ModelArts

Lite Server User Guide

Issue 01

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Before You Start

1.1 Using Lite Server

ModelArts Lite Server provides various resources, allowing you to install and deploy third-party software such as AI frameworks and applications as user **root**, as well as building a dedicated cloud server environment. To create a server and obtain the required physical resources on the cloud for daily training and inference, you only need to specify the server specifications, image, network configuration, and key.

This document helps you understand how to use Lite Server.

Resource provisioning

Resource use

Resource use

Resource management

Resource management

Log in to your server and run a training or inference job.

Starting or stopping a server saltus

Configure the network.

Configure storage.

Configure the software environment.

Configure access authorization.

Create a VPC.

Create a key pair.

Purchase resources.

Figure 1-1 Process for using Lite Server

Purchasing resources

To use Server resources, you need to purchase them first.

- Contact the customer manager to determine a resource solution. Apply for the required resource specifications since certain specifications are restricted.
- b. The default resources provided by the cloud services, such as elastic cloud server (ECS), elastic IP (EIP), and Scalable File Service (SFS), may not meet your requirements. Submit a service ticket to increase resource quota.

- c. Grant the required basic permissions to the IAM user.
- d. ModelArts needs to access other dependent services. Create an agency for ModelArts.
- e. Purchase Lite Server resources on the ModelArts console.
- 2. Configuring resources

After acquiring resources, set up network, storage, and drivers.

3. Using resources

Log in to the server for model training and inference. For details, see **Using Lite Server Resources**.

4. Managing resources

Lite Server allows you to start, stop, and switch OSs. You can manage resources on the ModelArts console.

Table 1-1 Terms

Term	Description
BMS	Combining VM scalability with physical server performance, BMS provides dedicated cloud servers. These servers are designed to meet the demands of computing performance and data security for core databases, critical applications, high-performance computing (HPC), and big data.
	After you purchase Lite Server on the ModelArts console, a BMS corresponding to it will be created on the BMS console as Lite Server is a BMS. You can mount disks and bind EIPs on the BMS console.
	For more information about bare metal servers, see Bare Metal Server .
Key Pair	You can log in to an elastic server using only an SSH key pair. Therefore, you do not need worry about password interception, cracking, and leakage.
	To ensure ECS security, private keys that are not managed by Huawei Cloud can be downloaded only once. Keep your downloaded private keys properly.
VPC	A VPC is a logically isolated, configurable, and manageable virtual network. It helps improve the security of cloud resources and simplifies network deployment. Within your own VPC, you can create security groups and VPNs, configure IP address ranges, and specify bandwidth sizes by customizing security groups, VPNs, IP address ranges, and bandwidth. This simplifies network management. You can also customize access rules to control BMS access within a security group and across different security groups to enhance BMS security. For details, see Virtual Private Cloud.

1.2 High-Risk Operations

To avoid adverse impacts on ModelArts Lite Server, you must perform high-risk operations according to operation guides during the routine O&M.

Risky operations fall into three levels:

- High: Such operations may cause service failures, data loss, system maintenance failures, and system resource exhaustion.
- Medium: Such operations may cause security risks and reduce service reliability.
- Low: Such operations include high-risk operations other than those of a high or medium risk level.

Table 1-2 High-risk operations

Object	Operation	Risk	Severit y	Solution
OS	Upgrade or modify the OS kernel.	The driver and kernel versions may not be compatible. As a result, the OS cannot be started or basic functions are unavailable. High-risk commands, such as aptget upgrade (upgrading all software in the system, including the kernel), are involved. Run the uname -a command to view the current kernel.	High	To perform upgrade or modification, contact Huawei Cloud technical support.
	Switch or reset OS.	The EVS system ID is changed. As a result, the EVS system disk cannot be scaled out, and message "The order is expired. The capacity cannot be expanded. Renew the order." is displayed.	Low	Mount an EVS or SFS disk for capacity expansion after you switch or reset the OS.

Object	Operation	Risk	Severit y	Solution
	When the cloud server service is running properly, the user deletes the NIC route in the system or performs network destruction operations, such as running ifconfigdown and ifconfigup, on the NIC.	The network service will be restarted and DHCP will be triggered to obtain the IP address and route again. As a result, the NIC route may be lost and the node may be unavailable.	High	Reset the OS. Ensure that your data has been backed up.
	Modify kernel parameters such as net.ipv4.ip_for ward.	The route forwarding function of the ECS may be affected, causing network disconnection.	Mediu m	Set net.ipv4.ip_fo rward to 1.
	Enable the system firewall.	The performance of HCCL, NCCL, and multinode multi-PU training tasks may be affected.	Low	Disable the firewall.
	Change the time zone.	The node time changes, which will affect services.	Mediu m	Restore the time zone.
Driver and firmwa re	Upgrade the NPU driver or firmware.	The driver and firmware may not match, causing unavailable servers and affecting services.	Mediu m	Reset the OS. Ensure that your data has been backed up.
	Change the GPU driver.	The driver and firmware may not match, causing unavailable servers and affecting services.	Mediu m	Reset the OS. Ensure that your data has been backed up.
	Change the SDI PU driver.	The NIC may be unavailable, causing unavailable servers and affecting services.	Mediu m	Reset the OS. Ensure that your data has been backed up.

Object	Operation	Risk	Severit y	Solution
Networ k	Change the NIC MAC address or IP address.	If misoperations are performed, the VM communication and services are interrupted, and other services are affected.	High	Roll back the modification. If the rollback fails, reset the OS. Ensure that your data has been backed up.
	Add, delete, or edit iptables rules, or restart the iptables service.	Service access requests are rejected.	High	Roll back the modification. If the rollback fails, reset the OS. Ensure that your data has been backed up.
Built-in OS softwar e	Upgrade, downgrade, or uninstall built- in OS software such as Python 3.	Network configuration software, such as the system built-in network, may be abnormal. As a result, the server NIC fails to be configured and the node is unavailable.	High	Roll back the modification. If the rollback fails, reset the OS. Ensure that your data has been backed up.
Directo ry/File	Modify key system directories and files of root or opt, such as /etc/ hccn.conf and /etc/ netplan/ roce.yaml.	The system functions may be affected, and the cloud server may be unavailable.	High	Roll back the modification. If the rollback fails, reset the OS. Ensure that your data has been backed up.
	Modify the permissions of directories and files.	The service may be abnormal.	High	Roll back the modification.

Object	Operation	Risk	Severit y	Solution
Server	Do not perform non-query operations on the server, such as stopping or starting the server, when the server instance is being provisioned, initialized, or when disks are being added, deleted, or the instance is being deleted.	Operations on the cloud server may fail.	Mediu m	Reset the OS. Ensure that your data has been backed up.
	Switch or reset OS.	The EVS system ID is changed. As a result, the EVS system disk cannot be scaled out, and message "The order is expired. The capacity cannot be expanded. Renew the order." is displayed.	Low	Mount an EVS or SFS disk for capacity expansion.
Process	Run the service network restart command.	Services may fail to be provisioned, the remote access to the cloud server may fail.	High	Restart the closed service.
	Stop key system processes, such as sshd ces- agent.	Moreover, data may fail to be collected, affecting the reporting of monitoring indicators.		
Data disk	Modify the data disk mounting mode and mount point.	Services that are being used may become abnormal.	Low	Ensure that the data disk is not used by any service.

Object	Operation	Risk	Severit y	Solution
Securit y group	Modify the port communication protocol. Allow high-risk ports such as port 22. IP address whitelist not configured.	The network may be attacked, affecting services of the server.	Mediu m	Restore the original content.

1.3 Mapping Between Compute Resources and Image Versions

Lite Server provides multiple images. You can learn about the supported images and details before creating Lite Server resources.

Images Supported by NPU Snt9b23 Supernode Servers

Image name: HCE2.0-Arm-64bit-for-Snt9b23-with-24.1.rc3.7-7.5.0.107.221-CANN8.0.RC3.20

Table 1-3 Image details

Software Type	Version Details
OS	HCE 2.0
Kernel version	5.10.0-182.0.0.95.r1941_123.hce2.aarch64
Architecture	aarch64
Firmware version	7.5.0.107.221
npu-driver	24.1.rc3.7
Ascend-cann-toolkit	8.0.RC3.20
cann-kernels	8.0.RC3.20
Ascend-mindx-toolbox	6.0.0
Docker	27.2.0
Ascend-docker-runtime	v6.0.RC3.1
Mpich	4.1.3

Images Supported by NPU Snt9b BMSs

• Image name: Ubuntu22.04-Arm-64bit-for-Snt9A2-BareMetal-with-24.1.0.3-7.5.0.5.220-CANN8.0.1

Table 1-4 Image details

Software Type	Version Details
OS	Ubuntu 22.04
Kernel version	5.15.0-91-generic
Architecture	aarch64
Firmware version	7.5.0.5.220
npu-driver	24.1.0.3
Ascend-cann-toolkit	8.0.1
cann-kernels	8.0.1
Ascend-mindx- toolbox	6.0.0
Docker	26.0.0
Ascend-docker- runtime	v6.0.0
Mpich	3.2.1
Mpich	3.2.1

Images Supported by NPU Snt9b ECSs

Image name: HCE2.0-Arm-64bit-for-Snt9A2-ECS-BareMetalwith-24.1.0.3-7.5.0.5.220-CANN8.0.1

Table 1-5 Image details

Software Type	Version Details
OS	HCE 2.0
Kernel version	5.10.0-136.12.0.86.r1526_92.hce2.aarch64
Architecture	aarch64
Firmware version	7.5.0.5.220
npu-driver	24.1.0.3
Ascend-cann-toolkit	8.0.1
cann-kernels	8.0.1

Software Type	Version Details
Ascend-mindx- toolbox	6.0.0
Docker	18.09.0
Ascend-docker- runtime	v6.0.0
Mpich	3.2.1

• Image name: Ubuntu22.04-Arm-64bit-for-Snt9A2-ECS-BareMetal-with-24.1.0.3-7.5.0.5.220-CANN8.0.1

Table 1-6 Image details

Software Type	Version Details
OS	Ubuntu 22.04
Kernel version	5.15.0-91-generic
Architecture	aarch64
Firmware version	7.5.0.5.220
npu-driver	24.1.0.3
Ascend-cann-toolkit	8.0.1
cann-kernels	8.0.1
Ascend-mindx- toolbox	6.0.0
Docker	26.0.0
Ascend-docker- runtime	v6.0.0
Mpich	3.2.1
Mpich	4.1.3

Images Supported by NPU Snt9 BMSs

Image name: HCE2.0-Arm-64bit-for-Snt9A2-BareMetal-with-24.1.0.3-7.5.0.5.220-CANN8.0.1

Table 1-7 Image details

Software Type	Version Details
OS	HCE 2.0

Software Type	Version Details
Kernel version	5.10.0-136.12.0.86.r1526_92.hce2.aarch64
Architecture	aarch64
Firmware version	7.5.0.5.220
npu-driver	24.1.0.3
Ascend-cann-toolkit	8.0.1
cann-kernels	8.0.1
Ascend-mindx-toolbox	6.0.0
Docker	18.09.0
Ascend-docker-runtime	v6.0.0
Mpich	3.2.1

Images Supported by NPU Snt3PD ECSs

Image name: Huawei-Cloud-EulerOS-2.0-64bit-for-kAi2p-with-HDK-24.1.0.1-and-CANN-8.0.1

Software Type	Version Details
OS	Ubuntu 22.04
Kernel version	5.15.0-25-generic
Architecture type	x86
driver	550.90.07
cuda	12.4
nvnv-fabricmanager	550.90.07-1
nv-container-toolkit	1.17.5-1
libnccl2	2.26.2-1+cuda12.4
libnccl-dev	2.26.2-1+cuda12.4
Docker	20.10.23
Mpich	4.1.5a1

Images Supported by GP Ant8 BMSs

• Image name: Ubuntu-22.04-x86-for-Ant1-Ant8-BareMetal-with-RoCE-and-NV-550.90.07-CUDA-12.4

Table 1-8 Image details

Software Type	Version Details
OS	Ubuntu 22.04
Kernel version	5.15.0-25-generic
Architecture type	x86
driver	550.90.07
cuda	12.4
nv-fabricmanager	550.90.07-1
nv-container-toolkit	1.17.5-1
libnccl2	2.26.2-1+cuda12.4
libnccl-dev	2.26.2-1+cuda12.4
Docker	20.10.23
Mpich	4.1.5a1

Images Supported by GP Vnt1 BMSs

■ NOTE

For Vnt1, the specifications in CN North-Beijing4, CN North-Beijing1, and CN East-Shanghai1 are the same. However, the product configuration and release time differ. As a result, the images cannot be shared.

• Image name: Ubuntu-22.04-for-BareMetal-Vnt1-p3-with-NV-535-CUDA-12.2 (only for CN North-Beijing1, CN North-Beijing4, and CN South-Guangzhou)

Table 1-9 Image details

Software Type	Version Details
OS	Ubuntu 22.04 server 64bit
Kernel version	5.15.0-25-generic
Architecture type	x86
Driver version	535.54.03
CUDA	12.2
container-toolkit	1.17.0-1
Docker	24.0.2

• Image name: Ubuntu-18.04-for-BareMetal-Vnt1-p6-with-NV-470-CUDA-11.4-Uniagent (only for CN East-Shanghai1)

Table 1-10 Image details

Software Type	Version Details
OS	Ubuntu 18.04 server 64bit
Kernel version	4.15.0-45-generic
Architecture type	x86
Driver version	470.182.03
CUDA	11.4
container-toolkit	1.15.01
mlnx-ofed-linux	5.7-1.0.2.1-ubuntu18.04-x86_64
libnccl2	2.10.3-1
nccl-test	v2.13.9
Docker	24.0.2

Images Supported by GP Ant1 BMSs

• Image name: Ubuntu-22.04-x86-for-Ant1-Ant8-BareMetal-with-RoCE-and-NV-550.90.07-CUDA-12.4

Table 1-11 Image details

Software Type	Version Details
OS	Ubuntu 22.04
Kernel version	5.15.0-25-generic
Architecture type	x86
driver	550.90.07
cuda	12.4
nv-fabricmanager	550.90.07-1
nv-container-toolkit	1.17.5-1
libnccl2	2.26.2-1+cuda12.4
libnccl-dev	2.26.2-1+cuda12.4
Docker	20.10.23
Mpich	4.1.5a1

Images Supported by GP Hnt02 ECSs

• Image name: HCE2.0-x86-for-H20-NV-535-CUDA-12.2 (only for CN North-Ulanqab1 and CN East2)

Software Type	Version Details
OS	HCE 2.0
Architecture	x86
nv	535.183.01
CUDA	12.2
nv-fabricmanager	535.183.01

• Image name: **Ubuntu22.04_x86_for_h20_Driver-535-and-CUDA-12.2** (only for CN North-Ulanqab1 and CN East 2)

Software Type	Version Details
OS	Ubuntu 20.04 server 64-bit
Architecture type	x86
Kernel version	5.15.0-107-generic
Driver	535.183.01
CUDA	12.2
nv-fabricmanager	535.183.01
Docker	27.0.2
nv-container-toolkit	1.17.2-1

Images Supported by GP Lnt002 ECSs

• Image name: **Ubuntu-22.04-server-64bit-with-Tesla-Driver-535.183.01-and-CUDA-12.2** (only for CN North-Beijing4, CN East-Shanghai1, ME-Riyadh, and AP-Jakarta)

Software Type	Version Details
OS	Ubuntu 20.04 server 64-bit
Architecture type	x86
Kernel	5.15.0-92-generic
nv	535.183.01
CUDA	12.2
Docker	27.3.1

Software Type	Version Details
nv-container-toolkit	1.17.1

Provisioning Lite Server Resources (Old Version)

Scenario

This section describes how to purchase Lite Server compute resources on the ModelArts console and how to prepare for the purchase.

You need to increase the resource quota, configure basic permissions, and set ModelArts agency authorization. To purchase the resources, you need to create an instance and pay for the order. Then, wait for 20 to 60 minutes. After the resource is created, you can configure an EIP for resource access and AI development.

Constraints

Currently, only the Yearly/Monthly billing mode is supported for ModelArts Lite Server.

Enabling Resources

Start

Apply for resource flavors.

Increase the resource quota.

Enable basic permissions.

Configure ModelArts agency permissions.

Purchase resources.

End

Figure 2-1 Flowchart for enabling resources

Table 2-1 Enabling resources

Phase	Step
Preparations	1. Apply for resource specifications.
	2. Increase the resource quota.
	3. Enable basic permissions.
	4. Configure an agency authorization for ModelArts.
Purchasing Lite Server resources	5. On the ModelArts console, purchase Lite Server resources.

Step 1: Applying for Resource Specifications

Contact the customer manager to determine a Lite Server resource solution. Then, apply for the required resource specifications. Alternatively, submit a service ticket.

Step 2: Increase the Resource Quota

The resources required by the server may exceed the default resources (such as ECS, EIP, SFS, memory, and CPUs) provided by cloud services. In this case, you need to increase the resource quota.

- 1. Log in to the **Huawei Cloud console**.
- 2. Hover over **Resources** from the top navigation bar and choose **My Quotas**.
- 3. Click **Increase Quota** in the upper right corner, fill in the materials, and submit a service ticket.

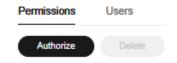
Increase the quota before purchasing and provisioning the resource, ensuring it exceeds the resource requirements. Otherwise, the resource will fail to be provisioned.

Step 3: Enabling Basic Permissions

Log in to the administrator account and grant the IAM user the required basic permissions, including ModelArts FullAccess, BMS FullAccess, ECS FullAccess, VPC FullAccess, VPC Administrator and VPCEndpoint Administrator. This allows the IAM user to use these cloud services.

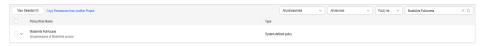
- Log in to the IAM console.
- 2. In the navigation pane on the left, choose **User Groups** and click **Create User Group** in the upper right corner.
- 3. Enter a group name and click **OK**.
- 4. Click Manage User in the Operation column and add the target users.
- 5. Click the user group name to access its details page.
- 6. In the **Permissions** tab, click **Authorize**.

Figure 2-2 Assigning permissions



7. Search for **ModelArts FullAccess** in the search box and select it.

Figure 2-3 ModelArts FullAccess



Use the same method to select BMS FullAccess, ECS FullAccess, VPC FullAccess, VPC Administrator, and VPCEndpoint Administrator. Server

Administrator and **DNS Administrator** are dependent policies and are automatically selected.

- 8. Click **Next** and set **Scope** to **All resources**.
- 9. Click OK.

Step 4 Creating an Agency Authorization on ModelArts

During task execution, ModelArts Lite Server must access other services. This includes pulling images from SWR when using containers. To do this securely, ModelArts requests your permission before accessing any cloud service. Once authorized, you can run AI computing tasks on ModelArts.

- Creating an agency
 - Create an agency in ModelArts to authorize access to other cloud services. To do so, log in to the ModelArts console. In the navigation pane on the left, choose **Permission Management** under **System Management**. On the displayed page, click **Add Authorization**.
- Updating an agency
 Update the permissions for your existing ModelArts agency.
 - a. Log in to the ModelArts console. In the navigation pane on the left, choose Lite Servers under Resource Management. On the displayed page, check whether a message indicating missing authorization is displayed.
 - b. Update the agency if needed. On the **Insufficient Permissions** page, set **Added To** to **Existing authorization** and click **OK**. The system shows the permission update is successful.

The following lists the permissions that must be assigned so that the dependent functions can run properly. FAQs.

Permission

Dependent Function

Description

Added To

Existing authorization

The missed permissions are added to the following agency. The permissions of all users configured for this agency will be updated.

Authorized For

Figure 2-4 Adding authorization

Step 5: Purchasing Lite Server Resources

When you purchase Lite Servers, resources are created.

Cancel

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**.
- 3. Click **Buy Lite Server** in the upper right corner. Configure the parameters on the displayed page.

Table 2-2 Parameters for basic configurations

Parameter	Description
Resource Type	 BMS: A BMS features both the scalability of Elastic Cloud Servers (ECSs) and high performance of physical servers, providing dedicated servers on the cloud for you and your enterprise. ECS: ECS provides secure, scalable, on-demand compute resources, enabling you to flexibly deploy applications and
	workloads.
Billing	Select Yearly/Monthly .
Mode	Yearly/Monthly is a prepaid billing mode in which your subscription is billed based on the required duration. This mode is more cost-effective when the usage duration is predictable.
	Pay–per–use billing is not supported.
No.	Select a region near you to ensure the lowest latency possible. After the resources are purchased, you can switch the region in the upper left corner of the console to view the resources.
AZ	A standalone data center with an independent network and power supply. When deploying resources, consider your applications' requirements on disaster recovery (DR) and network latency.
	For high DR capability, deploy resources in different AZs within the same region.
	For lower network latency, deploy resources in the same AZ.
	For details about how to provision edge station resources, see Managing CloudPond NPU Resources for Lite Server.

Table 2-3 Parameters for resource configurations

Parameter	Description
Server	Server name, which can contain 1 to 64 characters, including letters, digits, hyphens (–), and underscores (_). CAUTION The server name in the order will not be changed. If you change the name after placing the order, the new name will not be synchronized to the order.
CPU Architecture	CPU architecture of the resource type, which can be x86 or Arm .
	• x86: Select this if GPU resources are used.
	Arm: Select this if NPU resources are used.
	Select a CPU architecture and then select instance specifications as required. The flavors vary by region. The actual flavors are displayed on the console. Sold-out resources are displayed in gray and cannot be purchased. NOTE
	If no specifications are available, contact Huawei technical support .
System Disk	This parameter is displayed only when you select an instance flavor that supports mounting.
	Stores the OS of a server, and is automatically created and initialized upon Lite Server creation.
	Select a system disk type and set the disk size. The system disk size ranges from 100 GiB to 1,024 GiB.
	You can also expand the system disk capacity on ECS after the server is created.
	The system disk is automatically mounted to each compute node.
(Optional) Data Disk Type	You can click Add Data Disk to mount an EVS data disk to the Lite Server. Currently, local disks cannot be mounted.
	Select the data disk type and set the size and number of data disks. The data disk size ranges from 100 GiB to 32,768 GiB. For BMSs and ECSs, there can be a maximum of 59 data disks. For supernodes, there can be a maximum of 8 data disks.
	You can also expand the data disk capacity on ECS after the server is created.
	The data disk is automatically mounted to each compute node.

Table 2-4 Parameters for image configurations

Parameter	Description
Image	Public image Public images are available for all users. All users can read the image by image ID.
	ModelArts allows you to perform development and training directly without additional configuration as it provides multiple public images, supports multiple OSs, and has built-in AI drivers and software.
	For details about the supported public images, see Mapping Between Compute Resources and Image Versions.
	Private image Only the image creator can use the image. You can select a private image to save your time from repeatedly configuring servers.

Table 2-5 Network configuration parameters

Parameter	Description
VPC	A Virtual Private Cloud (VPC) ensures the security, isolation, and network flexibility of server resources.
	Choose the VPC associated with your server from the drop- down list. You are advised to choose the same VPC for all related cloud services to simplify network connections.
	If no VPC is available in the drop-down list, click Create VPC on the right to create a VPC. To create a VPC, you need to log in to the console as the administrator account.
Subnet	Select a subnet of the current VPC.
	If no subnet is available in the drop-down list, click Create Subnet on the right to create one.
Security Group	A security group is a collection of access control rules for ECSs that have the same security requirements and that are mutually trusted within a VPC.
	If no security group is available in the drop-down list, click Create Security Group on the right to create one.
IPv6 Network	IPv6 is available when it is supported by the subnet, specifications, and image configured for the network.
	Ensure that IPv6 has been enabled. To enable IPv6, see Creating a Subnet for an Existing VPC.
	This parameter is only displayed for certain specifications and images.

Parameter	Description
RoCE Network	When GPUs or Ascend Snt9b and Snt9b23 of series A are used for distributed training, you need to configure the RoCE network to use the RoCE NICs on the hardware.
	The parameter is only displayed if you have selected one specification that supports RoCE networks.
	If you have not created a RoCE network, click Create RoCE .
	If you have created a RoCE network, select it directly.

Table 2-6 Parameters for management configurations

able 2-6 Parameters for management configurations		
Parameter	Description	
Login Credential	Key pair is recommended as it features higher security than Password . If you select Password , ensure that the password meets complexity requirements to prevent malicious attacks.	
	Key pair Use a key pair to log in to the Server node. You can select an existing key pair, or click Create Key Pair to create one.	
	NOTE If you use an existing key pair, ensure that you have saved the key file locally. Otherwise, logging in to the Server node will fail.	
	Password A username and its initial password are used for authentication and logging in to the Server node.	
	For Linux, use the initial password of user root . For Windows, use the initial password of user Administrator . Password complexity must meet the following requirements:	
	– Contains 8 to 26 characters.	
	 Contains at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (!@\$%^=+[{}]:,/?). 	
	 The password should be different from the username or the username spelled backwards. 	
	 Cannot contain root, administrator, or their reverse. 	
Cloud Eye host monitorin g	Enable this function.	
	Once this function enabled, you can configure Cloud Eye host monitoring agency in one-click mode. Cloud Eye agency allows you to monitor various metrics of the server, including CPU, memory, network, disk, and process at an interval of 1 minute. For details, see Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node.	

Parameter Description Enterprise This parameter is available only if you have enabled Project enterprise projects or your account is an enterprise account. You can contact your service manager to enable this function An enterprise project groups cloud resources, so you can manage resources and members by project. The default project is **default**. Select an enterprise project from the drop-down list. For details about enterprise projects, see Enterprise Management User Guide. **CAUTION** The enterprise project cannot be modified for a purchased server. Currently, the enterprise project information cannot be synchronized in the order.

Table 2-7 Parameters for advanced configurations

Table 2-8 Parameters for required configurations

Parameter	Description
Required Duration	Set the required duration and select auto-renewal as needed.
Quantity	You can purchase multiple instances simultaneously, with a value between 1 and 10 .
	Each instance generates a separate order, which must be paid for individually.

4. View the configuration fee in the lower left corner of the page and click **Create now**. Then, pay for the order on the payment page.

The detailed fees will be displayed. You can click to view discount details if there is any. The configuration fee is the final discounted fee. To view the actual fee deduction, see the bill.

∩ NOTE

Each instance generates a separate order, which must be paid for individually.

5. Once paid, the resource will be created in 20 to 60 minutes. Wait until the resource is created. If the resource fails to be created, see **Handling Resource Purchase Failures**.

□ NOTE

If a container is used or shared by multiple users, you should restrict the container from accessing the OpenStack management address (169.254.169.254) to prevent host machine metadata acquisition. For details, see **Forbidding Containers to Obtain Host Machine Metadata**.

Handling Resource Purchase Failures

If the ModelArts Lite Server fails to be created, there may be multiple causes:

- Insufficient resources: Switch to the BMS or ECS page and check whether the specifications to be purchased are sold out. If so, there are no resources of this flavor. In this case, contact the customer manager to obtain resources and purchase again.
- Insufficient quota: Check if your account's resource quota (cores and RAM capacity) meets the requirements. If your quota is too low, you will need to increase it before proceeding. Apply for a quota adjustment before purchasing resources.
- Internal BMS or ECS error: Check whether there is an internal BMS or ECS error. If yes, submit a service ticket to BMS or ECS to locate and rectify the fault.

Provisioning Lite Server Resources (New Version)

■ NOTE

ModelArts has enhanced the creation page to improve the efficiency of creating Lite Server resources. The updated page streamlines operations and enhances the GUI display.

Scenario

This section describes how to purchase Lite Server compute resources on the ModelArts console and how to prepare for the purchase.

You need to increase the resource quota, configure basic permissions, and set ModelArts agency authorization. To purchase the resources, you need to create an instance and pay for the order. Then, wait for 20 to 60 minutes. After the resource is created, you can configure an EIP for resource access and AI development.

Constraints

Currently, only the Yearly/Monthly billing mode is supported for ModelArts Lite Server.

Enabling Resources

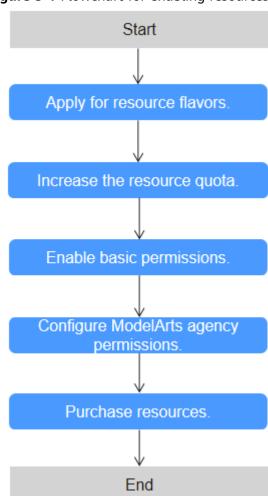


Figure 3-1 Flowchart for enabling resources

Table 3-1 Enabling resources

Phase	Task
Preparations	1. Apply for resource specifications.
	2. Increase the resource quota.
	3. Enable basic permissions.
	4. Configure an agency authorization for ModelArts.
Purchasing Lite Server resources	5. On the ModelArts console, purchase Lite Server resources.

Step 1: Applying for Resource Specifications

Contact the customer manager to determine a Lite Server resource solution. Then, apply for the required resource specifications. Alternatively, submit a service ticket.

Step 2: Increasing the Resource Quota

The resources required by the server may exceed the default resources (such as ECS, EIP, SFS, memory, and CPUs) provided by cloud services. In this case, you need to increase the resource quota.

- 1. Log in to the **Huawei Cloud console**.
- 2. Hover over **Resources** from the top menu bar and choose **My Quotas**.
- 3. Click **Increase Quota** in the upper right corner, fill in the materials, and submit a service ticket.

∩ NOTE

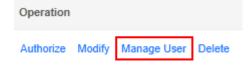
Increase the quota before purchasing and provisioning the resource, ensuring it exceeds the resource requirements. Otherwise, the resource will fail to be provisioned.

Step 3: Enabling Basic Permissions

Log in to the administrator account and grant the IAM user the required basic permissions, including ModelArts FullAccess, BMS FullAccess, ECS FullAccess, VPC FullAccess, VPC Administrator and VPCEndpoint Administrator. This allows the IAM user to use these cloud services.

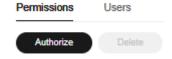
- 1. Log in to the IAM console.
- 2. In the navigation pane on the left, choose **User Groups** and click **Create User Group** in the upper right corner.
- 3. Enter a group name and click **OK**.
- 4. On the **User Groups** page, locate the target user group and click **Manage User** in the **Operation** column, and add the user to the user group.

Figure 3-2 User group management



- 5. Click the user group name to access its details page.
- 6. In the **Permissions** tab, click **Authorize**.

Figure 3-3 Assigning permissions



7. Search for **ModelArts FullAccess** in the search box and select it.

Figure 3-4 ModelArts FullAccess



Use the same method to select BMS FullAccess, ECS FullAccess, VPC FullAccess, VPC Administrator, and VPCEndpoint Administrator. Server Administrator and DNS Administrator are dependent policies and are automatically selected.

- 8. Click **Next** and set **Scope** to **All resources**.
- 9. Click **OK**.

Step 4 Creating an Agency Authorization on ModelArts

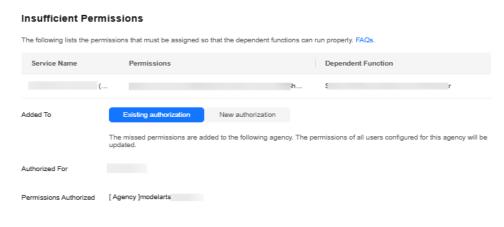
During task execution, ModelArts Lite Server must access other services. This includes pulling images from SWR when using containers. In such cases, ModelArts accesses other cloud services on behalf of you. To ensure security, ModelArts requires your authorization before accessing any cloud services, which is the agency process. Once authorized, you can run Al computing tasks on ModelArts.

Creating an agency

Create an agency on ModelArts to authorize access to other cloud services. To do so, log in to the ModelArts console. In the navigation pane on the left, choose **Permission Management** under **System Management**. On the displayed page, click **Add Authorization**.

- Updating an agency
 Update the permissions for your existing.
 - Update the permissions for your existing ModelArts agency.
 - a. Log in to the ModelArts console. In the navigation pane on the left, choose Lite Servers under Resource Management. On the displayed page, check whether a message indicating missing authorization is displayed.
 - c. Click **View missing permissions** to update the agency if needed. Set **Added To** to **Existing authorization** and click **OK**.

Figure 3-5 Adding authorization



Step 5: Purchasing Lite Server Resources

When you purchase Lite Servers, resources are created.

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**.
- 3. Click **Buy Lite Server** in the upper right corner. Configure the parameters on the displayed page.

□ NOTE

The purchase page offers two versions: New Version and Old Version. The parameter order shown below matches the layout on the New Version's purchase page. While the Old Version's purchase page displays parameters in a different order, their descriptions remain the same.

Figure 3-6 Basic configurations for purchasing Lite Servers

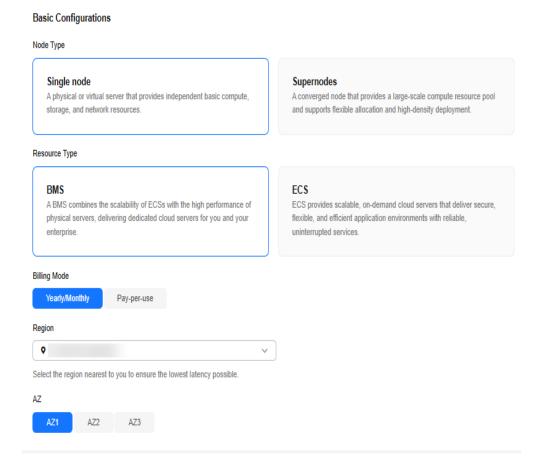


Table 3-2 Parameters for basic configurations

Parameter	Description
Node Type	Single node: A physical or virtual server that provides independent basic compute, storage, and network resources
	Supernode: A converged node that provides a large-scale compute resource pool and supports flexible allocation and high-density deployment Supernodes are specially designed to support large-scale model inference tasks. These servers are usually equipped with multiple compute cards (such as Ascend NPUs) to provide powerful computing capabilities to meet heavy-load inference requirements. Supernode resources are available only in CN Southwest-Guiyang1 and CN East 2.
Resource Type	This parameter is available only when Node Type is set to Single node . Select BMS or ECS as required.
	BMS: A BMS features both the scalability of Elastic Cloud Servers (ECSs) and high performance of physical servers, providing dedicated servers on the cloud for you and your enterprise.
	ECS: ECS provides secure, scalable, on-demand compute resources, enabling you to flexibly deploy applications and workloads.
	Supernodes: A supernode is a high-performance server used for large-scale model inference tasks. These servers are usually equipped with multiple compute cards (such as Ascend NPUs) to provide powerful computing capabilities to meet heavy-load inference requirements. Supernodes are supported only in CN Southwest-Guiyang1 and CN East2.
Billing	Select Yearly/Monthly .
Mode	Yearly/Monthly is a prepaid billing mode in which your subscription is billed based on the required duration. This mode is more cost-effective when the usage duration is predictable.
	Pay–per–use billing is not supported.
Region	Select a region near you to ensure the lowest latency possible.

Parameter	Description
AZ	An AZ is a physical region where resources use independent power supplies and networks. AZs are physically isolated but interconnected through an internal network. When deploying resources, consider your applications' requirements on disaster recovery (DR) and network latency.
	For high DR capability, deploy resources in different AZs within the same region.
	For lower network latency, deploy resources in the same AZ.
	When Node Type is set to Supernodes or Resouce Type is set to ECS , you can select a random AZ to display available node resources in each region. If Resource Type is set to BMS , random AZs are not supported.
	For details about how to provision edge station resources, see Managing CloudPond NPU Resources for Lite Server.

Table 3-3 Parameters for configuring specifications

Parameter	Description
CPU Architecture	CPU architecture of the resource type, which can be x86 or Arm .
	x86: Select this if GPU resources are used.
	Arm: Select this if NPU resources are used.
	Select a CPU architecture and then select instance specifications as required. The flavors vary by region. The actual flavors are displayed on the console. Sold-out resources are displayed in gray and cannot be purchased.
	When purchasing 48 supernodes, reserve a portion as standby nodes based on your service requirements. These standby nodes will automatically take over if a primary node fails.
	NOTE If no specifications are available, contact Huawei technical support.

Table 3-4 Parameters for configuring the OS

Parameter	Description
Image	Public image Public images are available for all users. All users can read the image by image ID.
	ModelArts allows you to perform development and training directly without additional configuration as it provides multiple public images, supports multiple OSs, and has built-in AI drivers and software.
	For details about the supported public images, see Mapping Between Compute Resources and Image Versions.
	Private image Only the image creator can use the image. You can select a private image to save your time from repeatedly configuring servers.

Table 3-5 Parameters for configuring storage

Parameter	Description
Storage	The storage configuration parameters apply to each single node. Actual storage configuration = Storage configuration of a single node x Number of purchased nodes.
Node System Disk Type	This parameter is displayed only when you select an instance flavor that supports mounting.
	The node system disk stores the OS of a server, and is automatically created and initialized upon Lite Server creation.
	Select a node system disk type and set the disk size. The system disk size ranges from 100 GiB to 1,024 GiB.
	You can also expand the system disk capacity after the server is created.
	The system disk is automatically mounted to each compute node.

Parameter	Description			
(Optional) Node Data	Click Add Data Disk to mount an EVS data disk to the Lite Server. Currently, local disks cannot be mounted.			
Disk Type	You can select Node Data Disk Type and set Size and Quantity .			
	The data disk size ranges from 100 GiB to 32,768 GiB.			
	For BMSs and ECSs, there can be a maximum of 59 data disks. For supernodes, there can be a maximum of 8 data disks.			
	You can also expand the data disk capacity after the server is created.			
	The data disk is automatically mounted to each compute node.			

Table 3-6 Parameters for configuring the network

Parameter	Description					
VPC	A Virtual Private Cloud (VPC) ensures the security, isolation, and network flexibility of server resources.					
	Choose the VPC associated with your server from the drop- down list. You are advised to choose the same VPC for all related cloud services to simplify network connections.					
	If no VPC is available in the drop-down list, click Create VPC on the right to create one. To create a VPC, you need to log in to the management console as the administrator, and plan the IP address segment based on site requirements.					
Subnet	Select a subnet of the current VPC.					
	If no subnet is available in the drop-down list, click Create Subnet on the right to create one.					
Security Group	A security group is a collection of access control rules for ECSs that have the same security requirements and that are mutually trusted within a VPC.					
	If no security group is available in the drop-down list, click Create Security Group on the right to create one.					
IPv6	IPv6 is available when it is supported by the subnet, specifications, and image configured for the network.					
	Ensure that IPv6 has been enabled. To enable IPv6, see Creating a Subnet for an Existing VPC.					
	This parameter is only displayed for certain specifications and images.					

Parameter	Description			
RoCE Network	This parameter is available only when Node Type is set to Single node .			
	When GPUs or Ascend Snt9b and Snt9b23 of series A are used for distributed training, you need to configure the RoCE network to use the RoCE NICs on the hardware.			
	The parameter is only displayed if you have selected one specification that supports RoCE networks.			
	If you have not created a RoCE network, click Create RoCE .			
	If you have created a RoCE network, select it directly.			
Supernode Network	This parameter is displayed only when Node Type is set to Supernodes . You can click Add Super Node Network on the right to create one.			
	Supernode networks are mandatory for distributed scenarios.			

Table 3-7 Node management parameters

Parameter	Description
Server Name	Server name, which can contain 1 to 64 characters. Only digit, letters, underscores (_), and hyphens (-) are allowed.
	CAUTION The server name in the order will not be changed. If you change the name after placing the order, the new name will not be synchronized to the order.

Parameter	Description				
Login Mode	Key pair is recommended as it features higher security than Password . If you select Password , ensure that the password meets complexity requirements to prevent malicious attacks.				
	Key pair Use a key pair to log in to the Server node. You can select an existing key pair, or click Create Key Pair to create one.				
	If you use an existing key pair, ensure that you have saved the key file locally. Otherwise, logging in to the Server node will fail.				
	Password				
	A username and its initial password are used for authentication and logging in to the Server node.				
	For Linux, use the initial password of user root . For Windows, use the initial password of user Administrator . The password must:				
	– Contain 8 to 26 characters.				
	 Contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (!@\$%^=+[{}]:,/?). 				
	 Cannot be the same as the username or the username spelled backwards. 				
	 Cannot contain root, administrator, or their reverse. 				
Enterprise Project	This parameter is only available if you have enabled the enterprise project function, or if your account is an enterprise account. To enable this function, contact your customer manager.				
	An enterprise project makes it easy to manage projects and groups of cloud resources and users. Use the default enterprise project or create one.				
	Select an enterprise project from the drop-down list. For details about enterprise projects, see Enterprise Management User Guide.				
	CAUTION The enterprise project cannot be modified for a purchased server. Currently, the enterprise project information cannot be synchronized in the order.				

Table 3-8 Parameters for advanced configurations

Parameter	Description			
Cloud Eye host monitoring	Once this function enabled, you can configure Cloud Eye host monitoring agency in one-click mode. Cloud Eye agency allows you to monitor various metrics of the server, including CPU, memory, network, disk, and process at an interval of 1 minute. For details, see Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node.			
NodeTaskHu b	The NodeTaskHub plug-in is preset for certain public images. This parameter is displayed when the corresponding image is selected.			
	Once enabled, the system automatically installs the NodeTaskHub plug-in for the task center to deliver Ascend software upgrade, pressure test, and fault diagnosis tasks. For details, see Managing Lite Server AI Plug-ins.			
Custom Instance Data Injection	 Use this function to configure Server nodes if you want to: Use scripts to simplify the Server node configuration. Use scripts to initialize OSs. Use existing scripts and upload them to the server when creating the Server node. Use scripts for other purposes. Currently, As text and As file are supported. For details, see Injecting User Data into BMSs or Injecting User Data into ECSs. 			

Table 3-9 Parameters for purchase configurations

Parameter	Description		
Required Duration	Set the required duration and select auto-renewal as needed.		
Quantity	You can purchase multiple instances simultaneously, with a value between 1 and 10 .		
	Each instance generates a separate order, which must be paid for individually.		

4. View the configuration fee in the lower left corner of the page and click **Buy Now**. Then, pay for the order on the payment page.

The detailed fees will be displayed. You can click to view discount details if there is any. The configuration fee is the final discounted fee. To view the actual fee deduction, see the bill.

Each instance generates a separate order, which must be paid for individually.

5. Once paid, the resource will be created in 20 to 60 minutes. Wait until the resource is created. If the resource fails to be created, see **Handling Resource**Purchase Failures.

If a container is used or shared by multiple users, you should restrict the container from accessing the OpenStack management address (169.254.169.254) to prevent host machine metadata acquisition. For details, see **Forbidding Containers to Obtain Host Machine Metadata**.

Handling Resource Purchase Failures

If the ModelArts Lite Server fails to be created, there may be multiple causes:

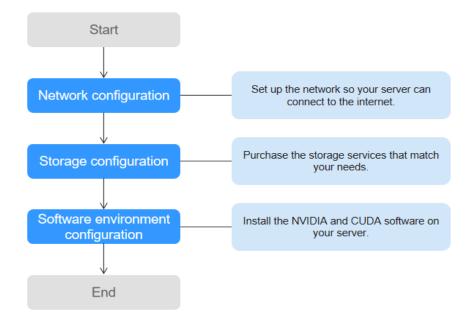
- Insufficient resources: Switch to the BMS or ECS page and check whether the specifications to be purchased are sold out. If so, there are no resources of this flavor. In this case, contact the customer manager to obtain resources and purchase again.
- Insufficient quota: Check if your account's resource quota (cores and RAM capacity) meets the requirements. If your quota is too low, you will need to increase it before proceeding. Apply for a quota adjustment before purchasing resources.
- Internal BMS or ECS error: Check whether there is an internal BMS or ECS error. If yes, submit a service ticket to BMS or ECS to locate and rectify the fault

4 Configuring Lite Server Resources

4.1 Configuration Process

After enabling Lite Server resources, you need to complete the configurations by referring to the following flowchart.

Figure 4-1 Flowchart for configuring resources



Task Description Step 1 Configuring the Configure the network so that the Lite Server can **Network** communicate with the Internet. Before configuring the storage and software environment, ensure that the server can access the network. 2 Data disks need to be mounted to the server to Configuring the store data files. Currently, SFS, Object Storage Storage Service (OBS), and EVS are supported. 3 Configuring the The pre-installed software varies among image. For details about installed software, see Mapping **Software Environment Between Compute Resources and Image** Versions. If the software pre-installed in the server cannot meet service requirements, you can configure the required software environment on the server.

Table 4-1 Resource configuration process

4.2 Configuring the Network

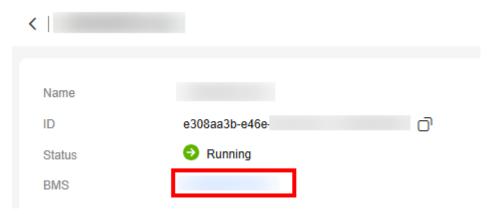
Configure the network so that Lite Server can communicate with the Internet. Network configuration involves the following two scenarios:

- **Binding an EIP to a Single Server**: Bind an EIP to a single server. The server exclusively uses network resources.
- Binding an EIP to Multiple Servers: An EIP is configured for a VPC. All servers in the VPC can access the Internet through the EIP and share network resources.

Binding an EIP to a Single Server

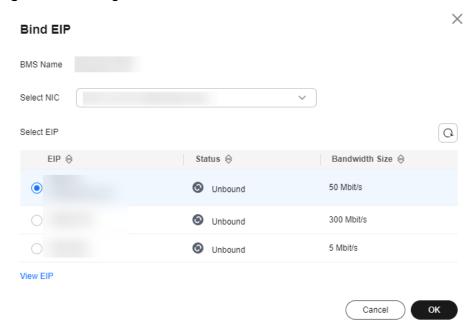
- **Step 1** Log in to the **ModelArts console**.
- **Step 2** In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- **Step 3** Click the target server name to access its details page.

Figure 4-2 BMS



Step 4 Click the **EIPs** tab and then click **Bind EIP**. The **Bind EIP** dialog box is displayed. Select the EIP to bind and click **OK**.

Figure 4-3 Binding an EIP



□ NOTE

Only one EIP can be bound to a NIC.

----End

Binding an EIP to Multiple Servers

NOTE

All servers must be deployed in the same VPC which does not have a NAT gateway or default route.

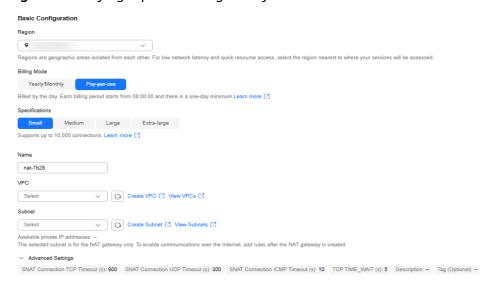
Step 1 Buy an EIP.

- 1. Log in to the **Huawei Cloud console**.
- In the service list on the left, choose Networking > Elastic IP.
- 3. In the upper right corner of the EIP page, click **Buy EIP**.
- 4. Retain the default settings and click **Next**.
- 5. Confirm the configurations and select "I have read and agree to the *Elastic IP Service Statement*".
 - If you set Billing Mode to Pay-per-Use, click Submit.
 - If you set Billing Mode to Yearly/Monthly, click Pay Now.
 On the payment page, confirm the order information, and click Pay.

Step 2 Buy a public NAT gateway.

- 1. Log in to the **Huawei Cloud console**.
- 2. In the service list on the left, choose **Network** > **NAT Gateway**.
- 3. In the upper right corner of the Public NAT Gateway page, click **Buy Public NAT Gateway**.
- 4. Set **VPC**, **Subnet**, and **Billing Mode**. Retain the default settings for other parameters and click **Next**.

Figure 4-4 Buying a public NAT gateway



- 5. On the displayed page, confirm the information and click **Submit**.
 - If you set Billing Mode to Pay-per-Use, click Submit.
 - If you set Billing Mode to Yearly/Monthly, click Pay Now.
 On the payment page, confirm the order information, and click Pay.

∩ NOTE

The VPC and subnet must be that of the server.

Step 3 Add an SNAT rule.

SNAT translates private IP addresses into EIPs, allowing servers in a VPC to share an EIP to access the Internet securely and efficiently.

- 1. On the **Public NAT Gateways** page, click the name of the created NAT gateway.
- 2. In the SNAT Rules tab, click Add SNAT Rule.
- 3. In the displayed dialog box, configure the SNAT rule as follows:
 - Scenario: Select VPC.
 - **Subnet**: Choose an existing subnet.
 - EIP: Select a created EIP.
- 4. Click OK.

Step 4 Configure a DNAT rule.

By adding a DNAT rule, the servers in a VPC can access services using SSH. For each server, a port corresponds to a DNAT rule, and one port can be mapped to only one EIP.

- 1. In the **DNAT Rules** tab, click **Add DNAT Rule**.
- 2. In the displayed dialog box, configure the DNAT rule as follows:
 - Scenario: Select VPC.
 - Port Type: Select Specific port.
 - Protocol: Select TCP.
 - EIP: Select a created EIP.
 - Outside Port: The recommended value ranges from 20000 to 30000.
 Ensure that the port number is unique.
 - Instance Type: Click Server and select a server.
 - **NIC**: Select a NIC.
 - Inside Port: Choose 22.
- 3. Click OK.

----End

4.3 Configuring the Storage

Currently, SFS, OBS, and EVS are supported for the server. The following table describes the differences of storage solutions. For details about how to configure local disks, see **Physical Machine Environment Configuration**.

Table 4-2 Comparison among EVS, SFS, and OBS

Dimensio n	SFS	OBS	EVS
Concept	SFS provides on- demand high- performance file storage, which can be shared by multiple cloud servers. SFS is similar to a remote directory for Windows or Linux OSs.	OBS provides massive, secure, reliable, and costeffective data storage for users to store data of any type and size.	EVS provides scalable block storage that features high reliability, high performance, and a variety of specifications for cloud servers to meet service requirements in different scenarios. An EVS disk is similar to a hard disk on a PC.
Data storage logic	SFS stores files and organizes them in a directory hierarchy.	OBS stores data as objects with metadata and unique identifiers. You can upload files directly to OBS. The system can generate metadata for files, or you can customize the metadata for files.	EVS stores binary data and cannot store files directly. To store files on an EVS disk, you need to format the file system first.
Access method	SFS file systems can be accessed only after being mounted to ECSs or BMSs through NFS or CIFS. You need to specify a network address or map it to a local directory for access.	Accessible through the Internet or Direct Connect (DC). You need to specify the bucket address for access and use transmission protocols such as HTTP and HTTPS.	EVS disks can be used and accessed from applications only after being attached to ECSs or BMSs and formatted.
Scenario	High-performance computing (HPC), media processing, file sharing, content management, and web services NOTE HPC: High bandwidth is required for shared file storage, such as gene sequencing and image rendering.	Big data analysis, static website hosting, online video on demand (VoD), gene sequencing, and intelligent video surveillance	HPC, enterprise core cluster applications, enterprise application systems, and development and testing NOTE HPC: High-speed and high-IOPS storage is required, such as industrial design and energy exploration.

Dimensio n	SFS	OBS	EVS
Capacity	РВ	ЕВ	ТВ
Latency	3–10 ms	10 ms	Sub-millisecond
IOPS/TPS	10,000 for a single file system	Tens of millions	128,000 for a single disk
Bandwidt h	GB/s	TB/s	MB/s
Data sharing	Yes	Yes	Yes
Remote access	Yes	Yes	No
Online editing	Yes	No	Yes
Used independe ntly	Yes	Yes	No (EVS must work with BMS to store files.)

Using SFS for Storage

If you use SFS for storage, SFS Turbo file systems are recommended. SFS Turbo provides high-performance file storage on demand. It features high reliability and availability. It can be elastically expanded and performs better as its capacity grows. The service is suitable for a wide range of scenarios.

- Create a file system on the SFS console. For details, see Creating an SFS
 Turbo File System. File systems and ECSs in different AZs of the same region
 can communicate with each other. Therefore, ensure that SFS Turbo and the
 server are in the same region.
- 2. Mount the created file system to the server. For details, see **Mounting an NFS File System to ECSs (Linux)**.
- 3. Set automatic mounting upon restart on the server to prevent mounting loss. For details, see **Mounting a File System Automatically**.

Using OBS for Storage

Use OBS's parallel file system with obsutil for optimal performance. This system provides fast access to files, with low latency (milliseconds), high bandwidth (TB/s), and millions of IOPS. You can use obsutil, a command line tool for accessing OBS, to perform configurations in OBS, for example, creating a bucket, as well as uploading, downloading, and deleting files/folders. If you are familiar with command line interface (CLI), obsutil can provide you with better experience in batch processing and automated tasks.

1. Create a parallel file system on the OBS console. For details, see **Creating a Parallel File System**.

- 2. Download the corresponding obsutil to the ECS based on your OS and install it. For details, see **Downloading and Installing obsutil**.
- Configure the OBS endpoint and AK/SK for obsutil to interconnect with OBS. You can use obsutil to perform operations on OBS buckets and objects only after obtaining the OBS authentication. For details, see Performing the Initial Configuration.
- 4. Use obsutil to upload and download OBS files in the server. For details about obsutil, see **obsutil Introduction**.

Using EVS for Storage

You can mount EVS data disks when **creating a server**. If the data disk space is insufficient after the server runs for a period of time, you can mount more data disks, which is known as post-mounting. In this case, you need to purchase EVS data disks and then mount them to the server. The following steps describe how to mount EVS disks in post-mounting mode.

- Purchase an EVS data disk. Purchase a disk on the EVS console, select the AZ where the server node is located, set Attach to Server to Later, set Billing Mode to Yearly/Monthly or Pay-per-use, and set the disk size as needed.
 - If the server resource type is set to BMS, the supported EVS disk types are subject to those displayed on the EVS console in the current AZ, and SCSI must be enabled in the advanced EVS configuration. A SCSI disk allows the server OS to directly access the underlying storage media and send SCSI commands to the disk.
 - If the server resource type is set to ECS, the supported EVS disk types are subject to those displayed on the EVS console in the current AZ. VBS and SCSI EVS disk types are supported. You can choose whether to enable SCSI.

For details about EVS purchase parameters, see **Purchasing an EVS Disk**.

Figure 4-5 Buying a disk



Currently, an EVS disk cannot be mounted to the cloud server when it is being created. In this case, the system displays a message indicating that the Yearly/Monthly ECS has not been synchronized to the operations system. Please try again later. To address such problem, log in to the Huawei Cloud console, and choose **Billing** from the top menu bar. In the navigation pane on the left, choose **Orders** > **Renewals**. On the displayed page, check whether the ECS has been synchronized to the OS. If yes, set **Attach to Server** to **Later**.

2. After purchasing an EVS data disk, mount it to an existing server. You can choose a disk mounting mode.

If the server type is BMS or ECS, disks can be mounted on the server details page.

Mounting disks on the server details page:

Log in to the ModelArts console. In the navigation pane on the left, choose **Lite Servers**. Click a server name to access its details page. In the **Disk** tab, select an EVS data disk and set the mount point.

To detach a disk, click **Detach** on the server details page. System disks cannot be detached.

The mounted EVS data disk will not be automatically deleted when you unsubscribe from a BMS. You can mount the disk to other BMSs or delete it as needed.

If the server type is BMS, you can mount a disk on the BMS details page. For details, see **Attaching Data Disks**.

If the server type is ECS, you can mount a disk on the ECS details page. For details, see **Attaching a Disk to an ECS**.

3. After an EVS data disk is attached, it needs to be initialized. For details, see **Initialization Overview**.

4.4 Configuring the Software Environment

4.4.1 Configuring the Software Environment on the NPU Server

Precautions

This section describes how to configure the environment on an Snt9b BMS, including merging and mounting disks and installing Docker. Pay attention to the following before the configuration:

- During the first installation, once you have configured the basic information such as storage, firmware, driver, and network access, try not to make any changes.
- For developers who need to develop on a BMS, start an independent Docker container as your personal development environment. The Snt9b BMS contains eight-card compute resources, which can be used by multiple users for development and debugging. To avoid usage conflicts, cards should be arranged to each user beforehand, and users should develop in their own Docker containers.
- ModelArts provides standard base container images, in which the basic MindSpore/PyTorch framework and the development and debugging tool chain are preset. You can use the image directly. Alternatively, you can use your own service images or images provided by AscendHub. If the software version preset in the image does not meet your requirements, you can install and replace it.

• Use the exposed SSH port to connect to the container in remote development mode (VSCode SSH Remote or Xshell) for development. You can mount your storage directory to the container to store code and data.

Ⅲ NOTE

Most operations in this guide have been preset in the latest Snt9b BMS environment. No further configuration is required. Skip the step if it has been preset.

Physical Machine Environment Configuration

Step 1 Configure timeout parameters.

Log in to the server using SSH and check the timeout configuration.

echo \$TMOUT

If it is set to **300**, the server will be disconnected after 5 minutes. You can configure the parameter to set a longer timeout interval. If it is set to **0**, skip this step. Run the following commands to configure the parameter:

vim /etc/profile

Change the value of **TMOUT** from **300** to **0** at the end of the file. The value **0** indicates that the idle connection is not disconnected. export TMOUT=0

Run the following command for the configuration to take effect on the current terminal:

TMOUT=0

By running the **export TMOUT=0** command, the idle timeout of the session is set to 0 during SSH connection to the Linux server, that is, the connection will not be automatically disconnected due to idleness. For security purposes, SSH connections may be automatically disconnected if no operation is performed for a while. However, if you are performing a task that requires long-time connection, run this command to prevent disconnection caused by idleness. You can run the **TMOUT=0** command in the current terminal session or add **export TMOUT=0** to the **/etc/profile** file. In this way, new sessions of all users will not be disconnected due to idleness.

Do not configure **TMOUT=0** in the production environment or on a public server, as it will bring certain security risks.

Step 2 Merge and mount disks.

After you enable server resources, there may be multiple unmounted NVMe disks on the server. Before configuring the environment, you need to merge and mount the disks. This operation must be performed at the very first so that the content you stored will not be overwritten.

1. Run the **lsblk** command to check whether three 7-TB disks are not mounted. In the following figure, nvme0n1, nvme1n1, and nvme2n1 are not mounted.

Figure 4-6 Unmounted disks

```
[root@devserver-7354 ~]# lsblk
NAME
        MAJ:MIN RM
                      SIZE RO TYPE MOUNTPOINT
           8:0
                  0
                      150G
                            0 disk
sda
                  0
                        1G
  -sda1
           8:1
                            0 part /boot/efi
                  0
  sda2
           8:2
                      149G
                            0
                              part /
                              disk
                  0
nvme0n1 259:0
                        7T
                            0
nvme1n1 259:1
                  0
                        7T
                              disk
                            0
nvme2n1 259:2
                  0
                        7T
                              disk
                            0
[root@devserver-7354 ~]#
```

The MOUNTPOINT column indicates the directory where the disk is mounted, as shown in the following figure. You can skip this step and create a directory in /home.

Figure 4-7 Mounted disks

```
[root@devserver-7354 ~]# lsblk
NAME
                           MAJ:MIN RM
                                        SIZE RO TYPE MOUNTPOINT
sda
                             8:0
                                     0
                                        150G
                                              0 disk
                                     0
                                           1G
                                              0 part /boot/efi
 -sda1
                             8:1
                                     0
                                        149G
  -sda2
                             8:2
                                              0 part /
n∨me0n1
                           259:0
                                     0
                                           7T
                                               0 disk /home
                                               0 disk
                           259:1
                                     0
nvme1n1
                                           7T
                          253:0
                                     0
                                               0 lvm /docker
 -nvme group-docker data
                                         14T
                           259:2
                                     0
                                          7T
nvme2n1
                                               0 disk
 -nvme group-docker data 253:0
                                     0
                                         14T
                                              0 lvm
                                                      /docker
```

Run the automatic mounting script to mount /dev/nvme0n1 to /home for each developer to create their own home directory. Mount the other two disks to /docker for containers to use. If /docker does not have enough space, the root directory may be fully occupied when multiple container instances are created.

```
cd /root/tools/
sh create_disk_partitions.sh
```

After the configuration, run the **df** -h command to view the information about the mounted disks.

Figure 4-8 Viewing mounted disks

```
[root@devserver-modelarts home]# df
Filesystem
                                       Size
                                             Used Avail Use% Mounted on
                                       756G
devtmpfs
                                                0
                                                    756G
                                                           0% /dev
                                                    .
756G
tmpfs
                                       756G
                                                           0% /dev/shm
                                                0
                                                    756G
tmpfs
                                       756G
                                              28M
                                                            1% /run
tmpfs
                                       756G
                                                0
                                                    756G
                                                           0% /sys/fs/cgroup
/dev/sda2
                                       196G
                                                    185G
                                             2.4G
                                       756G
                                              40K
                                                    756G
                                                            1% /tmp
tmpfs
                                                           1% /boot/efi
/dev/sda1
                                      1022M
                                             8.3M 1014M
                                             121G
/dev/mapper/nvme_group-docker_data
                                       14T
                                                            1% /docker
                                                    14T
/dev/nvme0n1
                                              50G
                                       7.0T
                                                    7.0T
                                                            1% /home
```

After the disks are merged and mounted, you can create a working directory and name it in **/home**.

Step 3 (Optional) Install the firmware and driver.

1. Run the **npu-smi info** command to check if the npu-smi tool can be used properly. If the following information is displayed, the npu-smi tool can be used properly.

If the command output is not complete as shown in the figure below (for example, an error is reported or only the upper part of the command output is displayed without the following process information), restore the npu-smi tool and install the firmware and driver of the new version. To do so, submit a service ticket to **contact Huawei Cloud technical support**.

Figure 4-9 Checking the npu-smi tool

[+0-		2 022251 1#	ani infa			
[root@devserver-bms-fd775372-833351 ~]# npu-smi info ++						
npu-s	mi 23.0.rc3	Version:	23.0.rc3			!
NPU Chip	Name	Health Bus-Id	Power(W) AICore(%)	Temp(Memor	C) y-Usage(MB)	Hugepages-Usage(page) HBM-Usage(MB)
0	910B2	OK 0000:C1:00.0	92.7	49 0	/ 0	0 / 0 4152 / 65536
1 0	910B2	OK 0000:01:00.0	87.0 0	52 0	/ 0	0 / 0 4152 / 65536
2	910B2	OK 0000:C2:00.0	94.5	53 0	/ 0	0 / 0 4152 / 65536
3 0	910B2	OK 0000:02:00.0	92.9	51 0	/ 0	0 / 0 4152 / 65536
4 0	910B2	OK 0000:81:00.0	91.9 0	53 0	/ 0	0 / 0 4152 / 65536
5 0	910B2	OK 0000:41:00.0	93.1	54 0	/ 0	0 / 0 4153 / 65536
6 0	910B2	OK 0000:82:00.0	92.2	52 0	/ 0	0 / 0 4153 / 65536
7 0	910B2	OK 0000:42:00.0	92.2 0	54 0	/ 0	0 / 0 4153 / 65536
+ NPU +	Chip	Process id	+ Process na	me	Pr	rocess memory(MB)
No ru	nning processes foun	d in NPU 0				į
No ru	nning processes foun	d in NPU 1	+======			
No ru	nning processes foun	=+======= d in NPU 2	+======		=======	+
No ru	nning processes foun	=+======= d_in NPU 3	+=======		=======	+ !
No ru	nning processes foun	d in NPU 4	+======			<u></u>
No ru	nning processes foun	d in NPU 5	+========			
No ru	nning processes foun	d in NPU 6	·			
No ru	nning processes foun	d in NPU 7 =+=======	+======			

2. View the environment information. Run the following command to view the current firmware and driver versions:

npu-smi info -t board -i 1 | egrep -i "software|firmware"

Figure 4-10 Viewing the firmware and driver versions

firmware indicates the firmware version, and **software** indicates the driver version.

If the current versions do not meet your requirements and need to be changed, see the subsequent operations.

3. View the OS version, check whether the architecture is AArch64 or x86_64, and obtain the firmware and driver packages from the Ascend official website.

The firmware package is **Ascend-hdk-***Model-***npu-firmware_***Version.***run** and the driver package is **Ascend-hdk-***Model-***npu-driver_***Version_***linux-aarch64.run**. Only Huawei engineers and channel users have the permission to download the commercial version. For details, see **the download link**. arch cat /etc/os-release

Figure 4-11 Viewing the OS version and architecture

```
[root@localhost ~]# arch
aarch64
[root@localhost ~]# cat /etc/os-release
NAME="EulerOS"
VERSION="2.0 (SP10)"
ID="euleros"
VERSION_ID="2.0"
PRETTY_NAME="EulerOS 2.0 (SP10)"
ANSI_COLOR="0;31"
```

The following uses the packages that adapt to EulerOS 2.0 (SP10) and AArch64 as an example.

4. Install the firmware and driver packages.

NOTE

- 1. Installation sequence is vital.
 - 1. Initial installation: In scenarios where no driver is installed on a hardware device before delivery, or the installed driver and firmware on the hardware device have been uninstalled, you need to install the driver and then firmware.
 - 2. Overwrite installation: In scenarios where the driver and firmware have been installed on a hardware device and you need to install them again, install the firmware first and then the driver.

Generally, the firmware and driver are pre-installed on the Snt9b server before delivery. So in this case, **overwrite installation** is used as an example.

- a. If the firmware and driver to be installed are of a lower version, ensure that npu-smi functions, and install the packages without the need to uninstall the existing versions.
- b. If the firmware and driver fail to be installed, search for the solution in Developer Community based on the error message.

The installation commands are shown below.

a. Install the firmware and then restart the server.

```
chmod 700 *.run
# Actual package name
./Ascend-hdk-Model-npu-firmware_Version.run --full
reboot
```

b. Install the driver. Enter y as prompted.

```
# Actual package name
./Ascend-hdk-Model-npu-driver_Version_linux-aarch64.run --full --install-for-all
```

c. **(Optional)** Determine whether to restart the system as prompted. If yes, run the following command. If not, skip this step.

reboot

d. After the installation, check the firmware and driver versions. If the output is normal, the installation is successful.

npu-smi info -t board -i 1 | egrep -i "software|firmware"

Figure 4-12 Checking the firmware and driver versions

Step 4 Install the Docker environment.

1. Run the **docker -v** command to check whether Docker has been installed. If yes, skip this step.

Run the following command to install Docker: yum install -y docker-engine.aarch64 docker-engine-selinux.noarch docker-runc.aarch64

Run the **docker -v** command to check whether the installation is successful.

Figure 4-13 Viewing the Docker version

```
[root@localhost ~]# docker -v
Docker version 18.09.0, build ba6df24
```

2. Configure IP forwarding for network access in containers.

Run the following command to check the value of **net.ipv4.ip_forward**. Skip this step if the value is **1**.

sysctl -p | grep net.ipv4.ip_forward

If the value is not **1**, run the following command to configure IP forwarding: sed -i 's/net\.ipv4\.ip_forward=0/net\.ipv4\.ip_forward=1/g' /etc/sysctl.conf sysctl -p | grep net.ipv4.ip_forward

3. Check whether Ascend-docker-runtime has been installed and configured in the environment.

docker info |grep Runtime

If the runtime is **ascend** in the output, the installation and configuration are complete. In this case, skip this step.

Figure 4-14 Querying Ascend-docker-runtime

```
[root@devserver-modelarts-demanager-0eaabe8f ~]# docker info |grep Runtime
Runtimes: ascend runc
Default Runtime: ascend
```

If Ascend-docker-runtime is not installed, click **here** to install it. The software package is a Docker plug-in provided by Ascend. During Docker runtime, paths of Ascend drivers can be automatically mounted to the container. You do not need to specify **--device** during container startup. After the package is downloaded, upload it to the server and install it.

chmod 700 *.run

./Ascend-hdk-Model-npu-driver_Version_linux-aarch64.run --install

For details, see Ascend Docker Runtime User Guide.

4. Set the newly mounted disk as the path used by Docker containers.

Edit the /etc/docker/daemon.json file. If the file does not exist, create it. vim /etc/docker/daemon.json

Add the two configurations as shown in the following figure. To ensure that the JSON format is correct, add a comma (,) at the end of the **insecure-registries** line. **data_root** indicates the path where the Docker data is stored. **default-shm-size** indicates the default sharing size during container startup. The default value is **64 MB**. You can modify it in case the training fails due to insufficient sharing memory during distributed training.

Figure 4-15 Docker configuration

Save the configuration and run the following command to restart Docker for the configuration to take effect:

systemctl daemon-reload && systemctl restart docker

Step 5 (Optional) Install pip.

1. Check whether pip has been installed and whether the access to the pip source is normal. If yes, skip this step.

pip install numpy

2. If pip is not installed, run the following commands: python -m ensurepip --upgrade In -s /usr/bin/pip3 /usr/bin/pip

3. Configure the pip source.

mkdir -p ~/.pip vim ~/.pip/pip.conf

Add the following information to the ~/.pip/pip.conf file:

```
[global]
index-url = http://mirrors.myhuaweicloud.com/pypi/web/simple
format = columns
[install]
trusted-host=mirrors.myhuaweicloud.com
```

Step 6 Test the RoCE network.

1. Install CANN Toolkit.

Check whether CANN Toolkit has been installed on the server. If the version number is displayed, it has been installed.

cat /usr/local/Ascend/ascend-toolkit/latest/aarch64-linux/ascend_toolkit_install.info

If it is not installed, obtain the software package from the official website. For common users, **download the community edition**. For Huawei engineers and channel users, the permissions of the commercial edition are limited, download it **from here**.

Install CANN Toolkit. Replace the package name. chmod 700 *.run ./Ascend-cann-toolkit_6.3.RC2_linux-aarch64.run --full --install-for-all

2. Install mpich-3.2.1.tar.gz.

Click **here** to download the package and run the following commands to install it:

mkdir -p /home/mpich mv /root/mpich-3.2.1.tar.gz /home/ cd /home/;tar -zxvf mpich-3.2.1.tar.gz cd /home/mpich-3.2.1 ./configure --prefix=/home/mpich --disable-fortran make && make install

3. Set environment variables and compile the HCCL operator.

export PATH=/home/mpich/bin:\$PATH
cd /usr/local/Ascend/ascend-toolkit/latest/tools/hccl_test
export LD_LIBRARY_PATH=/home/mpich/lib/:/usr/local/Ascend/ascend-toolkit/latest/
lib64:\$LD_LIBRARY_PATH
make MPI_HOME=/home/mpich ASCEND_DIR=/usr/local/Ascend/ascend-toolkit/latest

After the operator is compiled, the following information is displayed.

Figure 4-16 Compiled operator

```
[root@devserver-com hccl_test]# make MPI_HOME=/home/mpich ASCEND_DIR=/usr/local /Ascend/ascend-toolkit/latest
g++ -std=c++11 -Werror -fstack-protector-strong -fPIE -pie -02 -s -Wl,-z,relro
-Wl,-z,now -Wl,-z,noexecstack -Wl,--copy-dt-needed-entries ./common/src/hccl_check_buf_init.cc ./common/src/hccl_check_common.cc ./common/src/hccl_opbase_root
info_base.cc ./common/src/hccl_test_common.cc ./common/src/hccl_test_main.cc ./
opbase_test/hccl_allgather_rootinfo_test.cc -I./common/src -I/usr/local/Ascend/
ascend-toolkit/latest/include -I/usr/local/Ascend/ascend-toolkit/latest/include
-I/home/mpich/include -I./opbase_test -o all_gather_test -L/usr/local/Ascend/a
scend-toolkit/latest/lib64 -lhccl -L/usr/local/Ascend/ascend-toolkit/latest/lib
64 -lascendcl -L/home/mpich/lib -lmpi
all_gather_test compile completed
g++ -std=c++11 -Werror -fstack-protector-strong -fPIE -pie -02 -s -Wl,-z,relro
-Wl,-z,now -Wl,-z,noexecstack -Wl,--copy-dt-needed-entries ./common/src/hccl_check_buf_init.cc ./common/src/hccl_check_common.cc ./common/src/hccl_cpbase_root
info_base.cc ./common/src/hccl_test_common.cc ./common/src/hccl_opbase_root
info_base.cc ./common/src/hccl_test_common.cc ./common/src/hccl_test_main.cc ./
opbase_test/hccl_allreduce_rootinfo_test.cc -I./common/src -I/usr/local/Ascend/
ascend-toolkit/latest/include -I/usr/local/Ascend/ascend-toolkit/latest/include
-I/home/mpich/include -I./opbase_test -o all_reduce_test -L/usr/local/Ascend/a
scend-toolkit/latest/lib64 -lhccl -L/usr/local/Ascend/ascend-toolkit/latest/lib
64 -lascendcl -L/home/mpich/lib -lmpi
all_reduce_test compile completed
```

4. Perform all_reduce_test in the single-node scenario.

Go to the hccl test directory.

cd /usr/local/Ascend/ascend-toolkit/latest/tools/hccl_test

For single-node single-card, run the following command: mpirun -n 1 ./bin/all reduce test -b 8 -e 1024M -f 2 -p 8

For single-node multi-card, run the following command:

mpirun -n 8 ./bin/all_reduce_test -b 8 -e 1024M -f 2 -p 8

Figure 4-17 all_reduce_test

[root@devserver-com	n hccl testl# mni	run -n 8 ./bin/all_reduc	re test -h 8 -e 1024M
		741824, iters is 20, was	
data size(Bytes):	aveg time(us):		
8	1323.66	0.00001	success
16	1537.41	0.00001	success
32	1567.12	0.00002	success
64	1530.88	0.00004	success
128	1567.90	0.00008	success
256	1544.79	0.00017	success
512	1534.98	0.00033	success
1024	1771.28	0.00058	success
2048	1457.74	0.00140	success
4096	1619.05	0.00253	success
8192	1570.33	0.00522	success
16384	1575.37	0.01040	success
32768	1542.54	0.02124	success
65536	1568.91	0.04177	success
131072	1554.22	0.08433	success
262144	1552.85	0.16881	success
524288	1573.59	0.33318	success
1048576	1540.16	0.68082	success
2097152	1544.21	1.35807	success
4194304	1555.34	2.69671	success
8388608	1558.78	5.38153	success
16777216	1556.50	10.77880	success
33554432	1425.38	23.54074	success
67108864	1349.46	49.72998	success
134217728	2460.50	54.54894	success
268435456	4623.78	58.05536	success
536870912	9194.49	58.39050	success
1073741824	18450.20	58.19677	success

- 5. Test the bandwidth of multi-node RoCE NICs.
 - a. Check the Ascend RoCE IP address. cat /etc/hccn.conf

Figure 4-18 Viewing Ascend RoCE IP address

```
[root@devserver-com hccl_test]# cat /etc/hccn.conf
address 0=29.89.132.13
netmask 0=255.255.0.0
netdetect 0=29.89.0.1
gateway 0=29.89.0.1
send arp status 0=1
address 1=29.89.20.64
netmask 1=255.255.0.0
netdetect 1=29.89.0.1
gateway_1=29.89.0.1
send arp status 1=1
address 2=29.89.155.174
netmask 2=255.255.0.0
netdetect 2=29.89.0.1
gateway 2=29.89.0.1
send arp status 2=1
address 3=29.89.148.38
netmask 3=255.255.0.0
netdetect 3=29.89.0.1
gateway_3=29.89.0.1
send_arp_status_3=1
address 4=29.89.134.236
netmask 4=255.255.0.0
netdetect 4=29.89.0.1
gateway 4=29.89.0.1
send arp status 4=1
address 5=29.89.133.119
netmask 5=255.255.0.0
netdetect 5=29.89.0.1
gateway 5=29.89.0.1
send arp status 5=1
address_6=29.89.51.253
netmask 6=255.255.0.0
netdetect_6=29.89.0.1
gateway 6=29.89.0.1
send arp status 6=1
address 7=29.89.96.167
netmask 7=255.255.0.0
netdetect 7=29.89.0.1
gateway 7=29.89.0.1
```

b. Perform the RoCE test.

In session 1, run the -i Card ID command on the receive end.

```
hccn_tool -i 7 -roce_test reset
hccn_tool -i 7 -roce_test ib_send_bw -s 4096000 -n 1000 -tcp
```

In session 2, run the -i Card ID command on the sending end. The IP address of the receive end is at the end.

```
cd /usr/local/Ascend/ascend-toolkit/latest/tools/hccl_test
hccn_tool -i 0 -roce_test reset
hccn_tool -i 0 -roce_test ib_send_bw -s 4096000 -n 1000 address 192.168.100.18 -tcp
```

The following figure shows the RoCE test result.

Figure 4-19 RoCE test result (receive end)

```
[root@devserver-com hccl_test]# hccn_tool
Dsmi get perftest status end. (status=1)
Dsmi start roce perftest end. (out=1)
Dsmi get perftest status end. (status=2)
Dsmi get perftest status end. (status=1)
roce_report:
                                                                                                                                       -i 7 -roce_test ib_send_bw -s 4096000 -n 1000 -tcp
    oce_report:
     ***********
    Dual-port
Number of qps
                                                       : OFF
                                                                                                     Device
                                                                                                                                                      : hns_0
                                                                                                       Transport type : IB
Using SRQ : OFF
   Connection type
RX depth
CQ Moderation
Mtu
                                                                                                      Using SRQ
                                                             100
4096[B]
    Link type
                                                             Ethernet
   GID index : 3
Max inline data : 0[B]
   rdma_cm QPs : OFF
Data ex. method : Ethernet
   local address: LID 0000 QPN 0x000a PSN 0xf97ccb
GID: 00:00:00:00:00:00:00:00:00:00:255:255:29:89:96:167
remote address: LID 0000 QPN 0x001a PSN 0x3a835e
GID: 00:00:00:00:00:00:00:00:00:255:255:29:89:132:13
                                      #iterations
1000
    #bytes
4096000
                                                                                                                                                  BW average[MB/sec]
23395.00
                                                                                                                                                                                                                   MsgRate[Mpps]
0.005989
                                                                                      BW peak[MB/sec]
```

Figure 4-20 RoCE test result (server)

```
t@devserver-com hccl_test]# hccn_tool -i 0 -roce_test ib_send_bw -s 4096000 -n 1000 address 29.89.96.167 get perftest status end. (status=1) start roce perftest end. (out=1) get perftest status end. (status=1) __report:
                                     Send BW Test

DFF Device : hns_0

I Transport type : IB

RC Using SRQ : OFF
 Dual-port : OFF
Number of qps : 1
Connection type : RC
      depth
Moderation
IX depth : 128
CQ Moderation : 100
Mtu : 4096[B]
Link type : Ethernet
GID index : 3
Max inline data : 0[B]
rdma_cm QPs : OFF
Data ex. method : Ethernet
BW average[MB/sec]
23369.61
```

NOTE

If the RoCE bandwidth test has been started for a NIC, the following error message is displayed when the task is started again.

Figure 4-21 Error

```
[root@devserver-com hccl_test]# hccn_tool -i 7 -roce_test ib_send_bw -s 4096 -n
1000 -tcp
Dsmi get perftest status end. (status=2)
Roce perftest is doing, please try later.
Cmd execute failed!
```

Run the following command to stop the **roce_test** task and then start the task:

hccn_tool -i 7 -roce_test reset

- Run the following command to query the NIC status: for i in {0..7};do hccn_tool -i \${i} -link -g;done
- Run the following command to check the IP address connectivity of the NIC on a single node: for i in \$(seq 0 7);do hccn_tool -i \$i -net_health -g;done

----End

Creating a Containerized Custom Debugging Environment

Step 1 Prepare a service base image.

You could start your Docker container on the physical machine (PM) for development. You can use your service images or base images provided by ModelArts, including Ascend+PyTorch and Ascend+MindSpore.

- Choose an image based on your environment.
 # Container image matching Snt9b. The following shows an example.
 docker pull swr.
 region-code>.myhuaweicloud.com/atelier/<image-name>:<image-tag>
- 2. Start the container image. If multiple users and containers are sharing a machine, allocate the cards beforehand. Do not use cards occupied by other containers.

Start the container. Specify the container name and image information. **ASCEND_VISIBLE_DEVICES** indicates the cards to be used by the container, for example, **0-1,3** indicates cards 0, 1, and 3 are used. The hyphens (-) specify the range.

-v /home:/home_host indicates mounting the home directory of the host to the **home_host** directory of the container. Use this mounting directory in the container to store code and data for persistent storage.

docker run -itd --cap-add=SYS_PTRACE -e ASCEND_VISIBLE_DEVICES=0 -v /home:/home_host -p

docker run -itd --cap-add=SYS_PTRACE -e ASCEND_VISIBLE_DEVICES=0 -v /home:/home_host -p 51234:22 -u=0 --name *Custom container name SWR address of the image pulled in the preceding step* /bin/bash

3. Access the container.

docker exec -ti Custom container name in the last command bash

4. Access the Conda environment.

source /home/ma-user/.bashrc

5. View the information of available cards in the container.

If the following error message is displayed, the card specified by **ASCEND_VISIBLE_DEVICES** during container startup is occupied by another container. In this case, select another card and restart the new container.

Figure 4-22 Error

```
(PyTorch-1.11.0) [root@8e2a7f7f9f7a ma-user]# npu-smi info
DrvMngGetConsoleLogLevel failed. (g_conLogLevel=3)
dcmi model initialized failed, because the device is used. ret is -8020
```

- 6. After you run the **npu-smi info** command and the output is normal, run the following commands to test the container environment. If the output is normal, the container environment is available.
 - PyTorch image test: python3 -c "import torch;import torch_npu; a = torch.randn(3, 4).npu(); print(a + a);"
 - MindSpore image test:

 # The run_check program of MindSpore does not adapt to Snt9b. Configure two environment variables first.

 unset MS_GE_TRAIN

 unset MS_ENABLE_GE

 python -c "import

 mindspore;mindspore.set_context(device_target='Ascend');mindspore.run_check()"

 # Restore the environment variables after the test for actual training.

 export MS_GE_TRAIN=1

 export MS_ENABLE_GE=1

Figure 4-23 Accessing the Conda environment and performing a test

Step 2 (Optional) Configure SSH access for the container.

If you need to use the VS Code or SSH tool to directly connect to the container for development, perform the following operations:

1. After accessing the container, run the SSH startup command to start the SSH service.

```
ssh-keygen -A
/usr/sbin/sshd
# Check whether SSH is started.
ps -ef |grep ssh
```

Set a password for user root as prompted. passwd

Figure 4-24 Setting a password for user root

```
[root@9f4f3b6794f7 ~]$ passwd
Changing password for user root.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
```

Run the exit command to exit the container and perform the SSH test on the host.

ssh root@Host IP address -p 51234 (Mapped port number)

Figure 4-25 Perform the SSH test.

```
[root@localhost home]# ssh root@90.90.3.71 -p 51234
root@90.90.3.71's password:
Authorized users only. All activities may be monitored and reported.
```

If the error message "Host key verification failed" is displayed when you perform the SSH container test on the host machine, delete the ~/.ssh/known_host file from the host machine and try again.

4. Use VS Code SSH to connect to the container environment.

If you have not used VS Code SSH, install the VS Code environment and Remote-SSH plug-in by referring to **Step1 Manually Connecting to a Notebook Instance Through VS Code**.

Open VSCode Terminal and run the following command to generate a key pair on the local computer. If you already have a key pair, skip this step. ssh-keygen -t rsa

Add the public key to the authorization file of the remote server. Replace the server IP address and container port number.

cat ~/.ssh/id_rsa.pub | ssh root@*Server IP address* -p *Container port number* "mkdir -p ~/.ssh && cat >> ~/.ssh/authorized_keys"

Open the Remote-SSH configuration file of VSCode and add SSH configuration items. Replace the server IP address and container port number.

HostName Server IP address
User root
port SSH port number of the container
identityFile ~\.ssh\id_rsa
StrictHostKeyChecking no
UserKnownHostsFile /dev/null
ForwardAgent yes

Note: Use the key to log in. If you want to use the password, delete the identityFile configuration and enter the password as prompted during the connection.

After the connection, install the Python plug-in. For details, see **Install the Python Plug-in in the Cloud Development Environment**.

Step 3 (Optional) Install CANN Toolkit.

CANN Toolkit has been installed in the preset images provided by ModelArts. If you need to use another version or use your own image that is not preset with CANN Toolkit, see the following operations.

- 1. Check whether CANN Toolkit has been installed in the container. If the version number is displayed, it has been installed.

 cat /usr/local/Ascend/ascend-toolkit/latest/aarch64-linux/ascend_toolkit_install.info
- If it is not installed or needs to be upgraded, obtain the software package from the official website. For common users, download the community edition. For Huawei engineers and channel users, the permissions of the commercial edition are limited, download it from here.

```
Install CANN Toolkit. Replace the package name.
chmod 700 *.run
./Ascend-cann-toolkit_6.3.RC2_linux-aarch64.run --full --install-for-all
```

3. If it has been installed but needs to be upgraded, run the following command. Replace the package name.

```
chmod 700 *.run
./Ascend-cann-toolkit_6.3.RC2_linux-aarch64.run --upgrade --install-for-all
```

Step 4 (Optional) Install MindSpore Lite.

MindSpore Lite has been installed in the preset image. If you need to use another version or use your own image that is not preset with MindSpore Lite, see the following operations.

- 1. Check whether MindSpore Lite has been installed in the container. If the software information and version are displayed, it has been installed. pip show mindspore-lite
- If it is not installed, download the .whl and .tar.gz packages from the official website and download them. Replace the package names. pip install mindspore_lite-2.1.0-cp37-cp37m-linux_aarch64.whl mkdir -p /usr/local/mindspore-lite

tar -zxvf mindspore-lite-2.1.0-linux-aarch64.tar.gz -C /usr/local/mindspore-lite --strip-components 1

Step 5 Configure the pip source.

The pip source has been configured in the preset image provided by ModelArts. To use your own service images, configure it by referring to **Step 5**.

Step 6 Configure a Yum repository.

Configure the Yum repository in Huawei EulerOS.

```
# Create the EulerOS.repo file in the /etc/yum.repos.d/ directory,
cd /etc/yum.repos.d/
mv EulerOS.repo EulerOS.repo.bak
vim EulerOS.repo
# Configure the EulerOS.repo file based on the EulerOS version and system architecture. EulerOS 2.10 is
used as an example.
[base]
name=EulerOS-2.0SP10 base
baseurl=https://mirrors.huaweicloud.com/euler/2.10/os/aarch64/
enabled=1
gpgcheck=1
gpgkey=https://mirrors.huaweicloud.com/euler/2.10/os/RPM-GPG-KEY-EulerOS
# Clear the existing Yum cache.
yum clean all
# Generate a new Yum cache.
yum makecache
# Perform a test.
yum update --allowerasing --skip-broken --nobest
```

Configure a Yum repository in HCE OS.

```
# Download the new hce.repo file to the /etc/yum.repos.d/ directory.
wget -O /etc/yum.repos.d/hce.repo https://mirrors.huaweicloud.com/artifactory/os-conf/hce/hce.repo
# Clear the existing Yum cache.
yum clean all
# Generate a new Yum cache.
yum makecache
# Perform a test.
yum update --allowerasing --skip-broken --nobest
```

Step 7 To use **git clone** and **git lfs** commands to download large models, see the following operations:

1. The Euler source does not have the git-lfs package. Therefore, you need to decompress the package. To do so, enter the following address in the address box of the browser, download the git-lfs package, and upload it to the /home directory on the server. This directory is mounted to the /home_host directory of the container when the container is started. In this way, the git-lfs package can be directly used in the container.

https://github.com/git-lfs/qit-lfs/releases/download/v3.2.0/git-lfs-linux-arm64-v3.2.0.tar.gz

Go to the container and run the git-lfs installation commands.

```
cd /home_host
tar -zxvf git-lfs-linux-arm64-v3.2.0.tar.gz
cd git-lfs-3.2.0
sh install.sh
```

- 3. Disable SSL verification for Git configuration. git config --global http.sslVerify false
- 4. The following commands use code in diffusers as an example. Replace the development directory.

```
# git clone diffusers source code, -b You can specify a branch for this parameter. Replace the development directory.
cd /home_host/User directory
mkdir sd
cd sd
git clone https://github.com/huggingface/diffusers.git -b v0.11.1-patch
```

Run the **git clone** command to download the model on Hugging Face. The following uses a stable-diffusion (SD) model as an example. If error "SSL_ERROR_SYSCALL" is reported during the download, try again. The download may take several hours due to network restrictions and large file size. If the download still fails after multiple retries, download the large file from the website and upload it to the personal development directory in / **home** on the server. To skip the large files during download, set **GIT_LFS_SKIP_SMUDGE** to **1**.

```
git lfs install
git clone https://huggingface.co/runwayml/stable-diffusion-v1-5 -b onnx
```

Figure 4-26 Downloaded code

```
[root@38a757e4636a sd]# git clone <a href="https://github.com/huggingface/diffusers.git">https://github.com/huggingface/diffusers.git</a> -b v0.11.1-patch cloning into 'diffusers'...
remote: Enumerating objects: 34118, done.
remote: Counting objects: 100% (10965/10965), done.
remote: Compressing objects: 100% (765/765), done.
remote: Total 34118 (delta 10639), reused 10273 (delta 10190), pack-reused 23153
Receiving objects: 100% (34118/34118), 21.44 MiB | 9.58 MiB/s, done.
Resolving deltas: 100% (25313/25313), done.
[root@38a757e4636a sd]# cd diffusers/
[root@38a757e4636a diffusers]# git branch
* v0.11.1-patch
[root@38a757e4636a diffusers]#
```

Step 8 Save the image in the container environment.

After the environment is configured, you can develop and debug the service code. To prevent the environment from being lost after the host is restarted, run the following commands to save the configured environment as a new image:

```
# Check the ID of the container to be saved as an image.
docker ps
# Save the image.
docker commit Container ID Custom image name: Custom image tag
# View the saved image.
docker images
# If you need to share the image with others in other environments, save the image as a TAR file. This command takes a long time. You can view the file by running the ls command after it is saved.
docker save -o Custom name.tar Image name.Image tag
# Load the file on other hosts. After the file is loaded, you can view the image.
docker load --input Custom name.tar
```

For details about how to migrate services to Ascend for development and debugging, see the related documents.

----End

5 Using Lite Server Resources

5.1 Collecting and Uploading NPU Logs

Scenario

When an NPU is faulty, collect NPU log information by referring to this section. The logs generated in this exercise are saved on the node and automatically uploaded to the OBS bucket provided by technical support. Logs are used only for fault locating and analysis. You need to provide the AK/SK for authorization and authentication.

Constraints

Currently, this function is available only in CN Southwest-Guiyang1, CN Ulanqab1, CN East 2, CN East-Shanghai1, CN North-Beijing4, and CN South-Guangzhou.

Supported models: 300IDuo, Snt9B, and Snt9B23

Procedure

1. Obtain the AK/SK, which are used for script configuration, as well as authentication and authorization.

If an AK/SK pair is already available, skip this step. Find the downloaded AK/SK file, which is usually named **credentials.csv**.

The file contains the username, AK, and SK.

Figure 5-1 credential.csv



To generate an AK/SK pair, follow these steps:

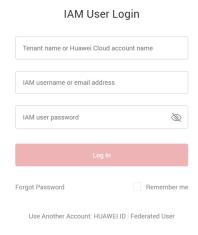
- a. Log in to the **Huawei Cloud console**.
- b. Hover the cursor over the username in the upper right corner and choose **My Credentials** from the drop-down list.

- c. In the navigation pane on the left, choose **Access Keys**.
- d. Click Create Access Key.
- e. Download the key and keep it secure.
- 2. Prepare the tenant ID and IAM ID for OBS bucket configuration.

Send the prepared information to technical support, who will configure an OBS bucket policy based on your information. You can upload the collected logs to the corresponding OBS bucket.

After the configuration, the OBS directory **obs_dir** is provided for you to configure subsequent scripts.

Figure 5-2 Tenant and IAM accounts



3. Collect the logs and upload the script.

Modify the **NpuLogCollection** parameter in the script below. Replace **ak**, **sk**, and **obs_dir** with the values obtained in the previous steps. For the 300IDuo model, set **is_300_iduo** to **True**. Upload the script to the node whose NPU logs need to be collected.

```
import ison
import os
import sys
import hashlib
import hmac
import binascii
import subprocess
import re
from datetime import datetime
class NpuLogCollection(object):
  NPU_LOG_PATH = "/var/log/npu_log_collect"
  SUPPORT_REGIONS = ['cn-southwest-2', 'cn-north-9', 'cn-east-4', 'cn-east-3', 'cn-north-4', 'cn-
south-1']
  OPENSTACK_METADATA = "http://169.254.169.254/openstack/latest/meta_data.json"
  OBS_BUCKET_PREFIX = "npu-log-"
  def __init__(self, ak, sk, obs_dir, is_300_iduo=False):
     self.ak = ak
     self.sk = sk
     self.obs_dir = obs_dir
     self.is_300_iduo = is_300_iduo
     self.region_id = self.get_region_id()
     self.card_ids, self.chip_count = self.get_card_ids()
```

```
def get_region_id(self):
     meta_data = os.popen("curl {}".format(self.OPENSTACK_METADATA))
     json_meta_data = json.loads(meta_data.read())
     meta_data.close()
     region_id = json_meta_data["region_id"]
     if region_id not in self.SUPPORT_REGIONS:
        print("current region {} is not support.".format(region_id))
        raise Exception('region exception')
     return region_id
  def gen_collect_npu_log_shell(self):
     # 300IDUO does not support
     hccn_tool_log_shell = "echo {npu_network_info}\n" \
                     "for i in {npu_card_ids}; do hccn_tool -i $i -net_health -g >> {npu_log_path}/npu-
smi_net-health.log;done\n"
                     "for i in {npu_card_ids}; do hccn_tool -i $i -link -g >> {npu_log_path}/npu-
smi_link.log;done\n"\
                     "for i in {npu_card_ids}; do hccn_tool -i $i -tls -g |grep switch >> {npu_log_path}/
npu-smi_switch.log;done\n"
                     "for i in {npu_card_ids}; do hccn_tool -i $i -optical -g | grep prese >>
{npu_log_path}/npu-smi_present.log ;done\n" \
                     "for i in {npu_card_ids}; do hccn_tool -i $i -link_stat -g >> {npu_log_path}/
npu_link_history.log ;done\n"
                     "for i in {npu_card_ids}; do hccn_tool -i $i -ip -g >> {npu_log_path}/
\label{linear_coe_ip_infolog} $$ npu\_roce\_ip\_info.log ; done\n'' \\ "for i in {npu\_card\_ids}; do hccn\_tool -i $i -lldp -g >> {npu\_log\_path}/
npu_nic_switch_info.log;done\n"
        .format(npu_log_path=self.NPU_LOG_PATH,
              npu_card_ids=self.card_ids,
              npu_network_info="collect npu network info")
     collect_npu_log_shell = "# !/bin/sh\n" \
                      "step=1\n" \
                      "rm -rf {npu_log_path}\n" \
                      "mkdir -p \{npu\_log\_path\} \ \ \\
                      "echo {echo_npu_driver_info}\n" \
                      "npu-smi info > npu_log_path/npu-smi_info.log\n" \
                      "cat /usr/local/Ascend/driver/version.info > {npu_log_path}/npu-smi_driver-
version.log\n" \
                      "/usr/local/Ascend/driver/tools/upgrade-tool --device_index -1 --component -1 --
version > {npu_log_path}/npu-smi_firmware-version.log\n" \
                      "for i in {npu_card_ids}; do for ((j=0;j<{chip_count};j++)); do npu-smi info -t
health -i $i -c $j; done >> {npu_log_path}/npu-smi_health-code.log;done;\n" \
                      "for i in {npu_card_ids}; do npu-smi info -t board -i $i >> {npu_log_path}/npu-
smi_board.log; done;\n" \
                      "echo {echo_npu_ecc_info}\n" \
                      "for i in {npu_card_ids};do npu-smi info -t ecc -i $i >> {npu_loq_path}/npu-
smi_ecc.log; done;\n"
                      "lspci | grep acce > {npu_log_path}/Device-info.log\n" \
                      "echo {echo_npu_device_log}\n" \
                      "cd {npu_log_path} && msnpureport -f > /dev/null\n" \
                      "tar -czvPf {npu_log_path}/log_messages.tar.gz /var/log/message* > /dev/null
\n" \
                      "tar -czvPf {npu_log_path}/ascend_install.tar.gz /var/log/ascend_seclog/* > /dev/
null\n" \
                      "echo {echo npu tools loa}\n" \
                      "tar -czvPf {npu_log_path}/ascend_toollog.tar.gz /var/log/nputools_LOG_*
> /dev/null\n" \
        .format(npu_log_path=self.NPU_LOG_PATH,
              npu_card_ids=self.card_ids,
              chip count=self.chip count,
              echo_npu_driver_info="collect npu driver info.",
              echo npu ecc info="collect npu ecc info.".
              echo_npu_device_log="collect npu device log.",
              echo_npu_tools_log="collect npu tools log.")
     if self.is_300_iduo:
        return collect_npu_log_shell
     return collect_npu_log_shell + hccn_tool_log_shell
```

```
def collect_npu_log(self):
     print("begin to collect npu log")
     os.system(self.gen_collect_npu_log_shell())
     date_collect = datetime.now().strftime('%Y%m%d%H%M%S')
     instance_ip_obj = os.popen("curl http://169.254.169.254/latest/meta-data/local-ipv4")
     instance_ip = instance_ip_obj.read()
     instance_ip_obj.close()
     log_tar = "%s-npu-log-%s.tar.gz" % (instance_ip, date_collect)
     os.system("tar -czvPf %s %s > /dev/null" % (log_tar, self.NPU_LOG_PATH))
     print("success to collect npu log with {}".format(log_tar))
     return log_tar
  def upload_log_to_obs(self, log_tar):
     obs_bucket = "{}{}".format(self.OBS_BUCKET_PREFIX, self.region_id)
     print("begin to upload {} to obs bucket {}".format(log_tar, obs_bucket))
     obs_url = "https://%s.obs.%s.myhuaweicloud.com/%s/%s" % (obs_bucket, self.region_id,
self.obs_dir, log_tar)
     date = datetime.utcnow().strftime('%a, %d %b %Y %H:%M:%S GMT')
     canonicalized_headers = "x-obs-acl:public-read"
     obs sign = self.gen obs sign(date, canonicalized headers, obs bucket, log tar)
     auth = "OBS " + self.ak + ":" + obs_sign
     header_date = '\"' + "Date:" + date + '\"'
     header_auth = '\''' + "Authorization:" + auth + '\'''
     header_obs_acl = '\"' + canonicalized_headers + '\"'
     cmd = "curl -X PUT -T " + log tar + " -w %{http_code} " + obs_url + " -H " + header_date + " -H
" + header_auth + " -H " + header_obs_acl
     result = subprocess.run(cmd, shell=True, capture_output=True, text=True)
     http code = result.stdout.strip()
     if result.returncode == 0 and http_code == "200":
        print("success to upload {} to obs bucket {}".format(log_tar, obs_bucket))
     else:
        print("failed to upload {} to obs bucket {}".format(log_tar, obs_bucket))
        print(result)
  # calculate obs auth sign
  def gen_obs_sign(self, date, canonicalized_headers, obs_bucket, log_tar):
     http_method = "PUT"
     canonicalized_resource = "/%s/%s/%s" % (obs_bucket, self.obs_dir, log_tar)
     IS_PYTHON2 = sys.version_info.major == 2 or sys.version < '3'
     canonical_string = http_method + "\n" + "\n" + date + "\n" + canonicalized_headers +
"\n" + canonicalized_resource
     if IS PYTHON2:
        hashed = hmac.new(self.sk, canonical_string, hashlib.sha1)
        obs sign = binascii.b2a base64(hashed.digest())[:-1]
        hashed = hmac.new(self.sk.encode('UTF-8'), canonical_string.encode('UTF-8'), hashlib.sha1)
        obs_sign = binascii.b2a_base64(hashed.digest())[:-1].decode('UTF-8')
     return obs_sign
  # get NPU Id and Chip count
  def get card ids(self):
     card_ids = []
     cmd = "npu-smi info -l"
     result = subprocess.run(cmd, shell=True, capture_output=True, text=True)
     if result.returncode != 0:
        print("failed to execute commond[{}]".format(cmd))
        return "
     match = re.search(r'Chip Count\s*:\s*(\d+)', result.stdout)
     # default chip count is 1, 300IDUO or 910C is 2
     chip_count = 1
     if match and int(match.group(1)) > 0:
        chip_count=int(match.group(1))
     # filter NPU ID Regex
     pattern = re.compile(r'NPU ID(.*?): (.*?)\n', re.DOTALL)
     matches = pattern.findall(result.stdout)
     for match in matches:
```

```
if len(match) != 2:
          continue
        id = int(match[1])
        # if drop card
        if id < 0:
           print("Card may not be found, NPU ID: {}".format(id))
           continue
        card_ids.append(id)
     print("success to get card id {}, Chip Count {}".format(card_ids, chip_count))
     return " ".join(str(x) for x in card_ids), chip_count
  def execute(self):
     if self.obs_dir == "":
        print("the obs_dir is null, please enter a correct dir")
     else:
        log_tar = self.collect_npu_log()
        self.upload_log_to_obs(log_tar)
if name == ' main ':
  npu_log_collection = NpuLogCollection(ak='ak',
                             sk='sk',
                             obs_dir='obs_dir',
                             is_300_iduo=False)
  npu_log_collection.execute()
```

4. Run the script to collect logs.

Run the script on the node. If the following information is displayed, logs are collected and uploaded to OBS.

Figure 5-3 Log uploaded

```
python npu-log-collection.py
Average Speed Time Time
                        % Received % Xferd
                                                                                                                                               Current
100 1778 100 1778
                                              0
                                                           0
                                                                21682
                                                                                                                                  -:--:- 21682
Deegin to collect npu log collect npu driver info. collect npu ecc info. collect npu device log. collect npu tools log.
                        % Received % Xferd
                                                                 Average Speed
                                                                                                 Time
                                                                Dload Upload
526 0
                                                                                                 Total
                                                                                                                 Spent
                                                                                                                                   Left
 uccess to collect npu log with 10.0.0.209-npu-log-20240809164759.tar.gz
egin to upload 10.0.0.209-npu-log-20240809164759.tar.gz to obs bucket npu-log-cn-north-9
uccess to upload 10.0.0.209-npu-log-20240809164759.tar.gz to obs bucket npu-log-cn-north-9
```

5. View the uploaded log package in the directory where the script is stored.

Figure 5-4 Viewing the result

5.2 Collecting and Uploading GPU Logs

Scenario

When a GPU is faulty, collect GPU log information by referring to this exercise. The logs generated in this exercise are saved on the node and automatically uploaded to the OBS bucket provided by technical support. Logs are used only for fault locating and analysis. You need to provide the AK/SK for authorization and authentication.

Procedure

1. Obtain the AK/SK, which are used for script configuration, as well as authentication and authorization.

If an AK/SK pair is already available, skip this step. Find the downloaded AK/SK file, which is usually named **credentials.csv**.

The file contains the username, AK, and SK.

Figure 5-5 credential.csv



To generate an AK/SK pair, follow these steps:

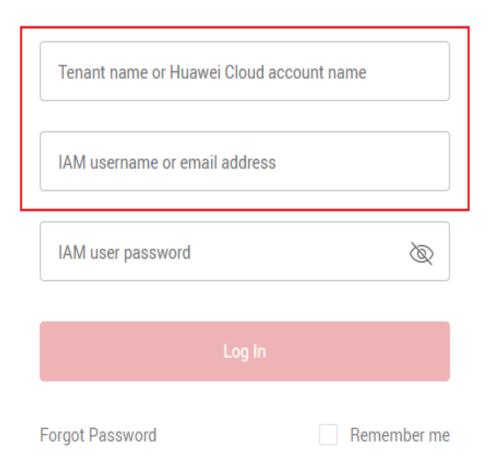
- a. Log in to the Huawei Cloud console.
- b. Hover over the username in the upper right corner and choose **My Credentials** from the drop-down list.
- c. In the navigation pane on the left, choose Access Keys.
- d. Click Create Access Key.
- e. Download the key and keep it secure.
- 2. Prepare the tenant ID and IAM ID for OBS bucket configuration.

Send the prepared information to Huawei technical support, who will configure an OBS bucket policy based on your information. You can upload the collected logs to the corresponding OBS bucket.

After the configuration, the OBS directory **obs_dir** is provided for you to configure subsequent scripts.

Figure 5-6 Tenant ID and IAM ID

IAM User Login



3. Collect the logs and upload the script.

Modify the **GpuLogCollection** parameter in the script below and replace **ak**, **sk**, and **obs_dir** with the values obtained in the previous steps. Upload the script to the node whose GPU logs need to be collected.

```
import ison
import os
import sys
import hashlib
import hmac
import binascii
from datetime import datetime
class GpuLogCollection(object):
  GPU_LOG_PATH = "nvidia-bug-report.log.gz"
  SUPPORT_REGIONS = ['cn-north-4', 'cn-north-9']
  OPENSTACK_METADATA = "http://169.254.169.254/openstack/latest/meta_data.json"
  OBS_BUCKET_PREFIX = "npu-log-"
  def __init__(self, ak, sk, obs_dir):
     self.ak = ak
     self.sk = sk
     self.obs_dir = obs_dir
     self.region_id = self.get_region_id()
  def get_region_id(self):
     meta_data = os.popen("curl {}".format(self.OPENSTACK_METADATA))
```

```
json_meta_data = json.loads(meta_data.read())
     meta_data.close()
     region_id = json_meta_data["region_id"]
     if region_id not in self.SUPPORT_REGIONS:
        print("current region {} is not support.".format(region_id))
        raise Exception('region exception')
     return region_id
  def gen_collect_gpu_log_shell(self):
     collect_gpu_log_shell = "nvidia-bug-report.sh"
     return collect_gpu_log_shell
  def collect_gpu_log(self):
     print("begin to collect gpu log")
     os.system(self.gen_collect_gpu_log_shell())
     date_collect = datetime.now().strftime('%Y%m%d%H%M%S')
     instance_ip_obj = os.popen("curl http://169.254.169.254/latest/meta-data/local-ipv4")
     instance_ip = instance_ip_obj.read()
     instance_ip_obj.close()
     log_tar = "%s-gpu-log-%s.gz" % (instance_ip, date_collect) os.system("cp %s %s" % (self.GPU_LOG_PATH, log_tar))
     print("success to collect gpu log with {}".format(log_tar))
     return log_tar
  def upload log to obs(self, log tar):
     obs_bucket = "{}{}".format(self.OBS_BUCKET_PREFIX, self.region_id)
     print("begin to upload {} to obs bucket {}".format(log_tar, obs_bucket))
     obs_url = "https://%s.obs.%s.myhuaweicloud.com/%s/%s" % (obs_bucket, self.region_id,
self.obs_dir, log_tar)
     date = datetime.utcnow().strftime('%a, %d %b %Y %H:%M:%S GMT')
     canonicalized_headers = "x-obs-acl:public-read"
     obs_sign = self.gen_obs_sign(date, canonicalized_headers, obs_bucket, log_tar)
     auth = "OBS " + self.ak + ":" + obs_sign
header_date = '\"' + "Date:" + date + '\"'
     header_auth = '\"' + "Authorization:" + auth + '\"'
     header_obs_acl = '\"' + canonicalized_headers + '\"'
     cmd = "curl -X PUT -T " + log_tar + " " + obs_url + " -H " + header_date + " -H " + header_auth
+ " -H " + header_obs_acl
     os.system(cmd)
     print("success to upload {} to obs bucket {}".format(log_tar, obs_bucket))
  # calculate obs auth sign
  def gen_obs_sign(self, date, canonicalized_headers, obs_bucket, log_tar):
     http_method = "PUT"
     canonicalized_resource = "/%s/%s/%s" % (obs_bucket, self.obs_dir, log_tar)
     IS_PYTHON2 = sys.version_info.major == 2 or sys.version < '3'
     canonical_string = http_method + "\n" + "\n" + date + "\n" + canonicalized_headers +
"\n" + canonicalized resource
     if IS_PYTHON2:
        hashed = hmac.new(self.sk, canonical_string, hashlib.sha1)
        obs_sign = binascii.b2a_base64(hashed.digest())[:-1]
        hashed = hmac.new(self.sk.encode('UTF-8'), canonical_string.encode('UTF-8'), hashlib.sha1)
        obs_sign = binascii.b2a_base64(hashed.digest())[:-1].decode('UTF-8')
     return obs sign
  def execute(self):
     log_tar = self.collect_gpu_log()
     self.upload_log_to_obs(log_tar)
if __name__ == '__main__':
  gpu_log_collection = GpuLogCollection(ak='ak',
                             sk='sk',
                             obs_dir='xxx')
  gpu_log_collection.execute()
```

4. Run the script to collect logs.

Run the script on the node. If the following information is displayed, logs are collected and uploaded to OBS.

Figure 5-7 Log collected

```
root@dev:
             ___::~/test# python3 log.py
           % Received % Xferd Average Speed
                                             Time
                                                      Time
 % Total
                              Dload Upload Total Spent
                                                              Left Speed
100 1710 100 1710
                     0
                            0 63333
                                         0 --:--:- 63333
begin to collect gpu log
nvidia-bug-report.sh will now collect information about your
system and create the file 'nvidia-bug-report.log.gz' in the current
directory. It may take several seconds to run. In some
cases, it may hang trying to capture data generated dynamically
by the Linux kernel and/or the NVIDIA kernel module. While
the bug report log file will be incomplete if this happens, it
may still contain enough data to diagnose your problem.
If nvidia-bug-report.sh hangs, consider running with the --safe-mode
and --extra-system-data command line arguments.
Please include the 'nvidia-bug-report.log.gz' log file when reporting
your bug via the NVIDIA Linux forum (see forums.developer.nvidia.com)
or by sending email to 'linux-bugs@nvidia.com'.
By delivering 'nvidia-bug-report.log.gz' to NVIDIA, you acknowledge
and agree that personal information may inadvertently be included in
the output. Notwithstanding the foregoing, NVIDIA will use the
output only for the purpose of investigating your reported issue.
Running nvidia-bug-report.sh... complete.
          % Received % Xferd Average Speed
                                             Time
                                                      Time
                                                               Time Current
                              Dload Upload Total
                                                      Spent
                                                              Left Speed
               12 0
     12 100
                           0
                                521
                                        0 --:--:--
success to collect gpu log with 192.168.0.23-gpu-log-20250206092139.gz
begin to upload 192.168.0.23-gpu-log-20250206092139.gz to obs bucket c30049938
success to upload 192.168.0.\underline{2}3-gpu-log-20250206092139.gz to obs bucket c30049938
```

View the uploaded log package in the directory where the script is stored.

Figure 5-8 Viewing the result

```
root@devser_____c:~/test# ls
192.168.0.23-gpu-log-20250206092139.gz log.py nvidia-bug-report.log.gz
```

6 Managing Lite Server Resources

6.1 Viewing Lite Server Details

After you create a Lite Server node, you can query and manage your servers on the management console. This section describes how to view Lite Server node details, including name, ID, specifications, and image.

On the **Lite Servers** page, you can view the status, creation time, billing mode, instance specifications, core hardware configuration, private IP address, and bound VPC name of the server node.

Figure 6-1 Viewing the server node



Click a node name to view its details. Table 6-1 lists the parameters.

Table 6-1 Parameters on the details page

Parameter	Description
Name	Name of the Lite Server
Specification s	Specifications of the Lite Server
ID	ID of the Lite Server, which can be queried in the Billing Center.
Billing Mode	Current billing mode of the Lite Server
Status	Running status of the Lite Server
VPC	VPC bound to the Lite Server during creation. You can click the link to go to the VPC details page.

Parameter	Description
BMS	The Lite Server is a BMS. You can click the link to access the corresponding BMS details page.
Image	Image of the Lite Server
Created	Time when the Lite Server is created
Updated At	Update time of the Lite Server
Order	Order corresponding to the Lite Server. You can click the link to go to the Billing Center.

Figure 6-2 Lite Server details



6.2 Starting or Stopping the Lite Server

You can stop a running server instance if Lite Server is no longer needed, avoiding resource consumption. To use a stopped Lite Server, start it.

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Start or stop a Lite Server as follows:
 - Starting a Lite Server: Click **Start**. The Lite Server must be stopped, failed to be stopped, or failed to be started.
 - Stopping a Lite Server: Click Stop. In the displayed dialog box, confirm the information, enable autofill, and click OK. The Lite Server must be running or failed to be stopped.

Stop Lite Server Instance

Instance devserver is to be stopped, and related jobs will be stopped simultaneously. Exercise caution when performing this operation.

Instance Lite Server will be stopped devserver

Name

Created At

devserver

Apr 08, 2025 11:30:17 GMT+08:00

Figure 6-3 Stopping a server

□ NOTE

Please note that the instances are stopped in forcible shutdown mode, which may interrupt your services. Make sure you have saved the files on them before stopping.

Cancel

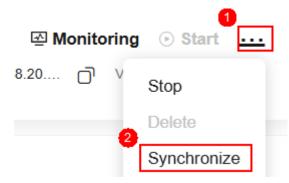
OK

6.3 Synchronizing the Lite Server Status

A Lite Server is an elastic BMS. After you change the BMS status on the cloud server page, you can synchronize the status to ModelArts.

- **Step 1** Log in to the ModelArts console.
- **Step 2** In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- **Step 3** Locate the target server in the list and choose > **Synchronize** on the right. In the displayed dialog box, confirm the information, enable autofill, and click **OK**.

Figure 6-4 Synchronizing a server



Synchronize Lite Server Instance

If your cloud server status is not synchronized, you can click OK to synchronize it.

Lite Server instance to be synchronized: devserver
Name
Created At
Apr 08, 2025 11:30:17 GMT+08:00

Enter YES to continue. Auto Enter

YES

Figure 6-5 Synchronization confirmation

----End

6.4 Changing or Resetting the Lite Server OS

Scenario

You can change or reset the Lite Server node OS if a BMS is used. Change the OS in any of the following ways:

- (Recommended) Change or reset the OS on the server page of the ModelArts console.
- Change the OS on the BMS console.
- Change the OS using BMS Go SDK.
- Change the OS by encapsulating APIs using Python.

Constraints

- Node status: The Lite Server node must be in the stopped, OS resetting failed, or OS changing failed state. Otherwise, the operation may fail as the system cannot be uninstalled and the disk will be uninstalled repeatedly.
- OS: The target OS must be an IMS public image or private shared image in the region.

Impact

There will be the following impacts when you reset or change the Lite Server node OS:

- 1. System disk ID change: The EVS system disk ID will be changed, which is different from that in the order. As a result, the EVS system disk capacity cannot be scaled out. When you scale out the system disk, a message is displayed, indicating that the current order has expired, the capacity cannot be expanded, and the order needs to be renewed.
- 2. userdata configuration: When you change the OS, userdata injection may not take effect, especially in configdriver mode. Ensure that the **userdata** parameter is imported during node creation, or manually configure necessary settings after the change. Therefore, mount an EVS disk or an SFS disk to expand the storage capacity after changing or resetting the OS.
- 3. Application and model: The deployed model or application may be impacted after you change the OS, as the dependent software package or library may need to be reinstalled or configured. Reconfigure necessary dependencies to ensure proper running of applications.
- 4. BMS risks: For BMS, upgrading OS kernel or driver may cause incompatibility, affecting system startup or basic functions. To perform an upgrade, contact the cloud service provider.

Before changing or resetting an OS, you need to ensure that the node is shut down, check the current settings, back up important data, and contact technical support if necessary.

Changing or Resetting the OS on the Server Page of the ModelArts Console

- **Step 1** Log in to the **ModelArts console**.
- **Step 2** In the navigation pane on the left, choose **Lite Serves** under **Resource Management**. Access the nodes page.
- Step 3 Locate the target Lite Server in the list and choose > Change OS or Reset OS on the right. In the displayed dialog box, confirm the information and click OK.

The Lite Server node is in the state of changing or resetting OS.

----End

Changing the OS on the BMS Console

Step 1 Obtain the OS image.

The OS image is provided by the cloud service. You can receive the image on the shared image page of IMS, as shown in the following figure.

Figure 6-6 Shared image



Step 2 Change OS.

Stop the BMS corresponding to the Lite Server resource. The OS must be stopped.

Locate the target BMS in the list and choose **More** > **Change OS** in the **Operation** column.

Figure 6-7 Changing OS



On the **Change OS** page, select the shared image received in the previous step.

----End

Changing the OS Using BMS Go SDK

The following is the sample code for changing the OS of a BMS using the Go language through SDK.

```
import (
   "fmt"
   "os"
   "github.com/huaweicloud/huaweicloud-sdk-go-v3/core/auth/basic"
   bms "github.com/huaweicloud/huaweicloud-sdk-go-v3/services/bms/v1"
   "github.com/huaweicloud/huaweicloud-sdk-go-v3/services/bms/v1/model"
   region "github.com/huaweicloud/huaweicloud-sdk-go-v3/services/bms/v1/region"
)

func main() {
   // Hardcoded or plaintext AK/SK is risky. For security, encrypt your AK/SK and store them in the configuration file or environment variables.
   // In this example, the AK/SK are stored in environment variables for identity authentication. Before running this example, set environment variables HUAWEICLOUD_SDK_AK and HUAWEICLOUD_SDK_SK.
```

```
ak := os.Getenv("HUAWEICLOUD_SDK_AK")
sk := os.Getenv("HUAWEICLOUD_SDK_SK")
auth := basic.NewCredentialsBuilder().
  WithAk(ak).
  WithSk(sk).
  Build()
client := bms.NewBmsClient(
  bms.BmsClientBuilder().
     WithRegion(region.ValueOf("cn-north-4")).
     WithCredential(auth).
     Build())
keyname := "KeyPair-name"
userdata := "aGVsbG8gd29ybGQsIHdlbGNvbWUgdG8gam9pbiB0aGUgY29uZmVyZW5jZQ=="
request := &model.ChangeBaremetalServerOsRequest{
  ServerId: "****input your bms instance id****",
  Body: &model.OsChangeReq{
     OsChange: &model.OsChange{
       Keyname: &keyname,
       Imageid: "****input your ims image id****",
       Metadata: &model.MetadataInstall{
          UserData: &userdata,
       },
     },
  },
response, err := client.ChangeBaremetalServerOs(request)
if err == nil {
  fmt.Printf("%+v\n", response)
} else {
  fmt.Println(err)
```

Changing the OS by Encapsulating APIs Using Python

The following is the sample code for changing the BMS OS using Python through APIs:

```
# -*- coding: UTF-8 -*-
import requests
import ison
import time
import requests.packages.urllib3.exceptions
from urllib3.exceptions import InsecureRequestWarning
requests.packages.urllib3.disable_warnings(InsecureRequestWarning)
class ServerOperation(object):
  ######################### IAM authentication
def __init__(self, account, password, region_name, username=None, project_id=None):
    :param username: if IAM user, here is small user, else big user
    :param account: account big big user
    :param password: account
    :param region_name:
    self.account = account
    self.username = username
    self.password = password
    self.region_name = region_name
    self.project_id = project_id
    self.ma_endpoint = "https://modelarts.{}.myhuaweicloud.com".format(region_name)
    self.service_endpoint = "https://bms.{}.myhuaweicloud.com".format(region_name)
```

```
self.iam_endpoint = "https://iam.{}.myhuaweicloud.com".format(region_name)
     self.headers = {"Content-Type": "application/json",
                "X-Auth-Token": self.get_project_token_by_account(self.iam_endpoint)}
  def get_project_token_by_account(self, iam_endpoint):
     body = {
        "auth": {
           "identity": {
             "methods": [
                "password"
              "password": {
                "user": {
                   "name": self.username if self.username else self.account,
                   "password": self.password,
                   "domain": {
                      "name": self.account
               }
             }
           "scope": {
             "project": {
                "name": self.region_name
       }
     headers = {
        "Content-Type": "application/json"
     import json
     url = iam_endpoint + "/v3/auth/tokens"
     response = requests.post(url, headers=headers, data=json.dumps(body), verify=True)
     token = (response.headers['X-Subject-Token'])
     return token
  def change_os(self, server_id):
     url = "{}/v1/{}/baremetalservers/{}/changeos".format(self.service_endpoint, self.project_id, server_id)
     print(url)
     body = {
        "os-change": {
           "adminpass": "@Server",
           "imageid": "40d88eea-6e41-418a-ad6c-c177fe1876b8"
       }
     response = requests.post(url, headers=self.headers, data=json.dumps(body), verify=False)
     print(json.dumps(response.json(), indent=1))
     return response.json()
if __name__ == '__main__':
  # Prepare for calling the API and initialize the authentication.
  server = ServerOperation(username="xxx",
                   account="xxx",
                   password="xxx"
                   project_id="xxx",
                   region_name="cn-north-4")
  server.change_os(server_id="0c84bb62-35bd-4e1c-ba08-a3a686bc5097")
```

6.5 Creating a Lite Server OS

Scenario

If the current Lite Server OS does not meet your requirements, you can use BMS or ECS to create an image and save the current OS as a new image for other Lite Servers.

Constraints

Before creating an image, ensure that the Lite Server is stopped.

The created image can only be created based on the current OS of the Lite Server.

Procedure

- 1. Delete temporary files before creating an OS image to prevent potential issues with running the image. To do so, log in to the server. Run the commands below separately or create a script to run the commands all at once. For details about the clearance script, see **Script for Deleting Temporary Files**.
 - a. Clear user login records:echo > /var/log/wtmp
 - echo > /var/log/btmpb. Delete temporary files:
 - rm -rf /var/log/cloud-init*
 - rm -rf /var/lib/cloud/*
 - rm -rf /var/log/network-config.log
 - rm -rf /opt/huawei/network_config/network_config.json
 - rm -rf /opt/huawei/port_config/uplink_hash_config.log
 - rm -rf /opt/huawei/firmware_check/firmware_check.log
 - c. Delete residual configurations.
 - CentOS/EulerOS/HCE OS: Check the files whose names start with ifcfg in the /etc/sysconfig/network-scripts/ folder and delete them except ifcfg-lo.

Check files:

ll /etc/sysconfig/network-scripts/

Delete files:

rm -rf /etc/sysconfig/network-scripts/ifcfgxxx

- Ubuntu:
 - rm -rf /etc/network/interfaces.d/50-cloud-init.cfg
- d. Clear the network information of the parameter plane: echo >/etc/netplan/roce.yaml echo > /etc/hccn.conf
- e. Clear operation records: history -w;echo > /root/.bash_history;history -c;history -c;history -c;
- 2. Shut down the Lite Server.

Log in to the **ModelArts console** and stop the target server.

Figure 6-8 Stopping the Lite Server

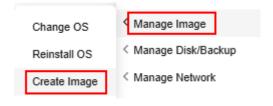


3. On the Lite Server details page, click the BMS address or ECS address to access its details page.

Figure 6-9 Lite Server details page

4. On the BMS or ECS console, return to the server list page, and choose Manage Image > Create Image in the Operation column.

Figure 6-10 Creating an image on an ECS



On the image creation page, enter the image name and enterprise project, select the agreement, and confirm the creation. The created image is saved in the private image list of the IMS service. For details, see **Creating an Image** and **Creating a Private Image from a BMS**.

The created image can be used for other Lite Servers. For details, see **Changing or Resetting the Lite Server OS**.

Script for Deleting Temporary Files

#!/bin/bash

Clear user login records:
echo > /var/log/wtmp
echo > /var/log/btmp

Delete temporary files:
rm -rf /var/log/cloud-init*

```
rm -rf /var/lib/cloud/*
rm -rf /var/log/network-config.log
rm -rf /opt/huawei/network_config/network_config.json
rm -rf /opt/huawei/port_config/uplink_hash_config.log
rm -rf /opt/huawei/firmware_check/firmware_check.log
# Delete residual configurations:
## CentOS/EulerOS/HCE OS:
## Check the files whose names start with ifcfg in the /etc/sysconfig/network-scripts/ folder and delete
them except ifcfg-lo.
find /etc/sysconfig/network-scripts/ -name 'ifcfg*' ! -name 'ifcfg-lo' -type f | xargs rm -f
## Ubuntu:
rm -rf /etc/network/interfaces.d/50-cloud-init.cfg
# Clear the network information of the parameter plane:
echo > /etc/netplan/roce.yaml
echo > /etc/hccn.conf
# Clear operation records:
history -w;echo > /root/.bash_history;history -c;history -c;history -c;
echo > ~/.bash_history
exec bash
```

6.6 Lite Server Hot Standby Nodes

Scenario

To enable Lite Server hot standby, create custom Kubernetes clusters. These clusters mark specific nodes as hot standbys by applying taints, so that service pods will not be scheduled to these nodes.

Constraints

Prepare required hot standby nodes by referring to the following table.

Table 6-2 Required hot standby nodes

Resou rce Type/ Requir ed Nodes	< 10	10-49	50-99	100- 249	250- 499	500- 749	750- 1,000	> 1,000
Snt9A	0	1	2	3	5	7	10	12
Snt9b	0	1	2	3	4	5	6	10
GP Ant8	0	1	2	3	5	6	8	12
GP Vnt1	0	1	2	3	5	8	10	12

Example 1:

If you have purchased six Snt9b nodes, which is less than 10. According to the preceding table, you do not need to prepare hot standby nodes.

Example 2:

If you have purchased 600 Snt9b nodes, which is between 500 and 749. According to the preceding table, you need to prepare five more nodes as hot standbys. In this case, you need to purchase 605 nodes in total.

Prerequisites

You have created a Kubernetes cluster using Lite Server.

Hot Standby Replacement

If a hardware fault occurs on a service node in the cluster and hot standby replacement is required, back up data first, and then taint the faulty node and remove the hot standby node's taint.

1. Data backup

Use rsync, a powerful file synchronization tool that supports local and remote synchronization, to flexibly and efficiently back up data.

```
rsync -avz -e ssh /source/ user@remote:/destination/
```

Back up the faulty node file to the hot standby node. The **backup.txt** file is used as an example.

Complete the backup using SSH. Then, you can view the file on the new hot standby node.

```
root@cce_456064-nodepool-69256-ucoi9:~# ls
back_up.txt check_env.sh disk_filter.sh print_log.sh snap
root@cce_456064-nodepool-69256-ucoi9:~# _
```

2. Hot standby node replacement

Taint the faulty node.

kubectl taint nodes <node-name> dedicated=ops:NoSchedule

- <node-name>: Replace it with the actual node name.
- dedicated=ops: key-value pair of the taint.
- NoSchedule: taint effect. This indicates that kube-scheduler will not schedule pods to the node.

Check whether the node is tainted.

The node is labeled as unschedulable.

Remove the taint from the hot standby node.

The hot standby node replacement is complete. Repair the faulty node.

6.7 Modifying a Lite Server Name

Scenario

After a Lite Server is created, you can change the server name as required for easy management.

Constraints

- The server name in the order will not be changed. If you change the name after placing the order, the new name will not be synchronized to the order.
- If a BMS or ECS is used to create a Lite Server, the server name can be changed. However, after the server name is changed on the BMS or ECS, the new name is not automatically synchronized to Lite Server. You need to manually synchronize the new name. For details, see Synchronizing the Lite Server Status.
- If a supernode is used to create a Lite Server, you can change the name of a subnode server. The supernode name cannot be changed.
- You can modify the server name only when the Lite Server is running or stopped.

Modifying a Server Node Name

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Click the target node to access its details page, and click on the right to change the node name.

Figure 6-11 Changing the node name



You can also change the server name on the subnode list of the supernode details page. After the name is changed, the new name is displayed.

6.8 Authorizing the Repair of Lite Server Nodes

Scenario

If hardware maintenance is required for a Lite Server node due to an unrecoverable fault, a scheduled event will be pushed to the event center of the console. In the event center, you can view the event information, type, status, and description. You can also authorize Huawei technical support to perform O&M on the faulty node or redeploy the node.

Table 6-3 Event operation execution conditions

Event Type	Event Status	Supported Operations	Applicable Resource Type	Description
System maintenan ce	Authoriz ation Pending	Authorizati on and redeployme nt	Snt9b	System maintenance is to authorize Huawei technical support to systematically maintain the faulty node.
Local disk recovery	Authoriz ation Pending	Authorizati on and redeployme nt	Snt9b	Local disk recovery is to authorize Huawei technical support to maintain the faulty local disk. WARNING After authorization, recovering the local disk will cause local supernode disk loss. Therefore, migrate services and back up data before authorization.
Supernode maintenan ce	Authoriz ation Pending	Authorizati on	Snt9b23	Supernode maintenance is to authorize Huawei technical support to recover faulty nodes by manually repairing or replacing components.
Supernode redeploym ent	Authoriz ation Pending	Authorizati on	Snt9b23	Supernode redeployment is to authorize the Huawei O&M system to recover faulty nodes by automatically replacing nodes. After the recovery, the node name, node ID, and IP address remain unchanged except the physical device information.

Event Type	Event Status	Supported Operations	Applicable Resource Type	Description
Supernode local disk recovery	Authoriz ation Pending	Authorizati on	Snt9b23	Supernode local disk recovery is to authorize Huawei technical support to restore the local disk of the supernode.
				WARNING After authorization, recovering the local disk will cause local supernode disk loss. Therefore, migrate services and back up data before authorization.

- Authorization: Authorize Huawei technical support to repair the hardware of the faulty node one by one, which takes a long time.
- Redeployment: Authorize Huawei technical support to replace the faulty node with a new one, which is fast, but local disk data will be lost after the redeployment. Exercise caution. Moreover, migrate services and back up data before redeployment.

Constraints

- Only Ascend Snt9b and Snt9b23 support hardware maintenance through scheduled events.
- Redeployment of supernodes must be performed within physical supernodes.
 If there are 48 supernodes, redeployment is not supported and the authorization button becomes unavailable.
- If the planned event does not meet the requirements listed in **Table 6-3**, the **Authorize** button becomes unavailable.
- Before authorizing a supernode redeployment event, you need to stop the server instance on the **Lite Servers** page. Otherwise, the authorization fails. After the event is executed, restart the server instance.
- Authorizing a node will affect services running on it. The authorization operation can be performed only when the event type is **Supernode Redeployment** and the node is shut down.
- After the local node disk and supernode disk are restored, the local disk data will be lost. Therefore, migrate services and backup data before authorization. After the local disk is restored, log in to the Lite Server node to partition the local disk.

Viewing Scheduled Events

Log in to the **ModelArts console**. In the navigation pane on the left, click **Event Center** under **Resource Management**. You can view the event details on the displayed page. By default, events in the **Authorization Pending**, **Authorized**, and

Executing states are displayed. You can remove the filter criteria to view events in all states.

Table 6-4 Scheduled event description

Attribute	Description	Example
Event ID	Unique event ID.	5ad1df12- e3d2-4f36- b367- xxxxxxxxxxxxx
Node Name/ID	Name and ID of the server node that initiates the event.	devserver-dd50 1e0d95ad-5a9f- 46e3-9ba6- c5f8fcxxxx
Event Type	For details about the event types, see Table 6-3 .	Supernode Redeployment
Event Status	Authorization Pending: Querying. The event is to be authorized. After authorization, the status changes to Authorized.	Authorization Pending
	 Authorized: The O&M task is planned to be executed but has not started. After the task starts, the task enters the Executing state. 	
	 Executing: The O&M task is being executed. Completed: The O&M task has been executed. 	
	Failed: The O&M task fails to be executed.	
	Canceled: The system cancels the O&M task.	
Event Descriptio n	Cause of the event.	Underlying hardware fault. alarmName=XX XX,bmcip=2409: 27ff:1003:0103: 0011:0000:0000 :xxxx,componen tName=XXXX is automatically connected through CAR.
Obtained At	Event creation time	2025/02/19 16:05:32 GMT +08:00
Executed	Time when an event enters the scheduling and execution phase	2025/03/03 16:23:16 GMT +08:00

Attribute	Description	Example
Operation	Authorize: Authorizing a node will affect services running on it. The authorization operation can be performed only when the event type is Supernode Redeployment and the node is shut down.	
	NOTE Redeployment of supernodes must be performed within physical supernodes. If there are 48 supernodes, redeployment is not supported and the authorization button becomes unavailable.	

Authorization Operations

If the faulty nodes meet the requirements listed in **Table 6-3**, you can authorize Huawei technical support to perform O&M on the faulty nodes.

To do so, log in to the ModelArts console. In the navigation pane on the left, choose **Event Center**. Locate the target node and click **Authorize** in the **Operation** column. In the displayed dialog box, click **OK**. The following steps describe how to authorize Huawei technical support to perform O&M on a supernode.

- Log in to the ModelArts console. In the navigation pane on the left, choose Event Center. On the displayed Event Center page, view events whose Event Type is Supernode maintenance and click Authorize.
- 2. The supernode maintenance event enters the **Authorized** state.
- 3. After the supernode is repaired, the event status is **Completed**. In this case, the node is available.

After the O&M, Huawei technical support will disable the authorization. You do not need perform any operation.

For local disk and supernode disk restoration, you need to log in to the Lite Server node to partition the local disk afterwards.

Redeployment Operations

If the faulty node meets the redeployment conditions described in **Table 6-3**, log in to the ModelArts console. In the navigation pane on the left, choose **Event Center** under **Resource Management**. Locate the target node and click **Redeploy** in the **Operation** column. In the displayed dialog box, enter **YES** and click **OK**.

After the redeployment, the data on the local disk will be lost. Exercise caution. Migrate services and back up data before redeployment.

If the planned event does not meet the requirements listed in **Table 6-4**, the **Redeploy** button becomes unavailable.

After the O&M, Huawei technical support will disable the authorization. You do not need perform any operation.

6.9 Releasing Lite Server Resources

You can delete or unsubscribe from the resources that are no longer used. For details about how to stop billing, see **Stopping Billing**.

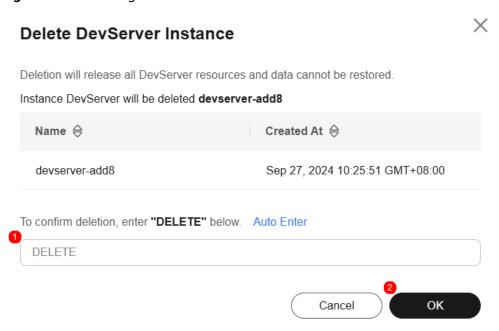
Constraints

- Yearly/Monthly Lite Server resources can be deleted only when they fail to be created or are in the error state. In other states, they can only be unsubscribed from.
- When you delete a yearly/monthly Lite Server resource, the data disks set on the Server creation page will be automatically deleted for ECSs, BMSs, and supernodes. Data disks that are mounted after the server is created will not be deleted.
- When you delete a pay-per-use Lite Server resource, the data disks set on the Server creation page will not be deleted for ECSs and BMSs. Data disks that are mounted after the server is created will not be deleted. For supernode resources, the data disks set on the Server creation page will be deleted, but the data disks that are mounted after the server is created will not be deleted.

Deleting Lite Server Resources

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Locate the target server in the list and choose > **Delete** on the right. In the displayed dialog box, confirm the information, enter **DELETE**, and click **OK**.

Figure 6-12 Deleting a Server instance



Unsubscribing from a Yearly/Monthly Lite Server

You can unsubscribe from the Lite Server in either of the following ways:

- Method 1: Unsubscribe from a single instance on the ModelArts console.
- Method 2: Unsubscribe from a single or multiple instances in the Billing Center.

Unsubscribing from a single instance on the ModelArts console

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Click View All.

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If an agency needs to be configured, contact your account administrator. For details, see **Configuring an Agency for ModelArts**.

- 4. Locate the target BMS in the list and choose > Unsubscribe.
- 5. Confirm the resources to be unsubscribed from and select the reason for unsubscription.
- 6. Confirm the information and select I understand a handling fee will be charged for this unsubscription and After being unsubscribed from, the resources not in the recycle bin will be deleted immediately and cannot be restored. I've backed up data or no longer need the data.
- 7. Click **Confirm** and confirm the resources to be unsubscribed from.
- 8. Click **Unsubscribe** again to unsubscribe from the yearly/monthly resources.

Unsubscribing from a single instance in the Billing Center

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Hover the cursor over the node name and copy the ID of the instance to be unsubscribed from.

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The resource ID (server ID) used in the purchase order is different from the BMS/ECS ID on the console. To unsubscribe from a server, log in to the ModelArts console, choose **Lite Servers** under **Resource Management**, and obtain the required ID.

- 4. Choose **Billing** from the top menu bar. In the navigation pane on the left, choose **Orders** > **Unsubscriptions and Returns/Exchanges**.
- 5. Search for the instance ID, confirm the information, and click **Unsubscribe from Resource** in the **Operation** column.
- 6. Confirm the resources to be unsubscribed from and select the reason for unsubscription.
- 7. Confirm the information and select I understand a handling fee will be charged for this unsubscription and After being unsubscribed from, the

resources not in the recycle bin will be deleted immediately and cannot be restored. I've backed up data or no longer need the data.

- 8. Click **Confirm** and confirm the resources to be unsubscribed from.
- 9. Click **Unsubscribe** again to unsubscribe from the yearly/monthly resources.
- Unsubscribing from multiple instances in the Billing Center
- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Nodes** tab is displayed.
- 3. Record the IDs of instances to be unsubscribed from.

∩ NOTE

If an agency needs to be configured, contact your account administrator. For details, see **Configuring an Agency for ModelArts**.

- 4. Choose **Billing** from the top menu bar. In the navigation pane on the left, choose **Orders** > **Unsubscriptions and Returns/Exchanges**.
- 5. Select the target instances and click **Batch Unsubscribe**.
- 6. Confirm the resources to be unsubscribed from and select the reason for unsubscription.
- 7. Confirm the information and select I understand a handling fee will be charged for this unsubscription and After being unsubscribed from, the resources not in the recycle bin will be deleted immediately and cannot be restored. I've backed up data or no longer need the data.
- 8. Click **Confirm** and confirm the resources to be unsubscribed from.
- 9. Click **Unsubscribe** again to unsubscribe from the yearly/monthly resources.

Releasing Frozen Yearly/Monthly Lite Server Resources

If yearly/monthly nodes or an entire rack of resources are frozen, you cannot unsubscribe to release the resources. In this case, use the release function to release them.

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. Then, access the **Nodes**, **Cabinets**, or **Supernodes** tab.
- 3. Locate the target resource in the list and choose > Release on the right. In the displayed dialog box, confirm the information and click **OK**.

Alternatively, access the resource details page, and choose > **Release** in the upper right corner. In the displayed dialog box, confirm the information and click **OK**.

Lite Server Plug-in Management

7.1 Managing Lite Server AI Plug-ins

Scenario

NodeTaskHub is a plug-in that manages elastic nodes efficiently. It sends tasks and enables automated O&M for ModelArts Lite Server nodes. It supports high-frequency operations such as Ascend software upgrade, real-time detection, and fault diagnosis, reducing manual intervention risks and ensuring stable and efficient AI service processes.

The Lite Server task center provides you with multiple task templates for creating tasks. Task delivery depends on the NodeTaskHub plug-in installed on the Lite Server node. For some public images of the Lite Server, the NodeTaskHub plug-in is preset. You can choose to automatically install the plug-in when purchasing the Lite Server. If it is not installed, manually install it by referring to the following content.

Constraints

- Currently, only Ascend Snt9b and Ascend Snt9b23 nodes are supported.
- The node must be in the running state.
- The Docker service is required for the plug-in. Ensure that the Docker environment has been installed on the node. The Docker environment has been installed in the public OS image of Lite Server. However, if it is not installed in your custom image, perform operations in Physical Machine Environment Configuration.
- The plug-in occupies port 25317 of the node.

Procedure

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. On the displayed page, click the **Agents** tab.

Figure 7-1 Agent Management



- 3. Locate a running node and view the plug-in installation status. If the plug-in is not installed, click **Install** in the **Operation** column.
- 4. Select the plug-in version as prompted and copy the one-click installation command to the node to install the NodeTaskHub.
- 5. After the plug-in is installed, return to the **Agents** tab. The plug-in is in the **Running** state.

Figure 7-2 Running plug-in



After the plug-in is installed, you can perform the following tasks in the task center:

- Upgrading the Ascend Driver and Firmware Version on Lite Server
- One-Click Pressure Test for Lite Server Nodes
- Lite Server Node Fault Diagnosis

7.2 Upgrading the Ascend Driver and Firmware Version on Lite Server

Scenario

This section describes how to deliver an Ascend driver and firmware upgrade task on the Lite Server task center. In this way, you can upgrade the driver and firmware on the Snt9b server in one-click mode.

Constraints

- Currently, only Ascend Snt9b and Ascend Snt9b23 nodes are supported.
- The upgrade may cause service interruption. Ensure that there is no running service on the node before the upgrade. After the upgrade, restart the node.

- The MCU version on the node will be upgraded accordingly during the upgrade.
- If the official driver and firmware versions are used on the node and the upgrade fails, they can be rolled back to the original versions. If the driver and firmware on the node are damaged or the official versions are not used, the query will fail. In this case, the upgrade task can still be delivered. However, the driver and firmware cannot be rolled back once the upgrade fails, and you need to contact Huawei O&M engineers.
- The driver and firmware are compatible with the Ascend software package, such as CANN and MindSpore. Ensure that the upgraded versions are compatible with the Ascend software package used in the service. For details, see Table 7-1.

Table 7-1 Component compatibility

CANN Version	Ascend HDK Version
CANN 8.0.RC3	Ascend HDK 24.1.RC3
	Ascend HDK 24.1.RC2
	Ascend HDK 24.1.RC1
	Ascend HDK 23.0.0/23.0.X
CANN 8.0.0	Ascend HDK 24.1.0
	Ascend HDK 24.1.RC3
	Ascend HDK 24.1.RC2
	Ascend HDK 24.1.RC1
	Ascend HDK 23.0.0/23.0.X
CANN 8.1.RC1	Ascend HDK 25.0.RC1
	Ascend HDK 24.1.0
	Ascend HDK 24.1.RC3
	Ascend HDK 24.1.RC2
	Ascend HDK 24.1.RC1
	Ascend HDK 23.0.X
CANN 8.2.RC1	Ascend HDK 25.2.0
	Ascend HDK 25.0.RC1
	Ascend HDK 24.1.0
	Ascend HDK 24.1.RC3
	Ascend HDK 24.1.RC2

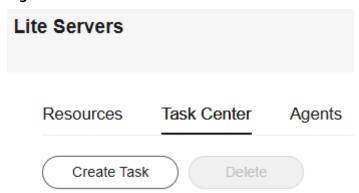
Prerequisites

This operation depends on the Lite Server AI plug-in pre-installed on the node. Install the plug-in by referring to Managing Lite Server AI Plug-ins.

Procedure

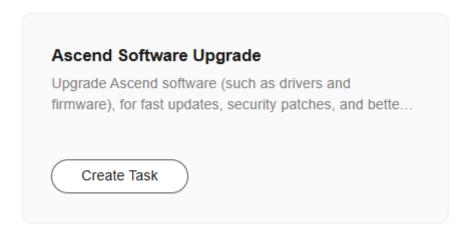
- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. On the displayed page, click the **Task Center** tab.

Figure 7-3 Task center



3. Click **Create Task** in the upper left corner. On the displayed **Job Templates** page, locate **Ascend Software Upgrade**, and click **Create Task**.

Figure 7-4 Task template



4. On the displayed page, set **Name**, **Description**, **Server Model**, and **Type**. Select a node, and click **OK** in the displayed dialog box. The driver firmware version query task will be delivered to the selected node, which takes about 1 minute. Then, you can obtain the actual driver firmware information.

Table 7-2 Parameters for creating a task

Parameter	Description
Name	The system automatically enters the name of the pressure test task. You can customize the task name.

Parameter	Description		
Description	Enter the task description for quick search.		
Server Model	Only Ascend Snt9b and Ascend Snt9b23 are supported.		
Туре	You can select Single node or Integrated rack , or search by keyword.		
	Select the target node to be upgraded in the node list (batch selection supported) and click OK . A query task will be delivered to the selected node to query the driver and firmware versions and CANN information.		
	Wait for the query result, which takes about one minute.		
Software Version	Select the target driver and firmware versions from the drop-down list.		
	Check the component compatibility by referring to Table 7-1 to prevent service interruption caused by upgrade failure. You can also deliver a fault diagnosis task for Ascend devices by referring to Lite Server Node Fault Diagnosis. The compatibility between the driver & firmware and CANN will be automatically diagnosed.		

- 5. Select the version to be upgraded from the drop-down list, click **Next**, confirm the upgrade information, select automatic or manual restart upon upgrade, and click **OK** to deliver the upgrade task. It takes about 10 minutes to complete the upgrade after the task is delivered.
- 6. During the upgrade, you can view the task execution status in the **Task Center** tab. Click the task name to access its details page, where you can view the task details and logs.
- 7. Restart is required upon upgrade. If manual restart is selected, run the **reboot** command on the node. The process takes about 10 minutes.
- 8. Run the command on the node to check whether the driver is loaded. If the command below is returned, the load is successful. Otherwise, contact Huawei technical support.

 npu-smi info

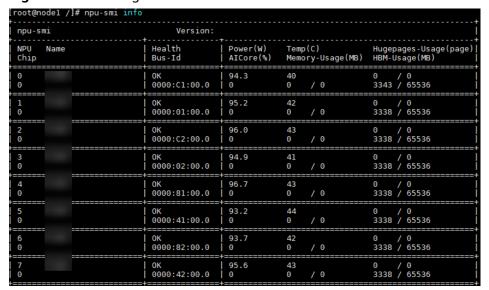


Figure 7-5 Checking whether the driver is loaded

7.3 Lite Server Node Fault Diagnosis

Scenario

Lite Server task center provides one-click fault diagnosis, including parameter plane network diagnosis and Ascend software diagnosis. You can quickly diagnose the network and Ascend software on Lite Server without learning about specific diagnosis commands. The parameter plane network diagnosis allows you to query the network status, IP address, and subnet mask of the PU. The Ascend software diagnosis allows you to diagnose the driver firmware version compatibility. You can batch start diagnosis tasks on multiple servers at the same time, improving efficiency to a large extent.

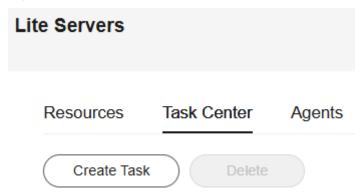
Constraints

- Currently, only Ascend Snt9b and Ascend Snt9b23 nodes are supported.
- The NodeTaskHub plug-in is required for the node where the task is to be created. Ensure that the plug-in is installed before task creation. For details, see Managing Lite Server AI Plug-ins.
- Only one diagnosis task can be executed on a node at the same time. The task cannot be interrupted once started. Plan the task priority.
- Ensure that no services are running on the nodes you are going to diagnose. Running commands during diagnosis can cause service interruptions or errors.
- Install the MCU, driver, and firmware for Ascend HDK 23.0.0 or later before starting the diagnosis. A preconfigured OS is already installed. If you use a custom OS, ensure that the software has been installed correctly.
- The diagnosis requires the Ascend-docker-runtime development kit. This software is pre-installed on the default OS. If you use a custom OS, ensure the software has been installed correctly.

Procedure

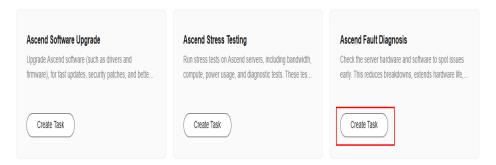
- 1. Log in to the ModelArts console.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. On the displayed page, click the **Task Center** tab.

Figure 7-6 Task center



3. Click **Create Task** in the upper left corner. On the displayed **Job Templates** page, locate **Ascend Fault Diagnosis**, and click **Create Task**.

Figure 7-7 Task templates



4. On the **Ascend Fault Diagnosis** page, enter the task name and description. Set server model and type, select a diagnosis item, select the notice, and click **Create now**.

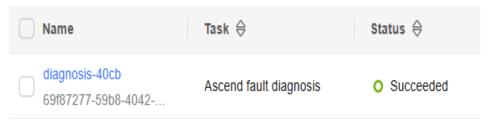
Table 7-3 Parameters for creating a task

Parameter	Description
Name	The system automatically enters the name of the pressure test task. You can customize the task name.
Description	Enter the task description for quick search.
Server Model	Only Ascend Snt9b and Ascend Snt9b23 are supported.

Parameter	Description
Туре	You can select Single node or Integrated rack , or search for a specific node by keyword.
Diagnosis Item	You can select Parameter Plane Network Diagnosis , Ascend Device Diagnosis , or both.
	Parameter Plane Network Diagnosis: Check and record parameter-plane network metrics and information.
	Ascend Device Diagnosis: Check the health and compatibility of Ascend software and chip metrics.

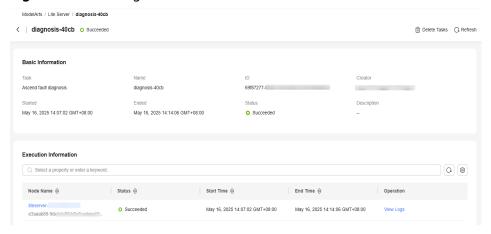
5. View the task execution status in the **Task Center** tab.

Figure 7-8 Viewing the task status



6. Click the task name to access its details page, where you can view the task details.

Figure 7-9 Checking the task details



7. On the task details page, locate the target node and click **View Logs** in the **Operation** column. In the displayed window on the right, view the detailed log about task execution.

Figure 7-10 Viewing logs



7.4 One-Click Pressure Test for Lite Server Nodes

Scenario

Lite Server task center provides one-click pressure test. You can quickly perform a pressure test on Lite Server without learning about software stacks such as AI Core and HBM. The task allows you to test the bandwidth, compute, power consumption, and diagnosis pressure of Ascend servers, providing hardware assurance for high-load scenarios such as AI training and inference. In addition, the task can be concurrently executed on multiple servers in batches, greatly improving efficiency.

Constraints

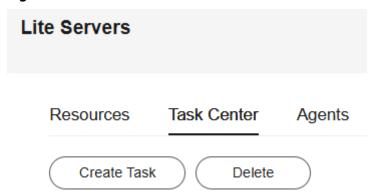
- Currently, only Ascend Snt9b and Ascend Snt9b23 nodes are supported.
- The NodeTaskHub plug-in is required for the node where the task is to be created. Ensure that the plug-in is installed before task creation. For details, see Managing Lite Server AI Plug-ins.
- Only one pressure test task can be executed on a node at the same time. The task cannot be interrupted once started. Plan the task priority.
- Ensure that no services are running on the target nodes. Running commands during the pressure test can cause service interruptions or errors.
- Install the MCU, driver, and firmware for Ascend HDK 23.0.0 or later before starting the pressure test. A preconfigured OS is already installed. If you use a custom OS, ensure that the software has been installed correctly.
- The pressure test requires the Ascend-docker-runtime development kit. This software is pre-installed on the default OS. If you use a custom OS, ensure the software has been installed correctly.

Procedure

1. Log in to the **ModelArts console**.

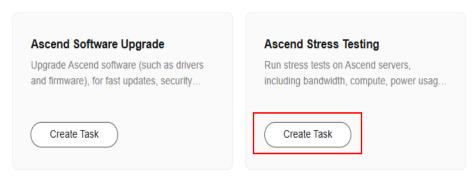
2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. On the displayed page, click the **Task Center** tab.

Figure 7-11 Task center



3. Click **Create Task** in the upper left corner. On the displayed **Job Templates** page, locate **Ascend Stress Testing**, and click **Create Task**.

Figure 7-12 Task templates



4. On the **Ascend Stress Testing** page, enter the task name and description. Set server model and type, select a pressure test case, select the notice, and click **Create now**.

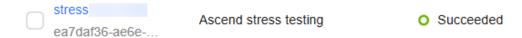
Table 7-4 Parameters for creating a task

Parameter	Description
Name	The system automatically enters the name of the pressure test task. You can customize the task name.
Description	Enter the task description for quick search.
Server Model	Only Ascend Snt9b and Ascend Snt9b23 are supported.
Туре	You can select Single node or Integrated rack , or search for a specific node by keyword.

Parameter	Description
Test Case	You can select any of the following pressure test cases. The pressure test cases can be executed one by one or at the same time.
	Al Core Stress Test: Run a stress test on Al Core errors to diagnose issues. The test uses 20 to 40 GB of memory on the host server. Before you start, make sure there is enough memory or the test may fail.
	HBM Stress Test: Run a stress test on the high- bandwidth memory to get results.
	P2P Stress Test: Check for faults on the HCCS communication links between all devices on the test node.

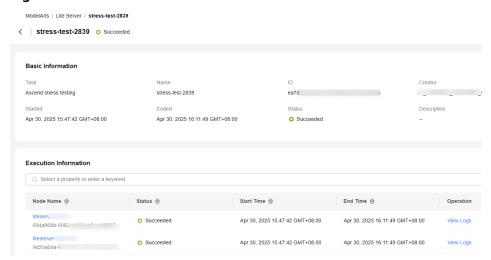
5. View the task execution status in the **Task Center** tab.

Figure 7-13 Task execution status



6. Click the task name to access its details page, where you can view the task details.

Figure 7-14 Task details



7. On the task details page, locate the target node and click **View Logs** in the **Operation** column. In the displayed window on the right, view the detailed log about task execution.

Figure 7-15 Viewing logs

8 Managing Lite Server Supernodes

8.1 Expanding and Reducing Lite Server Supernodes

Scenario

You need to purchase supernodes to expand Lite Server resources due to service changes.

Regardless of whether the purchased supernodes and the existing supernodes belong to the same Xpod (physical supernode), hyperplane networks of the two vxpod supernodes are disconnected, and network communication is available only on the parameter plane. This section describes how to enable intra–hyperplane communication for the added supernodes.

Constraints

Scaling out

- This applies only to the scale-out of Snt9b23 supernodes.
- There cannot be more than 48 subnodes during the supernode scale-out.
- Only available nodes can be scaled out.
- The scale-out does not affect services on original nodes.

Scaling in

- This applies only to the scale-in of Snt9b23 supernodes.
- If the supernode has only one subnode, scale-in is not supported.
- If the node to be scaled in is in an intermediate state, such as switching OS, restarting, starting, or stopping, scale-in is not supported.
- Scaling in affects services on original nodes and the EVS disks of the nodes are released. Ensure that services have been migrated away from the nodes to be scaled in to prevent data loss.

Billing

Yearly/monthly is supported for both node scale-out and scale-in. A billing order will be generated for the new nodes.

Scaling out the Supernodes

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Resources** tab is displayed.
- 3. Locate the target supernode in the list and choose **Supernode Specifications** on the right. **Change**
- 4. On the displayed page, view the resource information to be changed and select the target specifications. Sold-out resources are displayed in gray and cannot be selected.
- 5. Set the parameters.

Table 8-1 Parameters

Param eter	Description	
System Disk	Select System Disk Type and set Size . A system disk is automatically created when you create a Lite Server. Set the system disk size to at least 100 GB. You cannot expand the system disk capacity on ECS after the Lite Server resource is created.	
Add Data Disk	Click Add Data Disk to mount a data disk to the Lite Server. You can also mount data disks or expand the capacity of system disks on ECS after the Lite Server resource is created. For details, see Using EVS for Storage .	
Image	Public image Public images are available for all users. All users can read the image by image ID.	
	ModelArts allows you to perform development and training directly without additional configuration as it provides multiple public images, supports multiple OSs, and has built-in AI drivers and software.	
	For details about the supported public images, see Mapping Between Compute Resources and Image Versions.	
	Private image Only the image creator can use the image. You can select a private image to save your time from repeatedly configuring servers.	
Login Creden tial	Key pair is recommended as it features higher security than Password . If you select Password , ensure that the password meets complexity requirements to prevent malicious attacks.	
	Key pair Use a key pair to log in to the Server node. You can select an existing key pair, or click Create Key Pair to create one. NOTE	
	If you use an existing key pair, ensure that you have saved the key file locally. Otherwise, logging in to the Server node will fail.	

Param eter	Description
(Optio nal) Custo m Instanc e Injectio n	 Use this function to configure Server nodes if you want to: Use scripts to simplify the Server node configuration. Use scripts to initialize OSs. Use existing scripts and upload them to the server when creating the Server node. Use scripts for other purposes. Currently, As text and As file are supported. For details, see Injecting User Data into ECSs.

- 6. Click **Next** to preview the change information, view the node configuration and fee, and click **Submit**.
- 7. After the scale-out is complete, expand the supernode that has been scaled out on the resource list page and check the running status of the new subnodes under the supernode.

Scaling in the Supernodes

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**. The **Resources** tab is displayed.
- 3. Locate the target supernode in the list and choose > Change Supernode Specifications on the right.
- 4. On the displayed page, view the resource information to be changed and select the target specifications. In the list of target reserved nodes, select the nodes to be reserved.
 - Target specifications specify specifications of the nodes to be reserved.

 The number of reserved nodes must be the same as the number of compute
 - nodes in the target specifications. Otherwise, the scale-in task fails to be submitted.
- 5. Select I acknowledge the potential risks and agree to proceed with the scale-in and enter YES to confirm the scale-in.

MARNING

When scaling in, unreserved nodes and their associated EVS disks will be removed. Move your services off these nodes first to avoid losing data.

6. Click **Next** to preview the change information, view the node reservation and deletion information, confirm the information, and click **Submit**.

8.2 Periodic Stress Test on Lite Server Supernodes

Scenario

For Snt9B23 supernodes, you can perform periodic performance tests and fault diagnosis on Huawei Cloud AI servers to detect NPU faults in a timely manner and reduce impact on services.

Table 8-2 Performance test

Scenario	Description
Bandwidth test	Test the bus bandwidth, memory bandwidth, and total time consumption.
Compute test	Construct a matrix multiplication A(m,k)*B(k,n) and execute it a certain number of times. Calculate the AI Core compute and the real-time power at full computational load of the entire PU or processor based on the computation workload and the time taken to execute the matrix multiplication.
Power consumption test	Detect the power consumption of the entire PU by running the single-operator model.
Eye pattern test	Test the network and query the current signal quality.
Stream test	One-click traffic testing and custom traffic testing are supported.
Software and hardware version compatibility test	The software and hardware compatibility tool obtains the hardware information, architecture, driver version, firmware version, and version software.

Table 8-3 Fault diagnosis

Scenario	Description
Network diagnosis	Diagnose the health status of the network and output the diagnosis result.
Signal quality diagnosis	Diagnose the signal quality and output the diagnosis result.
On-chip memory diagnosis	Diagnose the high bandwidth memory and output the diagnosis result.
On-chip memory stress test	Run a stress test on the high-bandwidth memory and output the diagnosis result.

Scenario	Description
On-chip memory high-risk address stress test	Run a stress test on the high-risk addresses of the high bandwidth memory and output the diagnosis result.
Al Core diagnosis	Diagnose the Al Core error and output the diagnosis result.
Al FLOPs diagnosis	Diagnose the chip compute and output the test result.
Bandwidth diagnosis	Diagnose the local bandwidth and output the diagnosis result.
P2P stress test	Check whether the HCCS communication link from the source device to the target device has hardware faults and output the test result.
Power consumption stress test	Perform the EDP/TDP power consumption stress test and output the diagnosis result.

Constraints

- Only Snt9b23 supernodes are supported.
- Ascend DMI is used for stress test. Starting multiple processes on the same device to test performance data is not supported. If multi-process test is performed, the test result may be inaccurate or unpredictable.
- Performance test and fault diagnosis will affect training and inference services. Ensure that no service is running first.
- To ensure the correctness and accuracy of the test result, run each detection command separately.
- Ascend DMI can check only the NPUs that are properly installed. To ensure the accuracy of the test result, run the **npu-smi info** command first.

Performance Test 1: Bandwidth Test

Test the bus bandwidth, memory bandwidth, and total time consumption. **Table 8-4** describes the parameters of the bandwidth test command.

ascend-dmi --bw -h

Table 8-4 Parameters for the bandwidth test

Parameter	Description	Manda tory
[-bw,bw, bandwidth]	This parameter is used to test the bandwidth of the chipbw is supported, butbw andbandwidth are recommended.	Yes

Parameter	Description	Manda tory
[-t,type]	Specify the data flows to be tested. When the bandwidth test function is used, the tested data flows can be classified into the directions listed below. If this parameter is not specified, h2d , d2h , and d2d are returned by default.	No
	 Bandwidth and total duration in the three directions. h2d: Data is transferred from the host memory to the device memory through the PCIe bus. The overall 	
	 bandwidth and total duration are tested. d2h: Data is transferred from the device memory to the host memory through the PCIe bus. The overall bandwidth and total duration are tested. 	
	d2d: Data is transferred from the device memory to the same device memory. (This mode is used to test the device memory bandwidth.) The overall bandwidth and total duration are tested.	
	p2p: Data is transferred from the specified source device to the target device. The transfer rate and total duration are tested.	
[-s,size]	Specify the data size to be transferred and the test result display mode. For supernodes, the maximum transmission value ranges from 1 byte to 4 GB in d2h, h2d, and p2p modes.	No
	• The -s parameter must be followed by a number, which specifies the size of the data to be transferred. If no number is specified, the syntax is incorrect.	
	 In h2d, d2h, d2d, and p2p modes where -ds and -dd are specified, -s specifies the fixed-length mode. If -s is not specified, the step mode is used. The default data transfer range ranges from 2 bytes to 32 MB. 	
[-et,et, execute- times]	Specify the number of iterations, that is, the number of memory copy times. The value ranges from 1 to 1000. If this parameter is not specified, the default value 5 is used in step mode, and the default value 40 is used in fixed-length mode.	No
[-d, device]	Specify the ID of the device whose bandwidth needs to be tested. The device ID is the logical ID of the Huawei Cloud AI processor. If the device ID is not specified, the bandwidth information of device 0 is returned by default.	No

Parameter	Description	Manda tory
[-ds,ds, device-src]	Specify the ID of the source device for a P2P test. This parameter must be specified together with the -dd , dd , and device-dst parameters. Otherwise, all Huawei Cloud AI NPU chips are tested.	No
[-dd,dd, device- dst]	Specify the ID of the target device for a P2P test. This parameter must be specified together with the -ds , ds , and device-src parameters. Otherwise, all Huawei Cloud AI NPU chips are tested.	No
[-fmt, fmt, format]	Specify the output format. The value can be normal or json . If not specified, the default value normal is used.	No
[-q,quiet]	If this parameter is specified, no foolproof message is displayed. By default, this operation is allowed.	No

The following uses data transmission from a device to the same device as an example to describe how to test the bandwidth and total duration.

ascend-dmi --bw -t d2d -d 0

Figure 8-1 Bandwidth test example

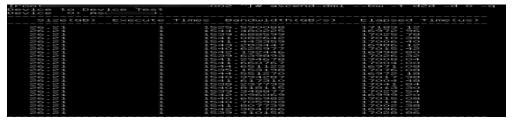


Table 8-5 Parameters for the bandwidth test output

Parameter	Description
Host to Device Test	Data flow direction of the bandwidth. The possible outputs are as follows:
	Host to Device Test
	Device to Host Test
	Device to Device Test
	Unidirectional Peer to Peer Test
	Bidirectional Peer to Peer Test
Device X: Ascend <i>XXX</i>	X indicates the ID of the device to be tested, and XXX indicates the processor type. 0 indicates the source device, and 1 indicates the target device.

Parameter	Description
ID	$0 \rightarrow 1$ indicates the unidirectional P2P bandwidth from device 0 to device 1.
	$0\leftrightarrow1$ indicates the bidirectional P2P bandwidth between device 0 and device 1.
Size(Bytes)	Size of the data to be transferred, in bytes.
Execute Times	Number of iterations.
Bandwidth(GB/s)	Bandwidth of the chip.
Elapsed Time(us)	Total execution duration.

Performance Test 2: Compute Test

Construct a matrix multiplication A(m,k)*B(k,n) and execute it a certain number of times. Calculate the AI Core compute and the real-time power at full computational load of the entire PU or processor based on the computation workload and the time taken to execute the matrix multiplication. For details about the parameters for compute test, see Table 8-6.

Table 8-6 Parameters for the compute test

Parameter	Description	Mand atory
[-f,flops]	This parameter is used to test the compute capability of the entire PU or chip.	Yes
[-t,type]	Specify the operator type. The value can be fp16, fp32, hf32, bf16, or int8. The default value is fp16.	No
[-d, device]	Specify the device ID. The entire PU where the device ID is located is tested. The device ID is the logical ID of the Huawei Cloud AI chip. If this parameter is not specified, the compute of device 0 is returned by default.	No
[-et,et, execute- times]	 Specify the number of times that the matrix multiplication is executed on a single AI Core of the chip. Training: If this parameter is not specified, the default value 60 is used. In this case, the unit is hundred thousand, and the value ranges from 10 to 80. Inference: If this parameter is not specified, the default value 10 is used. In this case, the unit is million, and the value ranges from 10 to 80. 	No

The following shows an example of running the int8 operator and 6 million executions of compute on device 7.

ascend-dmi -f -t int8 -d 7 -et 60-q

Figure 8-2 Compute test example

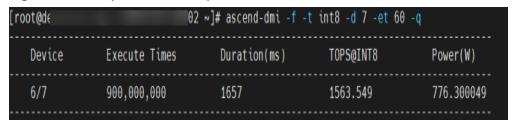


Table 8-7 Parameters for the compute test output

Parameter	Description
Device	Device ID.
Execute Times	Number of times that a single AI Core performs matrix multiplication multiplied by the number of AI Cores.
Duration(ms)	Time taken to perform matrix multiplication multiple times.
TFLOPS@ <i>FP16</i>	Compute obtained through compute test. FP16 is the specified operator run type.
Power(W)	Real-time power at full compute.

Performance Test 3: Power Consumption Test

Detect the power consumption of the entire PU by running the single-operator model. For details about the parameters for power consumption test, see **Table 8-8**.

ascend-dmi -p -h

Table 8-8 Parameters for power consumption test

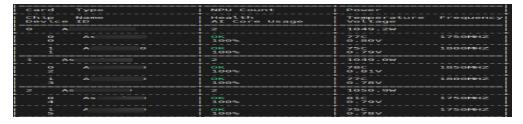
Parameter	Description	Mand atory
[-p, power]	This parameter is used to test the power consumption of the entire PU.	Yes
[-t,type]	Specify the operator type. The value can be fp16 or int8 . The default value is fp16 .	No

Parameter	Description	Mand atory
[-pt,pt, pressure- type]	 Currently, the following types are supported: Estimated design power (edp): EDP power consumption stress test Thermal design power (tdp): TDP power consumption stress test It can be used together withdur,it,pm, and -q. It cannot be used together with -t. If this parameter is not specified, the power consumption of the entire PU is tested by default. 	No
[-dur,dur, duration]	Specify the running time. If this parameter is not specified, the default value 600 is used. The unit is second. The value ranges from 60 to 604800 .	No
[-it,it, interval- times]	Specify the interval for refreshing the screen information. If this parameter is not specified, the default value 5 is used. The unit is second. The value ranges from 1 to 5.	No
[skip- check]	If this parameter is specified, the device health check is skipped. Otherwise, the device health status is checked by default.	No
[-pm,pm, print- mode]	 Specify the screen output mode. If this parameter is not specified, the default value refresh is used. Print modes: refresh: Clear the historical information each time the information is printed. history: Print the saved historical information. Note: In refresh mode, if there are a large number of chips, you are advised to reduce the font size so that all results are displayed on one screen. Otherwise, the display may be abnormal and some content may be repeatedly printed. 	No

The following shows an example of executing for 60s at an interval of 5s in refresh mode.

ascend-dmi -p --dur 60--it 5--pm refresh

Figure 8-3 Power consumption test example



Parameter Description PU model Type Card PU ID Chip Processor No. Name Processor name Processor model Type Chip Name Chip name **NPU Count** Number of NPUs Power Actual power consumption of the entire PU or chip. Health Processor health status Temperatur Current processor temperature Device ID Device logical ID of the processor Al Core Al Core usage Usage Voltage Current processor voltage

Table 8-9 Parameters for power consumption test output

Performance Test 4: Eye Pattern Test

Frequency

Test the network and query the current signal quality. This function is used to query the specific signal quality. To check whether the signal quality of the current port is normal, perform signalQuality diagnosis. If CDR loopback has been configured for an NPU, disable the loopback before performing the eye pattern test. For details about the parameters for eye pattern test, see **Table 8-10**.

ascend-dmi --sq -h

Table 8-10 Parameters for the eye pattern test

Current processor frequency

Parameter	Description	Mand atory
[-sq,sq, signal- quality]	Query the signal quality of the PCIe, HCCS, and RoCE communication ports on the NPU.	Yes

Parameter	Description	Mand atory
[-d, device]	Specify the device ID to be queried. If multiple device IDs are specified, use commas (,) to separate them. If this parameter is not specified, all NPUs on the device are queried by default.	No
[-ttype]	Specify the type of the communication port. Currently, HCCS and RoCE are supported. If multiple communication port types are specified, use commas (,) to separate them. If this parameter is not specified, the signal quality of the RoCE communication port is queried.	No

The following shows an example of querying the HCCS and RoCE signal quality of device 0 and device 1.

Figure 8-4 Eye pattern test example



Table 8-11 Parameters of the HCCS signal quality

Parameter	Description	
type	Specify the type of the communication port.	
device	Logical ID of an NPU.	
M* (macro port)	Macro port, for example, M0 and M1 indicate macro ports 0 and 1, respectively.	
L* (LANE)	Lane number of the HCCS link, for example, L0 and L1 indicate lane 0 and lane 1, respectively.	
S (SNR)	Signal-to-noise ratio (SNR) of a lane.	
H (HEH) Half eye height of a lane.		

Table 8-12 Parameters of the RoCE signal quality

Parameter	Description	
type	Specify the type of the communication port.	
device	Logical ID of the NPU.	

Parameter	Description	
M* (macro port)	Macro port, for example, M0 indicates macro port 0.	
S (SNR)	Signal-to-noise ratio (SNR) of a lane.	
H (HEH)	Half eye height of a lane.	
L* (LANE)	Lane number of the RoCE link, for example, L0 and L1 indicate lane 0 and lane 1, respectively.	

Performance Test 5: Stream Test

One-click traffic testing and custom traffic testing are supported.

Table 8-13 Stream test

Test Nam e	Supported Traffic Mode	Usage
One- click traffi c testi ng	Stream test in a CDR loopback or fiber optic circulator (loopback device)	Execute the one-click traffic test command. The Ascend DMI tool automatically sends and receives the streams of all lanes of the specified device. After a period of time, the streams are disabled and the results are queried.
Cust om traffi c testi ng	Stream test in a CDR loopback, fiber optic circulator (loopback device), and traffic test using direct connection between NPUs	Custom traffic testing is to separate each step of one-click traffic testing. You can flexibly control the TX and RX directions and specify the lanes for traffic testing.

There are three traffic testing modes:

• CDR loopback traffic test: A single device sends and receives traffic at the same time. This test can be used to check the signal quality from the physical SerDes port of the NPU to the CDR unit. Before starting traffic testing, ensure that the optical module is in position. Then, run the commands below to configure or disable CDR loopback.

Run the commands below to configure CDR loopback. In the commands, ${\bf t}$ uses values ${\bf 3}$ and ${\bf 0}$ in sequence and ${\bf i}$ indicates the NPU ID.

hccn_tool -i 0 -scdr -t 3

hccn tool -i 0 -scdr -t 0

Run the commands below to disable CDR loopback. In the commands, **t** uses values **2** and **1** in sequence and **i** indicates the NPU ID.

hccn_tool -i 0 -scdr -t 2

hccn_tool -i 0 -scdr -t 1

- Traffic testing using a fiber optic circulator (loopback device) connected to an
 optical module: A single device sends and receives traffic at the same time.
 This method can be used to check the signal quality of the physical SerDes
 port of the NPU to the optical module. No loopback needs to be set.
- Traffic testing using direct connection between NPUs: After traffic is sent in the TX direction of the SerDes port on NPU A, data flows reach the SerDes port on NPU B through the tested link. NPU B compares the received data with the code pattern in the RX direction and collects statistics on bit errors. This method can be used to check the signal quality of the link between two NPUs (only custom traffic testing is supported).

For details about parameters for stream tests, see Table 8-14.

ascend-dmi --prbs-check -h

Table 8-14 Parameters for stream test

Parameter	Description	Ma nda tory
[-pc,pc, prbs-check]	This parameter is used for PRBS stream tests.	Yes
[-d,device]	Specify the ID of the device for which the stream test is to be performed.	
	 The device ID is the logical ID of the Huawei Cloud AI processor. If this parameter is not specified, the stream of all Huawei Cloud AI NPUs is tested. 	
	Multiple device IDs can be specified at the same time. Use commas (,) to separate them.	
[-dur,dur, duration]	 Specify the duration of the stream test. The value ranges from 3 to 10, in seconds. If this parameter is not specified, the default value 3 is used. 	No

Parameter	Description	Ma nda tory
[prbs- mode]	 Whether to switch the traffic testing status. EN: enabled DS: disabled The value is case-sensitive. Ifprbs-mode is set to EN or DS, the configuration takes effect in both the signal TX and RX directions, regardless of whethergenerator-pattern,generator-lanes,checker-pattern, orchecker-lanes is specified. Ifprbs-mode is set to EN, -generator-pattern,checker-pattern,generator-lanes, andchecker-lanes can be specified. Ifprbs-mode is set to DS, the traffic testing stops. In 	Yes
	this case, -generator-pattern,checker-pattern,generator-lanes, andchecker-lanes cannot be specified. This parameter cannot be specified together withshow orclear.	
[generator- pattern]	 Specify the stream type of the TX end. Currently, the following stream types are supported: prbs7, prbs9, prbs10, prbs11, prbs15, prbs20, prbs23, and prbs31. If this parameter is not specified, the default value prbs31 is used. The parameter value is case-insensitive. For example, prbs7 and PRBS7 both are supported. This parameter cannot be specified together with show orclear. 	No
[generator- lanes]	 Specify the lane of the TX end. You can specify one or more lanes at a time. Use commas (,) to separate multiple lanes. If multiple lanes are specified, the lanes must be consecutive, for example, 0, 1, 2 or 2, 1, 3. Non-consecutive lanes are not supported. If this parameter is not specified, all lanes are tested by default. This parameter cannot be specified together with show orclear. The value can be 0, 1, 2, or 3. 	No

Parameter	Description	Ma nda tory
[checker- pattern]	 Specify the stream type of the RX end. Currently, the following types are supported: prbs7, prbs9, prbs10, prbs11, prbs15, prbs20, prbs23, and prbs31. If this parameter is not specified, the default value prbs31 is used. The parameter value is case-insensitive. For example, prbs7 and PRBS7 both are supported. This parameter cannot be specified together with show orclear. 	No
[checker- lanes]	 Specify the lane of the RX end. You can specify one or more lanes at a time. Use commas (,) to separate multiple lanes. If multiple lanes are specified, the lanes must be consecutive, for example, 0, 1, 2 or 2, 1, 3. Non-consecutive lanes are not supported. If this parameter is not specified, all lanes are tested by default. This parameter cannot be specified together with show orclear. The value can be 0, 1, 2, or 3. 	No
[-show, show, show- diagnostic- info]	 Display the stream test result. This parameter cannot be specified together with clear,prbs-mode,generator-pattern, generator-lanes,checker-pattern, andchecker-lanes. After the information is displayed, the result of the current stream test is cleared. 	No
[-clear, clear,clear- diagnostic- info]	 Clear the stream test result. This parameter cannot be specified together with show,prbs-mode,generator-pattern, generator-lanes,checker-pattern, andchecker-lanes. You can specify other parameters at the same time. 	No

The following is an example of one-click traffic testing:

ascend-dmi -pc -d 9--pattern prbs15 -dur 5

Figure 8-5 One-click traffic testing example



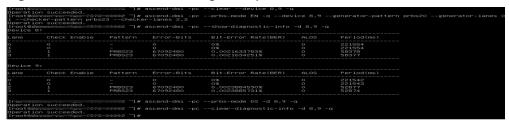
Table 8-15 Parameters of one-click traffic testing output

Parameter	Description	
device	Logical ID of the NPU.	
lane	Lane ID of the RoCE link.	
error count	Number of bit errors. The maximum value is 67092480 , indicating full bit errors.	
error rate	Bit error rate. If the bit error rate is less than 10-5, the signal quality is normal.	
alos	The value 0 indicates normal, and the value 1 indicates that the input signal amplitude is too low.	
times	Traffic testing duration.	

The following shows an example of custom traffic testing:

```
# Enable the stream test on Device8 and Device9.
ascend-dmi -pc --clear --device 8,9-q
# On Device9 and Device9, the TX ends are lane 0 and lane 1, and the code pattern is PRBS20. The RX ends
are lane 2 and lane 3, and the code pattern is PRBS23.
ascend-dmi -pc --prbs-mode EN -q --device 8,9--generator-pattern prbs20 --generator-lanes 0,1--checker-
pattern prbs23 --checker-lanes 2,3
# Display the stream test results of Device8 and Device9.
ascend-dmi -pc --show-diagnostic-info -d 8,9-q
# Disable traffic testing on Device8 and Device9.
ascend-dmi -pc --prbs-mode DS -d 8,9-q
# Clear the traffic testing results on Device8 and Device9.
ascend-dmi -pc --clear-diagnostic-info -d 8,9-q
```

Figure 8-6 Custom traffic testing example



Parameter Description Lane ID of the RoCE link. Lane Check status of the RX end. The value **0** indicates disabled Check Enable and 1 indicates enabled. Pattern Code pattern of check in the RX direction. **Error-Bits** Number of bit errors. The upper limit is 67092480 (full bit errors). Bit-Error Rate Bit error rate, which is the number of bit errors divided by the total number of transmitted bits multiplied by 100%. (BER) **ALOS** The value must be **0** for normal traffic testing. If the value is 1, the signal amplitude is too low. If no traffic is testing, this parameter is meaningless. Time when the traffic testing is controlled or the check Period

Table 8-16 Parameters of custom traffic testing output

Performance Test 6: Software and Hardware Version Compatibility Test

result is read last time.

The software and hardware compatibility tool obtains the hardware information, architecture, driver version, firmware version, and version software. For details about the parameters for software and hardware compatibility tests, see **Table 8-17**.

ascend-dmi -c -h

Table 8-17 Software and hardware version compatibility test

Parameter	Description	Mandatory
[-c, compatible]	This parameter is used to check the software and hardware version compatibility.	Yes
	 If driver 22.0.0 or CANN 6.2.RC1 or later has been installed, the -c parameter is used to check the compatibility between the NPU firmware and driver, and between the driver and CANN. 	
	 If the driver version is earlier than 22.0.0 and the CANN version is earlier than 6.2.RC1, the -c parameter is used to check whether the corresponding driver, firmware, and software package are installed. 	

Parameter	Description	Mandatory
[-p, path]	You can specify the installation path of the CANN software package to be tested. If the installation path is not specified, the default installation path is used.	No
	Example command for specifying the installation path of the software package: ascend-dmi -c -p /home/xxx/Ascend	

The following shows an example of the hardware and software version compatibility test:

ascend-dmi -c

Figure 8-7 Software and hardware version compatibility test example

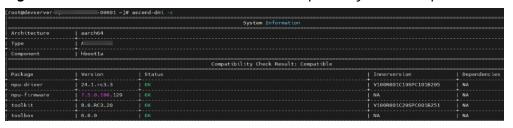


Table 8-18 Parameters for software and hardware version compatibility test output

Parameter	Description
System Information	System information
Architecture	Architecture
Type	PU or chip model
Compatibility Check Result	Compatibility check result
Package	Package name
Version	Version

Parameter	Description		
Status	Status. Possible values are as follows:		
	OK: compatible		
	INCOMPATIBLE PACKAGE: incompatible		
	 NA: Unknown status. The software version may fail to be obtained. Non-root users cannot query the firmware compatibility, and the status of NPU firmware is displayed as NA. 		
Innerversion	Internal version number		
Dependencies	Dependencies		

Fault Diagnosis

View the parameters of the fault diagnosis command.

ascend-dmi --dg -h

Table 8-19 Fault diagnosis parameters

Paramete r	Description	
[-dg,dg, diagnosis]	This parameter is used to perform a fault diagnosis test on the entire PU.	
[-i, items]	 Specify the diagnosis check items. You can specify one or more of driver, CANN, device, network, bandwidth, AI FLOPs, HBM, and signalQuality. Use commas (,) to separate multiple items. If this parameter is not specified, check items except AI Core and PRBS are diagnosed by default. 	
[-d, device]	· ·	

Paramete r	Description		
[-r, result]	Specify the path for storing the stress test result and information collection result, for example, /test. The specified path must meet security requirements and cannot contain the wildcard (*).		
	 To specify a path for storing results, you need to create the ascend_check folder in the specified path. The path specified by user root will be created in the root directory, and the path specified by non-root users will be created in the \$HOME directory. 		
	 If the path is not specified, the results will be stored in the default path, which is /var/log/ascend_check for user root and \$HOME/var/log/ascend_check for non- root users. 		
[-s, stress]	This parameter is used to perform stress tests. Currently, the following stress tests are supported: on-chip memory stress test, AI Core stress test, P2P stress test, and power consumption stress test.		
	• If on-chip memory and power consumption are included, this parameter can be used together with the -st parameter. The time for performing the stress test is specified byst.		
	 If AI Core check item is included, this parameter can be used together with the -sc parameter. The number of performed stress tests is specified bysc. 		
	If bandwidth check is specified, this parameter can be used together with -t to perform a P2P stress test.		
[-st,st,	Specify the time for the EDP and TDP stress tests.	No	
stress- time]	The value ranges from 60 to 604800 , in seconds.		
cirriej	• This parameter must be used together with [-s, stress] when the EDP and TDP stress tests are included.		
	This parameter must be used together with [-s,stress] when the on-chip memory diagnosis is included.		
[-fmt, fmt,	Specify the output format. The value can be normal or json .		
format]	If not specified, the default value normal is used.		
	 If this parameter is set to json, the stress test result will be stored in the ascend_check/ environment_check_before.txt file. However, if json format is not specified, the fault diagnosis result will not be stored. 		
[-h, help]	View the parameters of the fault diagnosis command.	No	

Fault Diagnosis 1: Network Diagnosis

Diagnose the health status of the network and output the diagnosis result.

```
# Example of diagnosing the network health status of Device0 ascend-dmi -dg -i network -d 0
```

Figure 8-8 Network diagnosis example

```
[root@devse ~]# ascend-dmi -dg -i network -d 0
Summary:
Arch: aarch64
Mode: A
Time: 20250315-17:39:04
Hardware:
network:
PASS
```

The parameters in the command output are as follows:

- **PASS**: The network is healthy.
- **SKIP**: The current product form does not support this check item.
- INFO: The network check result is informational.
- WARN: The network check result is an alarm.
- FAIL: The network check fails.

Fault Diagnosis 2: SignalQuality Diagnosis

Diagnose the signal quality and output the diagnosis result.

```
# Example of SignalQuality diagnosis ascend-dmi -dg -i signalQuality -q
```

Figure 8-9 SignalQuality diagnosis example

```
[root@dev ~]# ascend-dmi -dg -i signalQuality
Summary:
    Arch: aarch64
    Mode: A
    Time: 20250315-17:40:19

Hardware:
    signalQuality:
    PASS
```

The parameters in the command output are as follows:

- PASS: The HCCS and RoCE communication ports on the NPU pass the test, and the signal quality is normal.
- **SKIP**: The current device does not support eye pattern diagnosis.
- **IMPORTANT_WARN**: Important warning. The signal quality of one or more of the HCCS and RoCE ports is abnormal. Contact Huawei engineers.
- **FAIL**: The eye pattern detection fails.

Fault Diagnosis 3: On-Chip Memory Diagnosis

Diagnose the high bandwidth memory and output the diagnosis result.

```
# Example of on-chip memory diagnosis ascend-dmi -dg -i hbm
```

Figure 8-10 On-chip memory diagnosis example

Table 8-20 Parameters for on-chip diagnosis output

Output Status	Description		
PASS	The on-chip memory passes the check and is normal.		
SKIP	The current hardware form does not support on-chip memory check.		
GENERAL_W ARN	There are isolated pages with historical multi-bit errors. The NPU chip triggering the alarm has a health management fault code of 0x80E18401. The NPU chip can still be used.		
IMPORTANT_ WARN	The number of isolated pages now differs from the previous count. Restart to reset the NPU chip.		
EMERGENCY_ WARN	There are too many isolated pages with historical multi-bit errors, and too many device isolation rows. The NPU chip has a health management fault code of 0x80E18402. Replace the faulty part.		
	If there are four or more isolation rows in the same stack but different banks, the device is at high risk. Replace the spare part.		
	If the number of isolation rows in the same stack, same SID, and different PCs is greater than or equal to four, the device is at high risk. Replace the spare part.		
	 If the number of isolation rows in the same stack, SID, PC, and bank is greater than 16, the device is at high risk. Replace the spare part. 		
	If the number of different addresses is greater than five (excluding adjacent error addresses of four bits or less) in the same stack, SID, PC, and bank, the device is at high risk. Replace the spare part.		
FAIL	The on-chip memory detection fails. Contact Huawei engineers.		

Fault Diagnosis 4: On-Chip Memory Stress Test

Run a stress test on the high-bandwidth memory and output the diagnosis result.

```
# Example
ascend-dmi -dg -i hbm -s -st 60 -q
```

Figure 8-11 On-chip memory diagnosis example

```
[root@der l ~]# ascend-dmi -dg -i hbm -s -st 60 -q

Stress test is being performed, please wait.

Summary:

Arch: aarch64

Mode: )

Time: 20250317-10:19:40

Hardware:

hbm:

PASS
```

Output parameters:

- PASS: The on-chip memory stress test is passed.
- **SKIP**: The current device does not support the on-chip memory stress test.
- **FAIL**: The on-chip memory stress test fails because new multi-bit isolation pages are added. The software execution fails.

Fault Diagnosis 5: On-Chip Memory High-Risk Address Stress Test

Run a stress test on the high-risk addresses of the high bandwidth memory and output the diagnosis result.

Table 8-21 Parameters for on-chip memory high-risk address stress tests

Parameter	Description	
[-s, stress]	This parameter is used to perform stress tests. Currently, the following stress tests are supported: on-chip memory stress test, AI Core stress test, P2P stress test, and power consumption stress test.	
[-qs,qs, quick	Specify the range of fast stress test for high-bandwidth memory high-risk addresses.	
stress]	• The value ranges from 0 to 100 . The recommended value is 100 .	
	 If the value is 0, the fast stress test is performed on all high-bandwidth memory addresses by default. 	
	 If HBM diagnosis is included, this parameter must be used together with [-s,stress] and cannot be used together with [-st,st,stress-time] or [sc, stress-count]. 	

```
# Example of stress test on on-chip memory high-risk addresses ascend-dmi -dg -i hbm -s -qs 60-q
```

Figure 8-12 On-chip memory high-risk address stress test example

Output parameters:

- PASS: The high-bandwidth memory high-risk address fast stress test is passed.
 No isolation page is added.
- SKIP: The current device does not support the on-chip memory high-risk address stress test.
- **FAIL**: The high-bandwidth memory high-risk address fast stress test fails. New isolation pages are added.

Fault Diagnosis 6: AI Core Diagnosis

Diagnose the AI Core error and output the diagnosis result.

```
# Example of Al Core diagnosis
ascend-dmi -dg -i aicore -q
```

Figure 8-13 AI Core diagnosis example

Output parameters:

- PASS: The diagnosis result is normal.
- **SKIP**: The diagnosis is performed by a non-root user and AI Core diagnosis is not supported.
- EMERGENCY_WARN: emergency warning. Replace the hardware.
- FAIL: Al Core diagnosis fails. Contact Huawei engineers.

Fault Diagnosis 7: AI FLOPs Diagnosis

Diagnose the chip compute and output the test result.

```
# Example of AI FLOPs diagnosis
ascend-dmi -dg -i aiflops -q
```

Figure 8-14 AI FLOPs diagnosis example

Output parameters:

- PASS: The compute test result is normal (greater than the reference value).
- **WARN**: The chip overheats during the compute test.
- **FAIL**: The compute test fails. The test result is smaller than the reference value.

Fault Diagnosis 8: Bandwidth Diagnosis

Diagnose the local bandwidth and output the diagnosis result.

```
# Example of performing bandwidth diagnosis on Device0 ascend-dmi --dg -i bandwidth -d 0
```

Figure 8-15 Bandwidth diagnosis example

Output parameters:

- PASS: The bandwidth test result is normal.
- **FAIL**: The bandwidth test fails. The test result is smaller than the reference value. Contact Huawei engineers.

Fault Diagnosis 9: P2P Stress Test

Checks whether the HCCS communication link from the source device to the target device has hardware faults and outputs the test result.

Table 8-22 Parameters for P2P stress tests

Paramet er	Description	
[-s, stress]	This parameter is used to perform stress tests. Currently, the following stress tests are supported: on-chip memory stress test, AI Core stress test, P2P stress test, and power consumption stress test.	
	 If bandwidth check is specified, this parameter can be used together with -s to perform a P2P stress test. 	
[-t,	Specify the data flows to be tested.	Yes
type]	 This parameter takes effect only when item is set to bandwidth and -s is specified, indicating that the P2P pressure test is performed. 	
	 Currently, only the P2P bandwidth type is supported. p2p: Data is transferred from the specified source device to the target device. The transfer rate and total duration are tested. 	

```
# Example of P2P stress test
ascend-dmi -dg -i bandwidth --type p2p -s
```

Figure 8-16 P2P stress test example

Output parameters:

- PASS: The stress test is passed, and the result is normal.
- **SKIP**: The current device does not support the P2P stress test.
- **EMERGENCY_WARN**: emergency warning. The stress test fails. Contact Huawei engineers to replace the hardware.
- FAIL: P2P stress test fails. Contact Huawei engineers.

Fault Diagnosis 10: Power Consumption Stress Test

Perform the EDP/TDP power consumption stress test and output the diagnosis result.

```
# Example of power consumption stress test
ascend-dmi -dg -i edp -s -st 60-q
ascend-dmi -dg -i tdp -s -st 60-q
```

Figure 8-17 TDP power consumption stress test example

Figure 8-18 EDP power consumption stress test example

```
[root@dev ~]# ascend-dmi -dg -i edp -s -st 60 -c
Summary:
Arch: aarch64
Mode: / ...
Time: 20250317-10:29:01
Hardware:
edp:
PASS
```

Output parameters:

- PASS: The power consumption stress test result is normal.
- **SKIP**: The current device does not support the power consumption stress test.
- **IMPORTANT_WARN**: A chip alarm is generated during the stress test. Handle the alarm based on the description. If the fault persists, contact Huawei engineers.
- FAIL: The power consumption stress test fails. Contact Huawei engineers.

8.3 Enabling HCCL Communication Operator-Level Reexecution for Supernodes

Scenario

To address the high failure rate of optical modules under Snt9B23 supernodes, the stability and reliability of the system are improved by introducing a re-execution mechanism at the Huawei Collective Communication Library (HCCL) communication operator level.

HCCL, a distributed communication library designed by Huawei for Ascend AI processors, aims to optimize efficient collaboration between multiple devices and accelerate distributed training of deep learning models, applicable to AI scenarios where large-scale compute is required. In distributed training, HCCL is responsible for coordinating data synchronization (such as gradient aggregation and parameter update) between multiple Ascend processors, reducing communication overheads and improving training efficiency.

Constraints

- Only Snt9b23 supernodes are supported.
- Enabling operator re-execution slightly affects the performance.

- Re-execution depends on the VPC plane (non-parameter plane) network for status negotiation within the communication domain. If the VPC planes are different, re-execution cannot be performed.
- For the HCCS plane, if the link is not recovered and the route is not converged, re-execution cannot be performed.
- Re-execution depends on that all cards in a communication domain stop at the same communication operator when a fault occurs. Otherwise, re-execution cannot be performed. The success rate is about 95%.
- Using the communication operator in inplace mode may cause UserIn data to be polluted, affecting the reliability of re-execution. Although 80% of communication operators can be re-executed in the inplace mode, there are exceptions, for example, for all_reduce, all_gather, and reduce_scatter operators in the Torch framework.
- For RoH/RoCE failover (lane borrowing) caused by intermittent disconnection
 or link disconnection, re-execution can be performed only once in the same
 communication domain, and switchback is not supported. During the failover,
 services can be continued. However, you should save checkpoints and rectify
 faults in a timely manner.
- The following table lists the supported HCCL re-execution scope for the current Ascend execution mode.

 Table 8-23 HCCL re-execution scope

Mode	HCCL Communication Operator Unfolding Mode	Supported
Single-	Stars	Supported
operator	Ffts+	Supported
	AI CPU unfolding	Supported
	Integrate communication and computing (mc2)	Not supported
Graph mode	Full POD mode, in which communication operators are integrated as expanded tasks.	Not supported Full POD mode, in which HCCL is not involved in the graph execution process and cannot be re-executed.
	AI CPU unfolding	Supported

Principles

The connection system of the Snt9B23 supernode mainly includes two transmission planes: HCCS plane and RoH/RoCE plane.

On the HCCS plane, the optical interconnection technology is used between L1-1520 and L2-1520. On the RoH/RoCE plane, optical interconnection is used for parts beyond the NPU range. The fault rate of the electrical interconnection

domain is relatively low. Therefore, this mechanism is mainly used to handle optical module faults in the optical interconnection domain. Specifically:

- Faulty optical module between L1-1520 and L2-1520 on the HCCS plane
- Faulty optical module of the Snt9B23 out of the RoH/RoCE plane

HCCS plane

For the HCCS plane, if the optical module between L1 and L2 is intermittently disconnected or disconnected, the 1520 device automatically switches the path (provided that multiple paths exist). However, link disconnection may cause packet loss and further service interruption. In this case, the framework layer rolls back to the previous checkpoint for resumable training. By introducing the HCCL re-execution mechanism, returning to the checkpoint for resumable training may be effectively reduced after 1520 completes path switching, further improving service continuity and reliability.

RoH/RoCE plane

For the RoH/RoCE plane, the protocol has a built-in retransmission mechanism at the transport layer, which can rectify packet loss or intermittent disconnection. However, the reliability of this mechanism is still limited. To enhance the overall reliability, the re-execution mechanism is introduced at the HCCL layer. When an intermittent disconnection lasts for more than 30 seconds or a link disconnection occurs, the system establishes a new transmission path (lane borrowing) and starts the re-execution process at the operator level, ensuring service stability.

Parameter Configuration (HCCL_OP_RETRY_ENABLE)

The environment variable HCCL_OP_RETRY_ENABLE is used to configure whether to enable HCCL operator re-execution. Re-execution refers to the process in which HCCL attempts to re-execute the communication operator when the communication operator reports an SDMA or RDMA CQE error. This feature can effectively avoid communication interruption caused by hardware intermittent disconnection and improve communication stability.

The re-execution feature can be configured in the communication domains at the following physical layers:

- **LO**: communication domain within a server
- L1: communication domain between servers
- **L2**: communication domain between supernodes

Configuration:

Before running a training job, run the following command on the server node:

export HCCL OP RETRY ENABLE="L0:0, L1:1, L2:1"

Table 8-24 Parameters

Par ame ter	Description	Value Range		Rec om me nde d Val ue
LO	Communicati on domain within a server	 0: Re-execution is disabled for communication tasks in the communication domain within a server. 1: Re-execution is enabled for communication tasks in the communication domain within a server. 	0	0
L1	Communicati on domain between servers	 0: Re-execution is disabled for communication tasks in the communication domain between servers. 0 is the default value. 1: Re-execution is enabled for communication tasks in the communication domain between servers. 		1
L2	Communicati on domain between supernodes	 0: Re-execution is disabled for communication tasks in the communication domain between supernodes. 0 is the default value. 1: Re-execution is enabled for communication tasks in the communication domain between supernodes. 		1

Note:

- When **L2** is set to **1**, the communication between supernodes can be performed using the standby device NIC when the device NIC is faulty. The standby NIC is the NIC of the other die in the same NPU.
- If the communication domain is created based on the ranktable, you need to configure the standby NIC using the **backup device ip** parameter in the ranktable file.
- If the communication domain is created based on the root broadcast, the two dies of the same NPU are automatically configured as the standby NICs of each other. No manual configuration is required.

Parameter Configuration (HCCL_OP_RETRY_PARAMS)

The environment variable **HCCL_OP_RETRY_ENABLE** is used to configure the parameters for re-executing the HCCL operator, including the maximum number

of re-executions, the waiting time for the first re-execution, and the interval between two re-executions.

Configuration example

export HCCL_OP_RETRY_PARAMS="MaxCnt:3, HoldTime:5000, IntervalTime:1000"

Table 8-25 Parameters

Parameter	Description	Туре	Value Range	D ef a ul t V al u e	Unit	Rec om me nde d Val ue
MaxCnt	Maximum number of re- executions	uint32	[1, 10]	3	Count	Ret ain the def ault val ue 3 .
HoldTime	Waiting time from the time when a communicati on operator execution failure is detected to the time when the operator is re-executed for the first time	uint32	[0, 60000]	5 0 0 0	ms	Ret ain the def ault val ue 500 0 .
IntervalTime	Interval between two re-executions	uint32	[0, 60000]	1 0 0 0	ms	Ret ain the def ault val ue 100 0.

Constraints:

This environment variable takes effect only when the HCCL re-execution feature is enabled (at any layer) using the HCCL_OP_RETRY_ENABLE environment variable.

9 Monitoring Lite Server Resources

9.1 Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node

Scenario

You need Cloud Eye to monitor Lite Server. This section describes how to interconnect with Cloud Eye to monitor resources and events on Lite Server.

Constraints

- The Agent plug-in, which has strict resource usage restrictions, is required for monitoring. When the resource usage exceeds the threshold, the Agent circuit breaker occurs. For details about the resource usage, see Cloud Eye Server Monitoring.
- If you run the NPU pressure test command using Ascend-dmi, some NPU metric data may be lost.
- You have fully tested the monitoring agent in the public image provided by Lite Server. If you use your own image, perform the test before deploying the image in the production environment to prevent information errors.

Overview

For details, see **Bare Metal Server (BMS) Server Monitoring**. In addition to the images listed in the document, Ubuntu 20.04 is also supported.

The sampling period of monitoring metrics is 1 minute. Do not change it. Otherwise, the function may be abnormal. The current monitoring metrics include the CPU, memory, disk, and network. After the accelerator card driver is installed on the host, the related metrics can be collected.

The NPU metric collection function depends on the Linux system tool lspci. Some events depend on the blkid and grub2-editenv system tools. Ensure that these tools are normal.

Tool	Check Method	Installation Method
lspci	Run lspci in the shell environment. The PCI device in the system can be queried. The following shows an example: \$ sudo lspci 00:00.0 PCI bridge: Huawei Technologies Co., Ltd. HiSilicon PCIe Root Port with Gen4 (rev 21) 00:08.0 PCI bridge: Huawei Technologies Co., Ltd. HiSilicon PCIe Root Port with Gen4 (rev 21) 00:10.0 PCI bridge: Huawei Technologies Co., Ltd. HiSilicon PCIe Root Port with Gen4 (rev 21)	Ispci is a tool used to display PCI device information. It is usually included in the pciutils software package. This software package is installed by default in most Linux versions. Generally, Ispci is preinstalled. If Ispci is not installed, you can use the package manager to install pciutils. Run the following commands in Debian/
		Ubuntu: sudo apt-get update sudo apt-get install pciutils Run the following
		command in Red Hat/ CentOS/EulerOS: sudo yum install pciutils
blkid	Run blkid in the shell environment. The block device in the system can be queried. The following shows an example: \$ sudo blkid /dev/sda1: UUID="123e4567-e89b-12d3-a456-426614174000" TYPE="vfat" PARTUUID="56789abc-def0-1234-5678-9abcd3f2c0a1" /dev/sda2: UUID="a1b2c3d4-e5f6-789a-bcde-f0123456789a" TYPE="swap" PARTUUID="edcba98-7654-3210-fedc-ba9876543210" /dev/sda3: UUID="01234567-89ab-cdef-0123-456789abcdef" TYPE="ext4" PARTUUID="fedcba09-8765-4321-fedc-ba0987654321"	blkid is a tool used to display block device attributes in Linux. It is usually included in the util-linux software package. This software package is installed by default in most Linux versions. Generally, blkid is pre-installed. If blkid is not installed, you can use the package manager to install util-linux.
		Run the following commands in Debian/ Ubuntu: sudo apt-get update sudo apt-get install util-linux
		Run the following command in Red Hat/ CentOS/EulerOS: sudo yum install util-linux

Tool	Check Method	Installation Method
grub2- editenv (require d only for Red Hat, CentOS , and EulerO S)	Run blkid in the shell environment. The block device in the system can be queried. The following shows an example: 1 2 3 4 \$ sudo grub2-editenv list timeout=5default=0saved_entry=Red Hat Enterprise Linux Server, with Linux 4.18.0-305.el8.x86_64	grub2-editenv is part of GRUB2 and is used to manage GRUB environment variables. GRUB2 is installed by default in most Linux versions. Generally, grub2-editenv is preinstalled. If grub2-editenv is not installed, you can use the package manager to install it. Run the following commands in Debian/Ubuntu: sudo apt-get update sudo apt-get install grub2 Run the following command in Red Hat/CentOS/EulerOS: sudo yum install grub2

Installing CES Agent Monitoring Plug-ins

OS-level, proactive, and fine-grained server monitoring is provided after the Agent is installed on the ECS or BMS.

- **Step 1** Create an agency for Cloud Eye. For details, see **Creating a User and Granting Permissions**. If you have enabled Cloud Eye host monitoring authorization when creating the server, skip this step.
- **Step 2** Currently, one-click monitoring installation is not supported on the Cloud Eye page. You need to log in to the server and run the following commands to install and configure the agent. For details about how to install the agent in other regions, see **Installing the Agent on a Linux Server**.

cd /usr/local && curl -k -O https://obs.cn-north-4.myhuaweicloud.com/uniagent-cn-north-4/script/agent_install.sh && bash agent_install.sh

If the following information is displayed, the installation is successful.

Figure 9-1 Installation succeeded

```
telescope/linux arm64 bin/
telescope/linux arm64 bin/uninstall not root.sh
telescope/linux arm64 bin/telescope
telescope/linux_arm64_bin/install.sh
telescope/linux_arm64_bin/install not root.sh
telescope/linux arm64 bin/telescoped
telescope/linux arm64 bin/uninstall.sh
telescope/linux arm64 bin/tools/
telescope/linux arm64 bin/tools/hioadm
telescope/linux arm64 bin/tools/nvme
telescope/linux arm64 bin/tools/storcli64
telescope/linux arm64 bin/tools/sas3ircu
telescope/manifest.json
telescope/telescope-2.4.8-release.json
telescope/linux amd64 bin/
telescope/linux amd64 bin/uninstall not root.sh
telescope/linux amd64 bin/telescope
telescope/linux amd64 bin/install.sh
telescope/linux amd64 bin/install not root.sh
telescope/linux amd64 bin/telescoped
telescope/linux amd64 bin/uninstall.sh
telescope/linux amd64 bin/tools/
telescope/linux amd64 bin/tools/hioadm
telescope/linux amd64 bin/tools/nvme
telescope/linux amd64 bin/tools/storcli64
telescope/linux amd64 bin/tools/sas3ircu
telescope/conf/
telescope/conf/custom_conf.json
telescope/windows bin/
telescope/windows bin/uninstall.bat
telescope/windows_bin/shutdown.bat
telescope/windows bin/telescope.exe
telescope/windows bin/install.bat
telescope/windows bin/start.bat
telescope/windows bin/getpid.bat
telescope/config/
telescope/config/conf ces.json
telescope/config/logs_config.xml
telescope/config/conf.json
Current user is root.
Start to install telescope...
instance type: physical.p7vs.8xlarge.ei
Starting telescope...
Telescope process starts successfully.
```

Step 3 View the monitoring items on Cloud Eye page. Accelerator card monitoring items are available only after the accelerator card driver is installed on the host.

Figure 9-2 Monitoring page



The monitoring plug-in is now installed. You can view the collected metrics on the UI or configure alarms based on the metric values.

----End

Metric Namespace

AGT.ECS and SERVICE.BMS

Lite Server Monitoring Metrics

Table 9-1 only displays NPU-related metrics. For other metrics, see **Metrics Supported by the Agent**.

Table 9-1 NPU metrics

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
1	Over all	npu_ devic e_he alth	NPU Healt h Statu s	Healt h statu s of the NPU	-	N/A	0: norm al 1: mino r alar m 2: majo r alar m 3: critic al alar m	insta nce_i d, npu	Snt3 P 300I Duo Snt9 b Snt9 b23	tel esc op e: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
2		npu_ drive r_hea lth	NPU Drive r Healt h Statu s	Healt h statu s of the NPU drive r	-	N/A	0: norm al 3: critic al alar m	insta nce_i d, npu		
3		npu_ powe r	NPU Powe r	NPU powe r	W	N/A	>0	insta nce_i d, npu		
4		npu_t empe ratur e	NPU Temp eratu re	NPU temp eratu re	°C	N/A	Natu ral num ber	insta nce_i d, npu		
5		npu_ volta ge	NPU Volta ge	NPU volta ge	V	N/A	Natu ral num ber	insta nce_i d, npu		
6	НВМ	npu_ util_r ate_h bm	NPU HBM Usag e	HBM usag e of the NPU	%	N/A	0%- 100 %	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7.
7		npu_ hbm_ freq	HBM Freq uenc y	NPU HBM frequ ency	MHz	N/A	>0	insta nce_i d, npu		4.3 2.7. 5.3 2.7.
8		npu_f req_h bm	HBM Freq uenc y	NPU HBM frequ ency	MHz	N/A	>0	insta nce_i d, npu		5.4 2.7. 5.9 or
9		npu_ hbm_ usag e	HBM Usag e	NPU HBM usag e	МВ	N/A	≥0	insta nce_i d, npu		lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
10		npu_ hbm_ temp eratu re	HBM Temp eratu re	NPU HBM temp eratu re	°C	N/A	Natu ral num ber	insta nce_i d, npu		
11		npu_ hbm_ band width _util	HBM Band width Usag e	NPU HBM band width usag e	%	N/A	0%- 100 %	insta nce_i d, npu		
12		npu_ util_r ate_h bm_b w	HBM Band width Usag e	NPU HBM band width usag e	%	N/A	0%- 100 %	insta nce_i d, npu		
13		npu_ hbm_ mem _cap acity	NPU HBM Mem ory Capa city	HBM mem ory capa city of the NPU	МВ	N/A	≥0	insta nce_i d, npu		
14		npu_ hbm_ ecc_e nable	HBM ECC Statu s	NPU HBM ECC statu s	-	N/A	0: ECC detec tion is disab led. 1: ECC detec tion is enabl ed.	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
15		npu_ hbm_ singl e_bit _erro r_cnt	Singl e-bit Error s on HBM	Curre nt num ber of singl e-bit error s on the NPU HBM	count	N/A	≥0	insta nce_i d, npu		
16		npu_ hbm_ doub le_bit _erro r_cnt	Doub le-bit Error s on HBM	Curre nt num ber of doub le-bit error s on the NPU HBM	count	N/A	≥0	insta nce_i d, npu		
17		npu_ hbm_ total _sing le_bit _erro r_cnt	Singl e-bit Error s in HBM Lifec ycle	Num ber of singl e-bit error s in the NPU HBM lifecy cle	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
18		npu_ hbm_ total _dou ble_b it_err or_cn t	Doub le-bit Error s in HBM Lifec ycle	Num ber of doub le-bit error s in the NPU HBM lifecy cle	count	N/A	≥0	insta nce_i d, npu		
19		npu_ hbm_ singl e_bit _isola ted_p ages_ cnt	Isolat ed NPU Mem ory Page s with HBM Singl e-bit Error s	Num ber of isolat ed NPU mem ory page s with HBM singl e-bit error s	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
20		npu_ hbm_ doub le_bit _isola ted_p ages_ cnt	Isolat ed NPU Mem ory Page s with HBM Multi -bit Error s	Num ber of isolat ed NPU mem ory page s with HBM doub le-bit error s	count	N/A	≥0	insta nce_i d, npu		
21	DDR	npu_ usag e_me m	Used NPU Mem ory	Used NPU mem ory	МВ	N/A	≥0	insta nce_i d, npu	Snt3 P 300I Duo	tel esc op e:
22		npu_ util_r ate_ mem	NPU Mem ory Usag e	NPU mem ory usag e	%	N/A	0%- 100 %	insta nce_i d, npu		2.7.4.32.7.5.32.7.
23		npu_f req_ mem	NPU Mem ory Freq uenc y	NPU mem ory frequ ency	MHz	N/A	>0	insta nce_i d, npu		5.4 2.7. 5.9 or lat er
24		npu_ util_r ate_ mem _ban dwidt h	NPU Mem ory Band width Usag e	NPU mem ory band width usag e	%	N/A	0%- 100 %	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
25		npu_ sbe	NPU Singl e-bit Error s	Num ber of singl e-bit error s on the NPU	count	N/A	≥0	insta nce_i d, npu		
26		npu_ dbe	NPU Doub le-bit Error s	Num ber of doub le-bit error s on the NPU	count	N/A	≥0	insta nce_i d, npu		
27	AI Core	npu_f req_a i_cor e	AI Core Freq uenc y of the NPU	Al core frequ ency of the NPU	MHz	N/A	>0	insta nce_i d, npu	Snt3 P 300l Duo Snt9 b	tel esc op e: 2.7. 4.3 2.7.
28		npu_f req_a i_cor e_rat ed	Rate d Freq uenc y of the NPU AI Core	Rate d frequ ency of the NPU AI core	MHz	N/A	>0	insta nce_i d, npu	Snt9 b23	5.3 2.7. 5.4 2.7. 5.9 or lat er
29		npu_ util_r ate_a i_cor e	Al Core Usag e of the NPU	Al core usag e of the NPU	%	N/A	0%- 100 %	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
30	Al Vecto r	npu_ util_r ate_v ector _core	NPU Vecto r Core Usag e	NPU Vecto r Core Usag e	%	N/A	0%- 100 %	insta nce_i d, npu	Snt3 P 300I Duo Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er
31	AI CPU	npu_ aicpu _num	Num ber of AI CPUs of the NPU	Num ber of AI CPUs of the NPU	count	N/A	≥0	insta nce_i d, npu	Snt3 P 300l Duo Snt9 b	tel esc op e: 2.7. 4.3 2.7.
32		npu_ util_r ate_a i_cpu	NPU AI CPU Usag e	AI CPU usag e of the NPU	%	N/A	0%- 100 %	insta nce_i d, npu	Snt9 b23	5.3 2.7. 5.4 2.7. 5.9 or
33		npu_ aicpu _avg_ util_r ate	Aver age Al CPU Usag e of the NPU	Aver age Al CPU usag e of the NPU	%	N/A	0%- 100 %	insta nce_i d, npu		lat er
34		npu_ aicpu _max _freq	Maxi mum AI CPU Freq uenc y of the NPU	Maxi mum AI CPU frequ ency of the NPU	MHz	N/A	>0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
35		npu_ aicpu _cur_ freq	AI CPU Freq uenc y of the NPU	AI CPU frequ ency of the NPU	MHz	N/A	>0	insta nce_i d, npu		
36	CTRL CPU	npu_ util_r ate_c trl_cp u	Contr ol CPU Usag e of the NPU	Contr ol CPU usag e of the NPU	%	N/A	0%- 100 %	insta nce_i d, npu	Snt3 P 300l Duo Snt9 b	tel esc op e: 2.7. 4.3 2.7.
37		npu_f req_c trl_cp u	Contr ol CPU Freq uenc y of the NPU	Contr ol CPU frequ ency of the NPU	MHz	N/A	>0	insta nce_i d, npu	Snt9 b23	5.3 2.7. 5.4 2.7. 5.9 or lat er
38	PCIe link	npu_l ink_c ap_s peed	Max. NPU Link Spee d	Maxi mum link spee d of the NPU	GT/s	N/A	≥0	insta nce_i d, npu	310P 300l Duo Snt9 b Snt9	tel esc op e: 2.7. 4.3 2.7.
39		npu_l ink_c ap_w idth	Max. NPU Link Widt h	Maxi mum link width of the NPU	count	N/A	≥0	insta nce_i d, npu	b23	5.3 2.7. 5.4 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
40		npu_l ink_s tatus _spee d	NPU Link Spee d	Link spee d of the NPU	GT/s	N/A	≥0	insta nce_i d, npu		
41		npu_l ink_s tatus _widt h	NPU Link Widt h	Link width of the NPU	count	N/A	≥0	insta nce_i d, npu		
42	RoCE netw ork	npu_ devic e_net work _heal th	NPU Netw ork Healt h Statu s	Conn ectivi ty of the IP addr ess of the RoCE NIC on the NPU	-	N/A	O: The netw ork healt h statu s is norm al. Othe r value s: The netw ork statu s is abno rmal.	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or lat er
43		npu_ netw ork_p ort_li nk_st atus	NPU Netw ork Port Link Statu s	Link statu s of the NPU netw ork port	-	N/A	0: up 1: down	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
44		npu_ roce_ tx_ra te	NPU NIC Uplin k Rate	Uplin k rate of the NPU NIC	MB/s	N/A	≥0	insta nce_i d, npu		
45		npu_ roce_ rx_ra te	NPU NIC Dow nlink Rate	Dow nlink rate of the NPU NIC	MB/s	N/A	≥0	insta nce_i d, npu		
46		npu_ mac_ tx_m ac_p ause_ num	PAUS E Fram es Sent from MAC	Total num ber of PAUS E fram es sent from the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
47		npu_ mac_ rx_m ac_p ause_ num	PAUS E Fram es Recei ved by MAC	Total num ber of PAUS E fram es recei ved by the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		
48		npu_ mac_ tx_pf c_pkt _num	PFC Fram es Sent from MAC	Total num ber of PFC fram es sent from the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
49		npu_ mac_ rx_pf c_pkt _num	PFC Fram es Recei ved by MAC	Total num ber of PFC fram es recei ved by the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		
50		npu_ mac_ tx_ba d_pkt _num	Bad Pack ets Sent from MAC	Total num ber of bad pack ets sent from the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
51		npu_ mac_ rx_ba d_pkt _num	Bad Pack ets Recei ved by MAC	Total num ber of bad pack ets recei ved by the MAC addr ess corre spon ding to the NPU	count	N/A	≥0	insta nce_i d, npu		
52		npu_ roce_ tx_er r_pkt _num	Bad Pack ets Sent by RoCE	Total num ber of bad pack ets sent by the RoCE NIC on the NPU	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
53		npu_ roce_ rx_er r_pkt _num	Bad Pack ets Recei ved by RoCE	Total num ber of bad pack ets recei ved by the RoCE NIC on the NPU	count	N/A	≥0	insta nce_i d, npu		
54		npu_ roce_ tx_all _pkt_ num	Pack ets Trans mitte d by NPU RoCE	The num ber of pack ets trans mitte d by the NPU's RoCE	count	N/A	≥0	insta nce_i d, npu		tel esc op e: 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
55		npu_ roce_ rx_all _pkt_ num	Pack ets Recei ved by NPU RoCE	The num ber of pack ets recei ved by the NPU's RoCE	count	N/A	≥0	insta nce_i d, npu		
56		npu_ roce_ new_ pkt_r ty_nu m	Pack ets Retra nsmit ted by NPU RoCE	The num ber of pack ets retra nsmit ted by the NPU's RoCE	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
57		npu_roce_out_o f_ord er_nu m	Abno rmal PSN Pack ets Recei ved by NPU RoCE	This metri c indic ates that num ber of PSN pack ets recei ved by NPU RoCE is great er than that of expe cted or dupli cate PSN pack ets. If pack ets are out of order or lost, retra nsmi ssion is	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
				trigg ered.						
58		npu_ roce_ rx_cn p_pkt _num	CNP Pack ets Recei ved by NPU RoCE	The num ber of CNP pack ets recei ved by the NPU's RoCE	count	N/A	≥0	insta nce_i d, npu		
59		npu_ roce_ tx_cn p_pkt _num	CNP Pack ets Trans mitte d by NPU RoCE	The num ber of CNP pack ets trans mitte d by the NPU's ROCE	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
60	RoCE optic al mod ule	npu_ opt_t empe ratur e	NPU Optic al Mod ule Temp eratu re	NPU optic al mod ule temp eratu re	°C	N/A	Natu ral num ber	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 4.3 2.7. 5.3
61		npu_ opt_t empe ratur e_hig h_thr es	Uppe r Limit of the NPU Optic al Mod ule Temp eratu re	Uppe r limit of the NPU optic al mod ule temp eratu re	°C	N/A	Natu ral num ber	insta nce_i d, npu		2.7. 5.4 2.7. 5.9 or lat er
62		npu_ opt_t empe ratur e_lo w_th res	Lowe r Limit of the NPU Optic al Mod ule Temp eratu re	Lowe r limit of the NPU optic al mod ule temp eratu re	°C	N/A	Natu ral num ber	insta nce_i d, npu		
63		npu_ opt_v oltag e	NPU Optic al Mod ule Volta ge	NPU optic al mod ule volta ge	mV	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
64		npu_ opt_v oltag e_hig h_thr es	Uppe r Limit of the NPU Optic al Mod ule Volta ge	Uppe r limit of the NPU optic al mod ule volta ge	mV	N/A	Natu ral num ber	insta nce_i d, npu		
65		npu_ opt_v oltag e_lo w_th res	Lowe r Limit of the NPU Optic al Mod ule Volta ge	Lowe r limit of the NPU optic al mod ule volta ge	mV	N/A	Natu ral num ber	insta nce_i d, npu		
66		npu_ opt_t x_po wer_l ane0	TX Powe r of the NPU Optic al Mod ule in Chan nel 0	Trans mit powe r of the NPU optic al mod ule in chan nel 0	mW	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
67		npu_ opt_t x_po wer_l ane1	TX Powe r of the NPU Optic al Mod ule in Chan nel 1	Trans mit powe r of the NPU optic al mod ule in chan nel 1	mW	N/A	≥0	insta nce_i d, npu		
68		npu_ opt_t x_po wer_l ane2	TX Powe r of the NPU Optic al Mod ule in Chan nel 2	Trans mit powe r of the NPU optic al mod ule in chan nel 2	mW	N/A	≥0	insta nce_i d, npu		
69		npu_ opt_t x_po wer_l ane3	TX Powe r of the NPU Optic al Mod ule in Chan nel 3	Trans mit powe r of the NPU optic al mod ule in chan nel 3	mW	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
70		npu_ opt_r x_po wer_l ane0	RX Powe r of the NPU Optic al Mod ule in Chan nel 0	Recei ve powe r of the NPU optic al mod ule in chan nel 0	mW	N/A	≥0	insta nce_i d, npu		
71		npu_ opt_r x_po wer_l ane1	RX Powe r of the NPU Optic al Mod ule in Chan nel 1	Recei ve powe r of the NPU optic al mod ule in chan nel 1	mW	N/A	≥0	insta nce_i d, npu		
72		npu_ opt_r x_po wer_l ane2	RX Powe r of the NPU Optic al Mod ule in Chan nel 2	Recei ve powe r of the NPU optic al mod ule in chan nel 2	mW	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
73		npu_ opt_r x_po wer_l ane3	RX Powe r of the NPU Optic al Mod ule in Chan nel 3	Recei ve powe r of the NPU optic al mod ule in chan nel 3	mW	N/A	≥0	insta nce_i d, npu		
74		npu_ opt_t x_bia s_lan e0	TX Bias Curre nt of the NPU Optic al Mod ule in Chan nel 0	Trans mitte d bias curre nt of the NPU optic al mod ule in chan nel 0	mA	N/A	≥0	insta nce_i d, npu		
75		npu_ opt_t x_bia s_lan e1	TX Bias Curre nt of the NPU Optic al Mod ule in Chan nel 1	Trans mitte d bias curre nt of the NPU optic al mod ule in chan nel 1	mA	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
76		npu_ opt_t x_bia s_lan e2	TX Bias Curre nt of the NPU Optic al Mod ule in Chan nel 2	Trans mitte d bias curre nt of the NPU optic al mod ule in chan nel 2	mA	N/A	≥0	insta nce_i d, npu		
77		npu_ opt_t x_bia s_lan e3	TX Bias Curre nt of the NPU Optic al Mod ule in Chan nel 3	Trans mitte d bias curre nt of the NPU optic al mod ule in chan nel 3	mA	N/A	≥0	insta nce_i d, npu		
78		npu_ opt_t x_los	TX Los of the NPU Optic al Mod ule	TX Los flag of the NPU optic al mod ule	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
79		npu_ opt_r x_los	RX Los of the NPU Optic al Mod ule	RX Los flag of the NPU optic al mod ule	count	N/A	≥0	insta nce_i d, npu		
80		npu_ opt_ medi a_snr _lane 0	NPU Optic al Mod ule Chan nel 0 Optic al SNR	The signa l-to-noise ratio (SNR) on the medi a (opti cal) side of chan nel 0 in the NPU optic al mod ule	dB	N/A	Natu ral num ber	insta nce_i d, npu		tel esc op e: 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
81		npu_ opt_ medi a_snr _lane 1	NPU Optic al Mod ule Chan nel 1 Optic al SNR	The signa l-to-noise ratio (SNR) on the medi a (opti cal) side of chan nel 1 in the NPU optic al mod ule	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
82		npu_ opt_ medi a_snr _lane 2	NPU Optic al Mod ule Chan nel 2 Optic al SNR	The signa l-to-noise ratio (SNR) on the medi a (opti cal) side of chan nel 2 in the NPU optic al mod ule	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
83		npu_ opt_ medi a_snr _lane 3	NPU Optic al Mod ule Chan nel 3 Optic al SNR	The signa l-to-noise ratio (SNR) on the medi a (opti cal) side of chan nel 3 in the NPU optic al mod ule	dB	N/A	Natu ral num ber	insta nce_i d, npu		
84	HCCS Lane mod e	npu_ macr o1_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o1 in Lane 0 Mod e	The maxi mum time NPU Macr o1 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
85		npu_ macr o2_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o2 in Lane 0 Mod e	The maxi mum time NPU Macr o2 oper ates in Lane 0 mod e durin g a detection perio d	S	N/A	≥0	insta nce_i d, npu		
86		npu_ macr o3_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o3 in Lane 0 Mod e	The maxi mum time NPU Macr o3 oper ates in Lane 0 mod e durin g a detection perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
87		npu_ macr o4_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o4 in Lane 0 Mod e	The maxi mum time NPU Macr o4 oper ates in Lane 0 mod e durin g a detection perio d	S	N/A	≥0	insta nce_i d, npu		
88		npu_ macr o5_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o5 in Lane 0 Mod e	The maxi mum time NPU Macr o5 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
89		npu_ macr o6_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o6 in Lane 0 Mod e	The maxi mum time NPU Macr o6 oper ates in Lane 0 mod e durin g a detection perio d	S	N/A	≥0	insta nce_i d, npu		
90		npu_ macr o7_0l ane_ max_ conse c_sec	Maxi mum Dura tion of NPU Macr o7 in Lane 0 Mod e	The maxi mum time NPU Macr o7 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
91		npu_ macr o1_0l ane_t otal_ sec	Total Dura tion of NPU Macr o1 in Lane 0 Mod e	The total time NPU Macr o1 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		
92		npu_ macr o2_0l ane_t otal_ sec	Total Dura tion of NPU Macr o2 in Lane 0 Mod e	The total time NPU Macr o2 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
93		npu_ macr o3_0l ane_t otal_ sec	Total Dura tion of NPU Macr o3 in Lane 0 Mod e	The total time NPU Macr o3 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		
94		npu_ macr o4_0l ane_t otal_ sec	Total Dura tion of NPU Macr o4 in Lane 0 Mod e	The total time NPU Macr o4 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
95		npu_ macr o5_0l ane_t otal_ sec	Total Dura tion of NPU Macr o5 in Lane 0 Mod e	The total time NPU Macr o5 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		
96		npu_ macr o6_0l ane_t otal_ sec	Total Dura tion of NPU Macr o6 in Lane 0 Mod e	The total time NPU Macr o6 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
97		npu_ macr o7_0l ane_t otal_ sec	Total Dura tion of NPU Macr o7 in Lane 0 Mod e	The total time NPU Macr o7 oper ates in Lane 0 mod e durin g a detec tion perio d	S	N/A	≥0	insta nce_i d, npu		
98	HCCS Serde s SNR	npu_ macr o1_se rdes_ lane0 _snr	NPU Macr o1 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o1	dB	N/A	Natu ral num ber	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er
99		npu_ macr o1_se rdes_ lane1 _snr	NPU Macr o1 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o1	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
100		npu_ macr o1_se rdes_ lane2 _snr	NPU Macr o1 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o1	dB	N/A	Natu ral num ber	insta nce_i d, npu		
101		npu_ macr o1_se rdes_ lane3 _snr	NPU Macr o1 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o1	dB	N/A	Natu ral num ber	insta nce_i d, npu		
102		npu_ macr o2_se rdes_ lane0 _snr	NPU Macr o2 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o2	dВ	N/A	Natu ral num ber	insta nce_i d, npu		
103		npu_ macr o2_se rdes_ lane1 _snr	NPU Macr o2 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o2	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
104		npu_ macr o2_se rdes_ lane2 _snr	NPU Macr o2 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o2	dB	N/A	Natu ral num ber	insta nce_i d, npu		
105		npu_ macr o2_se rdes_ lane3 _snr	NPU Macr o2 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o2	dB	N/A	Natu ral num ber	insta nce_i d, npu		
106		npu_ macr o3_se rdes_ lane0 _snr	NPU Macr o3 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o3	dB	N/A	Natu ral num ber	insta nce_i d, npu		
107		npu_ macr o3_se rdes_ lane1 _snr	NPU Macr o3 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o3	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
108		npu_ macr o3_se rdes_ lane2 _snr	NPU Macr o3 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o3	dB	N/A	Natu ral num ber	insta nce_i d, npu		
109		npu_ macr o3_se rdes_ lane3 _snr	NPU Macr o3 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o3	dB	N/A	Natu ral num ber	insta nce_i d, npu		
110		npu_ macr o4_se rdes_ lane0 _snr	NPU Macr o4 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o4	dB	N/A	Natu ral num ber	insta nce_i d, npu		
111		npu_ macr o4_se rdes_ lane1 _snr	NPU Macr o4 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o4	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
112		npu_ macr o4_se rdes_ lane2 _snr	NPU Macr o4 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o4	dB	N/A	Natu ral num ber	insta nce_i d, npu		
113		npu_ macr o4_se rdes_ lane3 _snr	NPU Macr o4 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o4	dB	N/A	Natu ral num ber	insta nce_i d, npu		
114		npu_ macr o5_se rdes_ lane0 _snr	NPU Macr o5 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o5	dB	N/A	Natu ral num ber	insta nce_i d, npu		
115		npu_ macr o5_se rdes_ lane1 _snr	NPU Macr o5 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o5	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
116		npu_ macr o5_se rdes_ lane2 _snr	NPU Macr o5 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o5	dB	N/A	Natu ral num ber	insta nce_i d, npu		
117		npu_ macr o5_se rdes_ lane3 _snr	NPU Macr o5 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o5	dB	N/A	Natu ral num ber	insta nce_i d, npu		
118		npu_ macr o6_se rdes_ lane0 _snr	NPU Macr o6 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o6	dB	N/A	Natu ral num ber	insta nce_i d, npu		
119		npu_ macr o6_se rdes_ lane1 _snr	NPU Macr o6 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o6	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
120		npu_ macr o6_se rdes_ lane2 _snr	NPU Macr o6 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o6	dB	N/A	Natu ral num ber	insta nce_i d, npu		
121		npu_ macr o6_se rdes_ lane3 _snr	NPU Macr o6 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o6	dB	N/A	Natu ral num ber	insta nce_i d, npu		
122		npu_ macr o7_se rdes_ lane0 _snr	NPU Macr o7 SerD es Lane 0 SNR	The SNR for SerD es Lane 0 in NPU Macr o7	dB	N/A	Natu ral num ber	insta nce_i d, npu		
123		npu_ macr o7_se rdes_ lane1 _snr	NPU Macr o7 SerD es Lane 1 SNR	The SNR for SerD es Lane 1 in NPU Macr o7	dB	N/A	Natu ral num ber	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
124		npu_ macr o7_se rdes_ lane2 _snr	NPU Macr o7 SerD es Lane 2 SNR	The SNR for SerD es Lane 2 in NPU Macr o7	dB	N/A	Natu ral num ber	insta nce_i d, npu		
125		npu_ macr o7_se rdes_ lane3 _snr	NPU Macr o7 SerD es Lane 3 SNR	The SNR for SerD es Lane 3 in NPU Macr o7	dB	N/A	Natu ral num ber	insta nce_i d, npu		
126	HCCS pack et statis tics	npu_ macr o1_rx _cnt	Pack ets Recei ved by NPU Macr o1	The num ber of pack ets recei ved by NPU Macr o1 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
127		npu_ macr o2_rx _cnt	Pack ets Recei ved by NPU Macr o2	The num ber of pack ets recei ved by NPU Macr o2 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
128		npu_ macr o3_rx _cnt	Pack ets Recei ved by NPU Macr o3	The num ber of pack ets recei ved by NPU Macr o3 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
129		npu_ macr o4_rx _cnt	Pack ets Recei ved by NPU Macr o4	The num ber of pack ets recei ved by NPU Macr o4 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
130		npu_ macr o5_rx _cnt	Pack ets Recei ved by NPU Macr o5	The num ber of pack ets recei ved by NPU Macr o5 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
131		npu_ macr o6_rx _cnt	Pack ets Recei ved by NPU Macr o6	The num ber of pack ets recei ved by NPU Macr o6 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
132		npu_ macr o7_rx _cnt	Pack ets Recei ved by NPU Macr o7	The num ber of pack ets recei ved by NPU Macr o7 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
133		npu_ macr o1_tx _cnt	Pack ets Sent by NPU Macr o1	The num ber of pack ets sent by NPU Macr o1 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		
134		npu_ macr o2_tx _cnt	Pack ets Sent by NPU Macr o2	The num ber of pack ets sent by NPU Macr o2 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
135		npu_ macr o3_tx _cnt	Pack ets Sent by NPU Macr o3	The num ber of pack ets sent by NPU Macr o3 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		
136		npu_ macr o4_tx _cnt	Pack ets Sent by NPU Macr o4	The num ber of pack ets sent by NPU Macr o4 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
137		npu_ macr o5_tx _cnt	Pack ets Sent by NPU Macr o5	The num ber of pack ets sent by NPU Macr o5 durin g a detection period	count	N/A	≥0	insta nce_i d, npu		
138		npu_ macr o6_tx _cnt	Pack ets Sent by NPU Macr o6	The num ber of pack ets sent by NPU Macr o6 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
139		npu_ macr o7_tx _cnt	Pack ets Sent by NPU Macr o7	The num ber of pack ets sent by NPU Macr o7 durin g a detection period	count	N/A	≥0	insta nce_i d, npu		
140	HCCS retra nsmi ssion statis tics	npu_ macr o1_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o1	The num ber of pack ets retra nsmit ted by NPU Macr o1 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
141		npu_ macr o2_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o2	The num ber of pack ets retra nsmit ted by NPU Macr o2 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
142		npu_ macr o3_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o3	The num ber of pack ets retra nsmit ted by NPU Macr o3 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
143		npu_ macr o4_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o4	The num ber of pack ets retra nsmit ted by NPU Macr o4 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
144		npu_ macr o5_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o5	The num ber of pack ets retra nsmit ted by NPU Macr o5 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
145		npu_ macr o6_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o6	The num ber of pack ets retra nsmit ted by NPU Macr o6 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
146		npu_ macr o7_re try_c nt	Pack ets Retra nsmit ted by NPU Macr o7	The num ber of pack ets retra nsmit ted by NPU Macr o7 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
147	HCCS error pack et statis tics	npu_ macr o1_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o1	The num ber of invali d CRC pack ets recei ved by NPU Macr o1 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu	Snt9 b Snt9 b23	tel esc op e: 2.7. 5.9 or lat er
148		npu_ macr o2_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o2	The num ber of invali d CRC pack ets recei ved by NPU Macr o2 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
149		npu_ macr o3_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o3	The num ber of invali d CRC pack ets recei ved by NPU Macr o3 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
150		npu_ macr o4_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o4	The num ber of invali d CRC pack ets recei ved by NPU Macr o4 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
151		npu_ macr o5_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o5	The num ber of invali d CRC pack ets recei ved by NPU Macr o5 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
152		npu_ macr o6_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o6	The num ber of invali d CRC pack ets recei ved by NPU Macr o6 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
153		npu_ macr o7_cr c_err or_cn t	Invali d Pack ets Recei ved by NPU Macr o7	The num ber of invali d CRC pack ets recei ved by NPU Macr o7 durin g a detec tion perio d	count	N/A	≥0	insta nce_i d, npu		
154		npu_ macr o1_cr c_err or_ra te	NPU Macr o1 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o1 durin g a detection perio d	count	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
155		npu_ macr o2_cr c_err or_ra te	NPU Macr o2 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o2 durin g a detec tion perio d	%	N/A	≥0	insta nce_i d, npu		
156		npu_ macr o3_cr c_err or_ra te	NPU Macr o3 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o3 durin g a detec tion perio d	%	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
157		npu_ macr o4_cr c_err or_ra te	NPU Macr o4 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o4 durin g a detec tion perio d	%	N/A	≥0	insta nce_i d, npu		
158		npu_ macr o5_cr c_err or_ra te	NPU Macr o5 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o5 durin g a detec tion perio d	%	N/A	≥0	insta nce_i d, npu		

No.	Cate gory	Metr ic	Displ ay Nam e	Desc ripti on	Unit	Co nve rsio n Rul e	Valu e Rang e	Dime nsio n	Supp orte d Mod el	Su pp ort ed Ver sio ns
159		npu_ macr o6_cr c_err or_ra te	NPU Macr o6 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o6 durin g a detec tion perio d	%	N/A	≥0	insta nce_i d, npu		
160		npu_ macr o7_cr c_err or_ra te	NPU Macr o7 BER	The perce ntag e of invali d CRC pack ets recei ved by NPU Macr o7 durin g a detection perio d	%	N/A	≥0	insta nce_i d, npu		

Supported Events

You can use Cloud Eye to centrally collect key events and cloud resource operational events. When an event occurs, you will receive an alarm. Lite Server supports mainly BMS and ECS events. The table below lists NPU-related events. For details about other events, see **Events Supported by Event Monitoring**.

Table 9-2 Events supported by Lite Server

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
BMS/ ECS	SYS.B MS/ SYS.E CS	NPU: device not found by npu- smi info	NPUS MICar dNotF ound	Major	The Ascen d driver is faulty or the NPU is disco nnect ed.	Conta ct O&M engin eers.	The NPU canno t be used norm ally.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r
		NPU: PCIe link error	PCleE rrorFo und	Major	The lspci comm and outpu t shows that the NPU is in the rev ff state.	Conta ct O&M engin eers.	The NPU canno t be used norm ally.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		NPU: device not found by lspci	LspciC ardNo tFoun d	Major	The NPU is disco nnect ed.	Conta ct O&M engin eers.	The NPU canno t be used norm ally.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r
		NPU: overte mper ature	Temp eratur eOver Upper Limit	Major	The temp eratur e of DDR or softw are is too high.	Stop servic es, restar t the syste m, check the heat dissip ation syste m, and reset the device	The instan ce may be power ed off and device s may not be found .	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		NPU: uncor rectab le ECC error	Uncor rectab leEccE rrorW arnin g	Major	There are uncor rectab le ECC errors on the NPU.	If servic es are affect ed, replac e the NPU with anoth er one.	Servic es may be interr upted.	Snt3P 300ID uo	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r
		NPU: reque st for instan ce restar t	Rebo otVirt ualM achin e	Sugge stion	A fault occur s and the instan ce needs to be restar ted.	Collec t the fault infor matio n, and restar t the instan ce.	Servic es may be interr upted.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		NPU: reque st for SoC reset	Reset SOC	Sugge stion	A fault occur s and the SoC needs to be reset.	Collec t the fault infor matio n, and reset the SoC.	Servic es may be interr upted.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r
		NPU: reque st for restar t AI proce ss	Restar tAIPro cess	Sugge stion	A fault occur s and the Al proce ss needs to be restar ted.	Collec t the fault infor matio n, and restar t the AI proce ss.	The curre nt AI task will be interr upted.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.3 2.7. 5.4 2.7. 5.9 or late r

am Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
NPU: error codes	NPUE rrorC odeW arnin g	Major	A large numb er of NPU error codes indica ting major or highe r-level errors are return ed. You can furthe r locate the faults based on the error codes.	Locat e the faults accor ding to the Black Box Error Code Infor matio n List and Healt h Mana geme nt Error Defini tion.	Servic es may be interr upted.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 4.3 2.7. 5.4 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		Multi ple NPU HBM ECC errors	NpuH bmM ultiEc cInfo	Sugge stion	There are NPU HBM ECC errors	This event is only a refere nce for other event s. You do not need to handl e it separ ately.	This event is only a refere nce for other event s. You do not need to handl e it separ ately.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.9 or late r
		GPU: invali d RoCE NIC config uratio n	GpuR oceNi cConfi gIncor rect	Major	GPU: invali d RoCE NIC config uratio n	Conta ct O&M engin eers.	The para meter plane netwo rk is abnor mal, preve nting the execu tion of the multinode task.	GPU	tele sco pe: 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		Read Only issues in OS	Read OnlyF ileSys tem	Critic al	The file syste m %s is read-only.	Check the disk healt h status	The files canno t be writte n or opera ted.	-	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU: driver and firmw are not matc hing	NpuD riverFi rmwa reMis matc h	Major	The NPU's driver and firmw are do not matc h.	Obtain the matched version from the Ascend website and reinstall it.	NPUs canno t be used.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU: Docke r contai ner enviro nmen t check	NpuC ontai nerEn vSyste m	Major	Docke r unava ilable	Check if the Docke r softw are is norm al.	Docke r canno t be used.	-	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
				Major	The contai ner plug-in Ascen d- Docke r- Runti me is not install ed.	Install the contai ner plugin Ascen d-Docke r-Runti me. Other wise, the contai ner canno t use Ascen d cards.	NPUs canno t be moun ted to Docke r contai ners.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
				Major	IP forwa rding is not enabl ed in the OS.	Check the net.ip v4.ip_ forwa rd config uratio n in the /e tc/ sysctl .conf file.	Docke r contai ners experi ence netwo rk comm unicat ion issues .	-	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
				Major	The share d mem ory of the contai ner is too small.	The defaul t share d mem ory is 64 MB, which can be modified as needed. Meth od 1: Modify the default-shm-size field in the /e tc/docke r/daem on.jso n configuration file. Meth od 2: Use theshm-size para meter in the	Distri buted traini ng failed due to insuffi cient share d mem ory.		tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
						docke r run comm and to set the share d mem ory size of a contai ner.			
		NPU: RoCE NIC down	RoCEL inkSta tusDo wn	Major	The RoCE link of NPU %d is down.	Check the NPU RoCE netwo rk port status	The NPU NIC is unava ilable.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU: RoCE NIC healt h status abnor mal	RoCE Healt hStat usErr or	Major	The RoCE netwo rk healt h status of NPU %d is abnor mal.	Check the healt h status of the NPU ROCE NIC.	The NPU NIC is unava ilable.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		NPU: RoCE NIC config uratio n file /e tc/ hccn. conf not exist	Hccn Conf NotEx isted	Major	The RoCE NIC config uratio n file /e tc/ hccn. conf does not exist.	Check the /e tc/ hccn. conf NIC config uratio n file.	The RoCE NIC is unava ilable.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		GPU: basic comp onent s abnor mal	GpuE nviron ment Syste m	Major	The nvidi a-smi comm and is abnor mal.	Check wheth er the GPU driver is norm al.	The GPU driver is unava ilable.	GPU	tele sco pe: 2.7. 5.3 2.7. 5.9 or
				Major	The nvidia - fabric mana ger versio n was incon sisten t with the GPU driver versio n.	Check the GPU driver versio n and nvidia - fabric mana ger versio n.	The nvidia - fabric mana ger canno t work prope rly, affecti ng GPU usage .		late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
				Major	The contai ner plug-in nvidia - contai ner-toolki t is not install ed.	Install the contai ner plug- in nvidia - contai ner- toolki t.	GPUs canno t be attac hed to Docke r contai ners.		
		Local disk moun ting inspec tion	Moun tDiskS ystem	Major	The / etc/ fstab file contai ns invali d UUID s.	Ensur e that the UUID s in the /e tc/ fstab config uratio n file are correc t. Other wise, the server may fail to be restar ted.	The disk moun ting proce ss fails, preve nting the server from restar ting.	-	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		GP: incorr ectly config ured dyna mic route for Ant series server	GpuR outeC onfig Error	Major	The dyna mic route of the NIC %s of an Ant series server is not config ured or is incorr ectly config ured. CMD [ip route] : %s CMD [ip route show table all]: %s.	Confi gure the RoCE NIC route correc tly.	The NPU netwo rk comm unicat ion is abnor mal.	GPU	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU: RoCE port not split	RoCE UdpC onfig Error	Major	The RoCE UDP port is not split.	Check the RoCE UDP port config uratio n on the NPU.	The comm unicat ion perfor manc e of NPUs is affect ed.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		Warni ng of auto matic syste m kernel upgra de	Kerne lUpgr adeW arnin g	Major	Warni ng of auto matic syste m kernel upgra de. Old versio n: %s; new versio n: %s.	Syste m kernel upgra de may cause Al softw are excep tions. Check the syste m updat e logs and preve nt the server from restar ting.	The AI softw are may be unava ilable.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU enviro nmen t comm and detect ion	NpuT oolsW arnin g	Major	The hccn_ tool is unava ilable.	Check if the NPU driver is norm al.	The IP addre ss and gatew ay of the RoCE NIC canno t be configured.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
				Major	The npu- smi is unava ilable.	Check if the NPU driver is norm al.	NPUs canno t be used.	Snt3P 300ID uo Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
				Major	The ascen d-dmi is unava ilable.	Check if ToolB ox is prope rly install ed.	The ascen d-dmi canno t be used for perfor manc e analy sis.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.3 2.7. 5.9 or late r
		NPU: L1 switc h port partia l failur e	NpuL 1Swit chPor tParti alFun ctionF ailure	Major	Some functi ons of the NPU's L1 1520 switc h port fail.	Transf er this issue to the Ascen d or hardw are team for handli ng.	Servic es may be interr upted.	Snt9b 23	tele sco pe: 2.7. 5.9 or late r lqd cmi : 2.1. 0 and late r

Event Sourc e	Nam espac e	Event	Event ID	Event Sever ity	Descr iption	Soluti on	Impa ct	Supp orted Mode l	Sup por ted Ver sio ns
		NPU: L1 switc h fault	NpuL 1Swit chFau It	Major	There are faults in the L1 1520 switc h of the NPU.	Transf er this issue to the Ascen d or hardw are team for handli ng.	Servic es may be interr upted.	Snt9b 23	tele sco pe: 2.7. 5.9 or late r lqd cmi : 2.1. 0 and late r
		NPU: Unma tched RoCE IP addre ss	NpuR oceIP Addre ssMis matc h	Major	The actual IP addre ss of the RoCE NIC is incon sisten t with the IP addre ss in the hccn.c onf config uratio n file.	Conta ct O&M engin eers.	The para meter plane netwo rk is abnor mal, preve nting the execu tion of the multinode task.	Snt9b Snt9b 23	tele sco pe: 2.7. 5.9 or late r

9.2 Using Cloud Eye to Monitor the Health Status of Snt9B23 Supernodes

This section describes how to monitor the health status of Snt9B23 supernodes. The fault information can be sent to users via SMS messages or emails, and fault records can be queried through APIs.

Constraints

- This solution is implemented based on Cloud Eye alarm rules. As an account can create a maximum of 100 alarm rules on Cloud Eye, at most 100 supernodes can be monitored.
- Cloud Eye host monitoring agency needs to be enabled as the alarms are generated based on Cloud Eye fault detection events. You can enable this agency when purchasing the supernode or create the agency on the Cloud Eye console after the purchase. For details, see Permissions.
- Alarm notifications are sent via SMS messages and emails using Simple Message Notification (SMN). There will be certain fees. For details, see Product Pricing Details.

Procedure

- 1. Log in to the Cloud Eye console.
- 2. Create an alarm rule template.

Table 9-3 Parameters

Parameter	Recommended Value
Name	You are advised to name the template after the fault severity, for example, Subhealthy supernode .
Alarm Type	Event
Method	Select Configure manually . The recommended settings for other parameters are as follows:
	• Event Name: Select the target events by referring to Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node.
	• Alarm Policy: Generate the alarm once if the event occurs four times within 5 minutes. Note: Improper configurations may cause too many alarms or slow response.
	Alarm Severity: Select Major.

3. Create an alarm rule.

Table 9-4 Alarm rule parameters

Parameter	Recommended Value
Name	You are advised to name the alarm rule in the <supernode-name>_<fault-level> format, for example, SuperPod_01_Subhealthy.</fault-level></supernode-name>
Alarm Type	Event
Event Type	System event
Event Source	Elastic Cloud Server
Monitoring Scope	Specific resources
Instance	All subnodes in the supernode. Click Select Specific Resources , search for the supernode name, select all, and click OK .
Method	Configure manually
Alarm Policy	Enable Use Template and select the alarm template created in 2 from the drop-down list.
Alarm Notifications	(Optional) Enable this if you want to receive alarm notifications by SMS, email, HTTP, or HTTPS.
	Note : SMN charges you for SMS, email, HTTP, and HTTPS messages. For details, see Product Pricing Details .
Recipient	(Optional) This parameter is available only when Alarm Notifications is enabled. You are advised to create a topic.
Notification Window	(Optional) This parameter is available only when Alarm Notifications is enabled.
	The default value is recommended.
Trigger Condition	(Optional) This parameter is available only when Alarm Notifications is enabled.
	The default value is recommended.
Enterprise Project	Set this parameter based on the real-life situation.

4. (Optional) Create a topic.

Table 9-5 Parameters for creating a topic

Paramet er	Recommended Value
Topic Name	Enter a name in English, for example, SuperPod-Sub-Health .

Paramet er	Recommended Value
Display Name	Name displayed in the email subject. Set it to the fault severity, for example, Subhealthy supernode .
Enterpris e Project	Set this parameter based on the real-life situation.

5. (Optional) Add a subscription. After creating a topic, add subscriptions to receive alarm notifications.

Then, the terminal will receive a subscription confirmation. Confirm the subscription to receive alarm notifications.

Email Alarm Notification Example

In an alarm notification email, the subject displays the alarm severity, the content displays key information such as the alarm object, alarm policy, and alarm time. The alarm rule contains the name of the supernode to which the fault object belongs. For details about how to handle alarms, see **Supported Events**.

Querying Alarm Records

You can query alarm records through APIs. For details, see Alarm Records.

10 Managing CloudPond NPU Resources for Lite Server

Scenario

The Ascend compute resources that have been purchased by customers need to be provisioned by Lite Server. This section describes how to provision resources through Lite Server.

CloudPond is similar to an edge AZ of Huawei Cloud. Edge AZs deploy cloud infrastructure and services at customer premises. In scenarios where there are high requirements on application access latency, local data retention, and local system interaction, edge AZs ensure easy deployment to the local environment. For details about CloudPond, see What Is CloudPond?

Lite Server only manages the lifecycle of Ascend compute resources on CloudPond, such as provisioning, starting, stopping, and deleting.

Constraints

Lite Server can manage only Ascend Snt9b resources on CloudPond.

Only the new Lite Server purchase page supports the provisioning of CloudPond resources.

Prerequisites

- You have purchased CloudPond. For details, see Getting Started with CloudPond.
- Contact the customer manager to determine a Lite Server resource solution.
 Then, apply for the required resource specifications. Alternatively, submit a service ticket.
- Increase the resource quota. For details, see **Step 2: Increase the Resource Quota**.
- Enable basic permissions. For details, see Step 3: Enabling Basic Permissions.
- Configure ModelArts agency authorization. For details, see **Step 4 Creating** an **Agency Authorization on ModelArts**.

Billing

The Lite Server service is free of charge. You only need to pay for the purchased CloudPond resources.

Provisioning CloudPond Resources

Creating a Lite Server resource is the same as provisioning a CloudPond resource.

- 1. Log in to the **ModelArts console**.
- 2. In the navigation pane on the left, choose **Lite Servers** under **Resource Management**.
- 3. Click **Buy Lite Server** in the upper right corner. Configure the parameters on the displayed page.

◯ NOTE

Only the new Lite Server purchase page supports the provisioning of CloudPond resources.

Figure 10-1 Basic configurations for purchasing Lite Servers

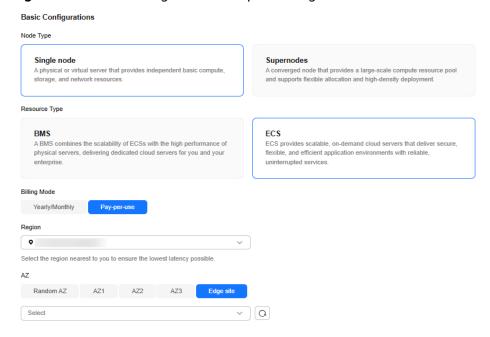


Table 10-1 Parameters for basic configurations

Parameter	Description
Туре	Select Single node.
Resource Type	Select ECS .
Billing Mode	Select Pay-per-use . Currently, Lite Servers are created free of charge.

Parameter	Description
Region	Select the region where the purchased Lite Site resources are located.
AZ	Select Lite Site and select existing CloudPond resources from the drop-down list. If no CloudPond resource is available, create one by referring to Getting Started with CloudPond .

Table 10-2 Parameters for resource configurations

Parameter	Description
CPU Architecture	CPU architecture of the resource type. Lite Server can manage only Ascend Snt9b resources of CloudPond. Therefore, select Arm .
	Select a CPU architecture and then select instance specifications as required. The flavors vary by region. The actual flavors are displayed on the console. NOTE If no specifications are available, contact Huawei technical support.
System Disk	This parameter is displayed only when you select a flavor that supports mounting. After an ECS is created, you can mount a data disk to the ECS or expand the capacity of the system disk on the ECS. The recommended value is not smaller than 100 GB.

Table 10-3 Parameters for configuring the OS

Parameter	Description
Image	Public image Public images are available for all users. All users can read the image by image ID.
	ModelArts allows you to perform development and training directly without additional configuration as it provides multiple public images, supports multiple OSs, and has built-in AI drivers and software.
	For details about the supported public images, see Mapping Between Compute Resources and Image Versions.
	Private image Only the image creator can use the image. You can select a private image to save your time from repeatedly configuring servers.

Table 10-4 Parameters for configuring storage

Parameter	Description
Node System Disk	This parameter is displayed only when you select an instance flavor that supports mounting.
Туре	The node system disk stores the OS of a server, and is automatically created and initialized upon Lite Server creation.
	Select a node system disk type and set the disk size. The system disk size ranges from 100 GiB to 1,024 GiB.
	You can also expand the system disk capacity after the server is created.
	The system disk is automatically mounted to each compute node.
(Optional) Node Data	Click Add Data Disk to mount an EVS data disk to the Lite Server. Currently, local disks cannot be mounted.
Disk Type	You can select Node Data Disk Type and set Size and Quantity .
	The data disk size ranges from 100 GiB to 32,768 GiB.
	For ECSs, there can be a maximum of 59 data disks. You can also expand the data disk capacity after the server is created.
	The data disk is automatically mounted to each compute node.

Table 10-5 Parameters for configuring the network

Parameter	Description
VPC	A Virtual Private Cloud (VPC) ensures the security, isolation, and network flexibility of server resources.
	Choose the VPC associated with your server from the drop- down list. You are advised to choose the same VPC for all related cloud services to simplify network connections.
	If no VPC is available in the drop-down list, click Create VPC on the right to create a VPC. To create a VPC, you need to log in to the management console as the administrator.
Subnet	Select the subnet under the CloudPond edge region of the VPC.
	If no subnet is available in the drop–down list, click Create Subnet on the right to create one.
Security group	A security group is a collection of access control rules for ECSs that have the same security requirements and that are mutually trusted within a VPC.
	If no security group is available in the drop-down list, click Create Security Group on the right to create one.

Parameter	Description	
IPv6	IPv6 is available when it is supported by the subnet, specifications, and image configured for the network.	
	Ensure that IPv6 has been enabled. To enable IPv6, see Creating a Subnet for an Existing VPC.	
	This parameter is only displayed for certain specifications and images.	
RoCE Network	When GPUs or Ascend Snt9b and Snt9b23 of series A are used for distributed training, you need to configure the RoCE network to use the RoCE NICs on the hardware.	
	The parameter is only displayed if you have selected one specification that supports RoCE networks.	
	If you have not created a RoCE network, click Create RoCE .	
	If you have created a RoCE network, select it directly.	

Table 10-6 Parameters for management configurations

Parameter	Description			
Server Name	Server name, which can contain 1 to 64 characters. Only digit, letters, underscores (_), and hyphens (-) are allowed.			
Login Mode	Key pair is recommended as it features higher security than Password . If you select Password , ensure that the password meets complexity requirements to prevent malicious attacks.			
	• Key pair Use a key pair to log in to the Server node. You can select an existing key pair, or click Create Key Pair to create one.			
	NOTE If you use an existing key pair, ensure that you have saved the key file locally. Otherwise, logging in to the Server node will fail.			
	 Password A username and its initial password are used for authentication and logging in to the Server node. 			
	For Linux, use the initial password of user root . For Windows, use the initial password of user Administrator . The password must:			
	– Contain 8 to 26 characters.			
	 Contain at least three types of the following characters: uppercase letters, lowercase letters, digits, and special characters (!@\$%^=+[{}]:,/?). 			
	 Cannot be the same as the username or the username spelled backwards. 			
	 Cannot contain root, administrator, or their reverse. 			

Parameter	Description
Cloud Eye host monitorin g	Enable this function. Once this function enabled, you can configure Cloud Eye host monitoring agency in one-click mode. Cloud Eye agency allows you to monitor various metrics of the server, including CPU, memory, network, disk, and process at an interval of 1 minute. For details, see Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node.
Enterprise Project	This parameter is only available if you have enabled the enterprise project function, or if your account is an enterprise account. To enable this function, contact your customer manager.
	An enterprise project makes it easy to manage projects and groups of cloud resources and users. Use the default enterprise project or create one.
	Select an enterprise project from the drop-down list. For details about enterprise projects, see <i>Enterprise Management User Guide</i> .
	CAUTION The enterprise project cannot be modified for a purchased server. Currently, the enterprise project information cannot be synchronized in the order.

Table 10-7 Parameters for advanced configurations

Parameter	Description
Cloud Eye host monitoring	Enable this function. Once this function enabled, you can configure Cloud Eye host monitoring agency in one-click mode. Cloud Eye agency allows you to monitor various metrics of the server, including CPU, memory, network, disk, and process at an interval of 1 minute. For details, see Using Cloud Eye to Monitor NPU Resources of a Single Lite Server Node.

Table 10-8 Parameters for purchase configurations

Parameter	Description
Quantity	You can purchase multiple instances simultaneously, with a value between 1 and 10 .

- 4. Click **Buy now**. Currently, Servers are provisioned free of charge.
- 5. The resource will be created in 20 to 60 minutes. If the resource fails to be created, see **Handling Resource Purchase Failures**.

1 1 Using CTS to Audit Lite Server Operations

ModelArts Lite Server can interconnect with Cloud Trace Service (CTS). With CTS, you can record operations associated with ModelArts Lite Server for later query, audit, and backtrack operations.

Constraints

CTS stores operation records of ModelArts Lite Server from the last seven days.

Prerequisites

You have enabled CTS. For details, see Cloud Trace Service User Guide.

Key Operations Supported by ModelArts Lite Server

Table 11-1 Key operations supported by ModelArts Lite Server

Operation	Resource Type	Trace
Create	Server	createServer
Update	Server	stopServer
Update	Server	startServer
Update	Server	rebootServer
Delete	Server	deleteServer
Read	Server	getServer
Update	Server	syncServer
Read	Server	listbyuserServer
Read	Server	listServer
Update	Server	changeosServer

Operation	Resource Type	Trace
Update	Server	reinstallosServer
Update	Server	attachvolumeServer
Update	Server	detachvolumeServer
Read	Server	getoperationServer
Update	Server	bindpublicipServer
Read	Server	listpublicipServer
Create	Server	createjobServer
Read	Server	getjobServer
Read	Server	listjobsServer
Delete	Server	deletejobsServer
Read	Server	listflavorsServer
Update	Server	updatejobServer
Create	ServerRoceNetwork	createrocenetwork- ServerRoceNetwork
Read	Plugin	listpluginsPlugin
Read	Serverlmage	listimagesServer- Image
Read	Serverlmage	getimageServerImag e
Read	ServerHyperinstance	getserverhyperin- stance
Read	ServerHyperinstance	listbyuserhyperin- stance
Read	ServerHyperinstance	listallhyperinstance
Update	ServerHyperinstance	changeoshyperin- stance
Delete	ServerHyperinstance	deleteserverhyperin- stance
Create	ServerHyperinstance	createtagshyperin- stance
Delete	ServerHyperinstance	deletetagshyperin- stance
Read	ServerHyperinstance	querytagshyperin- stance

Operation	Resource Type	Trace
Update	ServerHyperinstance	stophyperinstance
Update	ServerHyperinstance	starthyperinstance
Read	ServerHyperinstance	getoperationhyperin- stance
Update	ServerHyperinstance	scaleuphyperinstance

Viewing Audit Logs on the CTS Console

- 1. Log in to the CTS console.
- 2. Click in the upper left corner and select a region.
- 3. In the navigation pane on the left, choose **Trace List**.
- 4. Specify filters as needed. You can query traces using a combination of the following filters:
 - Trace Source, Resource Type, and Search By:
 Select a filter from the drop-down list.
 When you select Trace Name, you need to enter a specific trace name.
 When you select Resource ID, you need to enter a specific resource ID.
 When you select Resource Name, you need to enter a specific resource name.
 - **Operator**: Select a specific operator (a user rather than a tenant).
 - Trace Status: Select All trace statuses, Normal, Warning, or Incident.
 - **Time Range**: You can query traces generated during any time range of the last seven days.
- 5. Click \checkmark on the left of a trace to expand its details.
- 6. Locate the target trace and click **View Trace** in the **Operation** column. In the displayed **View Trace** dialog box, view the trace structure details.
 - For details about the CTS trace structure, see CTS User Guide.