the minimum logical unit of the file system for managing disk partitions. Disk blocks are similar to clusters in Windows. A block is also the minimum logic unit of disks used by OSs and software. The smallest unit for disk read or write is a sector. A sector is a physical area on the disk. The read and write operations to disk blocks are performed in sectors. Generally, a file is stored in several blocks, and one block maps to several physical sectors.

In block-level migrations, the file system is migrated by blocks. Therefore, if the network is interrupted during the migration, only impacted blocks need to be migrated again after the network is recovered. If files are modified during the migration, only modified blocks need to be synchronized after the migration. In file-level migrations, various tools like TAR and SSH or other transmission protocols are used for remote replication. Therefore, if the file is changed during decompression or the network is interrupted during migration, the migration fails. In addition, if the file is changed during incremental data synchronization, the file needs to be synchronized again. In this case, all the blocks of the file must be synchronized. So, the synchronization efficiency is low. Block-level migration of file systems can better meet the incremental data synchronization requirements of SAP databases.

For more information about SMS, see **Server Migration Service User Guide**.

## 8.2 Preparing for the Migration

## 8.2.1 Application Scenarios

The block-level migration of SMS can be used in the following SAP migration scenarios:

- SAP HANA independent databases
- Applications and SAP HANA database on the SAP ERP single node
- Applications and SAP HANA database on SAP ERP nodes deployed in HA mode (including the shared disks)

#### 

The block-level migration function of SMS cannot be used to migrate SFS and SFS Turbo. The migration of SFS and SFS Turbo must be completed at the file system level.

## 8.2.2 Preparations for Using SMS

The SMS of the latest version is used for the migration. Before using SMS, prepare the account and source and destination server environments, and obtain the required permissions. For details, see **Preparations Before Migration**.

SAP HANA and SAP S/4HANA1809 are installed on the source server used in this migration. After the migration is complete, SAP HANA and SAP S/4HANA1809 are also available on the destination server and can be started and run properly.

## 8.2.3 (Optional) Preparing a Destination ECS

For Linux block-level migration, you can choose to create an ECS or use the existing ECS as the destination server. Perform the following operations if you choose to use the existing ECS as the destination server.

Linux block-level migration of SMS is used here for the migration between different AZs in the same region. Before the migration, create a destination ECS with the same specifications, including disk quantity and size as well as OS, as those of the source server, and deploy it in the same VPC and region with but different AZs from the source server.

#### 

The created destination ECS must meet the following requirements. Otherwise, the migration may fail.

- A target server running Windows must have at least 2 GB memory.
- The destination server must have at least as many disks as the source server, and the size of each disk on the destination server must be at least as large as those on the source server.
- The destination server must run the same OS as the source server, or there will be a server name conflict.
- The destination server must have been configured with an EIP, VPN, or Direct Connect connection.
- The security group of the VPC that the destination ECS is in must be correctly configured. If the destination ECS runs Windows, enable the TCP ports **8899** and **8900**. If the destination ECS runs Linux, enable ports **8900** and **22**.

For details, see **How Do I Configure the Security Group Rules for Target Servers?** 

## 8.3 Performing the Migration

## 8.3.1 Installing the Migration Agent on the Source Server

You need to install the Agent on each Linux source server that you want to migrate. During the Agent installation, you need to enter the AK/SK pair of your HUAWEI CLOUD account of the destination ECS. After the Agent is started successfully, it automatically reports source server information to SMS.

Step 1 Log in to the source server to be migrated as user root.

Run the following command to download the Agent:

```
wget -t 3 -T 15 https://sms-agent-2-0-cn-north-1.obs.cn-
north-1.myhuaweicloud.com/SMS-Agent.tar.gz
```

```
sms-saptest:~/SMS # wget -t 3 -T 15 https://sms-agent-2-0-cn-north-1.obs.cn-nort
h-1.myhuaweicloud.com/SMS-Agent.tar.gz
--2021-07-14 14:20:25-- https://sms-agent-2-0-cn-north-1.obs.cn-north-1.myhuawe
icloud.com/SMS-Agent.tar<sub>m</sub>gz
Resolving sms-agent-2-0-&n-north-1.obs.cn-north-1.myhuaweicloud.com (sms-agent-2
-0-cn-north-1.obs.cn-north-1.myhuaweicloud.com)... 114.115.192.27, 114.115.192.1
62, 114.115.192.98
Connecting to sms-agent-2-0-cn-north-1.obs.cn-north-1.myhuaweicloud.com (sms-age
nt-2-0-cn-north-1.obs.cn-north-1.myhuaweicloud.com)|114.115.192.27|:443... conne
cted.
HTTP request sent, awaiting response... 200 OK
Length: 90937990 (87M) [application/gzip]
Saving to: 'SMS-Agent.tar.gz'
SMS-Agent.tar.gz
                     19%[==>
                                              1 17.02M 4.20MB/s
                                                                     eta 14s
```

**Step 2** Run the following command to decompress the downloaded package:

tar -zxvf SMS-Agent.tar.gz

```
sms-saptest:~/SMS # tar -zxvf SMS-Agent.tar.gz
SMS-Agent/
SMS-Agent/restart.sh
SMS-Agent/agent/
SMS-Agent/agent/x64/
SMS-Agent/agent/x64/sms-cmp
SMS-Agent/agent/x64/agent-cli
SMS-Agent/agent/x64/linuxmain
SMS-Agent/agent/cert/
SMS-Agent/agent/cert/srcAgent.pfx
SMS-Agent/agent/cert/ksa.file
SMS-Agent/agent/cert/ksb.file
SMS-Agent/agent/cert/destAgent.pfx
SMS-Agent/agent/x86/
SMS-Agent/agent/ioblock/
SMS-Agent/agent/ioblock/x64/
SMS-Agent/agent/ioblock/x64/2.6.32-573.1.1.el6.x86 64/
SMS-Agent/agent/ioblock/x64/2.6.32-573.1.1.el6.x86 64/iocapture.ko
SMS-Agent/agent/ioblock/x64/4.15.0-136-generic/
SMS-Agent/agent/ioblock/x64/4.15.0-136-generic/iocapture.ko
```

**Step 3** Run the following command to switch to the **SMS-Agent** directory of the source server:

#### cd SMS-Agent

**Step 4** (Optional) Perform this step if an HTTPS proxy server is used.

A proxy server is a special network service. If your source server cannot access HUAWEI CLOUD through the Internet, you can use a proxy server to access HUAWEI CLOUD. You need to configure a proxy server by yourself.

a. Run the following command to go to the **config** directory:

#### cd agent/config

b. Run the following command to open and edit the **auth.cfg** file:

#### vi auth.cfg

```
File Edit View Search Terminal He
[ploxy-config]
enable = true
proxy_addr = 10.10
proxy_port = 808
proxy_user = Administrator
use_password = true
```

c. Run the following command to save the **auth.cfg** file and exit:

:wq

#### D NOTE

- **proxy\_addr** indicates the IP address of the proxy server. It is used by the source server to access SMS.
- If the HTTPS proxy is not used during the migration, you are not allowed to modify the **auth.cfg** file.
- The proxy is used for registering the source server with SMS when a Direct Connect or VPN connection is used. It is not used for data migration.
- enable controls if the proxy is used or not. To use the proxy, set this to true.
- If a username is required to use the proxy, set **proxy\_user** to the username, for example, **root**. If the username is not required, leave this parameter blank.
- If a password is required to use the proxy, set **use\_password** to **true**. If the password is not required, set it to **false**.
- The values shown here are for reference only. Actual values will depend on your server configuration,
- **Step 5** Modify the **g-property.cfg** file in the **config** directory to enable Linux block-level migration.

```
/SMS/SMS-Agent/agent/config # vi g-property.cfg
  ......
[ssl config]
servercheck = False
[property]
times = 20
debug = False
file exist check = \Windows\system32\DRIVERS\atapi
RIVERS\intelide.sys
                                     Ī
enablesync = True
enablesnapsho<u>t = True</u>
enablelinuxblock = True
wmi = irue
targetip =
heartmonitorday = 30
stopsync = 0
uefi2bios = False
[enviromentcheck]
vss depend service = VSS
```

Run the **:wq** command to exit.

**Step 6** (Optional) If an SFS disk is mounted to the source server, run the following commands.

Modify the **g-property.cfg** file in the **config** directory.

```
sms-saptest:~/SMS/SMS-Agent/agent/config # ls
ErrorCode.ini cloud-region.json error.cfg init.cfg
auth.cfg commands.xml g-property.cfg srcAgent
blocktransferlayer.cfg disk.cfg huaweiapi.pem
sms-saptest:~/SMS/SMS-Agent/agent/config # vi g-property.cfg
```

#### Add nfs to exclude.filesystem.



Run the :wq command to exit.

Step 7 Run the following command to start the Agent:

#### ./startup.sh

```
sms-saptest:~/SMS/SMS-Agent # ./startup.sh
After being started, the migration Agent collects system configuration informati
on and uploads the information to SMS for migration task creation. The informati
on to be collected includes server IP address and MAC address. For details, see
the Server Migration Service User Guide. Are you sure you want to collect the in
formation?(y/n)
```

**Step 8** Carefully review the description of what information will be collected by the Agent, enter **y**, and press **Enter**.

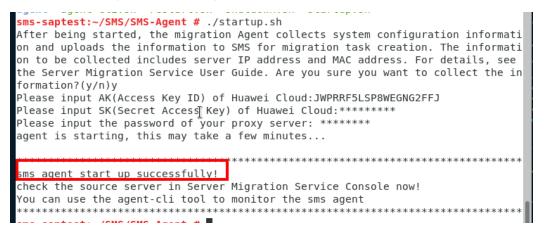
Enter the AK and SK of the HUAWEI CLOUD account of the destination ECS and the password of the HTTP proxy server as prompted.

sms-saptest:~/SMS/SMS-Agent # ./start@up.sh After being started, the migration Agent collects system configuration informati on and uploads the information to SMS for migration task creation. The informati on to be collected includes server IP address and MAC address. For details, see the Server Migration Service User Guide. Are you sure you want to collect the in formation?(y/n)y Please input AK(Access Key ID) of Huawei Cloud:JWPRRF5LSP8WEGNG2FFJ Please input SK(Secret Access Key) of Huawei Cloud:\*\*\*\*\*\*\*\*\* Please input the password of your proxy server:

Create and view the AK and SK on the management console.

Enter an access key ID. Q
Operation Modify   Disable   Delete

When the following information is displayed, the Agent has been started up and will automatically start reporting source server information to SMS.



Repeat the preceding steps to install the Agent on the source server where SAP HANA and SAP applications are installed.

----End

## 8.3.2 Configuring the Destination Server

Before the migration, you need to configure the destination server. The destination server is used to receive data from the source server. You can also use the it for migration test and launch the destination server. The destination server can be configured only after all migration items on the source server are checked and confirmed OK.

Step 1 Log in to the SMS management console and choose Servers in the left navigation pane. On the server list page, click the server to be migrated to go to the server details page. Select the Source Server Details tab to view check result for the migration items on the source server. You can perform the following steps only after all migration items are checked and confirmed OK. If there are some items found to be abnormal, locate the cause and rectify it on the current page.

S	Serversms-saptestSummary Back to Server List								
Ba	sic Information	Task Tracing							
	Source Server	fbd68510-eab1-48ce-932c-341ddee46c26	Constitution Character	Decend	A march Marries	3.0.0			
	IU	1008510-8801-48Ce-932C-341008840C20	Feasibility Check	Passeu	Agent Version	3.0.0			
	Name	sms-saptest	IP Address	10.10.1.21	Connection Status	Connected			
		8vCPUs   15GB   BIOS							
	Migration Setting								
	Region	-	Network	-	Migration Rate Lin	nit			
	Migration Metho	d							

**Step 2** Locate the server to be migrated and click **Configure** to configure the destination server.

=	SMS	Servers   Process Flow							<b>⊙</b> Q
6	Go to Old Edition	After you install and start the Agent on a source served.	ver, a record will be automatically gene	rated.					
•	Dashboard	We would much appreciate if you could complete ou							
	Servers	We would much appreciate if you could complete ou	ir questionnaire on SMS. Your feedback	will help us provide a better use	r experience.				
	Templates	Process Flow							
	Agents					-(4)			
		Prepare for Migration Prepare the migration network and AK/SK.	Install and Start Agent Install the Agent on the source service	ver and start Configure 1	arget arget server for the migration.	Start Migration After the initial repli	cation, the migration		() Launch Target g data to the source server and
		Preparations Before Migration	it. Installing Agent			automatically enters synchronization state	the continuous	launch the	target server. automatically performs a final
						The target server is r	eady for launch.	synchroniz	
			*****						
									C
		Start Pause Launch Target	Sync More •						0
		Source Name/ID	Source OS/IP Address	Migration Stage	Status	Target	Time Spent/Re	Enterprise Proj	Operation
		✓ Sms-saptest 4dfbe7f5-1a24-4207-9b25-6aa8e1150d	SUSE15_648/T_SP1 153 10.10.1.21	0000	Ready 2 minutes ago	Configure		default	Start   Launch Target   More 👻
		~ 🗆	SUSE15_648/T_SP1 10.10.1.23	0000	Disconnected 56 days ago	ld-s4-prd-2 New		default	Sync   Launch Target   More 👻
			SUSE12_648IT_SP5 10.1.128.21	00000	Disconnected 96 days ago	sms-h1-az3 Existing		default	Sync   Launch Target   More 💌

**Step 3** Configure basic settings as required. Select **Continuous Synchronization** and click **Next: Configure Target**.

Migration Template SM	5,54HANA.xp • (2)	
If you understand how	/ to configure the network, migration rate limit, and migration method, hide the instructions.	
Network	to compare une record, majorizon raz ema, eno majorizon necido, nos se relacionos.	
Retwork	Internet Office Connectivity	
To n To n	nigrate workloads over the internet, ensure that you have bound an EIP to the target server. The EIP will be used for migration. nigrate workloads over Direct Connect/VPN, ensure that you have purchased a Direct Connect or VPN connection. The private IP address of the target server will be used for migration.	
_	Molt/s	
Migration Rate Limit		
0 m	eans no rate limit. Ensure that ports 22, 8899 and 8900 have been enabled for Windows migration, and ports 22 and 8900 have been enabled for Linux migration.	
Migration Method	High efficiency but	
	Image: Might efficiency but         Image: Low efficiency but e	
	Block-level: Migration is performed block by block.	
	File-level: Migration is performed file by file.	
	For Windows servers, SMS only supports block-level migration.	
Risk Acknowledgement	✓ I acknowledge that SMS is not responsible for any service loss during a Linux block-level migration. Linux block-level migration is in an OBT. It is recommended that you only use this method to migrate servers running non-mission critical services or in a test environment.	
Continuous Synchronization		
·	No     Yes	
Partition Resizing		

**Step 4** Select **Create during migration** or **Use existing** for **Server**, configure whether to create shared disks, and select the VPC and disk specifications based on the site requirements. Click **Next: Confirm**.

Configure Mig						
Configure Basic Se	ettings — 2 Configure Target	t ——— (3) Confirm				
* Region	♀ 绛庵-广州	• ?				
Project	cn-south-1(default)	• ⑦				
* Server	Use existing Cre	eate during migration If you select Create d	uring migration, a pay-per-use ECS will be create	d by default. You can change its billing m	ode to yearly/monthly after it	: is created.
		If you switch services	over to a cloned target server, the target server	will use the same login credentials as the	source server.	
Server Template	Recommended te	estfcd				
VPC	vpc-fcdtest(10.10.0.0/16)	•				
Subnet	subnet-sapapp(10.10.1.0/24)	Automatically assign IP addr	ress 10 · 10 · 1 · 111			
Security Group	default (Inbound: 122.9.118.215/32	e⇒tc▼				
Advanced Settings	Configure now You can config	gure AZ, specifications, disk, and EIP to override th	e recommended ones. The fee may change after	the advanced settings are configured.		
	cmc contect					
Namé	sms-saptest					
	sms-saptest Random AZ1	AZ2 AZ3	A25 A26			
Name AZ	Random AZ1					
	Random AZ1 vCPUs All	Memory All	Flavor Name C	2		
AZ	Random AZ1 vCPUs All	Memory All	Flavor Name C	2 tra-high I/O GPU-accelerated	FPGA-accelerated	Large-memory
AZ	Random AZ1 vCPUs All	Memory All	Flavor Name C		FPGA-accelerated	Large-memory
AZ	Random AZ1 VCPUs All General computing General	<ul> <li>Memory All </li> <li>ral computing-plus</li> <li>highcpu</li> <li>Memory Memory</li> </ul>	Flavor Name C	ltra-high I/O GPU-accelerated		Large-memory
AZ	Random A21 VCRUs All General computing General of distange 2 clatarge 4 of clarage 4	Memory All     Memory All     Memory All     Memory All     DrCPUs   468     DrCPUs   868     DrCPUs   868     DrCPUs   868	Flavor Name         C           nory-optimized         Disk-intensive         UI           Intel Cascade Lake 2.0614z         Intel SkyLake 6151 3.0614z         Intel Cascade Lake 2.0614z	Ltra-high I/O         GPU-accelerated           1000/ 1000 Gbit/s         600/ 1500 Gbit/s           1200/ 4000 Gbit/s         1200/ 4000 Gbit/s	300000 300000 400000	Large-memory
AZ	Random     A21       VCRUs     All       General computing     General       cisLarge.2     cisLarge.4       cisLarge.4     cisLarge.4       @ cl.sLarge.2	Memory All     Memory All     Memory All     Computing-plus     https://www.internet.org/light.computing-plus     2xCPUs   468     2xCPUs   868     2xCPUs   868     4xCPUs   868	Flavor Name         C           nory-optimized         Disk-intensive         UI           Intel Cascade Lake 2.6GHz         Intel SkyLake 6151 3.0GHz         UI           Intel Cascade Lake 2.6GHz         Intel SkyLake 6151 3.0GHz         UI           Intel SkyLake 6151 3.0GHz         Intel SkyLake 6151 3.0GHz         UI	GPU-accelerated     GPU-accelerated     GOV 1500 Gbt/s     GoV 1500 Gbt/s     1200/ 4000 Gbt/s     1200/ 4000 Gbt/s	300000 300000 400000 500000	Lage-memory
AZ	Random         A21           VCRUs         All           General computing         General General computing           cislarge.2         cislarge.4           cislarge.4         cislarge.4           cislarge.2         cislarge.2	Memory All     Memory All     Memory All     Acrossed and a computing-plus     Acrossed and a computing-plus     Acrossed and a computing set of a computer set of a comp	Flavor Name         C           nory-optimized         Disk-intensive         UI           Intel Cascade Lake 2.6GHz         Intel SkyLake 6151 3.0GHz         UI           Intel Cascade Lake 2.6GHz         Intel Cascade Lake 2.6GHz         UI           Intel SkyLake 6151 3.0GHz         Intel SkyLake 6151 3.0GHz         UI           Intel Cascade Lake 2.6GHz         Intel Cascade Lake 3.0GHz         UI	GPU-accelerated     GPU-accelerated     GPU-accelerated     GPU-accelerated     GPU-too cbit/s     1200/ 1500 Cbit/s     1200/ 4000 Cbit/s     2400/ 8000 Cbit/s     2400/ 8000 Cbit/s	300000 300000 400000	Large-memory
AZ	Random     A21       VCRUs     All       General computing     General       cisLarge.2     cisLarge.4       cisLarge.4     cisLarge.4       @ cl.sLarge.2	Memory All     Memory All     Memory All     Computing-plus     https://www.internet.org/light.computing-plus     2xCPUs   468     2xCPUs   868     2xCPUs   868     4xCPUs   868	Flavor Name         C           nory-optimized         Disk-intensive         UI           Intel Cascade Lake 2.6GHz         Intel SkyLake 6151 3.0GHz         UI           Intel Cascade Lake 2.6GHz         Intel SkyLake 6151 3.0GHz         UI           Intel SkyLake 6151 3.0GHz         Intel SkyLake 6151 3.0GHz         UI	GPU-accelerated     GPU-accelerated     GOV 1500 Gbt/s     GoV 1500 Gbt/s     1200/ 4000 Gbt/s     1200/ 4000 Gbt/s	300000 300000 400000 500000 800000	Large-memory
AZ Specifications	Random     A21       vCPUs     All       General computing     General       ofslarge_2     clarge_4       ofslarge_4     clarge_4       ofslarge_2     clarage_2       ofslarge_2     clarage_2       ofslarage_2     clarage_4       Selections     General	Memory All     Memory All     Memory All     ScPUs   4G8     ScPUs   4G8     ScPUs   4G8     ScPUs   8G8     ScPUs   8G8     AcPUs   8G8     AcPUs   8G8     ScPUs   8G8	Flavor Name         C           hory-optimized         Disk-intensive         UI           intel Cascade Lake 2.6GHz         Intel Stylake 6151 3.0GHz         UI           intel Stylake 6151 3.0GHz         Intel Cascade Lake 2.0GHz         Intel Cascade Lake 2.0GHz	GPU-accelerated     GPU-accelerated     GPU-accelerated     GPU-accelerated     GPU-too cbit/s     1200/ 1500 Cbit/s     1200/ 4000 Cbit/s     2400/ 8000 Cbit/s     2400/ 8000 Cbit/s	300000 300000 400000 500000 800000	Large-memory
AZ Specifications System Disk	Random     A21       vCPus     All       General computing     General       dislarge.2     Clarge.4       o     clarge.4       o     clarge.2       clarge.4     clarge.2       o     clarge.2       clarge.2     clarge.2       clarge.4     clarge.2       clarge.2     clarge.2       clarge.1     clarge.2       clarge.2     clarge.2	Memory All      Memory All     SCPUs   468     SCPUs   468     SCPUs   868     SCPUs   868     4cPUs   868     4cPUs   868     4cPUs   868     Scenario   868	Flavor Name         C           http://poptimized         Disk-Intensive         UI           Intel Cascade Lake 2.6GHz         UI           Intel Skytake 6151 3.0GHz         Intel Cascade Lake 3.6GHz           Intel Cascade Lake 3.0GHz         Intel Cascade Lake 3.0GHz           Intel Cascade Lake 3.0GHz         Intel Cascade Lake 2.6GHz           Intel Cascade Lake 2.6GHz         Intel Cascade Lake 2.6GHz	GPU-accelerated     GPU-accelerated     GPU-accelerated     1000/ 1000 Gbt/s     1000/ 1500 Gbt/s     1000/ 3000 Gbt/s     2000/ 2000 Gbt/s     2000/ 2000 Gbt/s	300000 300000 400000 500000 800000	Large-memory
AZ Specifications	Random     AZ1       VCPUs     All       General computing     General       O     dslarge.2       O     dslarge.4       @     c3.large.2       O     dslarge.2       O     dslarge.2       O     dslarge.2       Selected specifications     General III       High I/O     •	Memory All     Memory All     Memory All     ScPUs   468     ScPUs   468     ScPUs   868     ScPUs   868     4cPUs   868     4cPUs   868     4cPUs   868     ScPUs   868	Flavor Name         C           http://poptimized         Disk-Intensive         UI           Intel Cascade Lake 2.6GHz         UI           Intel Skytake 6151 3.0GHz         Intel Cascade Lake 3.6GHz           Intel Cascade Lake 3.0GHz         Intel Cascade Lake 3.0GHz           Intel Cascade Lake 3.0GHz         Intel Cascade Lake 2.6GHz           Intel Cascade Lake 2.6GHz         Intel Cascade Lake 2.6GHz	GPU-accelerated     GPU-accelerated     GPU-accelerated     1000/ 1000 Gbt/s     1000/ 1500 Gbt/s     1000/ 3000 Gbt/s     2000/ 2000 Gbt/s     2000/ 2000 Gbt/s	300000 300000 400000 500000 800000	Large-memory
AZ Specifications System Disk	Random     AZ1       VCPUs     All       General computing     General       Clarge 2     Clarge 4       Clarge 4     Clarge 4       Clarge 2     Cdstarge 2       Cdstarge 2     Cdstarge 2       Selected specifications     General of High 10       Fligh 10     Image 1       Fligh 10     Image 2       Sci SCI ()     Share ()	Memory All      Memory All     SCPUs   468     SCPUs   468     SCPUs   868     SCPUs   868     4cPUs   868     4cPUs   868     4cPUs   868     Scenario   868	Plavor Name     C       Nory-optimized     Disk-intensive     UI       Intel Cascade Lake 2.6GHz     Intel SkyLake 6151 3.0GHz       Intel Cascade Lake 1.0GHz     Intel Cascade Lake 1.0GHz       Intel Cascade Lake 2.6GHz     Intel Cascade Lake 2.6GHz	GPU-accelerated           1000/1000 Gbt/s           660/1500 Gbt/s           1200/4000 Gbt/s           1200/4000 Gbt/s           2400/8000 Gbt/s           2400/8000 Gbt/s           2600/2000 Gbt/s           Hide~ Enabled SCSI Share	300000 300000 400000 500000 800000 600000	Large-memory
AZ Specifications System Disk	Random     AZ1       VCPUs     All       General computing     General       Clarge 2     Clarge 4       Clarge 4     Clarge 4       Clarge 2     Cdstarge 2       Cdstarge 2     Cdstarge 2       Selected specifications     General of High 10       Fligh 10     Image 1       Fligh 10     Image 2       Sci SCI ()     Share ()	Memory All     Memory All     Memory All     AccPus   468     2xCPUs   468     2xCPUs   868     4xCPUs   868     4xCPUs   868     4xCPUs   868     6xcPUs   868     6xcPUs	Plavor Name     C       nory-optimized     Disk-Internive     UI       Intel Cascade Lake 2.6GHz     Intel SkyLake 6151 1.0GHz       Intel Cascade Lake 1.0GHz     Intel Cascade Lake 1.0GHz       Intel Cascade Lake 1.0GHz     Intel Cascade Lake 2.6GHz       Intel Cascade Lake 2.0GHz     Intel Cascade Lake 2.0GHz       Intel Cascade Lake 2.0GHz     Intel Cascade Lake 2.0GHz       Intel Cascade Lake 2.0GHz     Intel Cascade Lake 2.0GHz	GPU-accelerated           1000/1000 Gbt/s           660/1500 Gbt/s           1200/4000 Gbt/s           1200/4000 Gbt/s           2400/8000 Gbt/s	300000 300000 400000 500000 800000 600000	Large-memory
AZ Specifications System Disk	Random     A21       VCPUs     All       General computing     General       c dslarge 2     cdslarge 4       c dslarge 4     cdslarge 2       c dslarge 2     cdslarge 2       c dslarge 2     cdslarge 2       c dslarge 2     cdslarge 2       c dsslarge 2     cdslarge 2	Memory All     Memory All     Memory All     Add computing-plus     Memory Add     2xCPUs   468     2xCPUs   868     4xCPUs   848     4xC	Planor Name     C       nory-optimized     Disk-Intensive     U       Intel Cascade Lake 2.66Hz     Intel SkyLake 6151 2.06Hz       Intel Cascade Lake 2.66Hz     Intel Cascade Lake 2.66Hz       Itimit: 5000     Quantity     1       Itimit: 5000     Quantity     1	GPU-accelerated           1000/1000 Gbt/s           660/1500 Gbt/s           1000/2000 Gbt/s           1000/2000 Gbt/s           2000/2000 Gbt/s           2000/2000 Gbt/s           9000/2000 Gbt/s	300000 300000 400000 500000 800000 600000	Large-memory

#### Parameter description

Name	Description	Examp le Value
Region	Select the region where the destination ECS is located. By default, the region is the one set for the current migration project, but you can select another region if needed.	CN East- Shangh ai2
Migration Method	• Linux block-level: Migration is performed block by block. This method has high efficiency but poor compatibility.	Linux block- level
	• <b>Linux file-level</b> : Migration is performed file by file. This method has low efficiency but excellent compatibility.	
	• Windows block-level: Migration is performed block by block. For Windows servers, SMS only supports block-level migration. This method has high efficiency.	

Name	Description	Examp le Value
Network	<ul> <li>Internet: If you select this option, an elastic IP address must be assigned on the target ECS. Network is set to Internet by default.</li> <li>Direct Connect/VPN: You need to create a Direct Connect or VPN connection between the source server and the VPC subnet where the target server is located in advance.</li> <li>Migration Rate Limit: You can set the rate limits as needed based on the bandwidth size of the source server and service requirements.</li> <li>NOTE         If the source and destination servers are in the same VPC, set Network to Direct Connect/VPN.         Configure it based on the site requirements.     </li> </ul>	
Whether to perform a continuou s synchroni zation after the full replicatio n is complete.	<ul> <li>If you select No, after the full replication, SMS will not perform a continuous synchronization and will automatically start the target ECS. To synchronize incremental data, click Start in the Operation column.</li> <li>If you select Yes, after the full replication, SMS will perform a continuous synchronization. To complete the migration, you need to manually launch or clone the target ECS.</li> </ul>	Yes
Server	<ul><li>Use existing</li><li>Create during migration</li></ul>	Use existing

**Step 5** Ensure that all parameters have been configured based on the site requirements and click **Save**.

Source Server				
Name sms-saptest	Private IP Address	10.10.1.21	Added	15 minutes ago
DS SUSE15_64BIT_SP1	Specifications	8 vCPUs   15.24 GB	Disk	Data Disk (): 100 GB; Data Disk (): 20 GB; Data Disk (): 80 GB; Data Disk (): 30 GB;
Configure Basic Settings				
Enterprise Project Defalut	Network	Direct Connect/VPN	Migration Rat	te Limit 0Mbit/s
Migration Method Block-level	Partition Resiz	ng No	Continuous S	ynchronization Yes
Vetwork				
VPC vpc-fcdtest	Subnet	subnet-sapapp	Security Group	default;
Private IP Address 10.10.1.111	EIP	Not required	Bandwidth	None
Target Server (To be purchased)				
Region CN South-Guangzhou	AZ	AZ2	Name	sms-saptest
DS SUSE15_64BIT_SP1	Specifications	General computing-plus   c3.xlarge.2	Disk	Data Disk (High I/O): 100 GB; Data Disk (SCSI,Share,High I/O): 20 GB; Data Disk (Hig
55 503E15_04611_3F1		4vCPUs   8GB	DBK	I/O): 80 GB; Data Disk (High I/O): 30 GB;
Modify Target Configuration Save as	Server Template			

----End

## 8.3.3 Starting the Migration

**Step 1** Back to the SMS console, and view the migration task status. If it is **Ready**, click **Start** in the **Operation** column.

Source Name/ID		Source OS/IP Address	Migration St	age	Status	Target	Time Spent/	Enterprise Pr	Operation
Sms-saptest	l9bb-a546-8f1ec9bc9c8	SUSE15_64BIT_SP1 10.10.1.21	60 00	00	Ready 39 seconds ago Configured	New		default	Start   More 🔻
Source Information				Current Stage					
Connection Status	Connected			Name	Target Configura	ition			
Total/Migrated Data	OGB   OGB			Description		ition starts, a target se			
Migration Rate	0Mblt/s				clone the target	server for service testing	ng before launching	g the target server.	
Migration Rate Limit	0Mblt/s			Status	😑 Ready (39 see	conds ago)			
Compression Rate	0%			Next Step					
Target Clone/Status	No clone								
Log Collection Status	Ready								
Current Task	View details								

#### Start Migration



## Are you sure you want to start a full replication or continuous synchronization of the following servers?

To ensure smooth migration, your target server will be automatically locked during migration and unlocked after the migration.

Name	Status	Remarks
sms-saptest	🐵 Ready (59 seconds ago)	Ready for start.
	the target server during the migration, ie the same login credentials as the sou ttached to the target server.	2 2

No

#### **Step 2** Wait until the migration is completed.

Source Name/ID Source C	OS/IP Address	Migration St	age	Status	Target	Time Spent/	Enterprise Pr	Operation
sms-saptest 2 SUSE15_ a7ca26a0-c6f7-49bb-a546-8f1ec9bc9ct 10.10.1.2	64BIT_SP1 21	000	00	Initializing 1 minutes ago Ongoing	New	40 seconds	default	Start   More 🔻
Basic Information			Task Informatio	n				
Region/Project cn-south-1			Task ID	301b3ed2-f96e-4	95c-9ddc-11ce7d2824	lfO		
Target Name			Start/End Time	2021/08/9 16:57:2	28			
Target ID			Task Status	Running				
Target IP Address 10.10.1.111								
Target IP Address 10.10.1.111 Latest Progress Initial replication Subtask	Start Time			End Time		Progre	255	
Latest Progress Initial replication	Start Time 2021/08/9 16:58:5			End Time		Progre	255	40%
Latest Progress Initial replication Subtask						Progre	ess	40%
Latest Progress Initial replication Subtask Create target.	2021/08/9 16:58:5					_	255	
Latest Progress Initial replication Subtask Create larget. Create a secure transmission channel.	2021/08/9 16:58:5					_	255	0%

Wait until the migration enters the continuous synchronization status. Before starting the destination server, stop SAP software and databases.

MS		NK/SK.	start it. Installing Agent		migration.		automatically enter synchronization sta The target server is	te.		ch the target server. 5 automatically performs a final zation.
ashboard ervers emplates		start Pause Launch Ta arch by Source name by default.	rget Sync More ¥ Source OS/IP Address	Migration SI	tage	Status	Target	Time Spent/	Enterprise Pr	C (
igents		<ul> <li>sms-saptest a7ca26a0-c6f7-49bb-a546-8</li> </ul>	SUSE15_64BIT_SP1 f1ec9bc9ct 10.10.1.21	000		Continuous sync 39 minut			default	Sync   Launch Target   More -
	4	Basic Information Region/Project cn-sout Target Name sms-sap Target ID 4d890al Target IP Address 10.10.1. Latest Progress Initial replication	rtest fa-7c90-4c49-aba4-0492638f3835		Task Information Task ID Start/End Time Task Status		95c-9ddc-11ce7d282 28	24f0		
		Subtask	Start Time			End Time		Progre	155	
		Create target.	2021/08/9 16:5	8:5		2021/08/9 17:0:0				100%
		Create a secure transmission cha	innel. 2021/08/9 17:0	:8		2021/08/9 17:0:25		_		100%
		Mount the Agent Image and rela	aunch the target. 2021/08/9 17:0	:28		2021/08/9 17:8:21		_		100%
		Format Linux block-level partitio	ns. 2021/08/9 17:8	:24		2021/08/9 17:8:36				100%
		Migrate Linux block-level data.	2021/08/9 17:8	:44		2021/08/9 18:49:53		_		100%

----End

## 8.3.4 Stopping the SAP Software

On the SMS manage console, view the migration status. When the migration enters the continuous synchronization status, the full replication is complete, and the system automatically synchronizes the I/O data from the source server to the destination server. To ensure that SAP-related data in the memory of the source server can be synchronized to the destination server, you need to stop SAP S/ 4HANA and SAP HANA so that the data in the memory of the source server is updated to the disk and then synchronized to the destination server by SMS.

- **Step 1** Log in to the SMS management console and view the migration progress. When the migration is in the continuous synchronization status, stop the SAP software.
- **Step 2** Log in to the source server and stop SAP S/4HANA.

```
sms-saptest:- # su - s0ladm
sms-saptest:- # su - s0ladm
sms-saptest:s0ladm 2> sapcontrol -nr 01 -function GetProcessList
30.11.2020 09:21:22
GetProcessList
OK
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
disp+work, Dispatcher, GREEN, Running, 2020 11 28 16:48:15, 40:33:07, 22718
igswd mt, IGS Watchdog, GREEN, Running, 2020 11 28 16:48:16, 40:33:06, 22724
icman, ICM, GREEN, Running, 2020 11 28 16:48:16, 40:33:06, 22724
icman, ICM, GREEN, Running, 2020 11 28 16:48:16, 40:33:06, 22724
icman, ICM, GREEN, Running, 2020 11 28 16:48:16, 40:33:06, 22724
icman, ICM, GREEN, Running, 2020 11 28 16:48:16, 40:33:06, 22725
sms-saptest:s0ladm 3> sapcontrol -nr 01 -function Stop
30.11.2020 09:21:29
Stop
OK
sms-saptest:s0ladm 4> sapcontrol -nr 01 -function Stop
30.11.2020 09:21:34
Stop
OK
sms-saptest:s0ladm 5> sapcontrol -nr 01 -function GetProcessList
30.11.2020 09:24:49
GetProcessList
OK
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
disp+work, Dispatcher GRAY, Stopped, , 22718
igswd mt, IGS Watchdog, GRAY, Stopped, , 22719
sms-saptest:s0ladm 6>
```

#### Step 3 Stop SAP HANA.

```
<mark>sms-saptest:~ #_su - s00adm</mark>
s00adm@sms-saptest:/usr/sap/S00/HDB00≻ sapcontrol -nr 00 -function GetProcessList
 30.11.2020 09:27:15
  GetProcessList
OK

name, description, dispstatus, textstatus, starttime, elapsedtime, pid

hdbdaemon, HDB Daemon, GREEN, Running, 2020 11 28 15:34:20, 41:52:55, 4002

hdbcompileserver, HDB Compileserver, GREEN, Running, 2020 11 28 15:34:24, 41:52:51, 4272

hdbnameserver, HDB Nameserver, GREEN, Running, 2020 11 28 15:34:24, 41:52:55, 4008

hdbpreprocessor, HDB Preprocessor, GREEN, Running, 2020 11 28 15:34:44, 41:52:31, 4274

hdbwebdispatcher, HDB Web Dispatcher, GREEN, Running, 2020 11 28 15:35:26, 41:51:49, 4681

hdbindexserver, HDB Indexserver-S00, GREEN, Running, 2020 11 28 16:40:20, 40:46:55, 13117

hdbxsengine, HDB XSEngine-S00, GREEN, Running, 2020 11 28 16:40:30, 40:46:45, 13189

hdbdostore, HDB Docstore-S00, GREEN, Running, 2020 11 28 16:40:30, 40:46:45, 13192

hdbdpserver, HDB DPserver-S00, GREEN, Running, 2020 11 28 16:40:30, 40:46:45, 13194

hdbdiserver, HDB Deployment Infrastructure Server-S00, GREEN, Running, 2020 11 28 16:46:39, 40:46:45, 13194

hdbdiserver, HDB Deployment Infrastructure Server-S00, GREEN, Running, 2020 11 28 16:40:30, 40:46:45, 13194

hdbdiserver, HDB Deployment Infrastructure Server-S00, GREEN, Running, 2020 11 28 16:46:39, 40:46:45, 13194

hdbdiserver, HDB Deployment Infrastructure Server-S00, GREEN, Running, 2020 11 28 16:46:49, 40:40:26, 20613

s00adm@sms-saptest:/usr/sap/S00/SVS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function Stop 400
 0K
  30.11.2020 09:27:24
  Stop
 Waiting for stopped instance using: /usr/sap/S00/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function WaitforSt
opped 600 2
 30.11.2020 09:28:20
   WaitforStopped
 0K
hdbdaemon is stopped.
s00adm@sms-saptest:/usr/sap/S00/HDB00> sapcontrol -nr 00 -function GetProcessList
                                                                                                                                                                                                                                                                                                                                             I
 30.11.2020 09:29:37
GetProcessList
0K
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
hdbdaemon, HDB Daemon, GRAY, Stopped, , , 4082
s00adm@sms-saptest:/usr/sap/S00/HDB00> ■
```

Then, the SMS migration progress is still in the continuous synchronization status. In this case, you can click **Launch Target**.

#### ----End

## 8.3.5 Launching the Destination Server

You can launch a server that is in the continuous synchronization state. After the server is launched, continuous synchronization is stopped. The destination server can only be launched if the migration is in the continuous synchronization state.

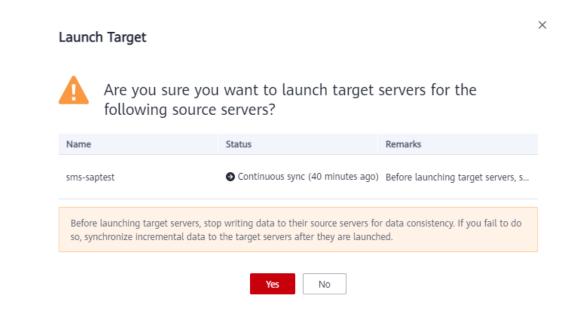
Before launching the destination server, you can clone the destination server for service testing. If there are no problems in the testing of cloned server, launch the destination server.

The cloned server must be in the same AZ as the destination server, but can be in a different VPC.

Step 1 Log in to the SMS management console. In the navigation pane on the left, choose Servers. Locate the target server you want to launch, and click Launch Target in the Operation column.

SMS	Prep	arations Before Migration	Installing Agent			mgratori.		synchronization state. The target server is rea			automatically perform zation.	ms a final
Dashboard Servers Templates Agents	Start Search	t Pause Launch Targe h by Source name by default. Source Name/ID sms-saptest a7ca26a0-c6f7-49bb-a546-8f1e	Source OS/ SUSE15_64		Migration S		Status Continuous sync 39 minut O Ongoing	Target 9 sms-saptest New	Time Spent/	Enterprise Pr default	Operation Sync Launch Targe	C 🛞 © Q More •
		Basic Information           Region/Project         cn-south-1           Target Name         sms-saptes           Target ID         4d890afa-:           Target IP Address         10.10.1111           Latest Progress Initial replication	c90-4c49-aba4-0492	2638f3835		Task Informatio Task ID Start/End Time Task Status	301b3ed2-f96e-4	95c-9ddc-11ce7d2824f0 28	D			
		Subtask		Start Time			End Time		Progre	255		
		Create target.		2021/08/9 16:58:5			2021/08/9 17:0:0				100%	
		Create a secure transmission chann	eL.	2021/08/9 17:0:8			2021/08/9 17:0:25				100%	
		Mount the Agent image and relaun	ch the target.	2021/08/9 17:0:28			2021/08/9 17:8:21				100%	
		Format Linux block-level partitions.		2021/08/9 17:8:24			2021/08/9 17:8:36				100%	
		Migrate Linux block-level data.		2021/08/9 17:8:44			2021/08/9 18:49:53		-		100%	

Step 2 In the displayed dialog box, click Yes.



**Step 3** Wait until the destination server is launched. When the status changes to **Finished**, the destination server is launched and the migration is completed.

	Proc	ess Flow							×
SMS		1)				4		-(5)	
	F	Prepare for Migration	Install and Start Agent	Configure Target		Start Migration		(Optiona	al) Launch Target
Go to Old Edition		Prepare the migration network and AK/SK.	Install the Agent on the source server and start it.	Configure a target server for migration.	or the	After the initial replicat automatically enters th			ng data to the source server h the target server.
Dashboard		Preparations Before Migration	Installing Agent	migration.		synchronization state.	e conunuous		automatically performs a final
Servers						The target server is rea	dy for launch.	synchronia	
Templates									
implates									
gents	9	Start Pause Launch Tan	get Sync More 💌						C
	Se	earch by Source name by default.							@ C
		Source Name/ID	Source OS/IP Address Migratio	n Stage Status		Target	Time Spent/ E	interprise Pr	Operation
		<ul> <li>sms-saptest a7ca26a0-c6f7-49bb-a546-8f</li> </ul>	SUSE15_64BIT_SP1 () C	S S S Finish	ed 13 minutes ago	sms-saptest New	d	lefault	Sync   Launch Target More 🕶
				<b>U</b> Fir	ished				
		Basic Information		Task Information					
		Region/Project cn-south		Task ID		195c-9ddc-11ce7d2824f0			
		Target Name sms-sapt	est	Start/End Time	2021/08/9 16:57:	195c-9ddc-11ce7d2824f0 28   2021/08/9 19:7:23			
		Target Name sms-sapt Target ID 4d890afa	est 1-7c90-4c49-aba4-0492638f3835						
		Target Name sms-sapt	est 1-7c90-4c49-aba4-0492638f3835	Start/End Time	2021/08/9 16:57:				
		Target Name sms-sapt Target ID 4d890afa	est -7c90-4c49-aba4-0492638f3835 11	Start/End Time	2021/08/9 16:57:				
		Target Name sms-sapt Target ID 4d890afa Target IP Address 10.10.1.1	est -7c90-4c49-aba4-0492638f3835 11	Start/End Time Task Status	2021/08/9 16:57:		Progress		
		Target Name sms-sapt Target ID 4d890afi Target IP Address 10.10.1.1 Latest Progress Target launch (1st	est -7c90-4c49-aba4-0492638f3835 11 Start Time	Start/End Time Task Status	2021/08/9 16:57:				100%

----End

## 8.3.6 Verifying the Migration

After the destination server is launched, you can log in to the destination server to check whether SAP S/4HANA and SAP HANA are running properly and whether the data in the database is consistent with that in the database of the source server.

Use the password of the source server to log in to the destination server.

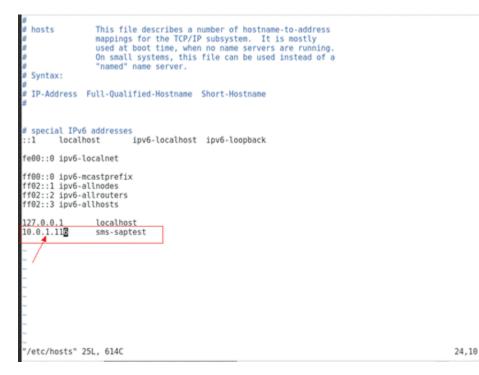
After the migration, the information of the destination server is the same as that of the source server, including the host name and the content in the **/etc/hosts** file.

**Step 1** Check the disk mounting status to ensure that all disks have been correctly mounted to the directories on the server.

sms-sap	otest:~	* · · · · · · · · · · · · · · · · · · ·	
		# lsblk -f	
NAME	FSTYPE	LABEL UUID	MOUNTPOINT
vda			
L-vdal	ext4	6f154186-728a-477c-8d12-55ecf8487572	/
vdb	swap	c6de0ab2-a5ee-4ac4-a53e-a395de7c4085	[SHAP]
vdc	xfs	fe5a3926-2ad0-4f74-b1c4-2319e80f26c0	/usr/sap
vdd	xfs	1e7b1fba-030c-4b1b-bf18-9abf41338f64	/sapmnt
vde	xfs	9c73a9d9-b68c-45c3-8ab9-6a89f8469597	/hana/log
vdf	xfs	7eb4b38e-bc5f-4c6a-901c-97433cea8925	/hana/data
vdg	xfs	77cfc0ef-8e10-49d1-a129-3e969f6e8ffa	/hana/shared
vdh	xfs	261d5228-5f62-4dd7-9674-826a6a52ab49	/hana/backup
sms-sap	otest:~	# ll /hana/	
total (	)		
dnixr-)	(r-x 2 )	root root 35 Nov 25 20:58 backup	
		root root 46 Nov 25 20:58 data	
dnixr->	(r-x 3 i	root root 46 Nov 25 20:58 log	
dnixr->	<r-x 4="" i<="" td=""><td>root root 67 Nov 25 20:58 shared</td><td></td></r-x>	root root 67 Nov 25 20:58 shared	
sms-sap	otest:~	# ll /   grep sap	
drwxr->	r-x	3 root sapsys 46 Nov 25 20:58 sapmnt	
sms-sap	otest:~	<pre># ll /usr/   grep sap</pre>	
dnixr->	(r-x 4	8 root sapsys 208 Nov 25 20:58 sap	
sms-sap	ptest:~	#	
		-	

**Step 2** Modify the **/etc/hosts** file on the destination server.

Modify the **/etc/hosts** file, and change the IP address mapped with the host name to the IP address of the destination server.



#### Step 3 Start SAP HANA.

```
ms-saptest:~ # su - s00adm
  s00adm@sms-saptest:/usr/sap/S00/HDB00> sapcontrol -nr 00 -function GetProcessList
 30.11.2020 10:26:36
 GetProcessList
 0K
 non
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
hdbdaemon, HDB Daemon, GRAY, Stopped, , , 3888
s00adm@sms-saptest:/usr/sap/S00/HDB00> HDB start
 StartService
 Impromptu CCC initialization by 'rscpCInit'.
See SAP note 1266393.
 nκ
 Starting instance using: /usr/sap/S00/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function StartWait 2700 2
 30.11.2020 10:26:41
 Start
OK
                                                                                                                                                                        I
 38.11.2028 10:27:46
 StartWait
 s00adm@sms-saptest:/usr/sap/S00/HDB00> sapcontrol -nr 00 -function GetProcessList
 30.11.2020 10:27:56
 GetProcessList
OK
OK

name, description, dispstatus, textstatus, starttime, elapsedtime, pid

hdbdaemon, HDB Daemon, GREEN, Running, 2020 11 30 10:26:42, 0:01:14, 5482

hdbcompileserver, HDB Compileserver, GREEN, Running, 2020 11 30 10:26:52, 0:01:04, 5753

hdbdocstore, HDB DocStore-S00, GREEN, Running, 2020 11 30 10:26:53, 0:01:03, 5796

hdbdoestore, HDB DPserver-S00, GREEN, Running, 2020 11 30 10:26:53, 0:01:03, 5798

hdbindexserver, HDB Indexserver-S00, GREEN, Running, 2020 11 30 10:26:53, 0:01:03, 5798

hdbindexserver, HDB Indexserver, GREEN, Running, 2020 11 30 10:26:53, 0:01:03, 5798

hdbindexserver, HDB Preprocessor, GREEN, Running, 2020 11 30 10:26:52, 0:01:04, 5755

hdbwebdispatcher, HDB Preprocessor, GREEN, Running, 2020 11 30 10:27:51, 0:00:25, 6527

hdbxsengine, HDB XSEngine-S00, GREEN, Running, 2020 11 30 10:26:53, 0:01:03, 5802

s00adm@sms-saptest:/usr/sap/S00/HDB00>
```

Step 4 Start SAP S/4HANA.

Run the following commands:

#### sapcontrol -nr 01 -function StartService S01

A11

#### sapcontrol -nr 02 -function StartService S01

Then run the following commands:

#### sapcontrol -nr 01 -function Start

#### sapcontrol -nr 02 -function Start

```
sms-saptest:= # su - s0ladm
sms-saptest:s0ladm 52> sapcontrol -nr 01 -function GetProcessList
30.11.2020 10:30:28
GetProcessList
OK
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
disp+work, Dispatcher, GRAY, Stopped, , , 5411
igswd mt, IGS Watchdog, GRAY, Stopped, , , 5412
sms-saptest:s0ladm 52> sapcontrol -nr 01 -function Start
30.11.2020 10:30:35
Start
OK
sms-saptest:s0ladm 53> sapcontrol -nr 02 -function Start
30.11.2020 10:30:40
Start
OK
sms-saptest:s0ladm 54> sapcontrol -nr 01 -function GetProcessList
30.11.2020 10:31:27
GetProcessList
OK
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
disp+work, Dispatcher, GREEN, Running, 2020 11 30 10:30:36, 0:00:51, 7365
igswd_mt, IGS Watchdog, GREEN, Running, 2020 11 30 10:30:37, 0:00:50, 7384
icman, ICM, GREEN, Running, 2020 11 30 10:30:37, 0:00:50, 7385
sms-saptest:s0ladm 55>
```

Step 5 (Optional) Use SAP GUI to connect to SAP S/4HANA for verification.

Choose **Variable Logon** in the toolbar, enter the IP address of the SAP application server, PAS instance number, and system ID, and click **Next**.

**Step 6** Click **Logon**. In the dialog box that is displayed, enter the username **ddic** and password, and press **Enter**.

≡	<
SAP	SAP
~	New password More $\checkmark$
Client:	000
*User:	ddic
*Password:	<b>************</b>
Logon Language:	

_		1
=		<
SAP SAP E	Casy Access	
$\sim$ SAP menu More $\sim$	Q	q
C Favorites		
SAP Menu		
> 🗀 Connector for Multi-Bank Connect		
> 🗅 Office		
> 🗀 Cross-Application Components		
> 🗀 Logistics		
> 🗀 Accounting		
> 🗀 Human Resources		
> 🗀 Information Systems		
> 🗀 Service		
> 🗅 Tools		
> 🛅 WebClient UI Framework		

**Step 7** The check is completed and the results meet the expected requirements. SAP S/ 4HANA and SAP HANA on the destination server can start and run properly, and the SAP GUI can be used to connect to SAP S/4HANA.

----End

## 8.4 Change History

Description	Released On	Prepared By
This issue is the first official release.	2020-11-30	Xiong Peng/ 00508152
Updated the migration procedure of the latest SMS.	2021-08-30	Fu Chuandong/ 00469497

# **9** Best Practice of SAP Migration from XEN to KVM

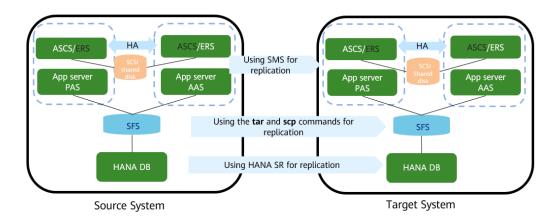
Introduction Overall Solution Preparations Implementation

## 9.1 Introduction

Xen PODs on HUAWEI CLOUD are gradually replaced by KVM PODs. In addition, AZs where Xen PODs reside are under inventory management and do not support new deployment and capacity expansion. This document guides SAP migration from the Xen POD to the KVM POD in two AZs isolated from each other in the same region. You can also refer to this document for other SAP migrations, such as migration from offline to online, or online migration.

## 9.2 Overall Solution

In this scenario, there are five servers, four of which are used to deploy applications and one is used to deploy database. The operating system (OS) of both the source and target systems needs to be the same. The HANA database version of the target system must be no earlier than that of the source system. The architecture and migration solution are shown in the following figure:



1. Use HUAWEI CLOUD Server Migration Service (SMS) to completely replicate and migrate the system image and disk data of the four application servers and the mounted storage disk to the target system.

2. Use the SFS shared storage and the **tar** and **scp** commands of the OS to copy data in the SAP directory to the target system.

3. Use SAP HANA System Replication (SR) to replicate data in HANA database to the target database.

## 9.3 Preparations

Before the migration, ensure that the following preparations are complete:

1. Obtain information about the OS version, network planning and design, and file system of the source system, and generated the delivery LLD of the target system based on the obtained information.

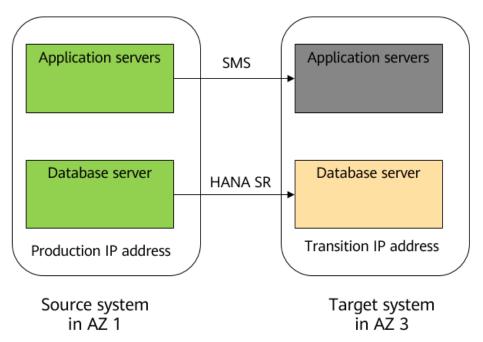
2. Confirm the HANA database version of the source and target systems, and obtain the OS image and installation package of the target database.

3. Ensure that your SMS account has sufficient balance for server creation and renewal.

## 9.4 Implementation

There are two phases for SAP migration. In the first phase, replicate files and data in the source system to the target system. In the second phase, stop the source system and bring the target system online.

## 9.4.1 Replication Procedures



In this phase, deploy new servers in AZ 3, use SMS for real-time replication of application servers, and use HANA SR for asynchronous database replication. In this case, the source system is running properly as the production system, while the target system is not running and has no impact on the production system.

### 9.4.1.1 Preparations

1. Before the replication, ensure that you have performed a full backup of the source system to restore the system in case of faults or misoperations. Back up the HANA database using HANA Studio or other methods. Back up the four application servers using the Cloud Backup and Recovery service of HUAWEI CLOUD.

2. Install the SMS migration Agent on the four application servers. For details, see **Preparations Before Migration** and **Installing the Agent on Linux Servers**.

### 9.4.1.2 Replicating the PAS and AAS

1. Configure target servers on SMS Console. For details, see **Configuring the Target ECS**.

2. Start server replication. For details, see **Starting Replication**.

3. Launch target servers. For details, see Launching the Target ECS.

Note: Before launching target servers, ensure that SAP in the source system is not set to automatically start upon power-on.

4. Check the target server configuration.

**Step 1** Run the **dh** -**h** command to check whether the file system of the target system (except the NFS file system) is the same as that of the source system.

**Step 2** Query the **/etc/fstab** configuration file to check whether the directories and items (except the NFS file system) mounted during startup are the same as those in the source system.

----End

## 9.4.1.3 Replicating the ASCS and ERS

1. Configure target servers by following the instructions provided in **Configuring the Target ECS**. The target servers must have same disks as the source servers have. The shared disk of the target ASCS is the same as that of the source ASCS, and that of the target ERS is the same as that of the source ERS.

2. Start server replication. For details, see **Starting Replication**.

3. Launch target servers. For details, see Launching the Target ECS.

Note: Before launching target servers, ensure that SAP in the source system is not set to automatically start upon power-on.

4. Check the target server configuration.

- **Step 1** On the HUAWEI CLOUD management console, mount the ERS shared disk to ASCS and the ASCS shared disk to ERS.
- **Step 2** Create an SBD shared disk and mount it to ASCS and ERS based on the delivery LLD.
- **Step 3** Run the **dh** -**h** command to check whether the file system of the target system (except the NFS file system) is the same as that of the source system.
- **Step 4** Query the **/etc/fstab** configuration file to check whether the directories and items (except the NFS file system) mounted during startup are the same as those in the source system.

----End

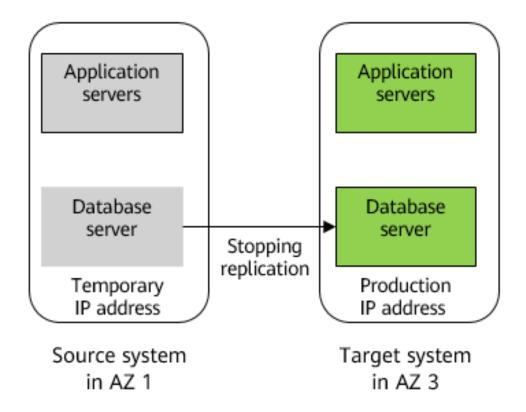
## 9.4.1.4 Replicating HANA Database

- **Step 1** Create an ECS for the target HANA database on HUAWEI CLOUD Console based on the delivery LLD.
- **Step 2** Install the HANA database and upgrade it to the target version. The version must be no earlier than the HANA version of the source system.
- **Step 3** Configure the SR data synchronization between the source database and the target database on the backend.

hdbnsutil -sr\_enable --name=[*Server name of the target HANA DB*] //(*Source HANA DB execution*) hdbnsutil -sr\_register --remoteHost=[*Server name of the target HANA DB*] --remoteInstance=00 -replicationMode=sync --name=[*Server name of the source HANA DB*] //(*Target HANA DB execution*) HDB start //(*Target HANA DB execution*)

----End

## 9.4.2 Go-online Procedures



In this phase, stop the source system, switch the production IP address to the target system in AZ 3, and start services in the target environment to take over production services.

### 9.4.2.1 Backup Before Going Online

Before going online, perform a full backup of the source system to restore the system in case of faults or misoperations. Back up the HANA database using HANA Studio or other methods. Back up the four application servers using the Cloud Backup and Recovery service of HUAWEI CLOUD.

### 9.4.2.2 Stopping the Source System

- **Step 1** Log in to SAP and lock all accounts except the DDIC and hand system accounts in the SU 10 mode.
- Step 2 Create a test user in PFCG.
- Step 3 Suspend backend tasks on SAP.
- **Step 4** Stop applications in the source system.

Log in to the PAS/AAS server as an application user and run the **sapcontrol** -**nr** [*Instance ID*] -**function Stop** command to stop PAS and AAS.

Log in to any ASCS/ERS node as the **root** user and run the **service pacemaker stop** command to stop ASCS and ERS.

**Step 5** Shut down the source database. Ensure that no other services directly read data from or write data to the HANA database after applications are stopped.

Log in to the target database as a database user and run the following command to stop data synchronization with the source database:

hdbnsutil -sr\_unregister

Log in to the source database as a database user and run the following command: HDB stop

Step 6 Change the IP addresses of the source servers.

Log in to the HUAWEI CLOUD management console and change the physical IP addresses of the primary and extension NICs of the five source servers to temporary IP addresses.

Note: Before changing the IP addresses of the primary NICs, ensure that the servers are shut down.

----End

#### 9.4.2.3 Starting the Target System

- **Step 1** On the management console, shut down the five servers of the target system.
- **Step 2** Change the physical IP addresses of the primary and extended NICs of the five servers in the target system from the transition IP addresses to the production IP addresses of the source system. Bind the virtual IP addresses of the ASCS/ERS servers in the source system to the primary NICs of the ASCS/ERS servers in the target system.
- **Step 3** On the management console, power on the five servers of the target system.
- **Step 4** Check the **/etc/hosts** files on the five servers in the target system and ensure that the IP addresses match the domain names or host names. Ensure that the target HANA host name is different from the source host name. Change the HANA host name if the target system uses the source one.
- **Step 5** Mount the SFS shared directory.

Mount the shared file system for database backup in the source system to the **/etc/fstab** file on the target database server.

Mount the shared file system for mounting **/sapmnt/** and **/usr/sap/trans** on the source application servers to the **/etc/fstab** file on the target application servers.

- **Step 6** Log in to the database server as a database user and run the **HDB start** command to start the database. After the database is started, log in to the database using HANA Studio and check whether the database is normal.
- Step 7 Log in to each application server and run the following command as an application user to check the database connection. If 00 is displayed in the command output, the database connection is normal.
  hdbuserstore list
  R3trans -d
- **Step 8** Change the SBD device ID in **/etc/sysconfig/sbd** on the active and standby ASCS/ERS nodes to the actual device ID and rebuild the SBD disk.

sbd -d /dev/disk/by-id/scsixxxxx -4 30 -1 15 create

**Step 9** Start the ASCS and ERS.

Start the two-node cluster and set it to the maintenance status.

service pacemaker start crm configure property maintenance-mode=true

Run the **crm configure edit** command to access the two-node cluster configuration page and change the ASCS/ERS shared disk ID to the actual disk ID of the target system.

Stop the maintenance status of the cluster.

crm configure property maintenance-mode=false

Check the cluster resources. Ensure that the ASCS/ERS resources are in the **started** status.

crm status

**Step 10** Log in to the PAS/AAS servers as an application user, start the PAS and AAS, check their process, and check the application status on SAP.

sapcontrol -nr [*Instance ID*] -function Start sapcontrol -nr [*Instance ID*] –function GetProcessList

----End

#### 9.4.2.4 Checking the System Status

Log in to SAP to check whether the test user created in **Step 2 in section 4.2.2** exists, whether the backend tasks are suspended, and whether the peripheral system integration is normal.

#### 9.4.2.5 Applying for and Importing a New License

You need to apply for a new SAP license according to the new hardware ID.

- 1. If you use SR for database synchronization, you do not need to apply for a new license because SR can adjust the license synchronously.
- 2. If you need to apply for the S/4HANA license, refer to the ASCS hardware ID. If servers are deployed in a two-node cluster and the license information is obtained from SAP, perform a active/standby switchover to ensure that ASCS on both the active and standby nodes is running, and then apply for and import a license for each node.

#### 9.4.2.6 Restoring and launching Services

Log in to SAP, unlock all backend tasks and users, and restore services.

# **10** Best Practice of SAP Disaster Recovery with SDRS

About This Document Preparations for Using SDRS DR Configurations SDRS Performance Test Change History

## **10.1 About This Document**

Storage Disaster Recovery Service (SDRS) provides disaster recovery (DR) services for many cloud services, such as Elastic Cloud Server (ECS), Elastic Volume Service (EVS), and Dedicated Distributed Storage Service (DSS). SDRS uses multiple technologies, such as storage replication, data redundancy, and cache acceleration, to provide you with high data reliability and service continuity.

SDRS protects service applications by replicating the server data and configurations to a DR site. It allows service applications to start at the DR site in the event that the server at the production site stops. This improves service availability and continuity.

For more information, see **Storage Disaster Recovery Service User Guide**.

VPC		
Production site (AZ 1)		DR site (AZ 2)
↓ ELB		
	Protection group	
ECS ECS ECS	Protected instance	ECS ECS ECS
1		1
EVS/DSS	Synchronous replication at the storage layer	EVS/DSS
	Replication pair	[]

## **10.2 Preparations for Using SDRS**

This document applies to the deployment of SAP on SQL Server. Currently, Scalable File Service (SFS) file systems and SFS Turbo cannot be mounted to ECSs. Use SDRS based on the actual scenarios.

In this test, the production site and DR site are in AZ 2 and AZ 3, respectively, in the South China region. The production site uses two servers that have SAP PAS and AAS instances installed respectively, and uses the SQL Server database. After SDRS is used, the servers at the DR site are the same as those at the production site. After a failover, the IP address of the server at the DR site is exchanged with that of the server at the production site, and the server at the DR site takes over workloads from the server at the production site. The SAP system can be started and run properly, and the original production site becomes the DR site. Specifications of the ECS at the production site in this test are as follows:

ECS Name	Flavor	Disk	Image	Remarks
ecssap1	m6.2xlarge.8	System disk: 100 GB, high I/O Data disk: 250 GB, high I/O	Windows Server 2012 R2 Standard 64-bit English (40 GB)	Used for installing SAP ERP and SQL Server
ecssap2	m6.xlarge.8			Used for installing AAS and SAP GUI

## Viewing the Hardware Key at the Production Site

Use the SAP GUI to connect to an SAP application, check and save the SAP hardware key, compare the key with the hardware key after the failover, and ensure that SAP is started.

**Step 1** Log in to **ecssap2** at the production site, run SAP Logon, and click **Variable Logon**.



=			SAP Logon 750	
V <u>a</u> riable Logon <u>N</u> ew Item	Change Item Del	ete item		
		Connections		
Favorites		Name	System Descri	ption
Shortcuts		_		
Connections				
		_		
		_		
		_		
		_		
		_		
		_		
		_		
		1		
		i		
	せ 捜索一下		<b>**</b>	

Step 2 Double-click User Specified System.

	SAP Logon 750
	Logon to System
Select of system	one of the available systems from the list below. If you choose the first entry, you can specify th parameters yourself.
7	Search For: Clear Filter
SID	Description
	User Specified System
<b>S</b>	301
If a SAF	Prouter other than the default is required for the specified system, select the other entry from ter dropdown list.
SAPIOL	ter dropdown list.
	SAProuter:
	Help         Cancel         < Back         Next >         Log On
1	

**Step 3** Configure required parameters based on the site requirements and click **Next**.

=	SAP Logon 750			
	Logon to	System		
Choose the connection type and On' are only active when all requi	change the system red input data has t	parameters as re been entered.	quired. Buttons 'N	ext >' and 'Log
Connection Type:	Custom Applicati	on Server		$\sim$
System Connection Parameter	s			
Application Server:	ecssap1			
Instance Number:	00			
System ID:	S01			
SAProuter String:	-			
Use this page as the first pag	e for subsequent lo	nons: setting take	effect immediate	
	e for subsequentio	gons, setting take	o cheet ininediate	ziy.
Help	<u>C</u> ancel	< <u>B</u> ack	Next >	Log On

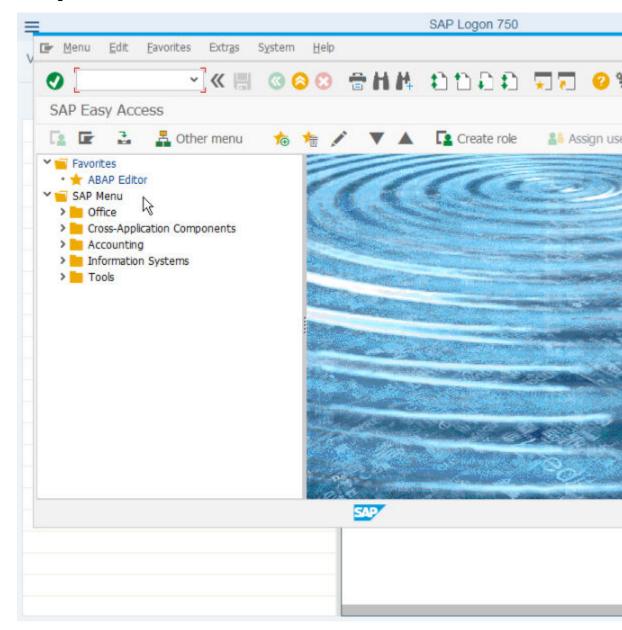
E		S	SAP Logon 750	
	Logon	to System		
Choose network settings.				
Secure Network Settings				
Activate Secure Networ	rk Communication			-
SNC Name				
<ul> <li>Authenticat</li> </ul>	tion only			
<ul> <li>Integrity pro</li> </ul>	otection			
Privacy pro	tection			
Maximum s	ecurity settings avail	able		
SNC logon with	user/password (no	Single Sign-On)		
Network Settings				
High Speed Connection		6		
O Low Speed Connection	1 (Reduced Network	Traffic)		
Help	Cancel	< <u>B</u> ack	Next >	Log On

Step 4 Click Log On.

	SAP Logon 750	
	Logon to System	
Select code pages for communication download.	on between SAP GUI and application server / file u	ipload and
Communication Language / Coo	le Page 🛛 🗟	
	ode page for communication between SAP GUI ar d only in very rare cases when legacy products are re information).	
Language:	Default	~
	-	
Unload/Developed Freeding		
	he files transfered from or to the back end. The fil	e will be or is
currently stored on the client ma	achine hard drive.	
Encoding:	(Default - ANSI for Unicode Systems)	
		~
		~
		~
		~
		~
Help	<u>Cancel</u> < <u>B</u> ack <u>Next</u> >	

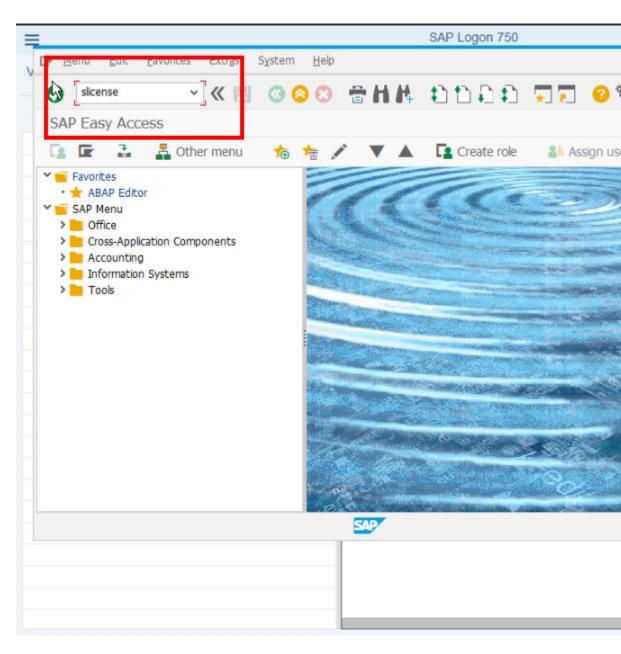
**Step 5** Enter username **ddic** and the password, and then press **Enter**.

Image: System Help     Image: System Help     Image: System Help     New password     Clent     Image: Doct     User     Image: Doct     Image	Image: Content of the second of t	=				SAP Logon 750	
SAP New password Clent  OO1 User ddid Password Logon Language EN	SAP New password Clent 001 User ddid Password Logon Language EN	V User System					
New password         Client       001         User       ddid         Password       ************************************	New password     Clent     User   Addid   Password     Logon Language   EN	0	~ «	🔠 🙆 🔕 🕄	8 H P		* ₹
Client 001 User ddid Password ************************************	Clent 001 User ddid Password ********* Logon Language IN	SAP					
User ddid Password ************************************	User ddic Password ************************************	New password					
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Password       Logon Language	Password  Logon Language EN		<b>F</b>				
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**Step 6** The login to SAP GUI is successful.

**Step 7** Enter **slicense** in the search box and press **Enter** to view the value of **Active Hardware Key** and record it.



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							22.01.2021		Temp 0000000
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				▲ 肖战士兵	清型 搜索一下			-	
				~		Canal March			

# 10.3 DR Configurations

## 10.3.1 Creating a Protected Group

Specify two AZs as the source and target AZs, and create a protection group. Then, you can create protected instances and replication pairs in this protection group.

Determine the production and DR sites before you create a protection group. In this version, only the VPC migration deployment model is supported. Specifically,

the servers at the production and DR sites must be in different AZs but in the same VPC.

Step 1 Log in to the management console and choose Storage > Storage Disaster Recovery Service.

≡	Service List
٢	Elastic Cloud Server
සි	Relational Database Service
,000	Auto Scaling
Ô	Bare Metal Server
0	Elastic Volume Service
<u>,</u>	Volume Backup Service
Ø	Virtual Private Cloud
$\bigtriangleup$	Elastic Load Balance
$\oplus$	Domain Registration
P	Elastic IP

#### 10 Best Practice of SAP Disaster Recovery with SDRS

			C 10			
Enter a	a servi	ce or	funct	lon r	name	۱.

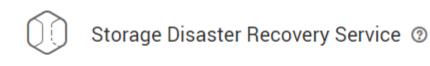
>

Recently Visited Services:	Elastic Cloud Server	Storage [
	Data Warehouse Service	Elast

	ſ	
Computing		Storage
Elastic Cloud Server	Ŧ	Elastic Vo
Halo ECS		Dedicated
Bare Metal Server	¥	Storage D
Cloud Phone		Cloud Ser
Image Management Service		Cloud Bac
FunctionGraph		Volume B
Auto Scaling	¥	Object St
Dedicated Cloud		Data Expr
Dedicated Host		Scalable F
		CDN
Application		Cloud Sto
AppCube		
ServiceStage		Manage
Cloud Service Engine		Cloud Tra
Cloud Service Engine ServiceComb		Cloud Eye
Distributed Cache Service Redis		Applicatio
Distributed Cache Service Memcached		Applicatio
Distributed Message Service		Identity a
Distributed Message Service for Kafka		Log Tank
Distributed Message Service for Rabbit		Tag Mana
Simple Message Notification		
Blockchain Service		El Enter
API Gateway		DAYU
Cloud Derformance Test Service		Data Lak

Cloud Darformanca Test Service

#### Step 2 Click Create Protection Group.



Getting Started with SDRS



**Step 3** Configure the basic information about the protection group as prompted. (Set **Production Site** and **VPC** to the actual AZ and VPC where the production server is located, respectively.)

Create Protection Grou	P < Back to Protection Group List
Region	CN South-Guangzhou Regions are geographic areas isolated from each other. Resour latency and quick resource access, select the nearest region.
DR Direction ②	Production Site DR
Deployment Model	VPC migration vpc-hana-s4 View VPC
Protection Group Name	Protection-Group-4be0

## Use for Free

Step 4 Click Create Now.

**Step 5** Click **Back to Protection Group List** to return to the SDRS homepage and query the protection group status.

or usage details of your	resource packages, go to	o the My Packages page.
		AZ2 🄊 AZ3
Protection Group	Protection-Group-	-4be0
Protection Group Status	🛛 📀 Available	0 Protected Instance
Deployment Model	VPC migrati	O Replication Pairs
	vpc-hana-s4	U I
VPC		O DR Drills
VPC Production Site	AZ2	0

**Step 6** Click the name of the protected group to view its details.

Name	Protection-Grou	ıp-4be0 💉	
ID	f60c6d	456	
Deployment Model	VPC migration		
VPC	vpc-hana-s4		
Created	Aug 24, 2020 16	6:05:39 GMT+08:00	
Protected Instan	ces Replica	ation Pairs DR Drills	
Create Protected	Instance	Delete Protected Instance	You can create 50 more
Name		Status	Production Site

#### Storage Disaster Recover... > Protection-Group-4be0

----End

## 10.3.2 Creating a Protected Instance

Select a protection group for each server to be replicated and create a protected instance using the server. When you create a protected instance, the server and disk will be created at the DR site for the production site server and disk. The server specifications can be configured as required. Specifically, the specifications of the DR site server can be different from those of the production site server. The disks of the production site and DR site are of the same specifications and can automatically form a replication pair.

The server at the DR site is in the **Stopped** state after the protected instance created. These automatically created resources, including the DR site servers and disks, cannot be used before a planned failover or failover.

**Step 1** On the **Storage Disaster Recovery Service** page, click **Protected Instances** in the created protection group.



For usage details of your resource packages, go to the My Packages page.

You can create 9 more protection groups and 100 more replication pairs.

			AZ2 湤 AZ3
Protection Group	Protection-Group-4be	e0	
Protection Group Status	<ul> <li>Available</li> </ul>	0	Protected Instances
Deployment Model	VPC migrati	~	
VPC	vpc-hana-s4	U	Replication Pairs
Production Site	AZ2	0	DR Drills
DR Site	AZ3		
Enable Protect	ion Execute Planne	ed Failove	r More 👻

Step 2 Click Create Protected Instance under the Protected Instances tab.

-			
Name	Protection-Gro	pup-4be0 🥒	
ID	f60c6d68	<b>****</b> ********************************	
Deployment Model	VPC migratior	1	
VPC	vpc-hana-s4		
Created	Aug 24, 2020	16:05:39 GMT+08:00	
Protected Instan	ces Replic	cation Pairs DR Drills	
Create Protected	Instance	Delete Protected Instance	You can create 50 more
Name		Status	Production Site

Storage Disaster Recover... > Protection-Group-4be0

**Step 3** Configure the basic information about the protected instance as prompted. The specifications of the server can be modified.

Create Protected Insta	Ance < Back to Pr	otection Gr	oup Details Pag	e
Protection Group Name	Protection-Group-4b	e0		
Protection Group ID	f60c6d		88888 <sup>16</sup>	
DR Direction	Production Site AZ2		DR Site AZ3	
Production Site	AZ2			
Deployment Model	VPC migration			
VPC	vpc-hana-s4			
* Production Site Server	You can select 5 pro Learn more about th			st. ting a protected instanc
	Name		Status	Specifications/Image
	🗸 🔽 ecssapi	2	Stopp	m6.xlarge.8   4 vCPUs Windows Server 2012
	🗸 🔽 ecssap		Stopp	m6.2xlarge.8   8 vCPU Windows Server 2012
	Selected: ecssap2 e	cssap1		
DR Site Server	ECS Del	1		
DR Site VPC	vpc-hana-s4			
DR Site Primary NIC	Select subnet You can specify a su	bnet of the	primary NIC, or	use the subnet automat
DR Site Disk	EVS DSS	3		
* Protected Instance Name	Protected-Instance	e-2222		
Price Hour + Dis This price is an estimate and	sk Price Hou		ricing details	

**Step 4** Click **Create Now**, confirm the configuration parameters, and click **Submit**.

01	cuterroteoteu	motunoc		
	Configure —			2 Confirm
	Details			
	Resource	Configuration		
	Protected instance	Protection Gro Protection Gro Production Site Deployment M Production Site Protected Insta Production Site Production Site Production Site DR Site DR Site Server	up ID e odel e VPC ance Name e Server Name e Server ID e Server Specifications	Protection-Group-4be0 f60c6 AZ2 VPC migration vpc-hana-s4 Protected-Instance-2222 ecssap2 ecssap1 caab9462 m6.xlarge.8   4 vCPUs   32 GB m6.2xlarge.8   4 vCPUs   32 GB m6.xlarge.8   4 vCPUs   32 GB m6.xlarge.8   4 vCPUs   32 GB m6.xlarge.8   8 vCPUs   64 GB
	Disk	Ultra-high I/O Ultra-high I/O	350GB 350GB	

### **Create Protected Instance**



Step 5 Click Back to Protection Group Details Page and view the protected instances of the protection group. If the protected instance status changes to Available or Protecting, the protected instance has been created successfully.

Storage Disaster Recover... > Protection-Group-4be0

Name	Protection-Gr	oup-4be0 💉		
ID	f60c6		56	
Deployment Model	VPC migratio	n		
VPC	vpc-hana-s4			
Created	Aug 24, 2020	16:05:39 GMT+08:00		
Protected Instan Create Protected	· ·	cation Pairs DR Dri		create 48 more
Name	(	Status	Product	tion Site
Protected-I	nstance-22	<ul> <li>Available</li> </ul>	AZ2	
Protected-I	nstance-22	🧿 Available	AZ2	

**Step 6** After a protected instance is created, the system automatically creates replication pairs for the disks of the protected instance and backs up all the disks. To view the replication pair details, click the **Replication Pairs** tab.

Nam	ie	Protection-Group-4	be0 🖉		
ID		f60c6		56	
Depl	oyment Model	VPC migration			
VPC		vpc-hana-s4			
Crea	ited	Aug 24, 2020 16:05	:39 GMT+08:00		
Pro	otected Instan	ces Replication	n Pairs DR Dri	lls	
С	Create Replicatio	n Pair	]	1	
	Name		Status		Production
`	<ul> <li>Protected-Ir</li> </ul>	nstance-2222-0	📀 Available		AZ2
~	<ul> <li>Protected-Ir</li> </ul>	istance-2222-0	Available		AZ2
~	<ul> <li>Protected-Ir</li> </ul>	nstance-2222-0	<ul> <li>Available</li> </ul>		AZ2
~	<ul> <li>Protected-Ir</li> </ul>	nstance-2222-0	🥏 Available		AZ2

Storage Disaster Recover... > Protection-Group-4be0

----End

## **10.3.3 Enabling Protection**

When data is written to the disks of the server at the production site, SDRS synchronizes the data to the disks of the server at DR site in real time.

**Step 1** On the **Storage Disaster Recovery Service** page, click **Enable Protection** in the pane of the desired protection group.



- **Step 2** In the displayed dialog box, confirm the protection group information, and click **Yes**. Once protection is enabled, data synchronization starts.
- **Step 3** Click the protected group to view the data synchronization progress.

Name         Status         Production Site         Symc Progress         Production Site Server         Production Site Server Site         IP Address         Production Site Server Site         Production Site Server Site <thp< th=""><th>tio Operation rd Attach Detach More</th><th>te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +</th><th>A22         300         Protecting           A22         A23         A23           A23         Interference         Q           Bite Server S1         IP Address         Production Site Server Specificatio.         Operation           101         IP Server S1         IP Address         Production Site Server Specificatio.         Operation</th><th>DB Direction A22 &gt;&gt;&gt;&gt; A23 Protection Graup Status •&gt;&gt;&gt;&gt; A23 Production Site •&gt;&gt;&gt;&gt; A23 DB Site A23 DB Site A23 DB Site A23 DB Site A23</th></thp<>	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	A22         300         Protecting           A22         A23         A23           A23         Interference         Q           Bite Server S1         IP Address         Production Site Server Specificatio.         Operation           101         IP Server S1         IP Address         Production Site Server Specificatio.         Operation	DB Direction A22 >>>> A23 Protection Graup Status •>>>> A23 Production Site •>>>> A23 DB Site A23 DB Site A23 DB Site A23 DB Site A23
sportered of used of the Potentian Constraint of the Potentian Constr	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	O Protecting     A22     A23     Name      Q,     If Address     Production Site Server Specificatio     Operation     109     Operation     Total Calling 6 (6)9 (20mic Adapte 6 (8 (4))000 (4) (6) (6)	Protection Group Status
Nume         Nume <th< td=""><td>tio Operation rd Attach Detach More</td><td>te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +</td><td>A22 A23 Site Server St I/P Address Production Site Server Specificatio Operation</td><td>Production Site A22 DR Site A23 Coluction Site Server Production Site Server Site. IP Address Production Site Server Specificatio Operation</td></th<>	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	A22 A23 Site Server St I/P Address Production Site Server Specificatio Operation	Production Site A22 DR Site A23 Coluction Site Server Production Site Server Site. IP Address Production Site Server Specificatio Operation
And A go 24 A 252 Li 6 C 55 G MT 406 400 BT 601 C T 100 C MT 406 400 BT 601 C T 100 C MT 400	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	A23           Name         Q           Site Server SL.         IP Address         Production Site Server Specificatio         Operation           101         Im Calatege 818 SerVals (46 68         Im Calatege 818 SerVals (46 68         Im Calatege 818 SerVals (46 68)	DR Site A23 Outcoin Site Server Production Site Server Site. IP Address Production Site Server Specificatio Operation
Name         Status         Production Site         Sync Projection         Sync Projection         Production Site Server 91.         IP Address         Production Site Server 92.         Production Site         Production Site         Sync Projection           Name         Status         Production Site         Sync Projection         Sync Projection         Production Site Server 92.         IP Address         IP Address<	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	Name         Q           Dite Server St         IP Address         Production Site Server Specificatio         Operation           10%         William Site (Site) 20         mic Adapter 28 10 KPVbs (46 68         Mic Mark 10 KPVbs (46 68	Name    Name    Name     Name
Detected Instance         You can create 44 more protected instance.         Name         Image: Control (Control (Contro) (Contro) (Control (Control (Control (Contro) (Control (Control (	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	Site Server St IP Address Production Site Server Specificatio. Operation  13***********************************	oduction Site Server Production Site Server St IP Address Production Site Server Specificatio Operation
Detected Instance         You can create 44 more protected instance.         Name         Image: Control (Control (Contro) (Contro) (Control (Control (Control (Contro) (Control (Control (	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	Site Server St IP Address Production Site Server Specificatio. Operation  13***********************************	oduction Site Server Production Site Server St IP Address Production Site Server Specificatio Operation
Name         Status         Production Site         Symc Progress         Production Site Server         Production Site Server Specification.         Operation           Protected istatuce-22.         P. Protecting         AZ2	tio Operation rd Attach Detach More	te Server Specificatio Operation 18 vCPUs   64 GB er 2012 R2 Standard Attach Detach More +	Site Server St IP Address Production Site Server Specificatio. Operation  13***********************************	oduction Site Server Production Site Server St IP Address Production Site Server Specificatio Operation
Protected futures:22.         P Protecting         A22	rd Attach Detach More	8 vCPUs   64 GB er 2012 R2 Standard Attach Detach More	(Star) 139 000000 (EIP) 20 m6.2xlarge.8   8 vCPUs   64 GB	
Protected Instance 20     Protected Ins	rd	er 2012 R2 Standard	(Stop) 139 00000000000000000000000000000000000	
Protected instance-22.         Protecting         AZ2         Image: State (State (St				ssap1 SRunning(Stop) 139 State (Pi / 20 m6.2xlarge 8   8 vCPUs   64 GB Attach Detach Mo 192.168.0.180 (Private IP) Windows Server 2012 R2 Standard
	rd., Attach Detach More		(Stop) 13500006 (EIP) 20 Mbit m6.xlarge.8   4 vCPUs   32 GB 192.166.0.84 (Private IP) Windows Server 2012 R2 Standard Attach Detach More -	ssap2   Running(Stop)  13  13  13  13  13  13  13  13  13  1
	anned Failover More	Execute Planned Failover More +	Enable Protection Disable Protection Execute Planned Failover More *	Enable Protection Disable Protection Execute Planned Failover More
	lanned Failover More	Execute Planned Failover More 👻		
e Protection-Group-Bed0 ≠ Region Guangshou Motod	Anned Failover More •	Execute Planned Failover More 👻	Guangzhou	Region Guangzhou
	anned Failover More •	Execute Planned Failover More 👻	Guangzhou AZ2 3000 AZ3	Region Guangzhou DR Direction A22 >>>> A23
Holded     DR Direction     A22       Joyment Model     VPC migration     Protection Group Status () () Protecting	anned Failover More •	Execute Planned Fallover More 👻	Guangshou A22 3333 A23 ② ● Protecting	Region Guangshou DR Direction A22 >>> A23 Protection Group Status ③ ● Protecting
Hole     D1 Decision     A22       typeset Model     VPC migration     Protection Graup Data       upchase4     Production Site     A22	anned Failover More	Execute Planned Failover More •	Guangzhou A22 3333 A23 © Protecting A22	Region     Guaegybou       DB Direction     A22       Protection Group Status     Image: Protecting       Production Site     A22
Febde     DR Direction     A22       vormert Model     VPC migration     Protection Group Status (*)     •       vpc hutte>4     Production Site     A22       ted     Aug 24, 2020 16 05.59 GMT+00.00     DR Site     A23	anned Failover Mote	Execute Planned Failover More +	Guangzhou A22 3333 A23 © Protecting A22	Region     Guaegybou       DB Direction     A22       Protection Group Status     Image: Protecting       Production Site     A22
Holoc         Dit Direction         A22           opment Model         VPC nigration         Potection Grass Status         ©         Petecting           vpc-bans-4         Potection Grass Status         ©         Petecting           read         Aug 2, 2020 16:65:9 GMT+08.00         DR Site         A23           zetected Instances         Peglication Pairs         DR Dills         Z			Guangtheu A22 >>>> A23 O Protecting A22 A23	Region     Guargebou       Drl Direction     A22       Protection Group Status     Image: Comparison of the status       Production Site     A22       Drl Site     A23
Hole-Compared in the second		me v Q	Guangtheu A22 333 A23 ③ ● Protecting A22 A23	Region     Guaegybou       Dfl Direction     A22       Protection Group Status (*)     Image: Comparison of the protecting       Production Site     A22       DR Site     A23
Holocome     DR Dection     A2       Logentation     Potention     Protection       upper log     Potention     A2       upper log     Potention     A2       upper log     DR Diffe     A2       upper log     DR Diffe     A2		me v Q de Disk Operation	Guangthou A22 333 A23 The Protecting A22 A23 Protected Instance Production Ste Dak Operation	Region     Guangshou       DB Direction     A22       Protection Group Status: <ul> <li>Protecting</li> <li>Production Site</li> <li>A22</li> <li>DB Site</li> <li>A23</li> </ul> Versities     A23
földe     BR Dection     A2       topment Model     VPC nigration     Protection Group Status     © Protecting       type hana 4     Protection Group Status     © Protecting       tet     Agg 24, 2020 160 0559 GMT+08.00     DR Bins       ottetetel Instance     Replication Pairs     DR Diffs       tete     Status     Production Site       Name     Status     Protection Site       © Protected Instance     Status     Production Site       © Protected Instance     Protected Instance     Protected Instance	r C Operation	me - Q Re Disk Operation Expand Capacity Delete	Buangshou       A22       Image: Constraint of the state of t	Region     Guangshou       DB Direction     A22       Protection Group Status ()     ●       Protection     A22       DB Site     A22       DB Site     A23
Hölco     Hölco     A2       toymet Model     Vic Angestion     Protection Group Status © Protecting       i     vpc.hane 34     Production Site     A22       adg 24, 2020 16 06 58 GMT+08 00     DR Bins     A23	C Operation Espand Cipacity Delete	me - Q Re Disk. Operation Expand Capacity Delete Expand Capacity Delete	Guangphou A22 JJJ A23 Protecting A22 A23 Name	Region     Guangshou       DR Direction     A22       DR Direction Group Status ()     ()       Production Stere     A22       DR Site     A22       DR Site     A23         Name     •       Crasted     Production Stere       Aug 34, 2020 16:14.52 GMT+0.     Producted Instance: 2222 0001       Valuer 414     Expand Capacity Delet

#### **Step 4** View the data synchronization results.

Storage Disaster Rec				Enable Protection	Disable Prot	ection	Execute Plan	ned Failover	More 👻	С					
Name	Protection-Group-	áhel) 🖉				Region		Guangzho	ш						
ID	160c6d		<b>88</b> 6			DR Direction		AZ2							
Deployment Model	VPC migration							Protect							
VPC	C vpc-hane-s4						Site	AZ2							
Created	Aug 24, 2020 16:0	5:39 GMT+08:00				DR Site		AZ3							
Protected Instan	Replication	on Pairs DR	Drills												
Create Protected	Instance De	lete Protected Ins	tance You can create 48 more pro	otected instances.							Name	*		C	C
Name	5	Status	Production Site	Sync Progress	Production S	ite Server	Production Site	Server St	IP Address	Product	tion Site Se	rver Specificatio	Operation		
Protected-In	nstance-22	Protecting	AZ2	100%	ecssap1		Running(Sto	p)	139 60 (EIP) 20 192.168.0.180 (Private II			PUs   64 GB )12 R2 Standard	Attach D	rtach More	•
Protected-In	nstance-22	Protecting	AZ2	100%	ecssap2		Running(Sto	p)	139 26 (EIP) 20 Mb 192.168.0.84 (Private IP	it m6.xlar ) Window		PUs   32 GB )12 R2 Standard	Attach D	stach More	•

Storage Disaster Recover > Pr	otection-Group-4be0				Enab	le Protection	Disable Prote	ection	Execute Plan	ned Failover	More *	C
Name Protection	n-Group-4be0 🖋			Region	Guangzhou							
ID f60c6	<b></b>			DR Direction	AZ2 🔊 AZ3							
Deployment Model VPC migr	ation			Protection Group Status 🕥	Protecting							
VPC vpc-hana	s4			Production Site	AZ2							
Created Aug 24, 2	020 16:05:39 GMT+08:00			DR Site	AZ3							
Protected Instances	plication Pairs DR Drills											
Create Replication Pair								Name	Ŧ		Q	С
Name	Status	Production Site	Sync Progress	Created	Protecter	Instance	Produc	tion Site Disk		Operation		
<ul> <li>Protected-Instance-222</li> </ul>	2-0 S Protecting	AZ2	100%	Aug 24, 2020 16:14:52 GM	AT+0 Protecter	Hinstance-2222-000	1 volume	r-e414		Expand Capaci	ty Delete	
✓ Protected-Instance-222	2-0 🔮 Protecting	AZ2	100%	Aug 24, 2020 16:14:51 GN	AT+0 Protecter	I-Instance-2222-000	1 ecssap	2		Expand Capaci	ty Delete	
<ul> <li>Protected-Instance-222</li> </ul>	2-0 O Protecting	AZ2	100%	Aug 24, 2020 16:14:48 GN	AT+0 Protecter	I-Instance-2222-000	2 ecssap	1-volume-000	n	Expand Capaci	ty Delete	
<ul> <li>Protected-Instance-223</li> </ul>	2-0 📀 Protecting	AZ2	100%	Aug 24, 2020 16:14:47 GN	AT+0 Protecter	I-Instance-2222-000	2 ecssap	1		Expand Capaci	ty Delete	

Step 5 Log in to the ECS console, and you can see that two ECSs with the same specifications as those at the DR site are created, the AZ of the two ECSs is the AZ selected when the protection group is created, and the two ECSs are in the Stopped state.

	Cloud Server Console		Elastic Cloud Server ③							≪ ECS News	D Quick Links	Buy ECS
8	Dashboard		We would much appreciate it if you could complete our of	puestionnaire on Ela	stic Cloud Server. Your feed	tback will help us provide	a better user experience.					3
.00.	Elastic Cloud Server Dedicated Host		Start Stop Reset Password More	*							C 🛞 🖸	88 =
6	Bare Metal Server		Searched by name by default.									Q
0	Elastic Volume Service	*	Name/ID	Monitoring	AZ 🖓	Status 🏹	Specifications/Image	IP Address	Billing Mode 😈	Enterprise Project	Operation	
0 4	Dedicated Distributed Storage Service	•	ecssap2 a09bfb23-	Ø	AZ3	Stopped Locked by SDRS	4 vCPUs   32 GB   m6xlarge.8 Windows Server 2012 R2 Standa	192.168.0.236 (Private I	Pay-per-use Created on Aug 24, 2	default	Remote Login	More 🔻
4	Image Management Service		ccsap1 3d376c8f-4	Ø	AZ3	Stopped Locked by SDRS	8 vCPUs   64 GB   m6.2xlarge.8 Windows Server 2012 R2 Standa	192.168.0.185 (Private I	Pay-per-use Created on Aug 24, 2	default	Remote Login	More 👻
0	Auto Scaling	*										
0	Key Pair	ø	caab9462-		AZ2	Running Locked by SDRS	4 vCPUs   32 GB   m5.xlarge.8 Windows Server 2012 R2 Standa	130 26 (EIP) 20 M 192.168.0.84 (Private IP	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More 👻
	ECS Group Halo Elastic Cloud Server NEW		CSSap1	ø	AZ2	Running Locked by SDRS	8 vCPUs   64 GB   m6.2xlarge.8 Windows Server 2012 R2 Standa	139	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More 👻

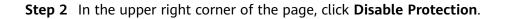
----End

## **10.3.4 Disabling Protection**

If you want to disable protection for all resources in a specified protection group, you can perform steps provided in this section. Once the protection is disabled, data synchronization for all protected instances in the protection group will stop.

**Step 1** Log in to the **Storage Disaster Recovery Service** page. In the pane of the protection group to be disabled, click **Protected Instances**.

Storage Disaster Recovery Service ③	Service Process     User Guide      Buy Protected Instance Package     + Create Protection Group     * Fall Soven
For usage details of your resource packages, go to the My Packages page.	Hame v Q C
AZ2 33 AZ3 Protection Group Protection-Group-4be0 Protection Group Status  Protecting Deployment Model VPC	



Storage Disaster Re	ecover • Protect	ion-Group-4be0						Enable Protection Di	isable Prote	ction	Execute Planner	l Failover	More 👻	C
Name	Protection-Gro	up-4be0 🖋				Region	Guangz	hou						
ID	f60c6	56				DR Direction	AZ2 📡	AZ3						
Deployment Model	VPC migration					Protection Group Sta	itus 🕐 🔮 Prol	ecting						
VPC	vpc-hana-s4				Production Site	ion Site AZ2								
Created	Aug 24, 2020 1	6:05:39 GMT+08:00				DR Site	AZ3							
Protected Instar		ation Pairs DR Drills	You can create 48 more prote-											C
Create Protected	ainstance	Delete Protected Instance	Tou can create 46 more protei	cted instances.						Name	Ψ		ų	G
Name		Status	Production Site	Sync Progress	Production Site	Server Produc	tion Site Server St	IP Address	Producti	on Site Server	Specificatio	Operation		
Protected-I	Instance-22	Protecting	AZ2	100%	ecssap1	<ul> <li>Ru</li> </ul>	nning(Stop)	139 60 (EIP) 20 192.168.0.180 (Private IP)		ge.8   8 vCPUs s Server 2012		Attach D	stach More 🗸	
Protected-I	Instance-22 🖋	Protecting	AZ2	100%	ecssap2	<ul> <li>Ru</li> </ul>	nning(Stop)	139 192.168.0.84 (Private IP)		e.8   4 vCPUs   s Server 2012		Attach D	stach More +	

**Step 3** In the displayed dialog box, confirm the protection group information, and click **Yes**.

Storage Disaster Recover > Protection-Group-4be0					Enable Protection Di	sable Protection Execute Planned I	Failover More * C
Name Protection Group-BeO / 66 D total VPC migration VPC VpC migration			, want to disable protec	tion for this protection g between the production site an DR Direction			
		Protection-Group-4be0	Protecting	From AZ2 to AZ3	_		
Protected Instances Replication Pairs DR Drills			Yes No		_		
Create Protected Instance Delete Protected Instance	You can create 48 more					Name 👻	QC
Name Status     Protected-Instance-22     Protecting	Production Site	Sync Progress	Production Site Server	Production Site Server St  Running(Stop)	IP Address 139 60 (EIP) 20		Operation Attach Detach More -
Protected-instance-22 O Protecting	AZZ		ecssap1	<ul> <li>Hunning(stop)</li> </ul>	192.168.0.180 (Private IP)	Windows Server 2012 Hz Standard	Attach Detach More +
Protected-Instance-22 O Protecting	AZ2	100%	ecssap2	Running(Stop)	139 26 (EIP) 20 Mbit 192.168.0.84 (Private IP)	m6.xlarge.8   4 vCPUs   32 GB Windows Server 2012 R2 Standard	Attach Detach More +
Storage Disaster Recover > Protection-Group-4be0					Enable Protection E	Disable Protection Execute Planned	Failover More • C
Name Protection-Group-4be0 🖋			Region	Guangzh	ou		
ID f60c6			DR Direct	ion AZ2 🔊	AZ3		
Deployment Model VPC migration			Protectio	n Group Status 🕥 🔅 Disab	oling protection		
VPC vpc-hana-s4			Productio	n Site AZ2			
Created Aug 24, 2020 16:05:39 GMT+08:00			DR Site	AZ3			
Protected Instances Replication Pairs DR Drills							
Create Protected Instance Delete Protected Instance	You can create 48 more p	rotected instances.				Name 👻	QC
Name Status	Production Site	Sync Progress	Production Site Server	Production Site Server St	IP Address		Operation
Protected-Instance-22 Disabling protection	AZ2	100%	ecssap1	<ul> <li>Running</li> </ul>	139 (EIP) 20 192.168.0.180 (Private IP)	m6.2xlarge.8   8 vCPUs   64 GB Windows Server 2012 R2 Standard	Attach Detach More -
Protected-Instance-22 Disabling protection	AZ2	100%	ecssap2	Running	13:0000 (EIP) 20 Mbit 192.168.0.84 (Private IP)	m6.xlarge.8   4 vCPUs   32 GB Windows Server 2012 R2 Standard	Attach Detach More -

After protection is disabled, data synchronization between the production site and DR site for all protected instances in the protection group will stop.

Storage Disaster Recover > Protection-Group-4be0					Enable Protection	Disable Protection Execut	te Planned Failover	More + C
Name Protection-Group-Bod /* D f60-c+ Dopplyment Mode VPC migration VPC vpc-base s4 Created Aug 24, 2020 16:05:39 GMT+08:00 Protected Instances Replication Pairs DR Drills			Region DR Direction Protection C Production 1 DR Site	iroup Status 🕥 🔮 Av	>>>> AZ3			
Create Protected Instance Delete Protected Instance	You can create 48 more protected in	nstances.				Name	*	QC
Name Status	Production Site Syn	nc Progress Produc	ction Site Server	Production Site Server S		Production Site Server Specif		
Protected-Instance-22 O Available	AZ2 -	ecssap	pl	8 Running(Stop)	139	m6.2xlarge.8   8 vCPUs   64 G Windows Server 2012 R2 Sta		More +
Protected-Instance-22 O Available	AZ2	ecssap	p2	S Running(Stop)	139 26 (EIP) 20 Mbit 192.168.0.84 (Private IP)	m6.xlarge.8   4 vCPUs   32 GE Windows Server 2012 R2 Sta		More +
Storage Disaster Recover • Protection-Group-4be0					Enable Protection	Disable Protection Execut	ite Planned Failover	More • C
Name Protection-Group-4be0 🖉			Region	Guanç	gzhou			
ID f60cc			DR Direction	AZ2	XXX AZ3			
Deployment Model VPC migration				Group Status 🛞 🔮 Av	vailable			
VPC vpc-hana-s4 Created Aug 24, 2020 16:05:39 GMT+08:00			Production DB Site	Site AZ2				
Created Aug 24, 2020 16:05:39 GMT+08:00 Protected Instances Replication Pair DR Drills Create Replication Pair			UN Sile	AL3		Name	Ŧ	QC
Name Status	Production Site	Sync Progress	Created		Protected Instance	Production Site Disk	Operation	
<ul> <li>Protected-Instance-2222-0</li> <li>Available</li> </ul>	AZ2	-	Aug 24,	2020 16:14:52 GMT+0	Protected-Instance-2222-0001	volume-e414	Expand Capacity	)elete
V Protected-Instance-2222-0 S Available	AZ2	-	Aug 24,	2020 16:14:51 GMT+0	Protected-Instance-2222-0001	ecssap2	Expand Capacity	Delete
V Protected-Instance-2222-0 O Available	AZ2	-	Aug 24,	2020 16:14:48 GMT+0	Protected-Instance-2222-0002	ecssap1-volume-0001	Expand Capacity	)elete
V Protected-Instance-2222-0 O Available	AZ2	-	Aug 24,	2020 16:14:47 GMT+0	Protected-Instance-2222-0002	ecssap1	Expand Capacity	Delete

**Step 4** To enable protection again, perform the steps described in **Enabling Protection**.

----End

### 10.3.5 Performing a Planned Failover

A planned failover changes the disaster recovery direction of a protection group. After the planned failover, data synchronization continues, but the DR direction is changed from the DR site to the production site. Perform planned failovers based on your planned outages to ensure no data loss. For example, if the production site (AZ 2) is going to encounter a power failure, you can perform a planned failover to switch the services in AZ 2 to the DR site (AZ 3). The planned failover will not affect data synchronization of the protection group.

SDRS will migrate NICs on the server during the planned failover. After the planned failover, the IP, EIP, and MAC addresses of the production site server will be migrated to the DR site server, so that the IP, EIP, and MAC addresses remain the same.

#### **NOTE**

- Ensure that all the servers in the protection group are stopped before the planned failover.
- During the planned failover, do not start the servers in the protection group. Otherwise, the planned failover may fail.
- Once a planned failover is complete, data synchronization will not stop, only the synchronization direction will reverse.
- After the planned failover is complete, the status of the protection group changes to **Protecting**. Switch to the protected instance details page and start the server at the production site.

# **Step 1** Log in to the ECS management console and stop the target server at the production site.

	Cloud Server Console		Elastic Cloud Server ⑦							<pre># ECS News</pre>	🕞 Quick Links	Buy ECS
5	Dashboard		We would much appreciate it if you could complete or	r questionnaire on El	stic Cloud Server. Your	r feedback will help us provide	a better user experience.					>
l	Elastic Cloud Server											
	Dedicated Host		Start Stop Reset Password M	ore 🔻							C 🛞 🖬	88 =
	Bare Metal Server		Searched by name by default.									Q
	Elastic Volume Service	•	Name/ID	Monitoring	AZ 🏹	Status 🖓	Specifications/Image	IP Address	Billing Mode 🏾 🍞	Enterprise Project	Operation	
	Dedicated Distributed Storage Service	•	crssp2 8096/b22	Ø	AZ3	Stopped Locked by SDRS	4 vCPUs   32 GB   m5.xlarge.8 Windows Server 2012 R2 Standa	192.168.0.236 (Private L.	Pay-per-use Created on Aug 24, 2	default	Remote Login	More •
	Image Management Service		ccssap1 3d376c8	Ø	AZ3	Stopped Locked by SDRS	8 vCPUs   64 GB   m5.2xlarge.8 Windows Server 2012 R2 Standa	192.168.0.185 (Private L.	Pay-per-use Created on Aug 24, 2	default	Remote Login	More •
	Auto Scaling	*										
	Key Pair	8	cab94		AZ2	Stopped Locked by SDRS	4 vCPUs   32 GB   m6xlarge.8 Windows Server 2012 R2 Standa	139.9.33.26 (EIP) 20 M 192.168.0.84 (Private IP	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More •
	ECS Group Halo Elastic Cloud		ecssp1 138735	Ø	AZ2	Stopped Locked by SDRS	8 vCPUs   64 GB   m6.2xlarge.8 Windows Server 2012 R2 Standa	139.159.234.60 (EIP) 2 192.168.0.180 (Private L.	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More •

**Step 2** Log in to the **Storage Disaster Recovery Service** page, click the protected group for which you want to perform a planned failover, and check the synchronization result and whether the server in the protected group is stopped.

Storage Disaster Rec	cover > Protection-	Group-4be0							Enable Protection	Disable Prote	ection	Execute Planned Fa	ilover	More 👻	С
Name	Protection-Group-4	be0 🖉				Region		Guangzh	ou						
ID	f60c6d					DR Direction	n	AZ2 እ	≫ AZ3						
Deployment Model	VPC migration					Protection (	Group Status	🔊 🥑 Prote	cting						
VPC	vpc-hana-s4					Production	Site	AZ2							
Created	Aug 24, 2020 16:05	:39 GMT+08:00				DR Site		AZ3							
Protected Instan	ces Replicatio	n Pairs DR Drills							I						
Create Protected	Instance Del	ete Protected Instance	You can create 48 more prot	tected instances.							Name	<b>-</b>		Q	С
Name	S	tatus	Production Site	Sync Progress	Production Site	e Server	Production S	ite Server St	IP Address	Producti	ion Site Serve	er Specificatio 0	peration		
Protected-In	nstance-22	Protecting	AZ2	100%	ecssap1		Stopped	Start)	139 50 (EIP) 20 192.168.0.180 (Private IP	m6.2xlar ) Window	rge.8   8 vCPU s Server 2012		ttach Detach	More •	
Protected-In	nstance-22	Protecting	AZ2	100%	ecssap2		Stopped	Start)	13 (EIP) 20 Mbi 192.168.0.84 (Private IP)	L m6.xlarg Window	ge.8   4 vCPUs s Server 2012		ttach Detach	More •	

#### **Step 3** Click **Execute Planned Failover**.

Storage Disaster Re	cover > Protecti	ion-Group-4be0						Er	nable Protection	Disable Prote	ction	Execute Plar	nned Failover	More 👻	C
Name	Protection-Grou	up-4be0 🖉				Region	Gu	uangzhou							
ID	f60c6	56				DR Direction	AZ	Z2 🔊 🔊	Z3						
Deployment Model	VPC migration					Protection Group	Status 🕜 😒	Protecting							
VPC	vpc-hana-s4					Production Site	Až	Z2							
Created	Aug 24, 2020 1	6:05:39 GMT+08:00				DR Site	AZ	Z3							
Protected Instar	nces Replica	ation Pairs DR Drills													
Create Protected	Instance	Delete Protected Instance	You can create 48 more prote	cted instances.							Name	÷		0	С
Name		Status	Production Site	Sync Progress	Production Site	Server Pro	duction Site Serv	ver St IP	Address	Producti	on Site Serve	r Specificatio	o Operation		
Protected-I	nstance-22 🖋	Protecting	AZ2	100%	ecssap1	۲	Stopped(Start)	11	39 30 60 (EIP) 20 92.168.0.180 (Private II	m6.2xlar 9) Windows	ge.8   8 vCPL Server 2012	ls   64 GB R2 Standard	Attach D	letach More	•
Protected-I	nstance-22	Protecting	AZ2	100%	ecssap2	۲	Stopped(Start)		3 20 Mbi 92.168.0.84 (Private IP)		e.8   4 vCPU: Server 2012	32 GB R2 Standard	Attach D	etach More	

**Step 4** Select the protected instance for which you want to perform a planned failover and click **Execute Planned Failover**.

torage Disaster Recover > Protection-Group-4be0		Enable Protection	Disable Protection Execute Planne	ed Failover More 👻
ame Protection Group-4be0 /	Execute Planned Failover	×		
f60ct	Check the status to ensure that the servers in the protection group are perform the planned failover. During the planned failover, do not start th protection group. Otherwise, the planned failover may fail.			
eated Aug 24, 2020 16:05:39 GMT+08:00	Protection Group Protection-Group-4be0	C		
Protected Instances Replication Pairs DR Drills	Protected Instance Server Server Stat., AZ	Created		
Create Protected Instance Delete Protected Instance You can create 48 more	Protected-Instance-22 ecssap1	Aug 19, 20	Name +	Q
Name Status Production Site	Protected-Instance-22 ecssap2    Stopped AZ2	Aug 19, 20	Production Site Server Specificatio	Operation
Protected-Instance-22 O Protecting AZ2	Execute Planned Failover Cancel	4.60 (EIP) 20 80 (Private I		Attach Detach More +
Protected-Instance-22  Protecting AZ2	100% ecssapz 😂 Stoppedi	(EIP) 20 Mb 192.168.0.84 (Private IP		Attach Detach More +

**Step 5** Check the protection group status.

**Step 6** Check whether the failover is complete. (The failover usually takes several minutes. The time required depends on the actual situation.)

Storage Disaster Reco	wer > Protectio	on-Group-4be0							Enable Protection	Disable Prote	ection	Execute Planner	d Failover	More 👻	C
Name	Protection-Grou	p-4be0 🖋				Region		Guangzho	u						
D	160c6a	56				DR Direction	,	AZ2 🔊	AZ3						
Deployment Model	VPC migration					Protection Grou	up Status 🛞 🕴	🔅 Planne	ed failover in progress						
VPC	vpc-hana-s4					Production Site		AZ2							
Created	Aug 24, 2020 16	:05:39 GMT+08:00				DR Site	,	AZ3							
	0 F														
Protected Instanc	es Heplica	tion Pairs DR Drills													
Create Protected In	Istance	Delete Protected Instance	You can create 48 more prote-	cted instances.							Name	*		Q	С
Name		Status	Production Site	Sync Progress	Production Site	e Server P	roduction Site Se	erver St	IP Address	Producti	ion Site Server	Specificatio	Operation		
Protected-Ins	itance-22	Planned failover in pr	AZ2	100%	ecssap1	6	Stopped		139 60 (EIP) 2 192.168.0.180 (Private	0 m6.2xlar IP) Windows	rge.8   8 vCPU: s Server 2012		Attach Detach	More +	
Protected-Ins	tance-22	Planned failover in pr	AZ2	100%	ecssap2	6	Stopped		1392.168.0.84 (Private II	bit m6.xlarg P) Windows	je.8   4 vCPUs s Server 2012		Attach Detach	More +	

After the failover, the previous production site becomes the new DR site, the previous DR site becomes the new production site, and the status of the protected group and protected instance changes from **Planned failover in progress** to **Protected**.

**Step 7** Log in to the ECS management console and view server details at the new production site and DR site.

Cloud Server Consol		Elastic Cloud Server ③							≪ ECS News	P Quick Links	Buy B
Dashboard		We would much appreciate it if you could complet	e our questionnaire on E	lastic Cloud Server. Yo	ur feedback will help us provide	a better user experience.					
Elastic Cloud Server											
Dedicated Host	st Start Stop Reset Password More *										88
Bare Metal Server		Searched by name by default.									
Elastic Volume Service	Ŧ	Name/ID	Monitoring	AZ 🏹	Status 😨	Specifications/Image	IP Address	Billing Mode	Enterprise Project	Operation	
Dedicated Distributed Storage Service	Ŧ	ecssap2 sosbfb::::::::::::::::::::::::::::::::::	۵	AZ3	Stopped Locked by SDRS	4 vCPUs   32 GB   m6.xlarge.8 Windows Server 2012 R2 Standa	139 20 (EIP) 20 M 192.168.0.84 (Private IP	Pay-per-use Created on Aug 24, 2	default	Remote Login	More +
Image Management Service		ad376c	ø	AZ3	Stopped Locked by SDRS	8 vCPUs   64 GB   m6.2xlarge.8 Windows Server 2012 R2 Standa	139	Pay-per-use Created on Aug 24, 2	default	Remote Login	More •
Auto Scaling Key Pair		Cash Control of Contro	2	AZ2	Stopped Locked by SDRS	4 vCPUs   32 GB   m6.xlarge.8 Windows Server 2012 R2 Standa	192.168.0.236 (Private I	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More •
ECS Group Halo Elastic Cloud Server NEW			Ø	AZ2	Stopped Locked by SDRS	8 vCPUs   64 GB   m6.2xlarge.8 Windows Server 2012 R2 Standa	192.168.0.185 (Private I	Pay-per-use Created on Aug 19, 2	SAP	Remote Login	More +

#### ----End

Compare the ECS details before and after the failover. It is found that the private and public IP addresses of the production site server before the failover are the same as the private and public IP address of the DR site server after the failover. In this case, manually start the new DR server. (Note that the server at the DR site cannot be manually started. Only the server at the production site can be manually started.)

### **10.3.6 Performing Other Operations on SDRS**

For details, see Storage Disaster Recovery Service User Guide.

10	<b>Best Practice</b>	of SAP	Disaster	Recovery	with SDRS
•••		•••••			,

Help Cente	r please enter keywords Q
ALL HELP	Help Center >Storage Disaster Recovery Service > User Guide > Managing Protection Groups >Disabling Protection
Storage Disaster Recovery Servi	Disabling Protection Scenarios
Service Overview	$\sim$ If you want to disable protection for all resources in a specified protection group, you can perform steps provide
Getting Started	Once the protection is disabled, data synchronization for all protected instances in the protection group will stop
User Guide	Prerequisites     The protection group has replication pairs.
Permissions Management	<ul> <li>The protection group is in the Protecting or Disabling protection failed state.</li> </ul>
Managing Protection Groups	^ Procedure
Disabling Protection	1. Log in to the management console.
Performing a Planned Fa	<ol> <li>Click Service List and choose Storage &gt; Storage Disaster Recovery Service. The Storage Disaster Recovery Service page is displayed.</li> </ol>
Performing a Failover	3. In the pane of the desired protection group, click <b>Protected Instances</b> .
Performing Reprotection	The operation page for the protection group is displayed.
renorming heprotection	4. In the upper right corner of the page, click <b>Disable Protection</b> .
Deleting a Protection Gr	5. In the displayed dialog box, click Yes.
Managing Protected Instanc	<ul> <li>Once the protection is disabled, data synchronization between the production site and DR site for all prot the protection group will stop.</li> </ul>
Managing Replication Pairs	Parent topic: Managing Protection Groups
Managing DR Drills	v
Interconnecting with CTS	×
Managing Quotas	Last Article: Managing Protection Groups Next Article: Performing a Planned Failover
Change History	Did this article solve your problem?
API Reference	<ul> <li>✓ ★★★★★★</li> </ul>
FAQ	~ other content

## **10.3.7 Checking SAP Applications**

After the failover, the production site and DR site are switched. Log in to the servers at the new production site to check whether the applications can start properly and whether the SAP hardware key is changed.

Step 1 After the failover, the servers at the new production site are still in the stopped state and you need to manually start them. If the startup passwords of the servers at the new production site are different from those at the current DR site, manually change the passwords of the servers at the new production site on the ECS console, restart the ECSs, and the new passwords will take effect.

HUAWEI CLOUD								Buy Same ECS
	^	b1db4367-1726			hanal	10.10	Created	Start
Cloud Server Console		LD-S4-PRD-2-fcd 4aeec679-b4be	₫	AZ2	Stopi 8 vCPUs   16 sapapp1	10.10	Pay-per-ust Created SAP实	Stop Restart
Dashboard		LD-S4-PRD-1-fcd a74eee9f-5a17	⊵	AZ2	Stop;     Stop;     Stop;     Stop;     Sapapp1	10.10	Pay-per-ust Created SAP实	Reset Password Modify Specifications
Elastic Cloud Server		LD-S4-PRD-6-fcd 572367ff-9f4c-4	⊵	AZ5	Stop;     Stop;     Stop;     Stop;     Sapapp1	10.10	Pay-per-ust Created SAP实	Change Billing Mode Delete
Bare Metal Server		ecs-windowsha 32a11779-98c0	⊠	AZ2	Stop: 16 vCPUs   3 Windows Ser	10.10	Pay-per-ust Created SAP实	Manage Image/Disk  Manage Network
Service Dedicated Distributed	Ţ	ecssap2-fcd 1f54ce2d-6bb9	⊠	AZ3	Stopp     Stopp     4 vCPUs   32     ecssap22	10.10	Pay-per-ust Created SAP实	Remote Login   More -
Storage Service Image Management Service		ecssap1-fcd c6d11d9d-8658	₫	AZ3	Stopp 8 vCPUs   64 test1	10.10	Pay-per-ust Created SAP实	Remote Login   More 🗸
Auto Scaling	•	sd2-winpc-felix 554fd427-d91d	⊴	AZ5	Stop: 2 vCPUs   4Gi Windows Ser	192.1	Pay-per-ust Created SAP	Remote Login   More 🗸
Key Pair ECS Group	e	dbef2487-2a35 db811133-9686	2	AZ3	Stopp 8 vCPUs   32 L MRS_COMM	10.0.0	Pay-per-ust Created default	Remote Login   More 🗸
Cloud Backup and	<u>ب</u> م	dbef2487-2a35	-	470	Stop: 4 vCPUs   8Gi		Pay-per-use	

**Step 2** Log in to the **ecssap1** server at the new production site, click **SAP Management Console** on the desktop, right-click **S01**, and choose **Start** from the shortcut menu.

-		sapmmc		_ <b>D</b> X
File Action View	w Favorites Window Help			
🗢 🔿 🔁 🖬 💈	🗙 🗊 🖸 🗟 📓 🚺 🕨	I		
Console Root	Console Roo	t\SAP Systems\S01		<b>- - X</b>
✓ SAP System ▷ □ S0 <sup>1</sup>			Туре	
	Start			
	Stop		DVEBMGS00	
	Restart		ASCS01	
	Version Info		D00	
	All Tasks			
	View +			
	New Window from Here			
	New Taskpad View			
	Delete			
	Refresh			
	Export List			
	Properties			
	Help			

**Step 3** Enter the password to start the SAP application and click **OK**.

	sapmmc	_ 🗆 X
File Action View Favor	ites Window Help	
SAP Systems SIP System Upda System Upda ECSSAP1 ECSSAP1 ecssap10 ecssap11 ecssap20	a OS user and password for this operation.	20

**Step 4** Click the refresh button to view the SAP startup information.

8	sapmmc		- 🗆 X
File Action View Favorite	s Window Help		
🗢 🔿 📶 🛣 📄 🤕	🚘 🛛 🖬 🕨 =		
	Console Root\SAP Systems\S01		<b>- - ×</b>
Console Root	S01		
⊿ 💇 SAP Systems ⊿ 👩 SO1	SAP Instance	Туре	
System Upda	System Update		
ECSSAP1	ECSSAP1	D00	
⊿ 🗧 ecssap10	ecssap10 ecssap11	ASCS01	
Process L ≡	ecssap2 0	D00	
j ∳r Current s j ∳r Open Ale	- ·		
🐺 Syslog			
Cueue St			
Access P & AS ABAP			
b 😵 ICM		2	
ecssap11			
a 🧧 ecssap2 0			
Process L			
< III >			

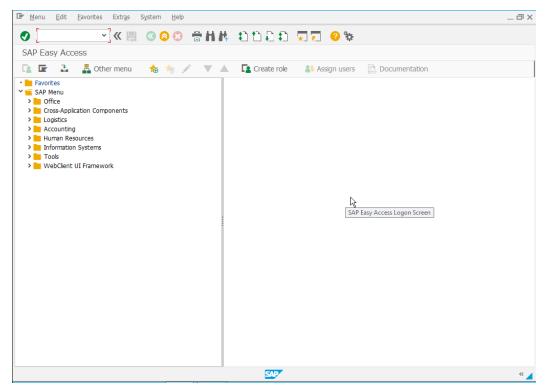
**Step 5** Click **SAP Logon** to run the SAP GUI.

SAP Logon 750       X         Variable Logon New item Change item Delete item       Explorer View         Connections          Favorites       Name       System Description         Shortcuts        So1       ecssap1         Connections           Connections           Connections	Recycle Bin SAP Logon SAP Logon SAP SAP SAP Business Client 6.5			
Connections     Filter Items       Favorites     Name     System Description     SID     Group/Server     Insta       Shortcuts     SAP     S01     ecssap1     00	=	SAP Logon 750		_ 🗗 ×
Favorites         Name         System Description         SID         Group/Server         Insta         Message           Shortcuts         SAP         S01         ecssap1         00	Variable Logon New Item Change Item Delete	Item		Explorer View $\sim$
Shortcuts SAP S01 ecssap1 00		Connections	Ę	Filter Items
	Favorites	Name System Description		
		SAP	S01 ecssap1	00
		k		

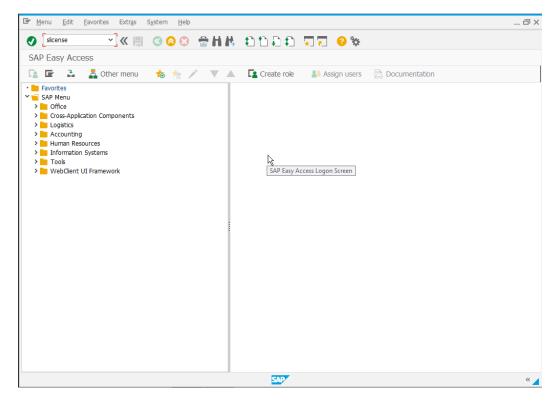
**Step 6** Enter username **ddic** and the password, and then press **Enter**.

≡	SAP Logon 750	~ ~
V 🖙 User System Help		_ 🗆 × Explorer View 🗸
- 📀 🤍 📲 🔇 🔕 🕄	- 🖶 H H L L L L 🖓 🕄 🖓 🕅	*
SAP		Filter Items
New password		Server Insta Message 1 00
Client 001		1 00
User ddic Password [*****************] Logon Language EN		
ę.		
		« _
		Log <u>Q</u> n

**Step 7** Check whether the SAP GUI login is successful, and whether the SAP application is running smoothly.



**Step 8** Enter **slicense** and press **Enter** to view the SAP license.



**Step 9** Compare the SAP hardware key before and after the DR failover to ensure that the SAP hardware key keeps unchanged before and after the failover. That is, the SAP license keeps unchanged.

0			~	« 📄 🔞 🤇	0	會出	14 1	DDD	*	7 0	\$	
SAP L	icen	se Adminis	trat	tion								
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2	÷.		me	Documentation								
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## **10.4 SDRS Performance Test**

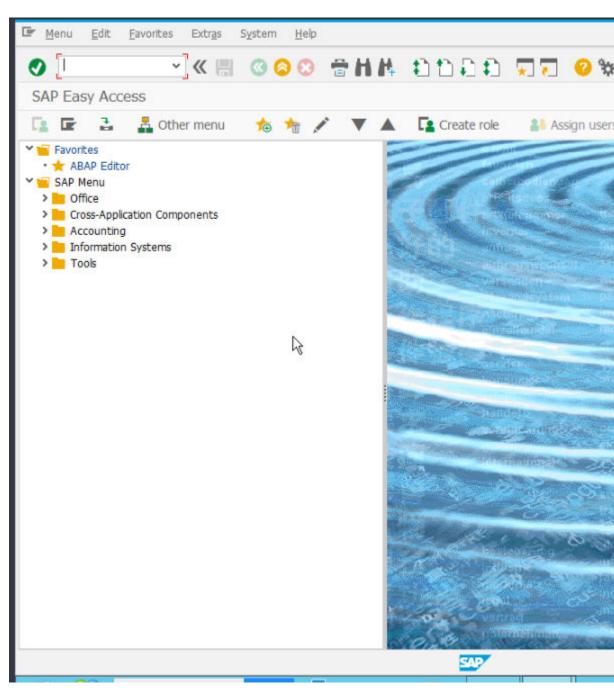
## **10.4.1 Testing Performance of SAP Applications**

This section describes how to test the SDRS performance by comparing the time required for performing the Client Copy operations before and after SDRS protection is enabled.

#### **Step 1** Click **Enable Protection** on the **Storage Disaster Recovery Service** page.

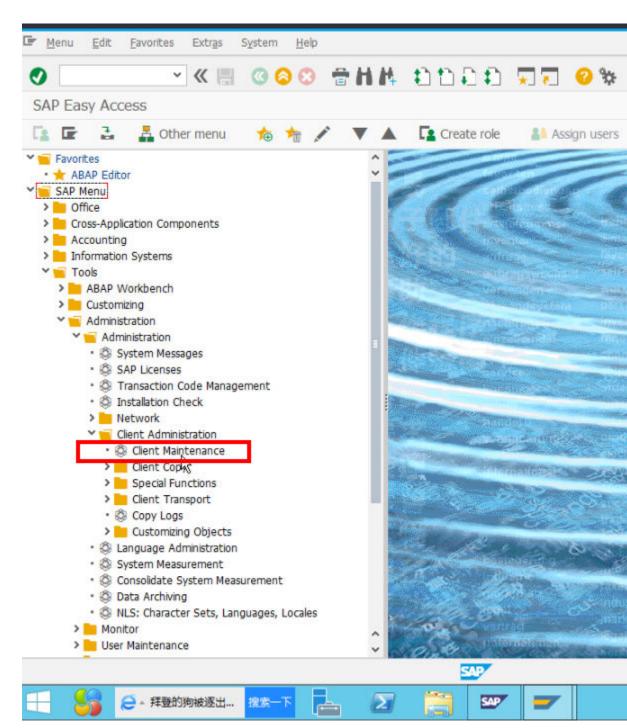
For usage details of your re	esource packages, go to	o the My Pac	kages page.
ou can create 9 more protec	ction groups and 96 mc	ore replicatio	n pairs.
			AZ2 《《《 AZ3
Protection Group	Protection-Group-	4be0	
Protection Group Protection Group Status		4be0 2	Protected Instances
		2	
Protection Group Status	Protecting		Protected Instances Replication Pairs
Protection Group Status Deployment Model	<ul> <li>Protecting</li> <li>VPC migrati</li> </ul>	2	

# Step 2 Log in to the SAP system as user **ddic**. For details, see Checking SAP Applications.



Step 3 Create a client.

Choose SAP Menu > Tools > Administration > Administration > Client Administration > Client Maintenance.



**Step 4** In the dialog box that is displayed, choose **Table View > Display-Change**.

<u>c</u> h	isplay -> Change hange -> Display	🐨 😒 🗟 🐿			
	ave ransport				
Pr	rint Ctrl+P	City	Crcy	Changed on	
Đ	xit Shift+F3	Walldorf	EUR		^
001	SAP AG Konzern	Walldorf	EUR		~
401	test1	Walldorf	EUR	09.03.2021	
402	test2	Walldorf	EUR	09.03.2021	
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Step 5 Click New Entries.

	New Entries	5. in e. e. e.			
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01	test1	Walldorf	EUR	09.03.2021	
02	test2	Walldorf	EUR	09.03.2021	
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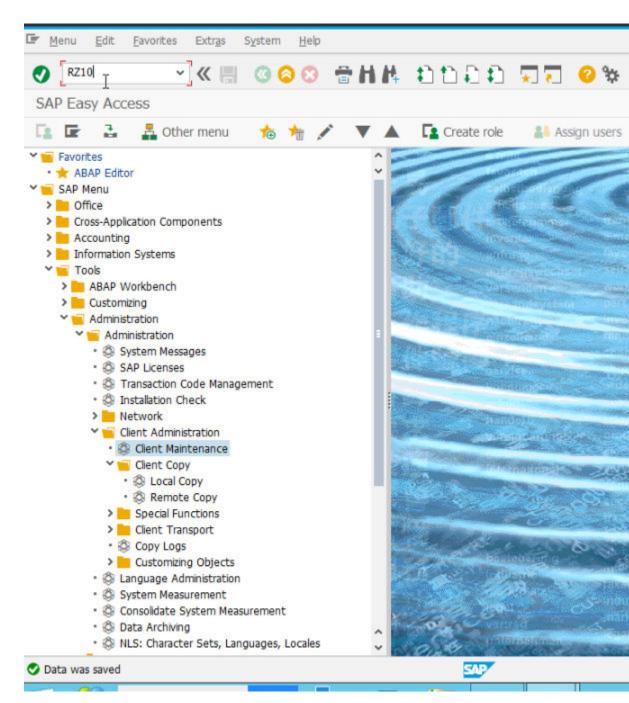
**Step 6** Enter the client parameters, save the settings, and exit.

Table View E	dit <u>G</u> oto Selection Utilitie;	<u>s</u> System <u>H</u> elp	
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New Entries: [	Details of Added Entries		
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Client	301 copytest		
City	shenzhen ]	Last Changed By	
Logical system		Date	
Currency	<u>्</u>		
Client role	Customizing	<b>v</b>	
	orts for Client-Specific Objects		
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Automatic recor     No changes allor			
and the second sec	weo itomatic recording, no transports a	Jowed	
O Changes w/o ac	comatic recording, no cransports a	mowed	
Cross-Client Object	Changes		
Changes to reposi	tory and cross-client customizing al	lowed 🗸	
Client Copy and Con	nparison Tool Protection		
Protection level 0:	No restriction	*	
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eCATT and CATT	Not Allowed	~	
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**Step 7** Choose **Table View** > **Change-Display** to save the settings.

	ange -> Display Ctrl+ 4	ЭW			
	ve Ctrl+S ansport	, <b>s</b> e e e			
	int Ctrl+P	City	Crcy	Changed on	
Ex	it Shift+F3	Walldorf	EUR		^
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2	test2	Walldorf	EUR	09.03.2021	
					~
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	Position.		Entry 1	af f	

Step 8 Assign the login permission to the new client, return to the home page, enter RZ10 in the search box, and press Enter.



Step 9 The initial profile cannot be selected. In the dialog box that is displayed, choose Utilities > Import profiles > Of active servers.

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	Import the start and ins	stance profiles of all a	active servers		
	The following default pr	cofile is imported:			
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	Instance profile \\ecsa		ile\ \$01.000.commol		
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Step 10	Select <b>DEFAULT</b>	for Profile name	and <b>Default</b>	Profile for Prof.type.
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Version		Resulcuons		v
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Edit Profile		Profile name	Prof.type	
<ul> <li>Administrative Data</li> </ul>		DEFAULT	Default Profile	
O Basic maintenance		S01_ASCS01_ECSSAP1	Instance profile	
O Extended maintenance		S01_D00_ECSSAP1	Instance profile	
		S01_D00_ECSSAP2	Instance profile	
óâ Display 🧪 Change				
		4 Entries found		
		4 Entries found		1

**Step 11** Select **Extended maintenance** and click **Change**.

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) Create	🚰 Check	Co	ру 📑	Impo	rt				
Profile	DEFAULT			(	Default Profile	э	)		
Version	000007			(	Saved, activa	ted	)		
Edit Profile									
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Step 12 Click Parameter.

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Maintain Profile 'DEFAULT' Versi	on '00000	)7'		
Copy 🤣 🚰 🎦 Parameter		neter 6 <del>0</del> Parame	eter 🔉	
	ctive para	imeters	14:47:24	
Parameter Name	P	Parameter value		
SAPDBHOST	E	CSSAP1		
dbms/type	1	133		
dbs/mss/server	E	CSSAP1		
dbs/mss/dbname	S	501		
dbs/mss/schema	3	101		
SAPSYSTEMNAME	S	501		
SAPGLOBALHOST	e	cssapl		
system/type	7	LBAP		
rsdb/ssfs_connect	0	)		
system/secure_communication	0	DN		
rdisp/mshost	e	ecssap1		
login/no_automatic_user_sapstar	0	)		
rdisp/msserv	5	sapmsS01		
rdisp/msserv_internal	3	3901		
enque/process_location	F	REMOTESA		
enque/serverhost	e	ecssap1		
enque/serverinst	0	01		
is/HTTP/show_detailed_errors	E	FALSE		
icf/user_recheck	1	Contract in		
icm/HTTP/ASJava/disable_url_session	_trackin I	n TRUE		
service/protectedwebmethods		SDEFAULT		
rsec/ssfs_datapath		<pre>\$ (DIR_GLOBAL) \$ (DIR_SEP) security\$ (DIR_SEP) rsec</pre>		
rsec/ssfs_keypath	ş	<pre>\$ (DIR_GLOBAL) \$ (DIR_SEP) security\$ (DIR_SEP) rsec</pre>		
gw/acl_mode	1			
gw/sec_info			_SEP) secinfo\$ (FT_DAT)	
login/password_downwards_compatibil		ALC: NO DECIDENT		
vmcj/enable		off		
login/system_client	0	001		

**Step 13** Enter the parameter name **LOGIN/NO\_AUTOMATIC\_USER\_SAPSTART**, set it to **0**, and click **Copy** to save the setting and exit.

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Maintain Profile 'DEFAULT' Version '000007'		
Copy 🤌 🗟 Line 📑 Line 🔺 PARAM+ 🔻 PARAM-		
	20000	2000000
Parameter name:	Status Active	Seq. no.
LOGIN/NO_AUTOMATIC_USER_SAPSTAR	Active	1
Parameter val.:		
Го т		
Unsubstituted standard value:		
Substituted standard value:		
Substituted standard value:		
Substituted standard value:		
Substituted standard value: Comment:		
Comment:		

**Step 14** Save the settings and exit.

< SAP	Maintain	n Profile	'DEFAULT'	Version '0	0000
✓ Copy	Display <-> Change	Check	Parameter	Parameter	Mo
29.03.2021 A	ctive parameters		1	11:14:41	
Parameter Name	Parameter	value			
enq/replicatorhost	ersha				
enq/replicatorinst	10				
system/type	ABAP				
SAPDBHOST	hanaha				
j2ee/dbtype	hdb				
j2ee/dbname	HDX				
j2ee/dbhost	hanaha				
dbs/hdb/dbname	HDX				
rsdb/ssfs_connect	0				
dbs/hdb/schema	SAPHANADB				
gw/acl_mode	1				
vmcj/enable	off	_			
login/no_automatic_user_sapstar	0				
	1	]			

**Step 15** Repeat the preceding steps to create the second client.

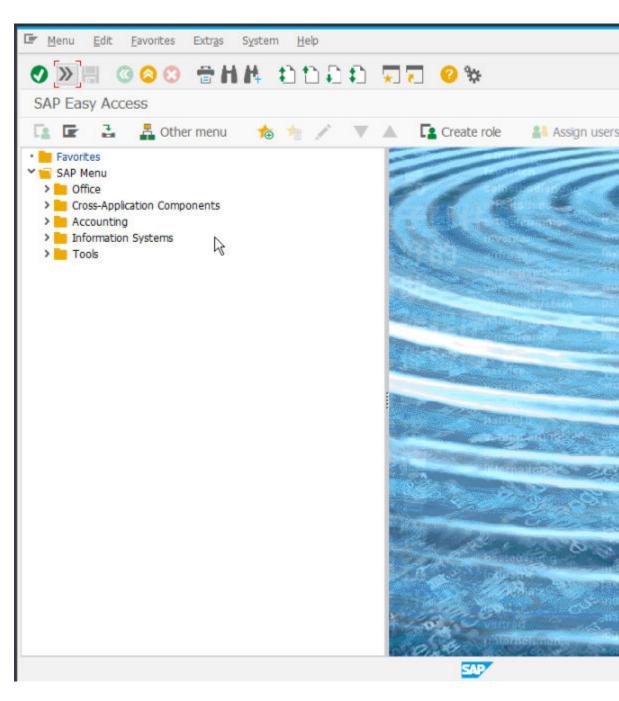
isplay	View "Clients": Ove	erview		
Client	Name	City	Crcy	Changed on
000	SAP AG Konzern	Walldorf	EUR	
001	SAP AG Konzern	Walldorf	EUR	
301	copytest	shenzhen	EUR	10.03.2021
302	copytest	shenzhen	EUR	10.03.2021
101	test1	Walldorf	EUR	09.03.2021
102	test2	Walldorf	EUR	09.03.2021

#### **Step 16** Restart SAP.

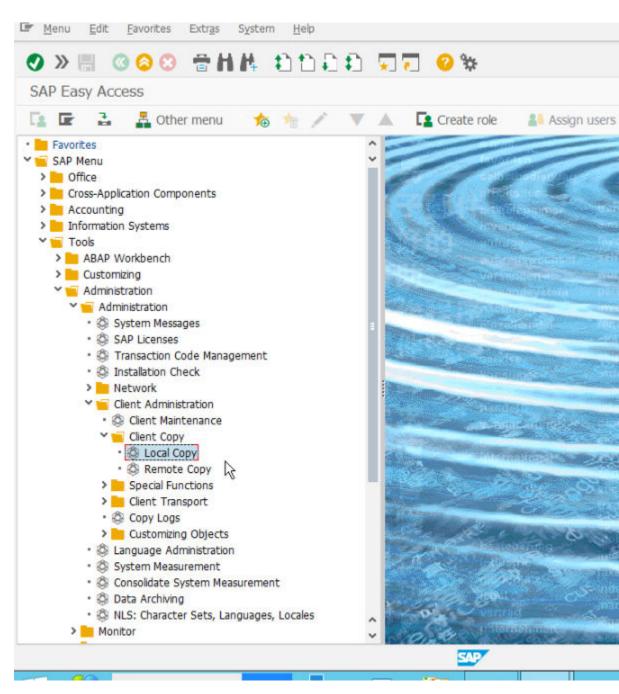
-				sapmmc		_ 🗆 X
File	Sto Re All Ne De Exp	art op start rsion Info I Tasks w Window from He w Taskpad View elete fresh port List operties	Window re	sapmmc Help Ie Root\SAP Systems\S01	Type D00 ASCS01 D00	×

**Step 17** Log in to the SAP GUI using the created client. The username is **SAP\*** and the password is **pass**.

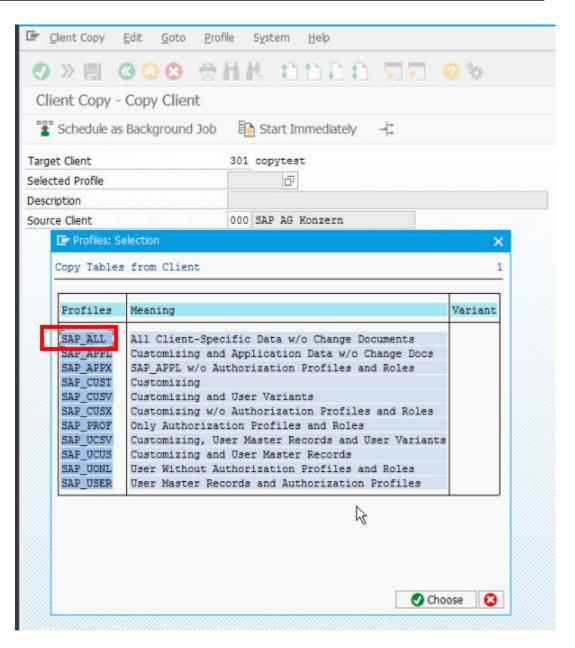
🖙 User System	Help			
🗸 » 🗏 🔇	8 C 🖶 H H	0000	* 7	🕜 💝
SAP				
New password				
Client	301			
User	SAP*			
Password	[******]******]			
Logon Language	EN			



**Step 18** Choose SAP Menu > Tools > Administration > Administration > Client Administration > Client Copy > Local Copy.



Step 19 Enter 000 for Source Client, select SAP\_ALL under Profiles, and click Start Immediately.

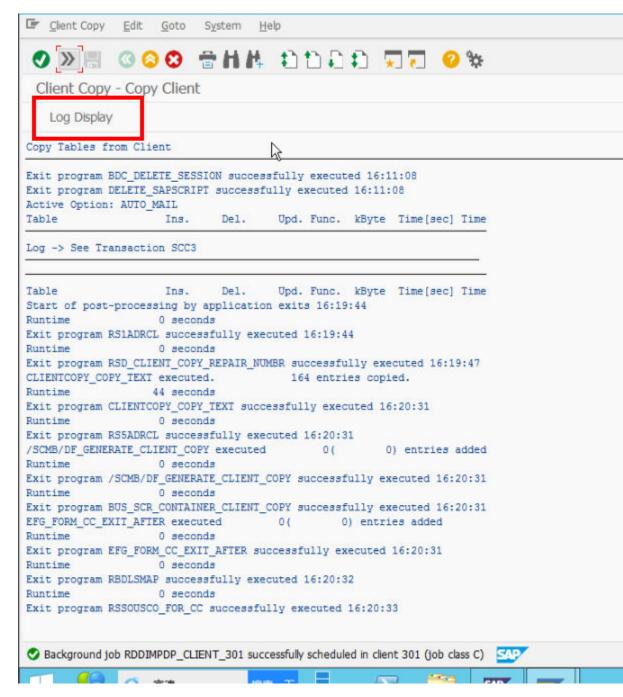


♥ ≫ 등 ⊗ ⊗ ⊗ ⊜ Client Copy - Copy Client	HK 111111
Schedule as Background Job	Start Immediately
Target Client	301 copyrest
Selected Profile	SAP_ALL D
Description	All Client-Specific Data w/o Change Documents
Source Client	000 SAP AG Konzern
Source Client User Masters	<b>000</b> 과
🗌 Test Run	

**Step 20** Click **Continue** to start the replication.

🖙 <u>C</u> lient Copy <u>E</u> dit	<u>G</u> oto <u>P</u> rofile System <u>H</u> elp	
🔿 » 🖪 🔇 🤇	0 CAN 100	11 🗐 🔽 🥝 🛠
Client Copy - Copy	y Client	
Schedule as Back	ground Job 🛛 📔 Start Immedial	tely -C
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narth Gelfen Dere Steller Ge		
Local Client Copy You have chosen the fol	owing parameters:	Change Documents
	301	
	SAP_ALL	
Source Client	000	
🗹 Customizing Data	Flavors	
Authorization profi		
Application Data	Change Documents	
Vuser Data	N	000
Copy Mode:	13	
Test Mode		
Continue?		
	Continue	

**Step 21** After the client copy operation is complete, click **Log Display**.



**Step 22** Record the operation duration. The duration of **Client Copy** is 1 hour and 13 minutes when SDRS protection is enabled

# Client Copy/Transport Log Analysis

Target Client	
Source Client (incl. Auth.	) 000
Source Client User Mast	er 000
Сору Туре	Local Copy
Profile	SAP_ALL
Status	Successfully Completed
User	SAP*
Start on	18.08.2020 / 16:10:10
Last Entry on	18.08.2020 / 17:23:51
Statistics for this Run	
- No. of Tables	66077 of 66077
- Deleted Lines	20
- Copied Lines	6351581

**Step 23** Click **Disable Protection** and perform the Client Copy operation again.

Storage Disaster Rec	cover > Protecti	on-Group-4be0			
Name	Protection-Grou	ıp-4be0 🖉			
ID	f60c6	56 <sup>56</sup>			
Deployment Model	VPC migration				
VPC	vpc-hana-s4				
Created	Aug 24, 2020 16	5:05:39 GMT+08:00			
Protected Instan	ces Replica	ation Pairs DR Drills			
Create Protected	Instance	Delete Protected Instance	You can create 48 more protect	cted instances.	
Name		Status	Production Site	Sync Progress	Productio
Protected-Ir	nstance-22	Protecting	AZ2	100%	ecssap1
Protected-Ir	nstance-22 🖋	Protecting	AZ2	100%	ecssap2

**Step 24** Log in to another new client 302.

User System	<u>H</u> elp
🕗 » 🗏 🔇	388 🕆 H H T T T T 🛛 🛠
SAP	
New password	
Client	302
User	SAP*
Password	[****[¥*******]
Logon Language	EN

**Step 25** Perform the Client Copy operation.

📀 » 🗒 🔇 🤤 👘	H H 🗈 🗅 🖓 🗊 🔽 🔽 🥹 🐄
Client Copy - Copy Client	
Schedule as Background Job	🛐 Start Immediately 🚽
Target Client	302 copytest
Selected Profile	SAP_ALL D
Description	All Client-Specific Data w/o Change Documents
Source Client	000 P AG Konzern
Source Client User Masters	000 SAP AG Konzern
Test Run	

Verification	Background Job	
Local Client Copy		Change Documents
You have chosen th Target Client	e following parameters: 302	
Profile Name	SAP_ALL	
Source Client	000	
Copy Mode:		
Continue?		

**Step 26** Wait until the operation is complete and record the operation duration.

## Client Copy/Transport Log Analysis

Target Client	
Source Client (incl. Auth.)	000
Source Client User Maste	er 000
Сору Туре	Local Copy
Profile	SAP_ALL
Status	Successfully Complete
User	SAP*
Start on	18.08.2020 / 17:31:10
Last Entry on	18.08.2020 / 18:43:25
Statistics for this Run	
- No. of Tables	66079 of 6607
- Deleted Lines	3
- Copied Lines	6351625

As shown in the preceding figure, when SDRS protection is enabled, the Client Copy operation takes 1 hour and 12 minutes.

----End

Conclusion: By comparing the time required for performing the preceding two Client Copy operations, you can find that the duration of the Client Copy operation does not change before and after SDRS protection is enabled. Therefore, enabling or disabling SDRS protection has no obvious impact on the application performance.

### **10.4.2 HammerDB Performance Test**

HammerDB is a graphical open-source database load testing and benchmarking tool for Linux and Windows to test databases running on any operating system. HammerDB is automated, multithreaded, and extensible with dynamic scripting support. You can use HammerDB to create a test schema, load data, and simulate the database workload of multiple virtual users in online transaction processing (OLTP) and online analytical processing (OLAP) scenarios.

HammerDB 3.3 is used in this document. Download HammerDB of the latest version.

**Step 1** Click **Enable Protection** on the **Storage Disaster Recovery Service** page.

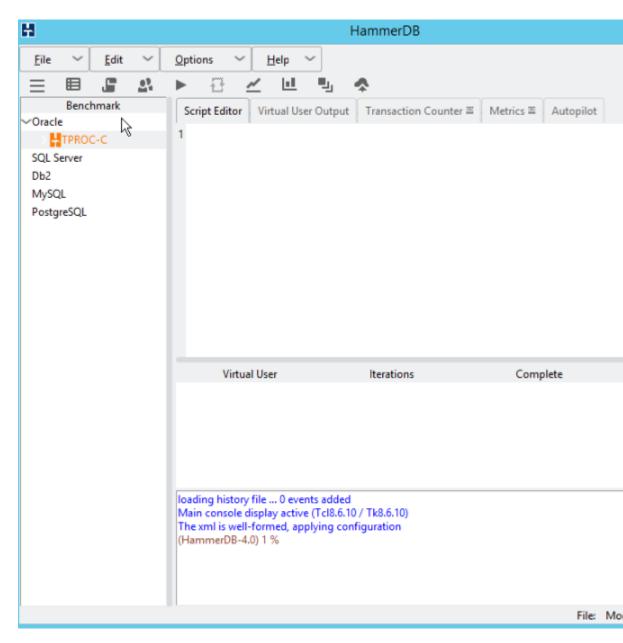


For usage details of your resource packages, go to the My Packages page.

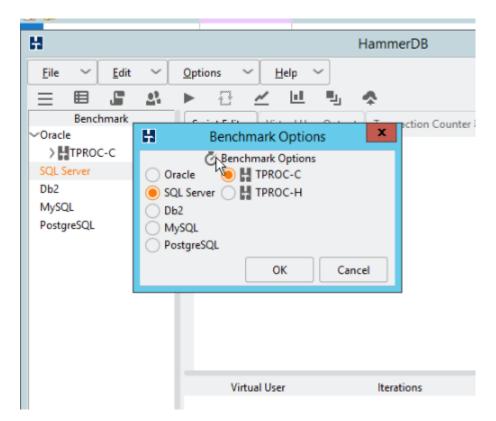
You can create 9 more protection groups and 96 more replication pairs.

			AZ2 《《《 AZ3
Protection Group	Protection-Group-	4be0	
Protection Group Statu		2	Protected Instances
Deployment Model VPC	VPC migrati vpc-hana-s4	4 Replication Pairs	
Production Site	AZ3	0	DR Drills
DR Site	AZ2		
Enable Prote	Execute Pla	nned Failov	ver More 🔻

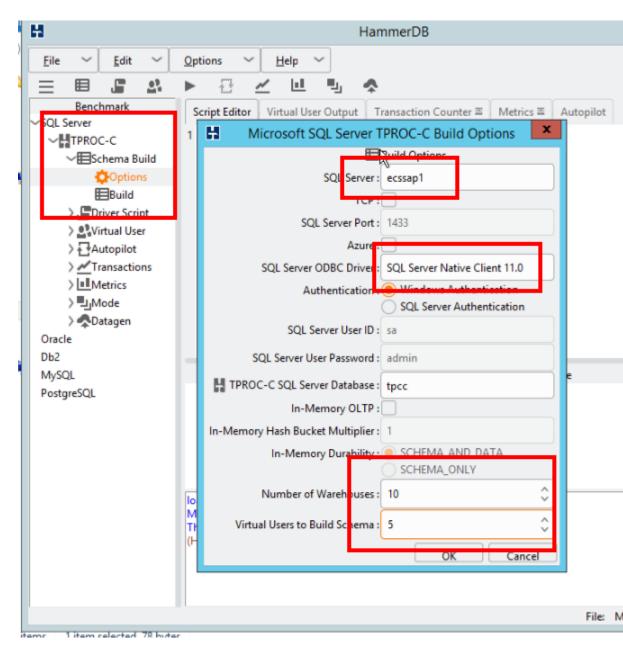
# **Step 2** Install and run the HammerDB performance test tool. For details, see **Test Method**.



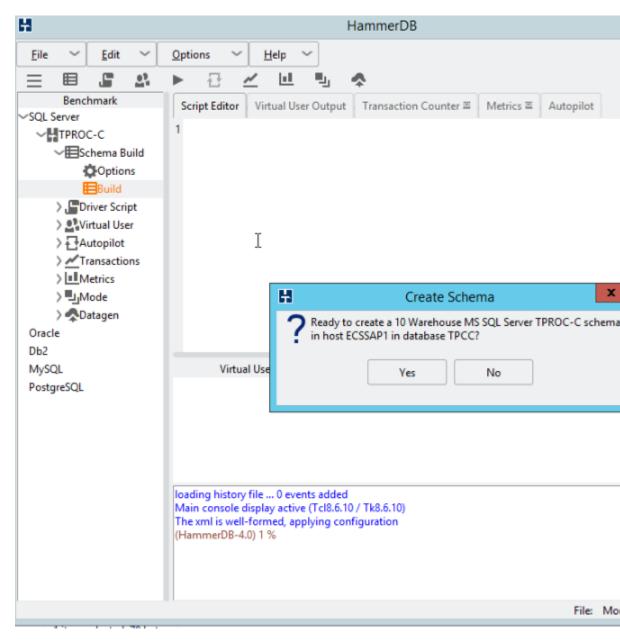
**Step 3** Select **SQL Server** and **TORPC-C** and click **OK**.



Step 4 Choose SQL Server > TPROC-C > Schema Build, and double-click Options to configure parameters. Configure SQL Server, SQL Server ODBC Driver, Number of Warehouses, Virtual Users to Build Schema, and click OK.



Step 5 Double-click Build and click Yes.



**Step 6** Wait until the schema is created. The duration depends on the number of warehouses and schemata.

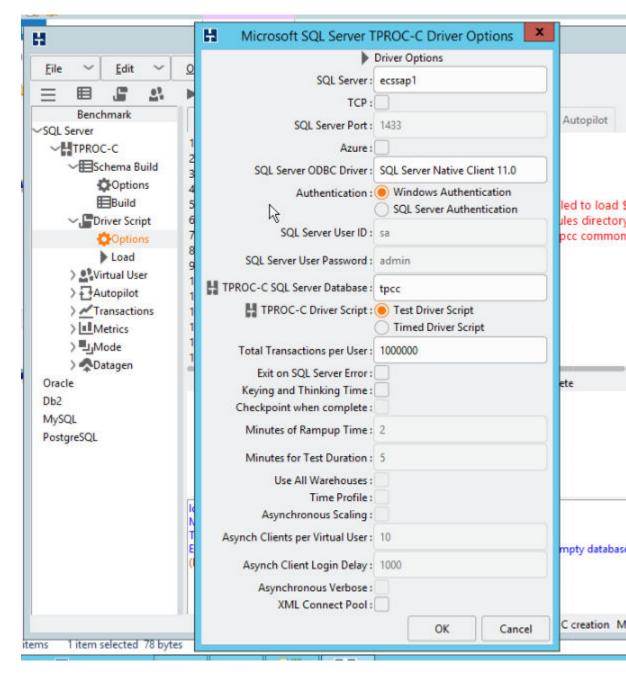
Image: Schema Build       CHECKING IF DATABASE tpcc EXISTS CREATING DATABASE tpcc CABLES CREATING DATABASE tpcc CABLES CREATING TPCC TABLES Loading Stock - 20000       Start:Fri Mar 12 12:12:16 CST 2021 Loading Stock Wel - Loading Stock Wel - Loading Stock - 20000         Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build         Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build         Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build         Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build         Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build       Image: Schema Build         Image: Schema Build	H	HammerDB			
SQL Server       Virtual User 1       Virtual User 1       Virtual User 1         Schpt Editor       Virtual User 1       CREATING TPCC SCHEMA       Unitual User 2         CREATING TPCC SCHEMA       CREATING TPCC SCHEMA       Loading 1 Warehouses start:1 end:1       L         CREATING DATABASE tpoc       CREATING TPCC TABLES       Loading Stock Wid+1       Loading Stock Wid+1       Loading Stock Wid+1         > Mode       Virtual User 4       Loading 1 Warehouses start:4 end:4       Start:Fri Mar 12 12:12:13 CST 2021       Loading Warehouse         Oracle       Db2       Virtual User       Iterations       Start:Fri Mar 12 12:12:13 CST 2021       Loading Warehouse       Virtual User 5         MySQL       Virtual User       Iterations       Complex       Complex       Start:Fri Mar 12 12:12:13 CST 2021       Loading Warehouse       Virtual User 5         MySQL       Virtual User       Iterations       Complex       Complex       Virtual User 5         Ne YES could not be established : [Microsoft][ODBC Driver Manager] Data source specified       Connecting to database)       Cri 1       Cri 1       Cri 1         MySQL       N= YES could not be established : [Microsoft][ODBC Driver Manager] Data source specified       Connecting to database)       Cri 1			4		
CREATING TPCC SCHEMA CHECKING IF DATABASE tpcc EXISTS CREATING TPCC TABLES Loading Stock Vide1 Loading Stock Vide1 Loading Stock Vide1 Loading Stock - 20000         Image: Stock Vide1 StartFri Mar 12 12:12:16 CST 2021 Loading Stock Vide1 Loading Stock Vide1 Loading Stock - 20000         Image: Stock Vide1 StartFri Mar 12 12:12:12 CST 2021 Loading Stock - 20000         Image: Stock Vide1 Loading Itwarehouses start: 4 end:4 StartFri Mar 12 12:12:12 CST 2021 Loading Warehouses Start:4 end:4 Loading Warehouses StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Oracle Db2 MySQL       Virtual User         PostgreSQL       Image: Stock - 2000 Virtual User         Image: Stock - 2000 StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: Stock - 2000 StartFri Mar 12 12:12:13 CST 2021 Loading Warehouse         MySQL       Virtual User         Image: Stock - 2000 StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: Stock - 2000 StartFri Mar 12 12:12:13 CST 2021 Loading Warehouse         MySQL       Virtual User         Image: Stock - 2000 StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: Stock - 2000 StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse         Image: StartFri Mar 12 12:12:12 CST 2021 Loading Warehouse					
Virtual User 4       Livitual User 5         Dracle       Loading 1 Warehouses start:3 end:3         Db2       Start:Fri Mar 12 12:12:CST 2021         MySQL       Virtual User         PostgreSQL       Iterations         C 1       Image: 0         2       C 1         2       C 1         3       C 1         3       C 1         2       C 1         2       C 1         3       C 1         3       C 1         4       C 1         5       C 1         2       C 1         2       C 1         3       C 1         4       C 1         5       C 1         5       C 1         2       C 1         5       C 1         5       C 1         6       Connecting to database)         Error in Virtual User 1: Connection to DRIVER=ODBC Driver 17 for SQL Server;SE = YES could not be established : [Microsoft][ODBC Driver Manager] Data source pecified         (connecting to database)       (HammerDB-4.0) 1 %	Schema Build Options Build Sui	CREATING TPCC SCHEMA CHECKING IF DATABASE tpcc EXISTS CREATING DATABASE tpcc CREATING TPCC TABLES	Loading 1 Warehouses start:1 end:1       Lo         Start:Fri Mar 12 12:12:16 CST 2021       S         Loading Warehouse       L         Loading Stock Wid=1       L		
PostgreSQL       1       1       0         2       1       0         3       1       0         4       1       0         5       1       0         1       0       0         1       0       0         2       1       0         1       0       0         2       1       0         1       0       0         2       1       0         2       1       0         2       1       0         2       1       0         2       1       0         2       1       0         2       1       0         2       1       0         2       1       0         3       1       0         2       1       0         2       2       0         2       1       1         2       1       1         2       2       1         2       2       1         2       2       1         2       2	> ∰Datagen Oracle	Loading 1 Warehouses start:3 end:3 Start:Fri Mar 12 12:12:12 CST 2021	Loading 1 Warehouses start:4 end:4 Lo Start:Fri Mar 12 12:12:13 CST 2021 S		
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		<u>^</u>	
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	<u>\$</u> 5	C'1	区 1
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**Step 7** Click the stop button.

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			File: TPROC-C creation

**Step 8** Choose **Driver Script**, double-click **Options** to confirm the parameters, and click **OK**.



Step 9 Double-click Load.

Step 10 Choose Virtual User and double-click Options. In the Virtual User Options dialog box, set Virtual Users to the number of virtual users, that is, 20 in this test, deselect Show Output, and click OK.

ipt Editor Virtual User Output Transaction Counter I Metrics I Autopilot #I/usr/local/bin/tclsh8.6 #EDITABLE OPTIONS####################################	1	HammerDB	
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Step 11 Double-click Run.

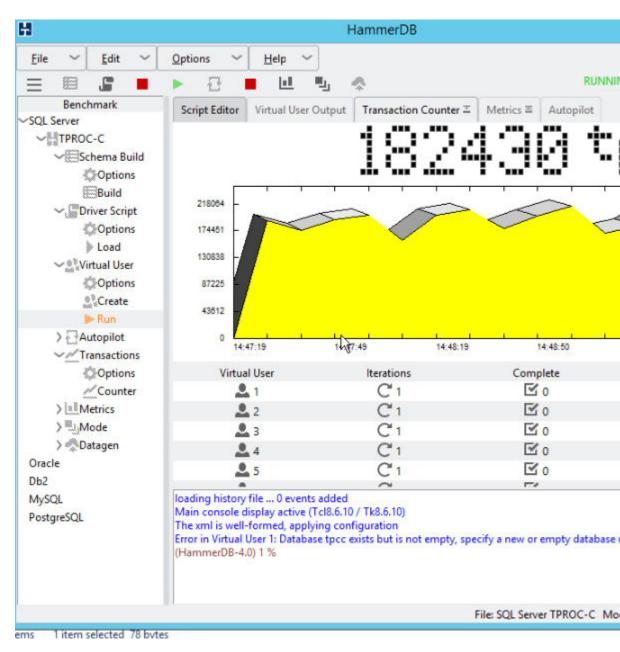
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			\$		RL
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**Step 12** Click the icon for starting transactions.

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	(HammerDB-4.0) 1 %		

**Step 13** Wait until the TPM reaches the peak value.

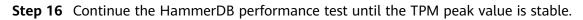


**Step 14** Disable SDRS protection.

Storage Disaster Recover > Protection-Group-4be0									
Name	Protection-Grou	Protection-Group-4be0 🖋							
ID	f60c6	56 <sup>56</sup>							
Deployment Model	VPC migration								
VPC	vpc-hana-s4	vpc-hana-s4							
Created	Created Aug 24, 2020 16:05:39 GMT+08:00								
Protected Instar	nces Replica	ation Pairs DR Drills							
Create Protected	Instance	Delete Protected Instance	You can create 48 more protec	cted instances.					
Name		Status	Production Site	Sync Progress	Productio				
Protected-I	nstance-22	Protecting	AZ2	100%	ecssap1				
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**Step 15** Test the HammerDB performance again.

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V <sup>®®</sup> Virtual User			
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> 🐥 Datagen Oracle		-	⊡ o ⊡ o
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#### **NOTE**

Transactions per minute (TPM): Number of simulated orders processed by the system in the TPCC standard model per minute.

#### ----End

Conclusion: By comparing the TPM values before and after SDRS protection is enabled, performance of the SQL Server database decreases by about 3.39% after SDRS protection is enabled.

## 10.5 Change History

#### Table 10-1

Description	Date	Prepared By
Initial version	2020-08-21	Xiong Peng/00508152
Optimized operations.	2021-05-20	Fu Chuandong/00469497

# **11** Best Practice of Rsync-based SAP Disaster Recovery

Script Overview Preparations Performing Synchronization

## **11.1 Script Overview**

This script is developed using Shell and is executed using Rsync and Inotify. Rsync and Inotify can be used in the Linux OS. This script is used to synchronize folders between two servers in real time.

## 11.1.1 Introduction to Rsync and Inotify

Remote Synchronize (Rsync) is a remote data synchronization tool. It can quickly synchronize files between multiple servers through LAN/WAN or synchronize different directories in the local disks. This software is pre-installed in the SUSE Linux OS, and can be directly used.

Inotify is a Linux kernel subsystem, which monitors changes to the filesystem, such as file storing, extracting, deleting, moving, and modification. This software is not pre-installed in the SUSE Linux OS. You need to install it if necessary. You can obtain this tool at https://github.com/rvoicilas/inotify-tools.

## 11.1.2 Script File

The script package is **DirSyncScript.zip**, which contains the following files:

- sync.sh: Main program
- **sync.conf**: Configuration file, which is used to configure information such as the directories to be synchronized and the address of the destination server
- **start\_inotifywait.sh**: Inotify monitoring script, which monitors the changes to the files and reports the changes after being executed

• inotify-tools-3.14.tar.gz: Inotify installation package

Rsync synchronization logs are stored in /var/log/rsyncd.log.

## **11.2 Preparations**

## **11.2.1 Preparing the Environment**

Prepare two servers for synchronization, and plan the directories to be synchronized and the destination directories for storing the synchronized directories. Note that one-to-one mapping relationships between source directories to be synchronized and destination directories are required, and the source directories must be available.

## 11.2.2 Configuring the Mutual Trust Relationship

Ensure that two severs can communicate with each other using SSH. Assume that the two servers for synchronization are node 1 and node 2. Perform the following steps to configure the mutual trust relationship.

#### Procedure

- **Step 1** Log in to node 1 as **user** root.
- **Step 2** Generate the public and private keys.

#### ssh-keygen -t rsa

The following information is displayed:

Generating public/private rsa key pair. Enter file in which to save the key (/home/deven/.ssh/ id\_rsa): (Press **Enter**.) Enter passphrase (empty for no passphrase): (Press **Enter**.) Enter same passphrase again: (Press **Enter**.) Your identification has been saved in /home/deven/.ssh/id\_rsa. Your public key has been saved in /home/deven/.ssh/id\_rsa.pub. The key fingerprint is:89:56:d6:4a:b2:6c:4a:05:.....

Press **Enter** after you enter the information required each time as prompted. The **id\_rsa** and **id\_rsa.pub** files are generated in the **/root/.ssh/** directory.

Step 3 Write id\_rsa.pub to the authorized-keys file.

cat /root/.ssh/id\_rsa.pub >> /root/.ssh/authorized\_keys

**Step 4** Modify the permission of **id\_rsa**.

#### chmod 600 /root/.ssh/id\_rsa



**Step 5** Copy **anthorized-keys** and **id\_rsa** to node 2.

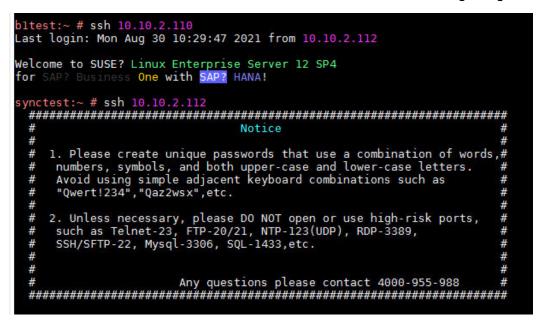
scp /root/.ssh/authorized\_keys /P address of node 2./root/.ssh/

After the command is executed, a message is displayed, indicating whether to connect to the node. Enter **yes** and then enter the password of node 2. The files are copied to node 2.

scp /root/.ssh/id\_rsa/P address of node 2:/root/.ssh/



**Step 6** Check whether the two servers can communicate with each other using using SSH.



----End

## 11.2.3 Downloading Software

#### Procedure

- Step 1 Log in to the source node 1 as user root using a key or password.
- **Step 2** On the CLI, run the following commands to download the **DirSyncScript.zip** package and decompress it to the **/opt/huawei** directory:

wget https://obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com:443/ Rsync/DirSyncScript.zip -P /opt/huawei

cd /opt/huawei

unzip DirSyncScript.zip -d DirSyncScript

<pre>nlt8st:/ # wget https://obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com:443/Rsync/DirSyncScript.zip -P /opt/huawei 2021-88-30 10:22:16 https://obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com/Rsync/DirSyncScript.zip Resolving obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com (obs-sap-cn-south-1.myhuaweicloud.com) 100.125.24.119, 100.125.24.34, 100.125.2 4.120, Connecting to obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com (obs-sap-cn-south-1.obs.cn-south-1.myhuaweicloud.com) 100.125.24.119 :443 connected. HTTP request sent, awaiting response 200 0K Length: 301333 (353K) [application/zip] Saving to: 'opt/huawei/DirSynCScript.zip.1'</pre>
100%[
2021-08-30 10:22:17 (6.18 MB/s) - '/opt/huawei/DirSyncScript.zip.1' saved [361333/361333]
bltest:/ # cd /opt/huawei bltest:/opt/huawei # unzip DirSyncScript.zip -d DirSyncScript

----End

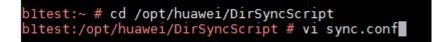
## **11.2.4 Modifying Configurations**

## Procedure

- Step 1 Log in to the source node 1 as user root using a key or password.
- **Step 2** Go to the directory where the decompressed file is stored and run the **vi** command to open the **sync.conf** configuration file.

#### cd /opt/huawei/DirSyncScript

vi sync.conf



**Step 3** Modify the configuration parameters by referring to **Table 11-1** and save the modification.

Parameter	Description	Example Value
Source_Direc tory	Directory to be synchronized on the source server. If there are multiple directories, separate them with slashes (/).	/src1/, / src2/, /src3/
	<b>CAUTION</b> If there is no slash (/) added to the end of the source directory to be synchronized, the directory itself and its content will be synchronized. If there is a slash (/) added to the end of the source directory, all contents in the directory will be synchronized (the directory itself excluded).	
	For example, if the directories to be synchronized on the source host are <b>/src1,/src2/</b> and the destination directories are <b>/dst1,/dst2</b> , <b>/dst1</b> contains the <b>/src1</b> file folder itself and the content included after synchronization, while <b>/dst2</b> contains all the contents in the <b>/src2</b> file folder (excluding the <b>/src2</b> folder itself).	
Destination_ Host	IP address of the destination server	192.168.0.1 1

#### Table 11-1 Configuring parameters

Parameter	Description	Example Value
Destination_ Directory	Destination directory. Use slashes (/) to separate multiple directories. The number of directories for storing the synchronized directories on the destination host must be the same as those to be synchronized.	/dst1, / dst2, /dst3

The directories in the following figure are used as an example. Configure the directories based on the site requirements.



----End

## **11.3 Performing Synchronization**

## Prerequisites

The two servers can communicate with each other using SSH.

## Procedure

**Step 1** After modifying the configuration file, run the following command on source node 1:

cd /opt/huawei/DirSyncScript

sh sync.sh

bltest:/opt/huawei/DirSyncScript # sh sync.sh
Info: Inotify is installed.
Check param done.
Info: Parameters are configured.
Info: Source direcotory ready.
Info: Source dir ready.
Info: Rsync is installed.
Info: Rsync is ready.
Info: Inotify is installed.
Info: inotify is ready.
Info: Test SSH connection success.
Info: SSH to destination success.
Info: Ready to start synchronization.
Sync /usr/sap with /usr/sap/
Sync /hana with /hana/
nohup: appending output to 'nohup.out'
Synchronization started.
nohup: appending output to 'nohup.out'

After this command is executed, the environment is initialized. After the environment is ready, the synchronization will be started.

#### **NOTE**

In addition to the script execution, the **sh sync.sh** command has the following functions:

- **sh sync.sh init** for environment initialization, checking whether Inotify has been installed. If no, it will be installed.
- **sh sync.sh check** for environment check, checking whether the modification file is correct and whether the required software has been installed to determine whether the synchronization can be started.
- **sh sync.sh start** for starting the synchronization when the environment is ready. A synchronization process will be generated for each directory to be synchronized.
- sh sync.sh stop for stopping the synchronization process

#### Step 2 Verifying the synchronization result.

Log in to node 2 and check whether the synchronized files are the same as those on the source server.

synctest:/u	us r	/sap +	# 11					
total 28								
drwxr-xr-x	4	1001	79	4096	Jul	31	12:14	HDX
drwxr-xr-x	13	1003	1002	4096	Aug	4	16:49	SAPBusinessOne
drwxr-xr-x	7	root	root	4096	Aug	4	15:10	hdbclient
drwxr-x	4	root	79	4096	Jul	30	19:27	hostctrl
								sapservices
-rwxr-xr	1	root	79	182	Jul	30	19:29	sapservices_202107_30_19.29.06
- rwxr-xr-x	1	root	79	208	Jul	30	19:29	sapservices_202107_31_12.10.18
and the second sec		1	11					

----End

# **12** SAP Backint Installation Guide

Overview Prerequisites Installation and Deployment Installation Verification and Common Usage Examples Logs and Troubleshooting Uninstalling Backint Agent

## 12.1 Overview

Backint is a backup and restoration solution provided by SAP HANA. Backint for SAP HANA is an API that enables third-party tool vendors to directly connect their backup agents to the SAP HANA database. Backups are transferred via pipe from the SAP HANA database to the third-party backup agent, which runs on the SAP HANA database server and then sends the backups to the third-party party backup server.

Huawei Backint Agent is provided to back up the data in SAP HANA to OBS. After the SAP HANA database and Huawei Backint Agent are deployed and related parameters of SAP HANA database and OBS are configured, Huawei Backint Agent backs up the SAP HANA database to OBS, restores it, or deletes the backup files using SAP management tools, such as SAP HANA Cockpit, SAP HANA Studio, or SAP HANA HDBSQL. Backint can be applied to the following scenarios:

- Backup: Full backup, incremental backup, and differential backup for system or tenant data
- Restoration: Data restoration from the latest backup file, to a specified time point, or from a specified backup file
- Deletion: Deletion of specified backup file or backup files earlier than the specified one
- Query: Queries for full backups, incremental backups, and differential backups

## **12.2 Prerequisites**

## 12.2.1 Logging in to Huawei Cloud

Before deploying the SAP system on Huawei Cloud, register a Huawei ID and enable Huawei Cloud services. Through this account, you can use Huawei Cloud services and pay only for the services you use.

For details, see **Registering a HUAWEI ID and Enabling Huawei Cloud Services** 

You can log in to Huawei Cloud using any of the methods described in **Logging In** to Huawei Cloud.

The server where the SAP HANA database is located and the OBS bucket must belong to the same Huawei Cloud account and be in the same region.

## 12.2.2 Purchasing an ECS and Installing SAP HANA

You must install SAP HANA first, and then the Backint Agent. For details about how to install SAP HANA on HUAWEI CLOUD, see **SAP HANA**.

You must install SAP HANA Studio or SAP HANA Cockpit on a Windows ECS to configure Backint. For details about how to install SAP HANA Studio on a HUAWEI CLOUD ECS, see **Installing the SAP HANA Studio on a Windows ECS**.

If you install SAP HANA on different servers, do not use the same system ID (SID). Otherwise, it is difficult to determine which SAP HANA database the data backed up in the OBS bucket belongs to. If you want to use the same system ID, create different OBS buckets for independent backup.

## 12.3 Installation and Deployment

## 12.3.1 Installing Backint Agent

## 12.3.1.1 Downloading Backint Agent

Do not delete the installation script for it is mandatory for installation, upgrade, and uninstallation. If the installation script is deleted by mistake, download the script again.

Run the following command to obtain the installation script. Select the download link based on the region where the server accommodating the SAP HANA database is located.

The following command uses the AP-Bangkok region as an example:

cd /tmp && curl -k -O https://obs-sap-ap-southeast-2.obs.apsoutheast-2.myhuaweicloud.com/backint/install.sh

	Table 12-1 Commands for obtaining installation scripts					
Scri pt	D es cri pt io n	Command				
inst all.s h	Ins tal lat	AP-Bangkok: cd /tmp && curl -k -O https://obs-sap-ap- southeast-2.obs.ap-southeast-2.myhuaweicloud.com/backint/ install.sh				
	io n scr	AP-Singapore: cd /tmp && curl -k -O https://obs-sap-ap- southeast-3.obs.ap-southeast-3.myhuaweicloud.com/backint/ install.sh				
	ipt	CN-Hong Kong: cd /tmp && curl -k -O https://obs-sap-ap- southeast-1.obs.ap-southeast-1.myhuaweicloud.com/backint/ install.sh				
		AF-Johannesburg: cd /tmp && curl -k -O https://obs-sap-af- south-1.obs.af-south-1.myhuaweicloud.com/backint/install.sh				
		TR-Istanbul: cd /tmp && curl -k -O https://obs-sap-tr- west-1.obs.tr-west-1.myhuaweicloud.com/backint/install.sh				
		LA-Santiago: <b>cd /tmp &amp;&amp; curl -k -O https://obs-sap-la-</b> south-2.obs.la-south-2.myhuaweicloud.com/backint/install.sh				
		LA-Sao Paulo1: cd /tmp && curl -k -O https://obs-sap-sa- brazil-11.obs.sa-brazil-1.myhuaweicloud.com/backint/install.sh				
		LA-Mexico City1: cd /tmp && curl -k -O https://obs-sap-na- mexico-1.obs.na-mexico-1.myhuaweicloud.com/backint/install.sh				
		LA-Mexico City2: <b>cd /tmp &amp;&amp; curl -k -O https://obs-sap-la-</b> north-2.obs.la-north-2.myhuaweicloud.com/backint/install.sh				

Table 12-1 Commands for obtaining installation scripts

## 12.3.1.2 Installing Backint Agent

The downloaded installation script is stored in the **/tmp** directory. You can execute the script in this directory.

Run the following command as user **root** to install Backint Agent. Enter the system ID of the server where Backint Agent is installed for *SID* in the command, for example, **bash install.sh --install S99**.

#### bash install.sh --install SID

The **install.sh** script will:

- Locate the installation package (JAR file) in /usr/sap/{SID}/SYS/ global/hdb/opt/hw-backint-agent/ and install Backint Agent.
- Download a compatible JRE version.
- Provide the **hdbbackint** script for invoking Backint Agent. The **hdbbackint** script cannot be modified.

• Send a message to notify of updating /usr/sap/{*SID*}/SYS/global/hdb/opt/ hdbconfig/hw-backint-agent.conf after the installation is finished.

In the high availability (HA) scenario, you need to repeat the preceding operations to install Backint Agent on the standby server.

## 12.3.2 Configuring Backint Agent

## 12.3.2.1 Creating an IAM Agency for the ECS Where SAP HANA Is Located

Before configuring Backint Agent, you need to create an agency for the ECS where the SAP HANA database is located to obtain the temporary AK and SK. The procedure is as follows:

1. Log in to the public cloud management console and select a desired region in the upper left corner.

2. In the navigation pane on the left, click = and choose **Management & Governance > Identity and Access Management**.

3. Choose **Agencies** in the pane on the left, and click **Create Agency** in the upper right corner. The **Create Agency** page is displayed.

4. Set agency parameters.

- Agency Name: Enter sap-backint. The name is only an example.
- Agency Type: Select Cloud service.
- Cloud Service: Select Elastic Cloud Server (ECS) and Bare Metal Server (BMS).
- Validity Period: Retain the default setting.
- Click **Next**. Select the policies or roles to be attached to the agency. Enter **OBS** in the search box and select **OBS OperateAccess**.
- Click **Next**, and select the authorization scope. By default, **All resources** is selected. Click **Show More** and select **Global resources**. Click **OK**.

5. Configure the agency created in the previous step for the ECS.

- In the navigation pane on the left, click = and choose **Compute** > **Elastic Cloud Server**.
- Select the ECS for which you want to configure the agency and click its name to switch to the basic information page.
- On the tab page that is displayed by default, click the edit icon next to **Agency** in the **Management Information** area, select the created agency, and save it.

## 12.3.2.2 Creating an OBS Bucket

Before configuring Backint Agent, you need to create an OBS bucket to store backups. The server where the SAP HANA database is located and the OBS bucket must belong to the same HUAWEI CLOUD account and be in the same region. If you have a qualified OBS bucket, skip this step. 1. Log in to the public cloud management console and select a desired region in the upper left corner.

2. In the navigation pane on the left, click = and choose **Storage** > **Object Storage Service**.

3. Click Create Bucket in the upper right corner.

4. Configure the bucket information as required. Note that:

- The server where the SAP HANA database is located and the OBS bucket must be in the same region.
- Select **Private** for **Bucket Policy**.

## 12.3.2.3 (Optional) Configuring a Lifecycle Rule

You can configure a lifecycle rule to periodically clear the expired files stored in the OBS bucket. For details, see **Configuring a Lifecycle Rule**. As to the file clearing frequency, the files need to be deleted every 30 days according to the SAP official document or you can configure it based on your backup policies.

## 12.3.2.4 Modifying the Backint Agent Configuration File

You can configure Backint Agent by modifying the parameters in its configuration file.

1. Run the following command to go to the directory where the configuration file is located:

cd /usr/sap/{*S*/*D*}/SYS/global/hdb/opt/hdbconfig

Replace {*SID*} in the directory with the actual system ID. Example command:

/usr/sap/S99/SYS/global/hdb/opt/hdbconfig

2. Run the following command to modify the file:

#### vi hw-backint-agent.conf

You must set **BUCKET**, **LOGLEVEL**, and **SID** in the configuration file.

- **BUCKET**: specifies the name of the OBS bucket where Backint Agent reads and writes data. This OBS bucket will be used to store backups.
- **LOGLEVEL**: specifies to what extent the log details can be. You only need to set it to **INFO**. **DEBUG** is used only for troubleshooting after a fault occurs.
- SID: specifies the system ID (SID) used during SAP HANA system installation.
- **THREADNUM**: specifies the number of concurrent backup and restoration tasks. The value ranges from **1** to **20**. The default value is **8**. Set this parameter based on the server specifications.
- **BACKUPSIZE**: indicates the data volume uploaded by each thread during backup and restoration (unit: MB). The data volume can be set to a value ranging from **1** to **2047** (unit: MB). The default value is **200**.

#### D NOTE

When Backint is used for backup or restoration, certain memory is occupied. Peak usage = 2 x THREADNUM x BACKUPSIZE. Configure these parameters properly based on the memory of the server. For oversized backup, the value of **BACKUPSIZE** cannot be too small. Backup size = **BACKUPSIZE** x 10000

The following example shows the valid content of the **hw-backint-agent.conf** file.

BUCKET=xxx

LOGLEVEL=INFO

SID=S01

THREADNUM=8

BACKUPSIZE=200

3. After the file is modified, press **Esc**, and then press **Shift** and : at the same time. Enter **wq!** to save and exit.

#### 12.3.2.5 Configuring SAP HANA

You can use the same configuration for the backup of all types of objects (data, log, and catalog), or you can use different configurations for each type of objects. If you want to use different configurations for the backup of different types of objects, set different values for the parameters listed in **Table 12-2**. Otherwise, use the same configuration for the backup of all types of objects.

Use SAP HANA Studio or SAP HANA Cockpit to set the parameters in the **backup** part of the **global.ini** configuration file to the values shown in the following table. To make the changes take effect, you do not need to restart SAP HANA.

Replace {*SID*} in the directory with the actual system ID. Example:

/usr/sap/S99/SYS/global/hdb/opt/hdbconfig/hw-backint-agent.conf

Parameter	Value	Description
enable_auto_log_ backup	yes	Specifies whether to enable the automatic log backup.
catalog_backup_ parameter_file (supported only by SAP HANA 2.0)	/usr/sap/{SID}/SYS/global/hdb/opt/ hdbconfig/hw-backint-agent.conf	Specifies the configuration file for catalog backup.

#### Table 12-2 SAP HANA configurations

Parameter	Value	Description
catalog_backup_ using_backint (supported only by SAP HANA 2.0)	true	Specifies whether to set the catalog backup method to Backint.
data_backup_par ameter_file	/usr/sap/{SID}/SYS/global/hdb/opt/ hdbconfig/hw-backint-agent.conf	Specifies the configuration file for data backup.
log_backup_para meter_file	/usr/sap/{SID}/SYS/global/hdb/opt/ hdbconfig/hw-backint-agent.conf	Specifies the configuration file for log backup.
log_backup_using _backint	true	Specifies whether to set the log backup method to Backint.

The following uses SAP HANA 2.0 and SAP HANA Studio as an example to describe the configuration procedure.

1. Open SAP HANA Studio and select a workspace if necessary. If there is no special requirement, retain the default settings. Right-click the blank area in the navigation pane on the left and select **Add System**.

2. In the displayed dialog box, enter the IP address of the server where SAP HANA is installed and configure required parameters.

3. In the navigation pane on the left, double-click the newly added system. In the **Filter** area on the **Configuration** tab, enter a parameter keyword and configure the system and database.

⊿ I SYSTEMDB@S00 (SYSTEM) ▷ Catalog	B SYSTEMDB@S01 (SY	STEM) 100.94.0	.241 00		
	Overview Landscape Alerts Perfo	rmance Volumes C	onfiguration System Information Dia	anosis Files	Trace Co
Content				griesis riles	mace ee
Provisioning	Filter: parameter	Catabase:	~		
▷ ➢ Security I (B) SYSTEMDB@S01 (SYSTEM)	Name	Default	System	Databases	Hos
Backup	⊿ 📄 computeserver.ini				-
> 🧁 Catalog	⊿ [] sql				-
Content	plan_cache_parame	ter_ true			_
Provisioning	plan_cache_paramet	ter_ 100000			-
Security	plan_cache_parame	ter_ 100			-
	⊿ 📄 diserver.ini		+		-
	⊿ [] api				_
	severity_for_invalid	pa ERROR			-
	⊿ 📄 global.ini		•	•	
	⊿ [] authorization				
	secure_client_param	nete false			
	⊿ [] backup		•	•	
	catalog_backup_par	am	/usr/sap/S01/SYS/gl	٠	
	data_backup_param	iete	/usr/sap/S01/SYS/gl	٠	
	log_backup_parame	ter	/usr/sap/S01/SYS/gl	۰	
	⊿ [] expensive_statement				

4. The following uses the tenant database as an example. On the page that is displayed, enter the corresponding value in the table and save the setting.

Databases			
S01			~
Active Value:			^
New Value:	/usr/sap/S01/SYS/global/hdb/opt/hdbconfig/hw-backint-agent.conf	Restore Default	]~

5. Repeat steps 3 and 4 until all the parameters listed in the table are configured.

For details about how to set other parameters, see the SAP official document.

After the configuration is complete, perform backup and restoration tests by referring to Installation Verification and Common Usage Examples to verify the installation and configuration.

## 12.3.3 (Optional) Upgrading Backint Agent

The installation script is required for upgrading Backint Agent. If the installation script is deleted by mistake, download the installation script by referring to **Downloading Backint Agent**.

1. Go to the **/tmp** directory.

#### cd /tmp

2. Run the following command as user **root** to upgrade Backint Agent. Enter the system ID of the server where Backint Agent is installed for *SID* in the command, for example, **bash install.sh --upgrade S99**.

```
bash install.sh --upgrade SID
```

The **install.sh** will:

- Install the Backint Agent of the latest version in the /usr/sap/{SID}/SYS/ global/hdb/opt/hw-backint-agent/.
- Update the **hdbbackint** script to invoke Backint Agent of the latest version. The **hdbbackint** script cannot be modified.
- Download the latest VERSION.txt file.
- Generate the new hw-backint-agent.conf configuration file. The original hwbackint-agent.conf file is renamed and retained.
- Send a message to notify of updating /usr/sap/{*SID*}/SYS/global/hdb/opt/ hdbconfig/hw-backint-agent.conf after the upgrade is finished.

After the upgrade, the parameters in the configuration file may be updated. You need to modify the configuration file by referring to **Modifying the Backint Agent Configuration File**.

In the HA scenario, you need to repeat the preceding operations to upgrade Backint Agent on the standby server.

#### **NOTE**

Before executing the upgrade command, ensure that no backup (including log backup) or restoration task is being executed. Otherwise, the running tasks may be affected.

## 12.4 Installation Verification and Common Usage Examples

## 12.4.1 Important Notes for Naming

Backups are uploaded to OBS buckets after Backint Agent is deployed. You need to follow the rules described in **OBS Naming Rules** when naming, for example, configuring **Backup Prefix**.

## 12.4.2 Backup

You can use SAP HANA Studio, SAP HANA Cockpit, or SAP HANA HDBSQL to back up the data.

Log backup can be triggered periodically after automatic backup is configured. Catalog can be automatically backed up when Backint Agent is deployed. For details about the configuration methods, see **Configuring SAP HANA**.

The following use a case where SAP HANA Studio is used to back up SAP HANA 2.0 and Backint Agent is deployed to make full backup for data, catalog, and log and store the backups to OBS as an example to describe the backup procedure.

1. Open SAP HANA Studio, right-click the system to be backed up on the left, choose **Backup and Recovery**, and select an option based on the actual requirements:

- Back Up System Database
- Back Up Tenant Database

2. For example, to back up a tenant database, select a tenant database and set **Destination Type** to **Backint**. You can customize **Backup Prefix**.

3. Confirm the backup information and click **Finish**. If the installation and configuration are successful, the backup progress is displayed until the backup is complete.

4. After the backup is complete, you can query the backup in OBS. You can view the backups through **OBS Browser+** or go to the Object Storage Service console to view the backups. The backup directories are as follows:

- System data backup directory: obs://{BUCKET}/usr/sap/{SID}/SYS/ global/hdb/backint/SYSTEMDB
- Tenant data backup directory: obs://{BUCKET}/usr/sap/{*SID*}/SYS/ global/hdb/backint/DB\_{*Tenant name*}

5. After accessing the preceding directories, you can find the corresponding backup files based on *Backup Prefix* you set. Examples of file names for different types of backups are as follows:

- Full data backup: {*Backup Prefix*}\_databackup\_*x\_x*.
- Incremental data backup: {*Backup Prefix*}\_databackup\_incremental\_x\_xxxxx\_xxxxx

- Differential data backup: {Backup Prefix}\_databackup\_differential\_x\_xxxxx\_xxxxx
- Catalog backup: log\_backup\_0\_0\_0\_0
- Log backup: **log\_backup**\_x\_**0**\_xxxxx\_xxxx

You can view the backup files in different directories. You can find the corresponding backup files based on the backup time and backup ID. If the corresponding files are found, the backup is successful. The following backup file directory is an example.

obs://xxx/usr/sap/S99/SYS/global/hdb/backint/DB\_S30/ COMPLETE\_DATA\_BACKUP\_databackup\_2\_1/1626157625497.bak

## 12.4.3 Restoration

You can use SAP HANA Studio, SAP HANA Cockpit, or SAP HANA HDBSQL to restore the data for SAP HANA.

The following use a case where SAP HANA Studio is used to restore the data in SAP HANA 2.0 and Backint Agent is deployed to make full backup for data, catalog, and log and store the backups to OBS as an example to describe the restoration procedure.

1. Open SAP HANA Studio, right-click the system which data restoration needs to be performed for on the left, choose **Backup and Recovery**, and select an option based on the actual requirements:

- Recovery System Database
- Recovery Tenant Database

2. For example, to restore the data in the tenant database, select a tenant database and select a restoration type:

- Recover the database to its most recent state
- Recover the database to the following point in time
- Recover the database to a specific data backup

3. For example, to restore the database to its most recent state, select **Search for the backup catalog in Backint only** in **Recover using the backup catalog**.

4. The tenant database needs to be shut down during the restoration. In the dialog box that is displayed, click **OK**.

5. After selecting a backup file, you can click **Check Availability** to check whether the backup file is available. If the icon turns into green, the backup file is available. Click **Next**. Confirm the information and click **Next**.

6. If you want to check the availability of differential backups and log backups during the restoration, select **Third-Party Backup Tool (Backint)** and click **Next**.

7. Confirm the information restored and click **Finish**. If the installation and configuration are successful, the restoration progress is displayed until the restoration is complete.

## 12.4.4 Restoring Data in New SAP HANA System

Backups in OBS can be used to restore the data (backed up from the production system) to the development or testing system and restore the data for the standby node in the disaster recovery (DR) scenario. You need to manually copy the backup files in OBS to the local path of the new SAP HANA system and then perform the restoration. This restoration method is simple, but it will consume a large storage space and take a long time when the number and size of backup files are large. You can deploy Backint Agent in the new SAP HANA system to enable the new system to connect to the OBS bucket and directly use the backups in the bucket to perform restoration. The specific scenarios are as follows.

## 12.4.4.1 Unchanged SID and Tenant Name

1. If the new system and the source system are not in the same region, you need to follow the instructions described in **Configuring Cross-Region Replication** to replicate the backups of the source system to the OBS bucket in the region where the new system is located, and perform the subsequent operations.

2. Install and configure Backint in the new system.

**Note**: If the source system is running and the backups of the source system need to be restored to the new system, do not configure Backint Agent in the new system to back up the logs and catalogs. Otherwise, the backups of the source and new systems will be stored in the same OBS bucket, which will affect the data restoration for the new system.

3. Select a restoration type by referring to **Restoration** based on the actual requirements.

4. If the source system is running and the backups of the source system need to be restored to the new system, configure Backint Agent in the new system to back up the logs and catalogs based on the actual requirements after data restoration is completed and configure a new OBS bucket to store the backups.

## 12.4.4.2 Changed SID or Tenant Name

1. If the new system and the source system are not in the same region, you need to follow the instructions described in **Configuring Cross-Region Replication** to replicate the backups of the source system to the OBS bucket in the region where the new system is located, and perform the subsequent operations.

2. Install and configure Backint in the new system.

3. Select a restoration type by referring to **Restoration** based on the actual requirements, select **Backint System Copy**, and specify the SID of the source system. Note: If the source system has multiple tenants, you need to specify both the tenant name and SID in the format of {*Tenant name*}@{*SID*}. The following figure uses **Recover the database to its most recent state** as an example. Select **Search for the backup catalog in Backint only** and set **Source System** to **S02@S03**.

Recovery of Tenant Database in	n S01 📃 🗖 🗙
Locate Backup Catalog	
Specify location of the backup catalog.	
Recover using the backup catalog	
○ Search for the backup catalog in the file system only	
Backup Catalog Location: /usr/sap/S01/HDB00/backup/log/DB_	\$30
$\odot$ Search for the backup catalog in Backint only	
○ Recover without the backup catalog	
Backint System Copy	
✓ Backint System Copy	
Source System: S02@S03	

## 12.4.5 Deleting Backups

You can use SAP HANA Studio, SAP HANA Cockpit, or SAP HANA HDBSQL to delete a data backup or the backups earlier than the specified one.

The following use a case where SAP HANA Studio is used to delete backups of SAP HANA 2.0 and Backint Agent is deployed to make full backup for data, catalog, and log and store the backups to OBS as an example to describe the backup deletion procedure.

1. Open SAP HANA Studio and double-click **Backup** on the left. On the page that is displayed, select **Backup Catalog** and select the target tenant from **Database**. The corresponding backups are displayed.

2. Right-click a backup to perform the following operations:

- To delete a single data backup, click **Delete Data Backup**.
- To delete the data backups earlier than the specified one, click Delete Older Backups. Third-Party Backup Tool (Backint) need to be selected in the subsequent step.

3. If you want to delete all backups, select **Catalog and Backup Location**. If you want to delete only the backups from the catalog, select **Catalog**.

4. Click **Next**, confirm the information, and click **Finish**.

## 12.5 Logs and Troubleshooting

If an error occurs during backup or restoration, the error information will be displayed in SAP HANA Studio or SAP HANA Cockpit. Therefore, you need to check whether the error information exists in the SAP HANA Studio or SAP HANA Cockpit. The error information may be displayed in the **backup.log** and **backint.log** files provided by SAP HANA. When the multi-tenant database is used, you must specify the database name.

If an error occurs, view the following logs:

- SAP HANA backup.log: contains information about operations such as SAP HANA backup and restoration.
- SAP HANA backint.log: contains the information about operations to Backint Agent and other external backup tools.
- Backint Agent log file: contains Backint Agent operation events. Backint Agent log files are stored in /var/log/huawei/backint/. The default log level is INFO. DEBUG is used only for troubleshooting after a fault occurs.

## 12.6 Uninstalling Backint Agent

The installation script is required for uninstalling Backint Agent. If the installation script is deleted by mistake, download the installation script by referring to **Downloading Backint Agent**.

1. Go to the **/tmp** directory.

#### cd /tmp

2. Run the following command as user **root** to uninstall Backint Agent. Enter the system ID of the server where Backint Agent is installed for *SID* in the command, for example, **bash install.sh --uninstall S99**.

#### bash install.sh --uninstall SID

The **install.sh** script performs the following operations:

- Delete the /usr/sap/{*SID*}/SYS/global/hdb/opt/hw-backint-agent directory and all files in it.
- Delete the **/usr/sap/{***SID***}/SYS/global/hdb/opt/hdbconfig** directory and all files in it.
- Delete the /usr/sap/{S/D}/SYS/global/hdb/opt/hdbbackint file.
- Delete the log files in /var/log/huawei/backint.

In the high availability (HA) scenario, you need to repeat the preceding operations to uninstall Backint Agent on the standby server.

# **13** Best Practices for Uploading SAP Backups to the OBS Bucket

Overview Preparations Before the Upload Uploading Backups to the OBS Bucket FAQs

## 13.1 Overview

## 13.1.1 Object Storage Service

Object Storage Service (OBS) is a cloud storage service that provides capabilities for massive, secure, reliable, and cost-effective data storage. With OBS, you can easily create, modify, and delete buckets, as well as upload, download, and delete objects.

OBS provides super large storage capacity that can store any type of files and is suitable for websites, enterprises, developers, and common subscribers. As a web service, OBS provides service interfaces over Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol Secure (HTTPS). You can use OBS Console and OBS client to access and manage data stored on OBS from any computer connected to the Internet anytime, anywhere. Besides, OBS supports REST APIs, facilitating data management and development of several types of upper-layer service application. As a cloud service, OBS features flexible expansion and allows the infrastructure to be deployed in multiple regions, while maintaining high reliability. Therefore, you can access OBS in specific regions according to your service needs and experience rapid access speed at cost-effective prices.

For further details about OBS, see OBS Product Introduction.

## 13.1.2 Script

This script is developed using Python and applies to the Linux operating system. This script is used to upload local files to the OBS bucket and save copies locally. This script calls the obsutil to upload files to the OBS bucket.

obsutil is a command line tool for accessing OBS. You can use this tool to perform common configurations in OBS, such as creating buckets, uploading and downloading files/folders, and deleting files/folders. If you are familiar with command line interface (CLI), obsutil is recommended as an optimal tool for batch processing and automated tasks.

For more information about obsutil, see Introduction to obsutil.

## 13.1.3 Dependency

The script runs on the Linux operating system and is compatible with all Linux versions. The script invokes obsutil. **Table 13-1** shows the dependency between the running environment of the obsutil and python.

Component/Module	Requiremen t	Remarks	Handling Method
Python	The version of Python must be Python3.	Incompatibility occurs when Python2 is used.	Upgrade the Python version.

Table 13-1 Dependency versions and description

## **13.2 Preparations Before the Upload**

## **13.2.1 Preparing the Environment**

Before using obsutil, you need to register a cloud service account, use the OBS service, create an IAM user, and obtain access keys (AKs and SKs). To ensure account and resource security, you are not advised to use the registered account to access OBS. Through the Identity and Access Management (IAM) service, you can create a user who has the permission to access OBS resources and perform operations on the OBS client.

## Procedure

- Step 1 Register an account and use OBS.
- Step 2 Create an IAM user.
- Step 3 Create Access Keys (AKs and SKs).

----End

## 13.2.2 Downloading Software

This section describes how to download and decompress the **obsutil\_adapter.zip** software package.

## Procedure

- Step 1 Log in to a server as user root using a key or password.
- Step 2 On the CLI, download the obsutil\_adapter.zip package and decompress it to the /opt/huawei directory. The download address of software packages varies by region. For details, see Table 13-2. The CN-Hong Kong is used as an example here.

wget https://obs-sap-ap-southeast-1.obs.https://obssap.obs.myhuaweicloud.com/obsutil\_adapter/obsutil\_adapter.zip.com/ obsutil\_adapter/obsutil\_adapter.zip -P /opt/huawei

Name	Description	How to Obtain
obsutil_adapter.zip	Software package	<b>CN-Hong Kong</b> : wget https://obs-sap-ap- southeast-1.obs.myhuaweicloud.com/ obsutil_adapter/obsutil_adapter.zip - P /opt/huawei
		<b>AP-Bangkok</b> : wget https://obs-sap-ap- southeast-2.obs.myhuaweicloud.com/ obsutil_adapter/obsutil_adapter.zip - P /opt/huawei
		SA-Johannesburg: wget https://obs-sap- af-south-1.obs.af- south-1.myhuaweicloud.com/ obsutil_adapter/obsutil_adapter.zip - P /opt/huawei

Table 13-2 Required software package

#### cd /opt/huawei

unzip obsutil\_adapter.zip -d obsutil\_adapter/

#### **NOTE**

- **obsutil\_adapter.py**: Script to be uploaded and executed. This script calls obsutil.
- **obsutil\_adapter.cfg**: Configuration file of this script
- **obsutil**: the obsutil client
- The log directory is /var/log/huawei/obsutil\_adapter.

----End

## 13.2.3 Modifying the Configuration File

## Prerequisites

You have prepared the OBS bucket name.

## Procedure

- **Step 1** Log in to a server as user **root** using a key or password.
- **Step 2** Run the following command to modify the **obsutil\_adapter.cfg** configuration file and save it:

#### vi /opt/huawei/obsutil\_adapter/obsutil\_adapter.cfg

**Step 3** Modify the configuration parameters by referring to **Table 13-3** and save the modification.

	Table	13-3	Parameters
--	-------	------	------------

Param eter	Description	Example Value
obs_pat h	Path of the OBS bucket to which the backups will be uploaded. You can enter the OBS bucket name and specify a path after the bucket name. The format is <i>bucket name/bucket path</i> . Use the OBS bucket path you need.	obs-sap/ hana
retry_ti me	Number of retransmission attempts. For example, if its value is set to <b>3</b> , it indicates that if the upload fails, the system retries twice. If the upload still fails, the script exits. <b>NOTE</b> The value of <b>retry_time</b> must be an integer.	3
modifie d_inter val	Upload interval. The unit is minute. The files that are modified within this period will not be uploaded. For example, if its value is set to 5, files that are modified within the last 5 minutes will not be uploaded. <b>NOTE</b> The value of <b>modified_interval</b> must be an integer.	5
reserve _time	File reservation period. The unit is minute. For example, if its value is set to 2880, the files in the <b>backup_archive</b> can be stored for 2880 minutes at most locally. <b>NOTE</b> The value of <b>reserve_time</b> must be an integer.	2880

Param eter	Description	Example Value
backup _path	Path that stores file backups. After the backup of a file is complete, the file is moved to <b>backup_archive</b> . <b>NOTE</b> Multiple paths are supported. Use commas (,) to separate paths. For example: <b>/hana/backup/data</b> , <b>/hana/backup/log</b>	/hana/ backup/ data
backup _archiv e	Files that are successfully uploaded are archived in this directory. When this script is executed, the files in the <b>backup_archive</b> directory are queried first. If the difference between the current time and the file creation time exceeds the value of <b>reserve_time</b> , the files will be deleted. Otherwise, files will be backed up in the <b>backup_path</b> directory. After the backup of files is complete, the files will be archived in <b>backup_archive</b> .	/hana/ backup/ archive

#### D NOTE

- The **backup\_path** and **backup\_archive** directories must be independent from each other. Each directory cannot be a subdirectory of another one. Ensure that the disk space of the two directories is sufficient for storing backup files.
- To ensure the integrity of uploaded files, you cannot run the multiple scripts that have been uploaded at the same time. Otherwise, the script execution fails.

----End

## 13.2.4 Initializing obsutil

Before using obsutil, you need to configure the interconnection between obsutil and OBS, including the endpoint and access keys (AK and SK) of OBS. You can use obsutil to perform operations on OBS buckets and objects only after obtaining the OBS authentication.

## Prerequisites

- The obsutil has been downloaded. For details, see **Downloading Software**.
- The access keys (AK and SK) have been obtained. For details, see **Step 3** in **Preparing the Environment**.

#### Procedure

**Step 1** Run the following commands to initialize obsutil:

chmod +x obsutil

./obsutil config -i=*ak* -k=*sk* -e=*endpoint* 

• **ak**: indicates the tenant access key, that is, the AK in **Creating Access Keys** (AK and SK).

- sk: indicates the tenant secret key, that is, the SK in Creating Access Keys (AK and SK).
- endpoint: The IP address of an endpoint varies from region to region. Table 13-4 lists OBS endpoint IP addresses. For more information about OBS endpoints, see Regions and Endpoints.

Table 13-4	Endpoints

Region Name	Endpoint Region	Endpoint
CN-Hong Kong	ap- southeast-2	obs.ap-southeast-1.myhuaweicloud.com
AP-Bangkok	ap- southeast-1	obs.ap-southeast-2.myhuaweicloud.com
AF- Johannesbur g	af-south-1	obs.af-south-1.myhuaweicloud.com

#### **NOTE**

- After running the preceding commands, a configuration file .obsutilconfig is automatically generated in the same directory of the user who executes obsutil commands (the ~ directory in Linux). .obsutilconfig contains all the configuration information of obsutil. For details about the parameters, see Parameter Description.
- The .obsutilconfig file contains user AK and SK information. To prevent key leakage, the obsutil file is hidden by default. You can run the ls -a command in the directory of the user who executes obsutil commands to view the file.
- **Step 2** After the configuration is complete, you can run the following command to check the connectivity:

#### ./obsutil ls -s

Check the command output.

- If the command output contains **Bucket number is:**, the configuration is correct.
- If the command output contains **Http status [403]**, the access keys are incorrectly configured.
- If the command output contains **A connection attempt failed**, the OBS service cannot be connected. Check whether the network is normal.

----End

## 13.3 Uploading Backups to the OBS Bucket

## 13.3.1 Manually Running the Script

#### Prerequisites

Before running the script, ensure that the database backup is complete. This script cannot identify whether the backup file is complete.

#### Procedure

**Step 1** After modifying the configuration file, run the following commands to start the upload:

cd /opt/huawei/obsutil\_adapter

python3 obsutil\_adapter.py

#### **NOTE**

After the script is executed, log in to OBS to view the uploaded file. The directory name on OBS is determined by time, and the structure is *Bucket path/Year and month/Day/*, for example, **obs-sap/hana/201808/22/**.

```
----End
```

## 13.3.2 Calling by Other Scripts

If other scripts need to call this script, ensure that its software package has been downloaded and decompressed. Before running the script, ensure that the database backup is complete. This script cannot identify whether the backup file is complete.

## Procedure

**Step 1** Run the following command to call the script:

#### cd /opt/huawei/obsutil\_adapter && python3 obsutil\_adapter.py

#### **NOTE**

In the preceding command, **/opt/huawei/obsutil\_adapter** indicates the path where the script is decompressed. Change it based on the site requirements.

----End

## **13.3.3 Configuring Scheduled Tasks**

If a backup task needs to be executed periodically, configure scheduled tasks using crontab on Linux to call the script. Before running the script, ensure that the database backup is complete. This script cannot identify whether the backup file is complete.

#### Procedure

Step 1 Edit the crontab file:

crontab -e

Set the scheduled task. Change the time according to the actual situation, save the modification, and exit.

If the following information is displayed, the script will be called at 21:30 o'clock every day:

30 21 \* \* \* cd /opt/huawei/obsutil\_adapter && python3 obsutil\_adapter.py >/dev/null 2>&1

**NOTE** 

The scheduled task execution time is defined by the customer. Ensure that the scheduled task execution time is later than the backup time.

**Step 2** View scheduled tasks. If you can find the scheduled tasks in **Step 1** by running the following command, it indicates that the setting is successful.

crontab -l

----End

## 13.4 FAQs

## 13.4.1 How Do I Download a Backup File of a Day from the OBS Bucket?

This topic describes how to use obsutil to download a backup file of a day from the OBS bucket to the local host.

#### NOTICE

- Ensure that source objects in the OBS bucket do not change. Otherwise, the download may fail or data may be inconsistent.
- If the objects to be downloaded are in the OBS Archive storage class, you must restore the objects first. Otherwise, the download fails.

## Procedure

- **Step 1** Log in to a server as user **root** using a key or password.
- **Step 2** Run the following command to recursively download all files and folders (including the folder itself) in the bucket to a local path:

./obsutil cp obs://obs\_path/Year/Month/Day|Local path -r -tempFileDir= a
specified path -f

In the preceding command:

- obs\_path: OBS bucket path, for example: obs-sap/hana
- *Year/Month/Day.* directory of a folder in the OBS bucket. For example: **201905/28**.
- *Local path*: path where the files are stored on the local host. For example: **src1**.

• *tempFileDir= a specified path*: Directory for storing temporary files during multipart download. The default value is the value of **defaultTempFileDir** in the configuration file. You can also specify a path.

D NOTE

- Temporary files generated during multipart download are stored in this directory. Ensure that the user who runs obsutil commands has the write permission on the path.
- The available space of the path must be greater than the size of the objects to be downloaded.

For example, in the **obs-sap** bucket, download the backup files of May 28, 2019 to the local path **src1**. The command is as follows:

./obsutil cp obs://obs-sap/hana/201905/28 /src1 -r -tempFileDir=/hana/backup -f

For more information about obsutil, see Introduction to obsutil.

----End

## 13.4.2 How Can I Periodically Delete Backup Files from a Bucket or Change the Storage Class of Backup Files?

This section applies to the following scenarios:

- Some files uploaded periodically need only to be retained for only one week or one month. You need to delete the files after they expire.
- Files are seldom accessed after a certain period of time. These files need to be transitioned to Infrequent Access or Archive storage or be deleted.

You can create lifecycle rules for objects in the preceding scenarios.

#### NOTICE

- Use an independent bucket to store backup files to prevent important files from being deleted by mistake during the periodical deletion.
- Apply the lifecycle rules to the entire bucket when configuring the lifecycle management function to manage the lifecycle of all objects in the bucket.

#### Procedure

**Step 1** For details, see **Configuring a Lifecycle Rule**.

----End

# **14** Best Practices of the SAP ASE Solution

Purpose Resource Planning Deployment HA Solution Backup DR Cloud Migration

## 14.1 Purpose

This document describes the HUAWEI CLOUD SAP ASE solution, including information about resource selection, system backup, high availability (HA), disaster recovery (DR), and offline system migration. HUAWEI CLOUD provides various cloud services to ensure stable and secure running of the SAP Adaptive Server Enterprise (ASE) system.

SAP ASE is a high-performance SQL database. It uses a relational model to power transaction-based applications, meeting tenants' advanced requirements on database performance, reliability, and efficiency. With SAP ASE, you can quickly and confidently perform online transaction processing (OLTP). You can build transaction-based modern applications and improve the running speed of applications inside enterprises and on the cloud. The high-performance SQL database server adopts the relational management model to deliver performance, reliability, and efficiency that various industries increasingly require.

The HUAWEI CLOUD SAP ASE solution has the following advantages:

• Rich specifications: Provides Elastic Cloud Servers (ECSs) of various specifications to meet requirements of different application scenarios. You can select appropriate specifications based on user quantity and performance requirements.

- Lower costs: Provides multiple economical ECSs.
- Higher efficiency: The entire SAP system can be deployed on HUAWEI CLOUD, facilitating SAP system O&M and improving the overall running efficiency of the SAP system.

HUAWEI CLOUD uses the built-in license for the SAP ASE database. HUAWEI CLOUD provides a high-performance enterprise-level relational database management system for SAP ASE, which is suitable for mission-critical services and data-intensive environments. For additional information about running SAP ASE on HUAWEI CLOUD, see SAP Note #2644322, which requires SAP Service Marketplace credentials.

## 14.2 Resource Planning

## 14.2.1 Network Planning

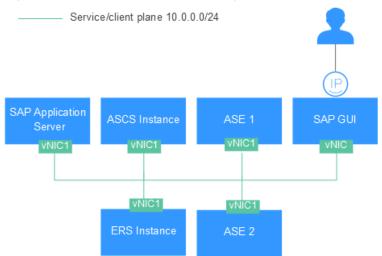
HUAWEI CLOUD Virtual Private Cloud (VPC) service provides an isolated virtual network environment for cloud servers, that can be configured and managed by users. It improves cloud resource security and simplifies network deployment. In a VPC, you can define subnets, IP address ranges, routing tables, and security group rules.

Plan the number of VPCs, number of subnets, IP network segments, and interconnection modes based on your service requirements. For details, see the **Network Planning** section in VPC documentation.

## HADR Network Planning

Use only one NIC to build the service/client network communication plane. **Figure 14-1** shows the HADR network plan.

#### Figure 14-1 HADR network planning



When deploying the SAP ASE system, you need to plan public and private IP addresses. For details, see **Table 14-1**.

#### **NOTE**

The following node names, network segments, and IP addresses are provided for reference only. Set them based on the actual network plan.

ІР Туре	Node Nam e	NIC	IP Addres s	Description
Public IP	ase00 1	eth0	10.0.0. 4	Configure the network plane as needed.
	ase00 2	eth0	10.0.0. 5	
Virtual IP	-	-	10.0.0. 6	The virtual IP address is optional. The active and standby ECSs where the ASE database resides use the same virtual IP address. You can access the ASE ECSs through the virtual IP address or a private IP address. The virtual IP address must be an unused IP address that is in the same network plane as the public IP address.

 Table 14-1
 Network planning

## **Application Server Network Planning**

or details about SAP application network planning, see the network planning section in the **Network Plane Planning**.

## 14.2.2 Server Specifications

This section describes ASE ECS specifications. For details about the ECSs for SAP applications powered on the SAP ASE database, see the **ECS Flavors for SAP NetWeaver**. You can choose from ECSs with the following specifications based on the business scale and application system requirements.

## Small-scale

This scheme is applicable to the small enterprise resource planning (ERP) system or other SAP systems, such as PI, SAP Portal product portfolio, CRM, and SRM. M3 ECSs are suitable for development, testing, and production systems. Table 14-2 lists the specifications.

Table 1	14-2	Scheme	for	small ER	Ρ
---------	------	--------	-----	----------	---

System	vCPUs	Memory (GB)	Flavor
Development	4	32	m3.xlarge.8
Testing	4	32	m3.xlarge.8

System	vCPUs	Memory (GB)	Flavor
Production	8	64	m3.2xlarge.8

#### Medium-scale

This scheme is applicable to the medium-sized ERP system. M3 ECSs are suitable for development, testing, and production systems. **Table 14-3** lists the specifications.

Table 14-3 Scheme for medium-sized ERP

System	vCPUs	Memory (GB)	Flavor
Development	4	32	m3.xlarge.8
Testing	8	64	m3.2xlarge.8
Production	16	128	m3.4xlarge.8

## Large-scale

This scheme is applicable to the large ERP system. M3 ECSs are suitable for development, testing, and production systems. Table 14-4 lists the specifications.

#### Table 14-4 Scheme for large ERP

System	vCPUs	Memory (GB)	Flavor
Development	8	64	m3.2xlarge.8
Testing	16	128	m3.4xlarge.8
Production	32	256	m3.8xlarge.8

## 14.2.3 File Systems

This section describes the file system planning of the SAP ASE database. For details, see **Table 14-5**. For SAP applications powered on the ASE database, the file system planning is the same as that of the applications using the HANA database. For details about the file system planning for SAP applications, see the **SAP NetWeaver User Guide**.

For the single-node ASE system, each file system needs an EVS disk.

File System	I/O	Space	Description
/sybase/ <dbsid></dbsid>	High I/O	20 GB	ASE software directory (shared or local)
/sybase/ <dbsid>/ sybsystem</dbsid>	Ultra- high I/O	10 GB	System directory
/sybase/ <dbsid>/ sybtemp</dbsid>	Ultra- high I/O	10 GB	Temporary directory of the SAP ASE database
/sybase/ <dbsid>/ saptemp</dbsid>	Ultra- high I/O	20 GB	SAP software temporary directory
/sybase/ <dbsid>/ sapdiag</dbsid>	Ultra- high I/O	10 GB	SAP tools directory
/sybase/ <dbsid>/ sapdata_<n></n></dbsid>	Ultra- high I/O	> 80 GB for ABAP, or > 40 GB for Java	Data file directory
/sybase/ <dbsid>/ saplog_<n></n></dbsid>	Ultra- high I/O	> 40 GB for ABAP, or > 20 GB for Java	Log file directory
/sybase/ <dbsid>/ sybsecurity</dbsid>	Ultra- high I/O	10 GB	ASE audit log

Table 14-5 ASE database file system planning

# 14.3 Deployment

# 14.3.1 Preparing Resources

Before deploying an SAP ASE system on HUAWEI CLOUD, you need to prepare the installation media, licenses, and operating system (OS).

#### **Installation Media**

Table 14-6 lists the required installation media.

#### Table 14-6 Installation media

Installation Media	How to Obtain
Software Provisioning Manager 1.0	Visit the SAP Software Downloads
UC Kernel (folder K_ <version>_<n or U&gt;_<os>)</os></n </version>	website.
ASE Database Software (database patches)	

Installation Media	How to Obtain
Installation Export (folders EXP*)	

#### Licenses

Bring-Your-Own-License (BYOL) is used for authorization. You can log in to the SAP help portal to apply for the license as required.

You also need to purchase some HUAWEI CLOUD resources.

#### OSs

The OS is SUSE Linux Enterprise Server For SAP Applications 12 SP3. SAP ASE database is mainly used for SAP NetWeaver 7.4 and 7.5. The Kernel version is 740 or later, and the ASE version is 16.0 or later.

For details about the version mapping, see the **OS Support List** on the SAP website.

# 14.3.2 Creating and Configuring Networks

Create a VPC and configure IP address segments, subnets, and security groups based on actual requirements. For details, see Creating and Configuring a VPC.

# 14.3.3 Creating an ECS

Purchase an ECS. For details, see **Purchasing an ECS with Customized Configurations**.

# 14.3.4 (Optional) Other Configuration

Perform the following operations as needed:

- If you need a virtual IP address, see Virtual IP Address Overview.
- You can share an EVS disk with multiple servers. For details, see Attaching a Shared Disk and Binding a Floating IP Address.
- If you want to connect the network of Huawei Cloud to your local network, see **Connecting the VPC to the IDC**.

# 14.3.5 Installing SAP ASE

Use **Software Provisioning Manager (SWPM)** to install the SAP ASE software. The installation procedure varies according to the system. For details, see **helpful documents** on the SAP website.

# 14.4 HA Solution

# 14.4.1 Database HA

The typical HA solutions commonly used by the ASE database are available on HUAWEI CLOUD. For example, both High-availability and disaster recovery (HADR) and SUSE<sup>®</sup> Linux Enterprise High Availability Extension (HAE) can be used to achieve ASE system HA. HUAWEI CLOUD also provides HA solutions for both the databases and applications to ensure stable and reliable running of the SAP ASE system.

#### 

The databases and applications of the SAP ASE production system is installed in distributed mode.

#### Solution 1: HADR (recommended)

HADR is an SAP solution designed for the ASE database. The HADR solution consists of two database nodes (active and standby) and one management node (Fault Manager). If the active database node is faulty, the standby node automatically takes over the workloads, ensuring high service availability. Generally, HA solutions use shared storage. However, in the HADR solution, resources of all nodes are isolated, which effectively reduces the risk of single points of failure. For details, see the HADR User Guide on the SAP website.

#### Solution 2: SUSE HAE

SUSE HAE is an integrated suite of open source clustering technologies that enables you to implement highly available physical and virtual Linux clusters and eliminates single points of failure. It ensures high availability and manageability of critical resources, including data, applications, and services. Therefore, it helps you maintain business continuity, protect data integrity, and reduce unplanned downtime for your mission-critical Linux workloads. Figure 14-2 shows the architecture of SUSE HAE for the SAP ASE system. For details, see the SUSE official document.

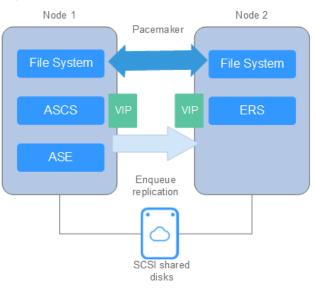


Figure 14-2 SUSE HAE scheme

# 14.4.2 Application HA

Applications and databases in the SAP ASE production system are installed in distributed mode, so that the application layer and HA scheme are the same as those of the SAP HANA system.

The HA solution of SAP ASE system applications is provided in the **SAP NetWeaver User Guide**. For details, see **Distributed HA Deployment Mode**.

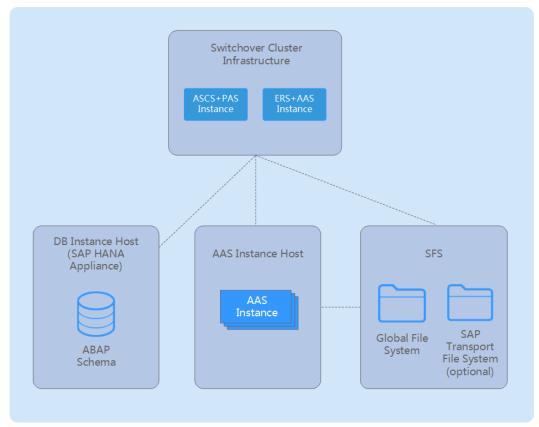


Figure 14-3 SAP Application HA Deployment

# 14.5 Backup

# 14.5.1 Backing Up the Database

HUAWEI CLOUD provides Scalable File System (SFS), Object Storage Service (OBS), Volume Backup Service (VBS), and Cloud Server Backup Service (CSBS) for backing up the SAP ASE system. As the SAP application servers and the ASE database servers are different, use different service combinations to back up the servers. You can use the tool provided by the ASE database or a third-party tool to back up and restore the database. The backup files can be stored in and restored from SFS file systems or OBS buckets.

SFS and OBS are suitable storage media for the database backup. SFS is a network attached storage (NAS) service that provides scalable high-performance file storage. Use SFS as the storage medium of ASE database backup files. OBS is a

stable, secure, efficient, and easy-to-use cloud storage service. It provides highly reliable storage capabilities at relatively low costs. Use OBS as the archive storage. You can upload SFS data to OBS.

HUAWEI CLOUD provides a free backup uploading script to periodically archive backup files in SFS file systems to OBS buckets, and clear the files in the SFS file systems based on user-defined rules. For details, see **Best Practices for Uploading SAP Backups to the OBS Bucket**.

#### Solution 1: Using DBA Cockpit

DBA Cockpit is dedicated to monitoring and managing databases of SAP systems. It simplifies the database administration. DBA Cockpit is integrated in SAP NetWeaver by default.

The procedure is as follows:

- 1. Log in to the SAP GUI.
- 2. Run the **TCODE dbacockpit** command.
- 3. Choose **Database** > **Jobs** > **DBA Planning Calendar** > **Add**.

DBA Cockpit					
Switch to SAPGUE 🛛 🧮 Start in We	b Browser				
Welcome, DDIC     Database A00       System Landscape     Database A00       Performance     Space       BA Planning Calendar       DBA Log       Systems     Sala       (0) (0) (0) (1)	DB Server: ase01	Back Forwa DBA Planning Co DBA Log DB Release: 10 0.03.07 Started ng Calendar		ne: 3 Hours 10 Minutes Last Refres	h: 06 08 2019 20 17:00
C A00 on ase01	Apply Selection August 2019,	5.08.2019 T Cate		V Factory Calendar:	ď
	View: Week v		Layout Legend		
1		Mondary, 5	Tuesday, 6	Wednesday, 7	Thursday, 8
	00:00				
	01:00				
	02:00				
	03:00				
	04:00				
Favorites	05:00				
EXPLAIN Access Plan	06:00				
SQL Command Line Schedule an Action	07:00				

4. Choose Job Selection > Database Dump > Start Immediately. You can also choose Schedule as Recurring Action as needed.

Schedule an Action				Persona
DB Server: ase01 DB Release: 16.0.03	07 Started: 06.08.2019 17:0	06:32 Uptime: 3 Hours 22	Minutes Last Refresh: 06.08.2019 20:29	:16
I. 2	3 4	5	6	
Introduction Job Selection	Parameters Recurren	nce Summary Exe	ecution Protocol	
Back Continue				
Back Continue * Action: Database Dump	*			
	v			

#### 5. Configure backup parameters.

Back	-	we	2 Job Selection	3 Parameter	s Recurrence	5 Summary	6 Execution Protocol	-1	
	base D		A00						
	ump Confi		Select Dump C	✓					
	anual ameters								
* N	umber of S	tripes:	2		*				
*L(	evel of Cor	npression:	100		~				
* V	erify Metho	id:	Full		~				
Strip	e List								
	Stripe	Path*							
	1	/sybase//	A00/backup/\$dbna	ame\$_\$stripenu	im\$_\$datetime\$.bal	k.dat			
	2	/sybase//	A00/backup/\$dbna	ame\$_\$stripenu	ım\$_\$datetime\$.bal	k.dat			
			ne appropriate to y						

\* Following wildcards are available for use in file name: \$dbname\$, \$stripenum\$, \$datetime\$

- 6. On the **Summary** page, review the parameter configuration and click **Execute**.
- 7. After the backup is complete, check the backup directory and backup logs.

For details about how to back up the ASE database and logs, see the following notes:

- Note 1588316 SYB: Configure automatic database and log backups
- Note 1558958 SYB DBA Cockpit Correction Collection SAP Basis 7.02 7.30

For more details about DBA Cockpit, see **The DBA Cockpit** on the SAP website.

#### Solution 2: Running the DUMP DATABASE Commands

The procedure is as follows:

- Run the following dump command to back up my\_database:
   DUMP DATABASE my\_database TO '/local\_dump\_dir/my\_database.dump'
- Run the following command to back up transaction logs of my\_database: DUMP TRANSACTION my\_database TO '/local\_dump\_dir/ my\_database.\$timestamp.dumptran'
- 3. Back up the local files to SFS or OBS.
- 4. Restore the database.
  - a. Run the following command to stop the database before the restoration:
     dbcc dbreboot(shutdown\_load, my\_database)
  - b. Run the following commands to restore the database:

LOAD DATABASE my\_database FROM "my\_database.dump" LOAD TRAN my\_database FROM "my\_database.\$timestamp.dumptran"

c. Run the following command to start the restored database:

online database my\_database

#### **NOTE**

For incremental backup, set **trunc log on chkpt** to **false**. The command is as follows: **sp\_dboption my\_database**, **"trunc log on chkpt"**, **false** 

For details about how to run the DUMP DATABASE commands to back up the database, see the "Backing Up Databases" section in **Backup and Recovery** on the SAP website.

#### Solution 3: Using a Third-party Backup Tool

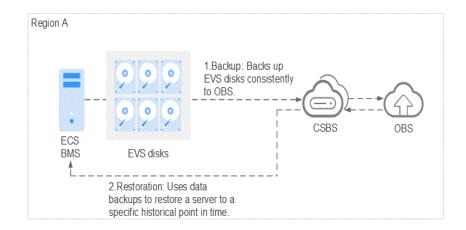
Use a third-party backup tool, such as AnyBackup. For details, see the **EISOO** website.

# 14.5.2 Backing Up Application Servers

The application servers are stateless. Use CSBS to back up SAP application servers on HUAWEI CLOUD.

CSBS offers the backup protection service for ECSs and Bare Metal Servers (BMSs). It works based on the consistent snapshot technology for disks. With CSBS, you can use backup data to restore server data, enhancing data integrity and service continuity.

For details, see **Cloud Server Backup Service User Guide**.



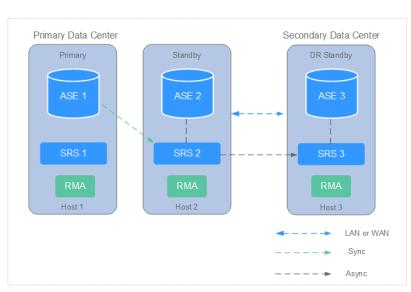
# 14.6 DR

# 14.6.1 Database DR

In the SAP ASE system, the DR strategies for applications and databases are different.

- On HUAWEI CLOUD, use SDRS for the DR of SAP application servers.
- For the ASE database, use the HADR scheme or HUAWEI CLOUD SDRS. For details about the SDRS, see the Storage Disaster Recovery Service User Guide.

Figure 14-4 shows the HADR scheme of the ASE database.



#### Figure 14-4 Database DR scheme

#### Description

The SAP ASE production system is deployed in HA mode. The HADR scheme facilitates synchronous replication between the primary and standby nodes to ensure data consistency. The asynchronous replication is implemented between the standby node and the standby DR node.

The DR system is deployed in a different area from the production system. The two areas are connected through private lines. For more details about HADR, see **HADR with SAP ASE** on the SAP website.

#### **NOTE**

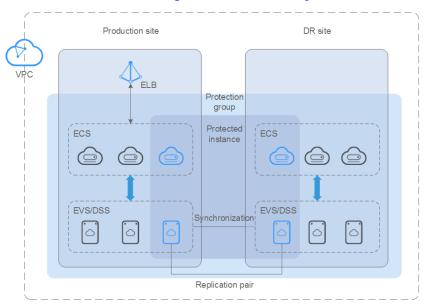
The primary, standby, and standby DR nodes must have the following in common:

- OS and patch level
- SAP ASE version
- ASE database parameter configuration

# 14.6.2 Application Server DR

Use SDRS for application server DR on HUAWEI CLOUD. SDRS supports ECS, Elastic Volume Service (EVS), and Dedicated Distributed Storage Service (DSS). SDRS uses multiple technologies, such as storage replication, data redundancy, and cache acceleration, to ensure high data reliability and service continuity.

SDRS facilitates and accelerates DR of SAP ASE application servers. For more information, see the **Storage Disaster Recovery Service User Guide**.



#### D NOTE

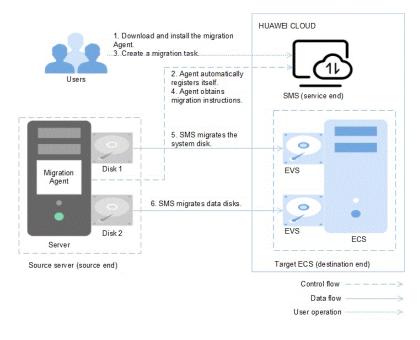
This service applies only to the systems running on HUAWEI CLOUD. To backup and recover on-premises servers to HUAWEI CLOUD, deploy the application servers on HUAWEI CLOUD.

# 14.7 Cloud Migration

# 14.7.1 Migrating Application Servers to HUAWEI CLOUD

You can migrate an existing SAP ASE system to HUAWEI CLOUD. There are migration solutions for different systems.

Use HUAWEI CLOUD Server Migration Service to migrate application servers. For details, see the **Server Migration Service User Guide**.



#### **NOTE**

This solution applies only to the scenario where the source and target application servers are the same. If you need to change the application server software version or perform heterogeneous database migration, you need to reinstall the application servers.

# 14.7.2 Migrating the Database to HUAWEI CLOUD

#### 14.7.2.1 Homogeneous Migration

HUAWEI CLOUD ECSs and BMSs can run the ASE database. You have many optional methods to migrate the offline database to HUAWEI CLOUD.

Homogeneous migration refers to the migration where the source server OS is same as the target OS (versions can be different), and the ASE database version and patch do not change.

You can select a homogeneous migration solution as needed. **Table 14-7** describes the optional schemes.

Solution	Description
Database backup and restoration	The operation is simple, but the service downtime is long. <b>NOTE</b> The downtime includes the time for offline backup, backup uploading, and restoration.
Using HADR for migration	The service downtime is minimized, but the configuration is complex. The administrator must be familiar with the ASE database.

Table 14-7 Migration solution
-------------------------------

Solution	Description
HUAWEI CLOUD Server Migration Service	SMS supports batch migration and does not require ASE database administrators. However, the downtime of this scheme is long, which is mainly for incremental data synchronization.

#### Solution 1: Database backup and restoration

The procedure for backing up and restoring the database is as follows:

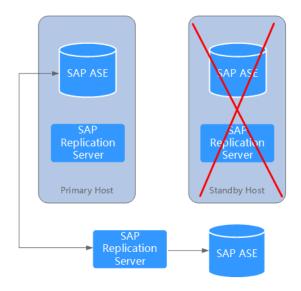
- **Step 1** On HUAWEI CLOUD, plan the subnet for the target end, configure security group policies, and build a target system that has the same OS, database, and application servers as the source system.
- **Step 2** Stop the services on the source system and back up the ASE database offline.
- **Step 3** Copy the database backup files from the source system to the file system in the target system. You can use OBS to transfer the files. Upload the files to Huawei Cloud OBS using **obsutil** and then download the file to the target server.
- **Step 4** Import the uploaded backup file to the target database.
- **Step 5** Verify data integrity and switch the database services to the target system.

----End

#### Solution 2: Using HADR for migration

Figure 14-5 shows the HADR migration scheme.

Figure 14-5 Using HADR for migration



The procedure is as follows:

- **Step 1** On HUAWEI CLOUD, create the a subnet, configure security group policies, and build a target system that has the same OS, database, and application servers as the source system.
- **Step 2** Configure the data replication from the source system to the target system. For details, see **SAP HADR Users Guide**.
- **Step 3** After the synchronization is complete, stop services in the source system and switch them to the target system.

----End

#### **Solution 3: HUAWEI CLOUD Server Migration Service**

Perform the following steps to use HUAWEI CLOUD Server Migration Service:

- **Step 1** On HUAWEI CLOUD, plan the subnet for the target end, configure security group policies, and build a target system that has the same OS, database, and application servers as the source system.
- **Step 2** Prepare for the migration. Install the migration Agent on the source server, enable the ports required for migration, and provide user information used for migration.
- **Step 3** Migrate the database server. Use the Server Migration Tool to migrate the ECSs. You do not need to stop the services on the source server.
- **Step 4** Synchronize incremental data and switch the services. Synchronize incremental data to the target ECS and switch services to the target system after the synchronization.
- **Step 5** Monitor the target system for about one week to check if the target system is running properly. After the verification, release source system resources.

For details, see Server Migration Service User Guide.

----End

#### 14.7.2.2 Heterogeneous Migration

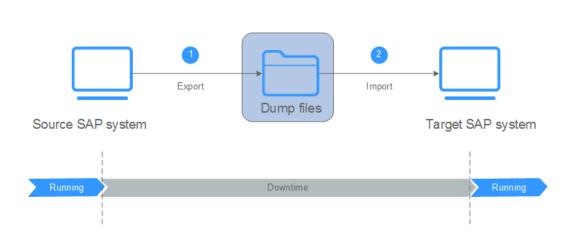
Heterogeneous migration refers to a migration where the source and target OSs, ASE databases, and SAP software versions are different. Use SAP R3load to import and export systems for heterogeneous migration.

#### Solution: SAP System Copy procedures (R3load)

Services must be stopped when R3load exports data. The service interruption duration depends on the database size. If the data to be imported and exported is more than 1 TB, the interruption time is long, causing great impacts on services. This solution is provided by SAP. If you encounter any problem during the migration, contact SAP technical support for solutions.

**Figure 14-6** shows the procedure.

#### Figure 14-6 System migration



System Migration Procedure

The procedure is described as follows:

- **Step 1** On HUAWEI CLOUD, create the a subnet, configure security group policies, and build the target system, including the database and application servers.
- **Step 2** Stop the source system services. Run the SWPM tool on the source server and use System Copy to export data. For details, see **SAP System Copy**.
- **Step 3** Upload the exported data to the file system of the target system.
- **Step 4** Run the SWPM tool in the target system and use System Copy to import data.
- **Step 5** Verify data integrity and switch the database services to the target system.

----End

# **15** Best Practices of SAP System Capacity Expansion

#### Overview Before You Start

Upgrading ECS Configuration

Expanding EVS Disk Capacity

Verifying the Expansion

FAQs

# **15.1 Overview**

If the ECSs or EVS disks you purchased cannot meet your surging SAP business requirements, you can expand the resources on HUAWEI CLOUD.

This document describes how to expand ECSs and EVS disks on HUAWEI CLOUD.

# 15.2 Before You Start

# **15.2.1 Expansion Scenario**

This section describes the capacity expansion of ECSs and EVS disks.

#### **ECS Expansion**

#### • Modifying ECS Specifications

If the ECS specifications do not meet service requirements, you can modify the ECS specifications, including vCPUs and memory. **Table 15-1** describes an example where an SAP HANA ECS is upgraded from e1.4xlarge to e1.8xlarge.

Table 15-1 ECS specification modification

ECS Name	Before	After
hana01	e1.4xlarge	e1.8xlarge

#### • Modifying Specifications and AZ/Region

If you need to migrate an ECS to another AZ or region when upgrading the ECS configuration, you can create a full-ECS image on HUAWEI CLOUD for the migration.

#### • Modifying Specifications and AZ/Region with Low RTO

If you need to migrate an ECS to another AZ or region when upgrading the ECS configuration, use full-ECS image and backup recovery or system replication for the migration to reduce RTO.

#### **EVS Disk Capacity Expansion**

EVS disk capacity expansion is to expand the system disk or data disk to meet data storage requirements. For details about the pricing of a changed specification, see **Pricing of a Changed Specification**.

For details about Expanding EVS Disk Capacity (Without LVM), see Table 15-2.

EVS Disk Name	Capacity Before Expansion (GB)	Capacit y After Expansi on (GB)	Mount Point	Partit ion	File System	Mountin g Director y
hana01- volume-sys	100	200	xvda	xvda1	ext4	N/A
hana01- volume- data	470	940	xvdb	None	xfs	/hana/ data

Table 15-2 EVS disk capacity expansion (without LVM)

Description:

A system disk of 100 GB and a data disk of 470 GB are attached to an ECS. The system disk and data disk are expanded to 200 GB and 940 GB, respectively.

• For details about the **Expanding EVS Disk Capacity (with LVM)**, see **Table** 15-3.

EVS Disk Name	Capacit y Before Expansi on (GB)	Capacity After Expansio n (GB)	Mou nt Poin t	File Syste m	Mounti ng Directo ry	Directo ry Size Before Capacit y Expansi on	Directo ry Size After Capacit y Expansi on
hana- data0 1	400	800	vdb	xfs	/hana/ data	696 GB	1.4 TB
hana- data0 2	400	800	vdc				

**Table 15-3** EVS disk capacity expansion (with LVM)

Description:

There are two data disks of 400 GB each attached to an ECS. A logical volume of 696 GB is divided from the LVM volume that is formed by the two data disks and mounted to the **/hana/data** directory. You can expand the **/hana/ data** directory to 1.4 TB by expanding the capacity of EVS disks and the file system.

The following documents describe how to expand the capacity of an EVS disk.

- Expansion Overview
- Post-Expansion Operations for a Windows EVS Disk

# **15.2.2 Expansion Restrictions**

This section describes the restrictions on capacity expansion. You need to learn these restrictions before capacity expansion.

#### **ECS Expansion Restrictions**

- SAP HANA ECSs: You can change ECS types E1 to E2, E2 to E1, and ET2 to E3. Other ECS type changes are not supported.
- SAP application ECSs: You cannot change ECS types H1 and M3.

ECS Application Scenario	ECS Type Before Change	ECS Type After Change
SAP HANA	E1/E2	E1/E2
	ET2	ET2
	ET2	E3

 Table 15-4 Supported ECS specification change

ECS Application Scenario	ECS Type Before Change	ECS Type After Change		
	e3	e3		
SAP	H1	H1		
applications	M3	M3		
	c6	c6		

## **EVS Disk Capacity Expansion Restrictions**

Table 15-5 describes the restrictions to the EVS disk capacity expansion.

Туре	Restriction
Capacity expansion of EVS disks	Disk capacities can be expanded only, but cannot be reduced.
Capacity expansion of non-shared disks	Only certain ECS OSs support capacity expansion of non- shared disks in the <b>In-use</b> status. For details, see <b>Expanding</b> <b>an In-use EVS Disk</b> .
	If an EVS disk in the <b>In-use</b> status is to be expanded, the ECS OS to which the EVS disk is mounted must meet the requirements. If the server OS does not support capacity expansion of <b>In-use</b> disks, detach the disk and then expand its capacity. Otherwise, you may need to stop and then start the ECS after the expansion to make the expansion takes effect. You do not need to shut down the ECS if OSs are: SUSE Linux Enterprise Server 12 SP3 64bit SUSE Linux Enterprise Server 12 SP2 64bit SUSE Linux Enterprise Server 12 SP1 64bit
Capacity expansion of shared disks	A shared disk must be detached from the ECS before expansion, and the shared disk status must be <b>Available</b> .
Expansion increment	1 GB

 Table 15-5 EVS disk capacity expansion restrictions

#### NOTICE

When a disk has been put to use, you must check the disk partition style before expanding its capacity as follows:

- If the MBR partition style is used, the maximum disk capacity supported is 2 TB (2048 GB), and the disk space exceeding 2 TB cannot be allocated and used.
- With GPT, you can expand the capacity of a data disk to up to 32 TB. An EVS data disk supports up to 32 TB (32768 GB) so that you can expand the capacity of a data disk to up to 32 TB when the GPT partition style is used.

If the in-use partition style is MBR and the disk capacity needs to be expanded to over 2 TB, change the partition style from MBR to GPT. Ensure that the disk data has been backed up before changing the partition style because services will be interrupted and data on the disk will be cleared during this change.

## 15.2.3 Impact

This section describes the possible impacts of the capacity expansion.

#### Impact During Capacity Expansion

The ECS must be stopped when you change ECS specifications, which interrupts services.

To reduce the impact on the system running, you are advised to perform the capacity expansion during off-peak hours.

#### Impact After Capacity Expansion

None

# **15.3 Upgrading ECS Configuration**

# **15.3.1 Modifying ECS Specifications**

This section describes how to modify ECS specifications. In this section, a HANA database ECS is changed from e1.4xlarge to e1.8xlarge.

For details, see General Operations of Modifying Specifications.

#### NOTICE

- Modifying ECS specifications, such as the number of vCPUs or memory, may affect the ECS performance. The specifications of an ECS can be modified only when the ECS is in the **Stopped** state.
- Do not power on the ECS during the specification modification. Otherwise, the modification will fail. The new specifications take effect immediately after the modification is complete.

#### Preparations

To prevent NIC IP address flapping after the specification is modified, run the following commands on the ECS to delete the network rules files whose names contain **persistent** and **net** from the directory before modifying the specification:

rm -fr /etc/udev/rules.d/\*net\*persistent\*.rules

rm -fr /etc/udev/rules.d/\*persistent\*net\*.rules

#### Procedure

- **Step 1** Log in to HUAWEI CLOUD management console.
- Step 2 Choose Service List > Computing > Elastic Cloud Server.
- **Step 3** In the ECS list, select the ECS whose specifications you want to modify and click **Stop**.

**NOTE** 

Stop the SAP applications running on the ECS before stopping the ECS.

- Step 4 In the displayed dialog box, click Yes.
- **Step 5** After the ECS is stopped, locate the row that contains the ECS, click **More** in the **Operation** column, and choose **Modify Specifications**.
- Step 6 Select a flavor, for example: e1.8xlarge, and click Submit.
- Step 7 Confirm the change details, select I have read and agree to the Huawei Image Disclaimer, and click Submit Application.

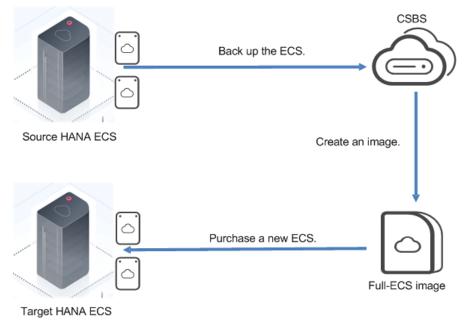
It takes about 2 minutes to change the ECS specification.

----End

# 15.3.2 Modifying Specifications and AZ/Region

If you need to migrate an ECS to another AZ or region when upgrading the ECS configuration, you can create a full-ECS image on HUAWEI CLOUD for the migration. Figure 15-1 shows the migration process. This section uses a HANA database ECS as an example.

#### Figure 15-1 Full-ECS image backup



#### Procedure

- **Step 1** Stop the HANA database of the source system or shut down the source ECS.
- **Step 2** Create a full-ECS image using the ECS. For details, see **Creating a Full-ECS Image Using an ECS**.
- **Step 3** (Optional) If you need to purchase an ECS in another region, copy the newly created full-ECS image to the target region. For example, the original HANA server is an ECS in a CN East region, and you need to migrate it to a CN South region.
  - Log in to the management console and choose Service List > Computing > Image Management Service.
  - 2. In the **Operation** column of the newly created image, click **More** and choose **Replicate**.
  - 3. Set parameters as prompted. For details, see Table 15-6.

Parameter	Description	Example Value
Replication Mode	Set this parameter as you need.	Across Regions
Name	lmage name	copy_cn- east-2_hana_002
Destination Region	Select the region where you want to use the image.	CN South-Guangzhou
Destination Project	Select a project in the destination region.	cn-south-1

**Table 15-6** Configuration parameters

Parameter	Description	Example Value		
IAM Agency	Select a created IMS agency as needed.	ims-rep		

- 4. Click **OK** and wait until the replication is complete.
- **Step 4** Use the full-ECS image to purchase the target ECS. Select the specifications according to your requirements. You can change the disk size when setting disks to adapt to the new specifications. For details, see **Purchasing an ECS**.
- Step 5 The IP address of the newly purchased ECS may be different from that in the source system. If necessary, update all the use of IP addresses in the source system. In addition, you need to log in to the new system and update the /etc/ hosts file and host name information of the new system.

#### 

You can modify the private IP address of an ECS. If the source and target systems are in the same VPC, you need to release the source ECS IP address first and then change the target ECS IP address to the released one. For details, see **Modifying a Private IP Address**.

- **Step 6** (Optional) Adjust the disk capacity after modifying ECS specifications. For details, see **Expanding EVS Disk Capacity**.
- **Step 7** Start the HANA database for verification.
- **Step 8** Check the connection between an SAP application and the HANA database and configure SAP HANA HA.

----End

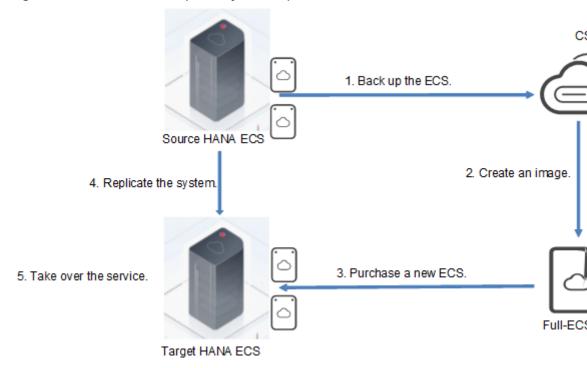
# 15.3.3 Modifying Specifications and AZ/Region with Low RTO

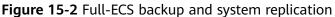
If you want to reduce the RTO when using a full-ECS image to migrate the HANA database, use the backup recovery or data replication function, such as HANA system replication (HSR). Perform these operations during off-peak hours. The following uses the HANA database as an example to describe how to migrate data with a lower RTO.

#### Procedure

- Step 1 Create a full-ECS image for the ECS. For details, see Creating a Full-ECS Image Using an ECS.
- **Step 2** Purchase a HANA database ECS using the full-ECS image. For details about how to create the image, see **Step 2** to **Step 7**.
- **Step 3** Migrate data from the source system to the target system. Use the backup recovery or the HSR function.
  - Using HSR for the migration

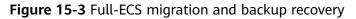
After the HANA database ECS is provisioned, use HSR to synchronize data. **Figure 15-2** shows the scheme. For details, see **SAP HANA Administration Guide**. Configure system replication and synchronize the data. Perform database takeover on the target ECS and modify the address mapping between the SAP application server and the database ECS.

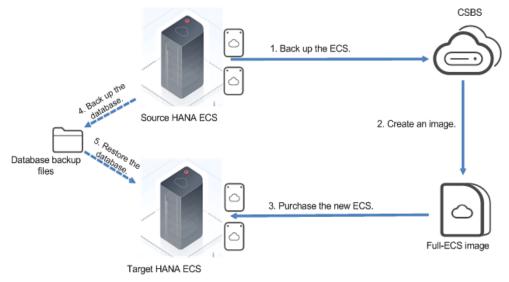




• Using HANA backup recovery for the migration

After the target ECS is provisioned, stop the source database service to ensure data consistency. Back up the HANA database ECS (including log files) using full-ECS backup, transfer backup data to the target system, and use the HANA database recovery function to import the backup data to the target system. **Figure 15-3** shows the scheme.





**Step 4** Check connections between SAP applications and the HANA database and perform subsequent operations, such as configuring HANA HA.

----End

# **15.4 Expanding EVS Disk Capacity**

# 15.4.1 Expanding EVS Disk Capacity (Without LVM)

This section describes how to expand the capacity of an EVS disk that does not have an LVM logical volume. In the following example, a 100-GB system disk and a 470-GB data disk are mounted to an ECS, and the system and data disks are expanded to 200 GB and 940 GB, respectively.

#### Procedure

**Step 1** Expand the EVS disk capacity.

- 1. Log in to HUAWEI CLOUD management console.
- 2. Choose Service List > Computing > Elastic Cloud Server.
- 3. In the ECS list, click the name of an ECS.
- 4. Under the **Disks** tab, click  $\stackrel{\checkmark}{}$  next to the system disk name.
- 5. Click the system disk ID to go to the system disk details page.
- 6. In the upper right corner of the page, click **Expand Capacity**.
- 7. Enter the capacity to be added based on the site requirements. For example: 100 GB and click **Next**.
- 8. Confirm the configuration information and click **Submit**.

The system disk capacity expansion is complete.

9. Expand the data disk capacity by following step **Step 1.1** to **Step 1.8**.

#### **Step 2** Expand partitions.

- 1. Log in to the ECS as user **root**.
- 2. Run the following commands to check the disk capacity after the expansion: **lsblk**

#### df -Th

If information similar to the following is displayed, the disk capacity has been expanded to 200 GB and 940 GB, but the mounted directory and **/hana/data** directory are not expanded. Expand partitions and file systems of the expanded EVS disks.

```
hana01:~ # lsblk
       MAJ:MIN RM
                   SIZE RO TYPE MOUNTPOINT
NAME
       202:0 0 200G 0 disk
xvda
                0 100G 0 part /
└─xvdal 202:1
xvdb
       202:16
                0 940G 0 disk /hana/data
hana01:~ # df -Th
Filesystem
                        Size
                              Used Avail Use% Mounted on
              Type
devtmpfs
              devtmpfs
                        463G
                                 0 463G
                                           0% /dev
tmpfs
              tmpfs
                        694G
                               80K
                                    694G
                                           1% /dev/shm
tmpfs
              tmpfs
                        463G
                               42M
                                    463G
                                           1% /run
tmpfs
              tmpfs
                        463G
                                 0
                                    463G
                                           0% /sys/fs/cgroup
/dev/xvdal
              ext4
                         99G
                              4.3G
                                     90G
                                           5% /
tmpfs
              tmpfs
                         93G
                               16K
                                     93G
                                           1% /run/user/0
/dev/xvdb
              xfs
                        470G
                               33M 470G
                                           1% /hana/data
```

3. In this example, system disk **xvda** has a partition **xvda1**. You need to run **growpart** to expand the partition.

#### growpart /dev/xvda 1

```
hana01:~ # growpart /dev/xvda 1
CHANGED: partition=1 start=2048 old: size=209713152 end=209715200 new: size=4194
28319,end=419430367
```

4. Run the following command to check whether the **xvda1** partition of the system disk has been expanded to 200 GB. The data disk has no partition. You do not need to run **growpart**. The default size is 940 GB.

fdisk -l

```
hana01:~ # fdisk -l
Disk /dev/xvda: 200 GiB, 214748364800 bytes, 419430400 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x000ed768
Device Boot Start End Sectors Size Id Type
```

/dev/xvdal 2048 419430366 419428319 200G 83 Linux

```
Disk /dev/xvdb: 940 GiB, 1009317314560 bytes, 1971322880 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

**Step 3** Run the following command to expand the capacity of the file system:

- Run the resize2fs command to expand the ext2, ext3, or ext4 file systems.
- Run the xfs\_growfs command to expand the xfs file system.

In this example, run the following commands:

#### resize2fs /dev/xvda1

#### xfs\_growfs /hana/data

```
hana01:~ # resize2fs /dev/xvda1
resize2fs 1.42.11 (09-Jul-2014)
Filesystem at /dev/xvdal is mounted on /; on-line resizing required
old desc blocks = 7, new desc blocks = 13
The filesystem on /dev/xvdal is now 52428539 blocks long.
hana01:~ # xfs growfs /hana/data
                                  isize=256
                                               agcount=4, agsize=30801920 blks
meta-data=/dev/xvdb
                                  sectsz=512
                                               attr=2, projid32bit=1
                                               finobt=0 spinodes=0
                                  crc=0
         =
                                  bsize=4096 blocks=123207680, imaxpct=25
data
         =
                                  sunit=0
                                               swidth=0 blks
         =
                                               ascii-ci=0 ftype=1
naming
                                  bsize=4096
         =version 2
                                               blocks=60160, version=2
sunit=0 blks, lazy-count=1
                                  bsize=4096
         =internal
log
                                  sectsz=512
                                  extsz=4096
                                               blocks=0, rtextents=0
realtime =none
data blocks changed from 123207680 to 246415360
```

```
----End
```

# 15.4.2 Expanding EVS Disk Capacity (with LVM)

This section describes how to expand the capacity of EVS disks that have an LVM logical volume. In the following example, two 400-GB data disks are mounted to an ECS. The two disks form a 696-GB LVM logical volume through data striping, and the logical volume is mounted to the **/hana/data** directory. This section

describes how to expand the **/hana/data** directory to 1.4 TB by expanding the capacity of the EVS disks and file systems.

#### Procedure

- **Step 1** Expand the capacity of the EVS disks by following the instructions provided in **Expanding EVS Disk Capacity (Without LVM)**.
- **Step 2** Run the following command to check the sizes of the two EVS disks after capacity expansion:

lsblk

. . . . . .

. . . . .

If information similar to the following is displayed, the sizes of the two EVS disks are both 800 GB, but the size of the logical volume is still 696 GB.

hanaprd-0002:~ # lsblk						
NAME	MAJ:MIN	RM	SIZE	R0	TYPE	MOUNTPOINT
vda	253:0	0	100G	0	disk	
└─vda1	253:1	0	100G	0	part	/
vdb	253:16	0	800G	0	disk	
└─vghanadata-lvhanadata	254:0	0	696G	0	lvm	/hana/data
vdc	253:32	0	800G	0	disk	
∟vghanadata-lvhanadata	254:0	0	696G	0	lvm	/hana/data

Disk /dev/vdb: 800 GiB, 858993459200 bytes, 1677721600 sectors Units: sectors of 1 \* 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/vdc: 800 GiB, 858993459200 bytes, 1677721600 sectors Units: sectors of 1 \* 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mapper/vghanadata-lvhanadata: 696 GiB, 747324309504 bytes, 1459617792
sectors
Units: sectors of 1 \* 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/0 size (minimum/optimal): 262144 bytes / 524288 bytes

**Step 3** Run the following commands to expand the physical volume capacity and check the sizes of the physical volumes after the capacity expansion:

#### pvresize /dev/vdb

pvresize /dev/vdc

pvs

If information similar to the following is displayed, the sizes of the physical volumes are both 800 GB after the capacity expansion:

```
hanaprd-0002:~ # pvresize /dev/vdb
Physical volume "/dev/vdb" changed
1 physical volume(s) resized / 0 physical volume(s) not resized
hanaprd-0002:~ # pvresize /dev/vdc
Physical volume "/dev/vdc" changed
1 physical volume(s) resized / 0 physical volume(s) not resized
hanaprd-0002:~ # pvs
PV VG Fmt Attr PSize PFree
/dev/vdb vghanadata lvm2 a-- 800.00g 452.00g
/dev/vdc vghanadata lvm2 a-- 800.00g 452.00g
```

**Step 4** Run the following command to check the size of the LVM volume group:

#### vgdisplay

If information similar to the following is displayed, the size of the LVM volume group is expanded to 1.56 TB.

```
hanaprd-0002:~ # vgdisplay
  --- Volume group ---
  VG Name
                         vghanadata
  System ID
  Format
                         lvm2
  Metadata Areas
                         2
  Metadata Sequence No 4
  VG Access
                         read/write
  VG Status
                         resizable
 MAX LV
                         0
  Cur LV
                         1
  0pen LV∐
                         1
  Max PV
                         0
  Cur PV
                         2
  Act PV
                         2
  VG Size
                        1.56 TiB
  PE Size
                         4.00 MiB
  Total PE
                        409598
                         178176 / 696.00 GiB
231422 / 903.99 GiB
  Alloc PE / Size
  Free PE / Size
  VG UUID
                         40I95K-yAw2-ENOV-04rC-Yy5c-fKpU-vXYn3a
```

Step 5 Run the following command to add 696 GB to the logical volume:

#### lvextend -L +696G /dev/mapper/vghanadata-lvhanadata

If information similar to the following is displayed, the logical volume capacity is expanded by 696 GB.

hanaprd-0002:~ # lvextend -L +696G /dev/mapper/vghanadata-lvhanadata Using stripesize of last segment 256.00 KiB Size of logical volume vghanadata/lvhanadata changed from 696.00 GiB (178176 e xtents) to 1.36 TiB (356352 extents). Logical volume lvhanadata successfully resized

Step 6 Run the following command to check the logical volume capacity:

lvdisplay

```
hanaprd-0002:~ # lvdisplay
  --- Logical volume ---
  LV Path
                          /dev/vghanadata/lvhanadata
 LV Name
                         lvhanadata
  VG Name
                         vghanadata
 LV UUID
                         tt0tqr-wMwv-caGg-eFwk-DXYv-1rtw-1feewu
 LV Write Access
                         read/write
 LV Creation host, time hanaprd-0002, 2018-10-25 15:38:11 +0800
 LV Status
                         available
 # open
                         1
                         1.36 TiB
 LV Size
                         356352
  Current LE
  Seaments
                         1
                         inherit
  Allocation
  Read ahead sectors
                         auto
  - currently set to
                         8192
  Block device
                         254:0
```

Step 7 Run the following command to expand the capacity of the file system:

- Run the resize2fs -d /hana/data command to expand the ext2, ext3, or ext4 file system.
- Run the xfs\_growfs -d /hana/data command to expand the xfs file system.

In this example, run the following command:

#### xfs\_growfs -d /hana/data

```
hanaprd-0002:~ # xfs_growfs -d /hana/data
meta-data=/dev/mapper/vghanadata-lvhanadata isize=256
                                                               agcount=32, agsize=5701
568 blks
                                                   attr=2, projid32bit=1
finobt=0 spinodes=0
                                     sectsz=512
                                     crc=0
data
                                     bsize=4096
                                                   blocks=182450176, imaxpct=25
          =
                                     sunit=64
                                                   swidth=128 blks
                                     bsize=4096
naming
          =version 2
                                                   ascii-ci=0 ftype=1
                                                   blocks=89088, version=2
sunit=64 blks, lazy-count=1
                                     bsize=4096
          =internal
log
                                     sectsz=512
realtime =none
                                     extsz=4096
                                                   blocks=0, rtextents=0
data blocks changed from 182450176 to 364904448
```

----End

# 15.5 Verifying the Expansion

# 15.5.1 Verifying the ECS Expansion

After the capacity of an ECS is expanded, you can view the ECS specifications to check whether the capacity expansion is successful.

#### Procedure

- **Step 1** View the ECS specification.
  - 1. Log in to HUAWEI CLOUD management console.
  - 2. Choose Service List > Computing > Elastic Cloud Server.
  - 3. In the ECS list, locate the row that contains the target ECS, check whether the ECS specification is successfully changed.
    - If yes, the expansion is successful.
    - If no, handle the problem by referring to What Can I Do If the ECS Specifications Fail to Be Modified?.

#### Step 2 Check disk attachment status.

After the specification is modified, disk attachment may fail. Therefore, check disk attachment after specification modification. If disks are properly attached, the specification modification is successful.

- 1. Log in to the ECS as user **root**.
- 2. Run the following command to view the disks attached before specification modification:

#### fdisk -l| grep 'Disk /dev/'

3. Run the following command to view disks attached after specification modification:

#### df -h| grep '/dev/'

- 4. Check whether the number of disks in **Step 2.2** and **Step 2.3** is the same.
  - If yes, the disk attachment is successful. No further action is required.
  - If no, the disk attachment failed. In such a case, go to Step 2.5.
- 5. Run the **mount** command to attach the disks.

Example:

#### mount /dev/vbd1 /mnt/vbd1

In the preceding command, **/dev/vbd1** is the disk to be attached, and **/mnt/vbd1** is the path for disk attachment.

#### NOTICE

Ensure that /mnt/vbd1 is empty. Otherwise, the attachment will fail.

Run the following commands to check whether the number of disks in **Step 2.2** and **Step 2.3** are the same:

fdisk -l| grep 'Disk /dev/'

df -h| grep '/dev/'

- If they are the same, no further action is required.
- If no, contact customer service for technical support.

----End

# 15.5.2 Verifying the EVS Expansion

After the capacity of an EVS disk is expanded, you can view the EVS specifications and capacity indicators to check whether the capacity expansion is successful.

#### Procedure

- **Step 1** Log in to the ECS as user **root**.
- **Step 2** Run the following command to check the capacity of the **/hana/data** directory after the expansion:

df -Th

• Expanded EVS disk capacity (without the LVM logical volume).

If information similar to the following is displayed, the capacity of the / and / hana/data directories have been expanded to 200 GB and 940 GB, respectively.

hana01:~ # df	-Th					
Filesystem	Туре	Size	Used	Avail	Use%	Mounted on
devtmpfs	devtmpfs	463G	0	463G	0%	/dev
tmpfs	tmpfs	694G	80K	694G	1%	/dev/shm
tmpfs	tmpfs	463G	42M	463G	1%	/run
tmpfs	tmpfs	463G	0	463G	0%	/sys/fs/cgroup
/dev/xvdal	ext4	197G	4.3G	184G	3%	/
tmpfs	tmpfs	93G	16K	93G	1%	/run/user/0
/dev/xvdb	xfs	940G	33M	940G	1%	/hana/data

 Expanded EVS disk capacity (with the LVM logical volume)
 If information similar to the following is displayed, the capacity of the /hana/ data directory has been expanded to 1.4 TB.

hanaprd-0002:~ # df -Th					
Filesystem	Туре	Size	Used	Avail	Use% Mounted on
devtmpfs	devtmpfs	172G	4.0K	172G	1% /dev
tmpfs	tmpfs	257G	80K	257G	1% /dev/shm
tmpfs	tmpfs	172G	10M	172G	1% /run
tmpfs	tmpfs	172G	0	172G	0% /sys/fs/cgroup
/dev/vdal	ext4	99G	4.3G	90G	5% /
tmpfs	tmpfs	35G	20K	35G	1% /run/user/0
/dev/mapper/vghanadata-lvhanadata	xfs	1.4T	35M	1.4T	1% /hana/data

----End

# 15.6 FAQs

# 15.6.1 What Can I Do If the ECS Specifications Fail to Be Modified?

View the failure cause using the Cloud Trace Service by performing the following operations:

- 1. Log in to the management console.
- 2. Under Management & Governance, click Cloud Trace Service.
- 3. In the navigation pane on the left, choose **Trace List**.
- 4. In the **Trace Name** column, locate the **resizeServer** event by resource ID. Resource ID is the ID of the target ECS.
- Click View Trace in the Operation column to view the failure cause.
   If the fault cannot be rectified based on logs, contact customer service for technical support.

# A Change History

Description	Released On
This issue is the fifteenth official release, which incorporates the following changes:	2023-11-06
Added section "SAP S/4HANA (1809) HA Deployment Best Practice".	
Removed the best practice of obsfs-enabled SAP HANA backup.	
This issue is the fourteenth official release, which incorporates the following change:	2022-12-01
Added section "SAP S/4HANA (1809) HA Deployment Best Practice".	
This issue is the thirteenth official release, which incorporates the following change:	2022-06-24
Updated the SAP Backint Installation Guide and SAP Monitoring Best Practices.	
This issue is the twelfth official release, which incorporates the following change:	2021-12-31
Added the SAP Backint Installation Guide.	
This issue is the eleventh official release, which incorporates the following change:	2021-10-08
Added the best practice of SAP migration from Xen to KVM.	

Description	Released On
This issue is the tenth official release, which incorporates the following changes:	2021-08-31
Added the "HUAWEI CLOUD SAP on Oracle Installation Best Practice".	
Added the "HUAWEI CLOUD SAP Business One on HANA Installation Best Practice".	
Added the "Best Practice of Using Block-Level Migration of SMS to Migrate SAP Applications and Databases Running on Linux Servers".	
Added the "Best Practice of Rsync-based SAP Disaster Recovery".	
This issue is the ninth official release, which incorporates the following change:	2021-08-04
Added the best practice of obsfs-enabled SAP HANA backup on HUAWEI CLOUD.	
This issue is the eighth official release, which incorporates the following change:	2021-06-30
Added SAP monitoring best practices.	
This issue is the seventh official release, which incorporates the following changes:	2021-06-07
Added the "SAP S/4HANA (1809) HA Deployment Best Practice".	
Added the "HUAWEI CLOUD SAP on DB2 Installation Best Practice".	
Added the "HUAWEI CLOUD SAP on SQL Server Installation Best Practice".	
Added the "Best Practice of SAP Disaster Recovery with SDRS".	
This issue is the third official release, which incorporates the following change:	2020-07-06
Added the best practices of migrating the SAP system to HUAWEI CLOUD.	
This issue is the second official release, which incorporates the following change:	2019-07-12
Added the best practices of uploading SAP backups data to the OBS bucket.	
This issue is the first official release.	2019-05-24