

Bare Metal Server

Best Practices

Issue 01
Date 2023-03-30



Copyright © Huawei Cloud Computing Technologies Co., Ltd. 2023. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Cloud Computing Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are the property of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei Cloud and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Contents

1 Monitoring	1
1.1 Overview.....	1
1.2 Installing and Configuring the Agent for an Existing BMS.....	1
1.2.1 Installing the Agent.....	2
1.2.2 (Optional) Managing the Agent.....	4
1.3 Monitoring Data.....	5
1.4 Monitored Metrics (with Agent Installed).....	5
1.5 Monitored Metrics.....	26
1.6 FAQs.....	30
1.6.1 Why Does Not the Cloud Eye Console Display Monitoring Data or Why Is There a Delay in Data Display After Agent Is Installed and Configured?.....	30
1.6.2 How Do I Create an Agency for Server Monitoring of the BMS?.....	30
A Change History	32

1 Monitoring

1.1 Overview

Solution Introduction

After purchasing a BMS, you want to know its running status. Bare Metal Server (BMS) works with the Cloud Eye service to automatically collect monitoring metrics, such as the CPU, memory, disk, and network usage of a BMS. These metrics help you learn about the running status and performance of your BMS in time.

This document is prepared based on the BMS and Cloud Eye practices and provides guidance for you to configure server monitoring for BMSs.

Constraints

- Agent can be installed only on BMSs running a 64-bit Linux OS.
- An agency must be configured for monitoring BMSs. For details, see [How Do I Create an Agency for Server Monitoring of the BMS?](#)
- Private images do not support this function.

[Table 1-1](#) lists the Linux images that support server monitoring.

Table 1-1 Linux images that support server monitoring

OS Type (64-bit)	Version
SUSE	Enterprise11 SP4
CentOS	6.9, 7.2, 7.3, and 7.4

1.2 Installing and Configuring the Agent for an Existing BMS

1.2.1 Installing the Agent

This section describes how to install the Agent for an existing BMS. The procedure is as follows:

1. **Adding the Resolved Domain Names:** Add the resolved domain names of regions to the `/etc/resolv.conf` file on the BMS.
2. **Configuring the Security Group:** Download the Telescope package, send metrics, and collect logs.
3. **Procedure:** Manually install the Agent on the BMS.

Adding the Resolved Domain Names

1. Log in to the BMS as user **root**.
2. Enter `vi /etc/resolv.conf` to open the `/etc/resolv.conf` file.
3. Add `nameserver 100.125.1.250` and `nameserver 100.125.21.250` to the file, as shown in **Figure 1-1**.

Figure 1-1 Adding the resolved domain names

```
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 100.125.1.250
nameserver 114.114.114.114
nameserver 114.114.115.115
search openstacklocal
```

4. Press **Esc** and enter `:wq!` to save the configuration.

Configuring the Security Group


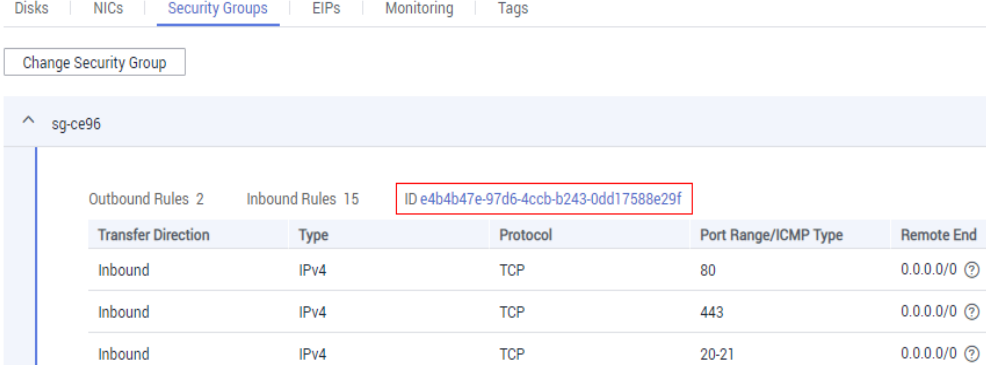
1. On the page showing the BMS details, click the **Security Groups** tab.
2. Click  to expand the security group details, showing the configured security group rules.
3. In the upper right corner of the rule list, click the security group ID to go to the **Security Groups** page.

Figure 1-2 Security group rules



Transfer Direction	Type	Protocol	Port Range/ICMP Type	Remote End
Inbound	IPv4	TCP	80	0.0.0.0/0
Inbound	IPv4	TCP	443	0.0.0.0/0
Inbound	IPv4	TCP	20-21	0.0.0.0/0

4. In the **Operation** column, click **Manage Rule**. On the **Outbound Rules** tab page, click **Add Rule** to add a rule based on **Table 1-2**.

Table 1-2 Security group rules

Direction	Protocol	Port	Destination IP address	Description
Outbound	TCP	80	100.125.0.0/16	Used to download the Agent installation package from the OBS bucket to the BMS and obtain the metadata and authentication information of the BMS.
Outbound	TCP and UDP	53	100.125.0.0/16	Used by DNS to resolve domain names, for example, resolve the OBS domain name when users are downloading the Agent installation package, and resolve the Cloud Eye endpoint when the Agent is sending monitoring data to Cloud Eye.
Outbound	TCP	443	100.125.0.0/16	Used to collect monitoring data that will be sent to Cloud Eye.

Procedure

1. Log in to the BMS as user **root**.
2. Run the following command to install the Agent:

The Agent is installed successfully if the command output similar to the following figure is displayed.

Figure 1-3 Successful installation

```
telescope_linux_amd64/  
telescope_linux_amd64/uninstall.sh  
telescope_linux_amd64/install.sh  
telescope_linux_amd64/bin/  
telescope_linux_amd64/bin/conf.json  
telescope_linux_amd64/bin/telescope  
telescope_linux_amd64/bin/conf_ces.json  
telescope_linux_amd64/bin/conf_lts.json  
telescope_linux_amd64/bin/record.json  
telescope_linux_amd64/bin/logs_config.xml  
telescope_linux_amd64/bin/agent  
telescope_linux_amd64/telescoped  
telescope_linux_amd64/telescope-1.0.12-release.json  
Current user is root.  
Current linux release version : CENTOS  
Start to install telescope...  
In chkconfig  
Success to install telescope to dir: /usr/local/telescope.  
Starting telescope...  
Telescope process starts successfully.  
[root@ecs-74e5-7 local]#
```

3. After the installation is complete, configure the Agent by referring to [\(Optional\) Manually Configuring the Agent \(Linux\)](#).
4. Run the following command to delete the installation script:

```
if [[ -f /usr/local/uniagent/extension/install/telescope/bin/telescope ]];  
then rm /usr/local/agent_install.sh; else rm /usr/local/agentInstall.sh; fi
```

1.2.2 (Optional) Managing the Agent

This section guides you to manage the Agent. You can view, start, stop, and uninstall the Agent as needed.

NOTE

You need to view, start, stop, and uninstall the Agent as user **root**.

Checking the Agent Status

Log in to the BMS and run the following command to check the Agent status:

```
service telescoped status
```

The Agent is running properly if the system displays the following information:

```
"Telescope process is running well."
```

Starting the Agent

Run the following command to start the Agent:

```
/usr/local/telescope/telescoped start
```

Restarting the Agent

Run the following command to restart the Agent:

```
/usr/local/telescope/telescoped restart
```

Stopping the Agent

Run the following command to stop Agent:

```
service telescoped stop
```

NOTE

If the Telescope installation fails, you may fail to stop the Agent, and you can run the following command to stop the Agent again:

```
/usr/local/telescope/telescoped stop
```

Uninstalling the Agent

You can manually uninstall the Agent. After the uninstallation, Cloud Eye does not collect the BMS monitoring data. If you need to use the Agent again, install it again. For details, see section [Installing the Agent](#).

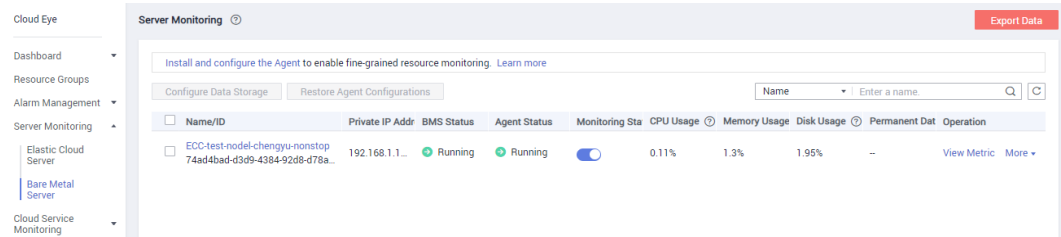
Run the following command to uninstall the Agent:

`/usr/local/telescope/uninstall.sh`

1.3 Monitoring Data

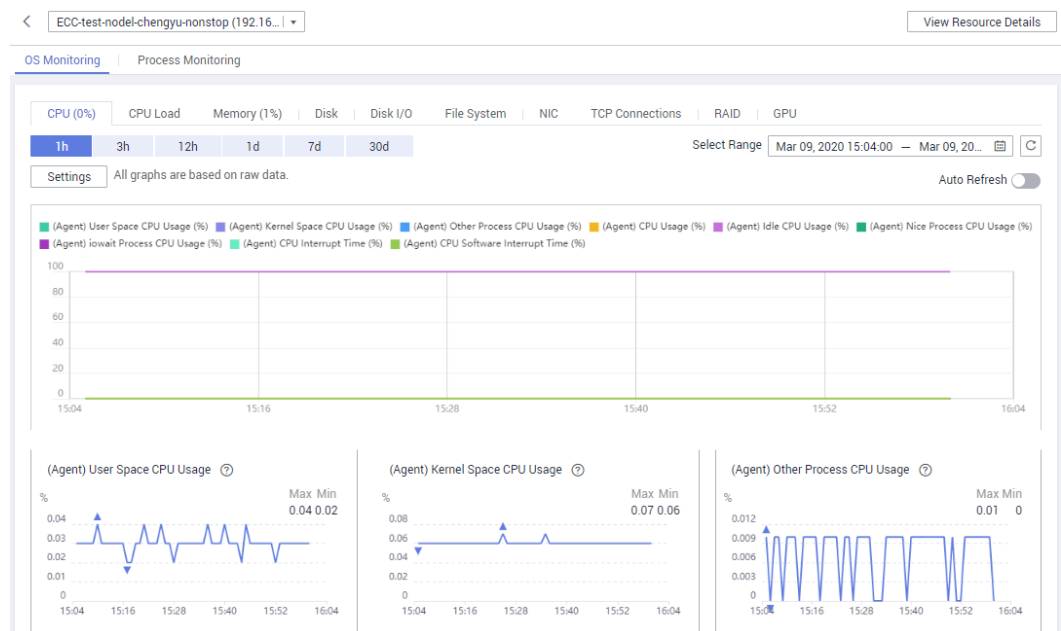
Log in to the management console and choose **Cloud Eye**. In the navigation pane on the left, choose **Server Monitoring** > **Bare Metal Server**. In the right pane, **Name/ID**, **Status**, and **Agent Status** of the BMS are displayed.

Figure 1-4 Server monitoring



You can click **View Metric** in the **Operation** column to obtain the visualized monitoring graph of the BMS and view monitoring metrics of the BMS, such as the CPU usage, CPU load, and memory usage.

Figure 1-5 Visualized monitoring graph



1.4 Monitored Metrics (with Agent Installed)

Description

This section describes monitoring metrics reported by BMS to Cloud Eye as well as their namespaces and dimensions. You can use the management console or APIs provided by Cloud Eye to query the metrics of the monitored objects and alarms generated for BMS.

 NOTE

After installing the Agent on a BMS, you can view its OS monitoring metrics. Monitoring data is collected at an interval of 1 minute.

Namespace

SERVICE.BMS

Metrics

Supported BMS **OS Monitoring** metrics include CPU metrics listed in [Table 1-3](#), CPU load metrics listed in [Table 1-4](#), memory metrics listed in [Table 1-5](#), disk metrics listed in [Table 1-6](#), disk I/O metrics listed in [Table 1-7](#), file system metrics listed in [Table 1-8](#), NIC metrics listed in [Table 1-9](#), software RAID metrics listed in [Table 1-10](#), and process metrics in [Table 1-11](#).

 NOTE

To monitor software RAID metrics, Agent 1.0.5 or later is required.
Currently, BMSs running the Windows OS cannot be monitored.

Table 1-3 CPU metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
cpu_usage_idle	(Agent) Idle CPU Usage	Percentage of time that CPU is idle Check the metric value changes in the <code>/proc/stat</code> file in a collection period. Run the <code>top</code> command to check the <code>%Cpu(s) id</code> value. Unit: percent	0-100%	BMS	1 minute
cpu_usage_other	(Agent) Other Process CPU Usage	Percentage of time that the CPU is used by other processes Formula: Other Process CPU Usage = 1 - Idle CPU Usage - Kernel Space CPU Usage - User Space CPU Usage Unit: percent	0-100%	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
cpu_usage_system	(Agent) Kernel Space CPU Usage	Percentage of time that the CPU is used by kernel space Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) sy value. Unit: percent	0-100%	BMS	1 minute
cpu_usage_user	(Agent) User Space CPU Usage	Percentage of time that the CPU is used by user space Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) us value. Unit: percent	0-100%	BMS	1 minute
cpu_usage	(Agent) CPU Usage	CPU usage of the monitored object Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) value. Unit: percent	0-100%	BMS	1 minute
cpu_usage_nice	(Agent) Nice Process CPU Usage	Percentage of time that the CPU is used by the Nice process Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) ni value. Unit: percent	0-100%	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
cpu_usage_iowait	(Agent) iowait Process CPU Usage	Percentage of time during which the CPU is waiting for I/O operations to complete Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) wa value. Unit: percent	0-100%	BMS	1 minute
cpu_usage_irq	(Agent) CPU Interrupt Time	Percentage of time that the CPU is servicing interrupts Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) hi value. Unit: percent	0-100%	BMS	1 minute
cpu_usage_softirq	(Agent) CPU Software Interrupt Time	Percentage of time that the CPU is servicing software interrupts Check the metric value changes in the /proc/stat file in a collection period. Run the top command to check the %Cpu(s) si value. Unit: percent	0-100%	BMS	1 minute

Table 1-4 CPU load metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
load_average 1	(Agent) 1-Minute Load Average	<p>CPU load averaged from the last 1 minute</p> <p>Obtain its value by dividing the load1/ value in /proc/loadavg by the number of logical CPUs.</p> <p>Run the top command to check the load1 value.</p>	≥ 0	BMS	1 minute
load_average 5	(Agent) 5-Minute Load Average	<p>CPU load averaged from the last 5 minutes</p> <p>Obtain its value by dividing the load5/ value in /proc/loadavg by the number of logical CPUs.</p> <p>Run the top command to check the load5 value in the /proc/loadavg file.</p>	≥ 0	BMS	1 minute
load_average 15	(Agent) 15-Minute Load Average	<p>CPU load averaged from the last 15 minutes</p> <p>Obtain its value by dividing the load15/ value in /proc/loadavg by the number of logical CPUs.</p> <p>Run the top command to check the load15 value in the /proc/loadavg file.</p>	≥ 0	BMS	1 minute

Table 1-5 Memory metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mem_available	(Agent) Available Memory	Available memory size of the monitored object Obtain the MemAvailable value by checking the file /proc/meminfo . If it is not displayed in the file: MemAvailable = MemFree + Buffers + Cached Unit: GB	≥ 0 GB	BMS	1 minute
mem_usedPercent	(Agent) Memory Usage	Memory usage of the monitored object Obtain its value by checking the file /proc/meminfo . Memory Usage = (MemTotal - MemAvailable) / MemTotal Unit: percent	0-100%	BMS	1 minute
mem_free	(Agent) Idle Memory	Amount of memory that is not being used Obtain its value by checking the file /proc/meminfo . Unit: GB	≥ 0 GB	BMS	1 minute
mem_buffers	(Agent) Buffer	Memory that is being used for buffers Obtain its value by checking the file /proc/meminfo . Run the top command to check the KiB Mem:buffers value. Unit: GB	≥ 0 GB	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mem_cache_d	(Agent) Cache	Memory that is being used for file caches Obtain its value by checking the file /proc/meminfo . Run the top command to check the KiB Swap:cached Mem value. Unit: GB	≥ 0 GB	BMS	1 minute

Table 1-6 Disk metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_free	(Agent) Available Disk Space	Available disk space of the monitored object Run the df -h command to check the data in the Avail column. The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~). Unit: GB	≥ 0 GB	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_total	(Agent) Disk Storage Capacity	<p>Disk storage capacity of the monitored object</p> <p>Run the df -h command to check the data in the Size column.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: GB</p>	≥ 0 GB	BMS	1 minute
mountPointPrefix_disk_used	(Agent) Used Disk Space	<p>Used disk space of the monitored object</p> <p>Run the df -h command to check the data in the Used column.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: GB</p>	≥ 0 GB	BMS	1 minute
mountPointPrefix_disk_usedPercent	(Agent) Disk Usage	<p>Disk usage of the monitored object. It is calculated as follows: Disk Usage = Used Disk Space/Disk Storage Capacity.</p> <p>Disk Usage = Used Disk Space/Disk Storage Capacity</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: percent</p>	0-100%	BMS	1 minute

Table 1-7 Disk I/O metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_agt_read_bytes_rate	(Agent) Disks Read Rate	<p>Volume of data read from the monitored object per second</p> <p>The disk read rate is calculated by checking data changes in the sixth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: byte/s</p>	≥ 0 bytes/s	BMS	1 minute
mountPointPrefix_disk_agt_read_requests_rate	(Agent) Disks Read Requests	<p>Number of read requests sent to the monitored object per second</p> <p>The disk read requests are calculated by checking data changes in the fourth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: request/s</p>	≥ 0	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_agt_write_bytes_rate	(Agent) Disks Write Rate	<p>Volume of data written to the monitored object per second</p> <p>The disk write rate is calculated by checking data changes in the tenth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: byte/s</p>	≥ 0 bytes/s	BMS	1 minute
mountPointPrefix_disk_agt_write_requests_rate	(Agent) Disks Write Requests	<p>Number of write requests sent to the monitored object per second</p> <p>The disk write requests are calculated by checking data changes in the eighth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: request/s</p>	≥ 0	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_readTime	(Agent) Average Read Request Time	<p>Average amount of time that read requests have waited on the disks</p> <p>The average read request time is calculated by checking data changes in the seventh column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: ms/count</p>	≥ 0 ms/Count	BMS	1 minute
disk_writeTime	(Agent) Average Write Request Time	<p>Average amount of time that write requests have waited on the disks</p> <p>The average write request time is calculated by checking data changes in the eleventh column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: ms/count</p>	≥ 0 ms/Count	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_ioUtils	(Agent) Disk I/O Usage	<p>Disk I/O usage of the monitored object</p> <p>Check the data changes in the thirteenth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: percent</p>	0-100%	BMS	1 minute
disk_queue_length	(Agent) Disk Queue Length	<p>Average number of read or write requests to be processed for the monitored disk in the monitoring period</p> <p>The average disk queue length is calculated by checking data changes in the fourteenth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: count</p>	≥ 0	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_write_bytes_per_operation	(Agent) Average Disk Write Size	<p>Average number of bytes in an I/O write for the monitored disk in the monitoring period</p> <p>The average disk write size is calculated by dividing the data changes in the tenth column of the corresponding device by that of the eighth column in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: KB/op</p>	≥ 0 KB/op	BMS	1 minute
disk_read_bytes_per_operation	(Agent) Average Disk Read Size	<p>Average number of bytes in an I/O read for the monitored disk in the monitoring period</p> <p>The average disk read size is calculated by dividing the data changes in the sixth column of the corresponding device by that of the fourth column in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: KB/op</p>	≥ 0 KB/op	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_i o_svct m	(Agent) Disk I/O Service Time	<p>Average time in an I/O read or write for the monitored disk in the monitoring period</p> <p>The average disk I/O service time is calculated by dividing the data changes in the thirteenth column of the corresponding device by the sum of data changes in the fourth and eighth columns in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: ms/op</p>	≥ 0 ms/op	BMS	1 minute

Table 1-8 File system metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_f s_rwst ate	(Agent) File System Read/Write Status	<p>Read and write status of the mounted file system of the monitored object</p> <p>Possible values are 0 (read and write) and 1 (read only).</p> <p>Check file system information in the fourth column in the /proc/mounts file.</p>	0 and 1	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
disk_inodes Total	(Agent) Disk inode Total	Total number of index nodes on the disk Run the df -i command to check information in the Inodes column. The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).	≥ 0	BMS	1 minute
disk_inodes Used	(Agent) Total inode Used	Number of used index nodes on the disk Run the df -i command to check data in the IUsed column. The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).	≥ 0	BMS	1 minute
disk_inodes UsedPercent	(Agent) Percentage of Total inode Used	Percentage of used index nodes on the disk Run the df -i command to check data in the IUse% column. The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~). Unit: percent	0-100%	BMS	1 minute

Table 1-9 NIC metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
net_bitRecv	(Agent) Inbound Bandwidth	Number of bits received by this NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: bit/s	≥ 0 bit/s	BMS	1 minute
net_bitSent	(Agent) Outbound Bandwidth	Number of bits sent by this NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: bit/s	≥ 0 bit/s	BMS	1 minute
net_packetRecv	(Agent) NIC Packet Receive Rate	Number of packets received by this NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: count/s	≥ 0 count/s	BMS	1 minute
net_packetSent	(Agent) NIC Packet Send Rate	Number of packets sent by this NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: count/s	≥ 0 count/s	BMS	1 minute
net_errin	(Agent) Receive Error Rate	Percentage of receive errors detected by this NIC per second Unit: percent	0-100 %	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
net_errout	(Agent) Transmit Error Rate	Percentage of transmit errors detected by this NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: percent	0-100 %	BMS	1 minute
net_dropin	(Agent) Received Packet Drop Rate	Percentage of packets discarded by this NIC to the total number of packets received by the NIC per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: percent	0-100 %	BMS	1 minute
net_dropout	(Agent) Transmitted Packet Drop Rate	Percentage of packets transmitted by this NIC which were dropped per second Check metric value changes in the / proc/net/dev file in a collection period. Unit: percent	0-100 %	BMS	1 minute

Table 1-10 Software RAID metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
md1_status_device:1	(Agent) Status	Software RAID status of the monitored object. Its value is 0 if the RAID is abnormal. Run the plug-in script /usr/local/telescope/plugins/raid-monitor.sh in a collection period. Obtain its value by checking data changes in the /proc/mdstat file and run mdadm -D/dev/md0 (md0 indicates the RAID name) .	0 and 1	BMS	1 minute
md1_active_device:2	(Agent) Active Disks	Number of active disks in software RAID of the monitored object. Its value is -1 if the RAID is abnormal. Run the plug-in script /usr/local/telescope/plugins/raid-monitor.sh in a collection period. Obtain its value by checking data changes in the /proc/mdstat file and run mdadm -D/dev/md0 (md0 indicates the RAID name) .	$\geq 0, -1$	BMS	1 minute
md1_working_device:2	(Agent) Working Disks	Number of working disks in software RAID of the monitored object. Its value is -1 if the RAID is abnormal. Run the plug-in script /usr/local/telescope/plugins/raid-monitor.sh in a collection period. Obtain its value by checking data changes in the /proc/mdstat file and run mdadm -D/dev/md0 (md0 indicates the RAID name) .	$\geq 0, -1$	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
md1_failed_device:0	(Agent) Failed Disks	<p>Number of failed disks in software RAID of the monitored object. Its value is -1 if the RAID is abnormal.</p> <p>Run the plug-in script <code>/usr/local/telescope/plugins/raid-monitor.sh</code> in a collection period. Obtain its value by checking data changes in the <code>/proc/mdstat</code> file and run <code>mdadm -D/dev/md0</code> (<code>md0</code> indicates the RAID name).</p>	≥ 0, -1	BMS	1 minute
md1_spare_device:0	(Agent) Spare Disks	<p>Number of spare disks in software RAID of the monitored object. Its value is -1 if the RAID is abnormal.</p> <p>Run the plug-in script <code>/usr/local/telescope/plugins/raid-monitor.sh</code> in a collection period. Obtain its value by checking data changes in the <code>/proc/mdstat</code> file and run <code>mdadm -D/dev/md0</code> (<code>md0</code> indicates the RAID name).</p>	≥ 0, -1	BMS	1 minute

Table 1-11 Process metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
proc_pHashId_cpu	CPU Usage	<p>CPU consumed by a process. pHashId (process name and process ID) is the value of md5.</p> <p>Check the metric value changes in the /proc/pid/stat file.</p> <p>Unit: percent</p>	0-100 %	BMS	1 minute
proc_pHashId_mem	Memory Usage	<p>Memory consumed by a process. pHashId (process name and process ID) is the value of md5.</p> <p>Memory Usage = RSS x PAGESIZE/MemTotal</p> <ul style="list-style-type: none"> Obtain the RSS value by checking the second column of the file /proc/pid/statm. Obtain the PAGESIZE value by running the getconf PAGESIZE command. Obtain the MemTotal value by checking the file /proc/meminfo. <p>Unit: percent</p>	0-100 %	BMS	1 minute
proc_pHashId_file	Opened Files	<p>Number of files opened by a process. pHashId (process name and process ID) is the value of md5.</p> <p>Run the ls -l /proc/pid/fd command to view the number of opened files.</p>	≥0	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
proc_running_count	(Agent) Running Processes	Number of running processes You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute
proc_idle_count	(Agent) Idle Processes	Number of idle processes You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute
proc_zombie_count	(Agent) Zombie Processes	Number of zombie processes You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute
proc_blocked_count	(Agent) Blocked Processes	Number of blocked processes You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
proc_sleeping_count	(Agent) Sleeping Processes	Number of sleeping processes You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute
proc_total_count	(Agent) Total Processes	Total number of processes on the monitored object You can obtain the status of each process by checking the Status value in the /proc/pid/status file, and then collect the total number of processes in each state.	≥0	BMS	1 minute

1.5 Monitored Metrics

Description

 NOTE

After installing the Agent on a BMS, you can view its OS monitoring metrics. Monitoring data is collected at an interval of 1 minute.

Namespace

SERVICE.BMS

Metrics

[Table 1-12](#) lists the metrics supported by BMS.

Table 1-12 Metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
cpu_usage	(Agent) CPU Usage	<p>CPU usage of the monitored object</p> <p>Obtain its value by checking metric value changes in the /proc/stat file in a collection period.</p> <p>Run the top command to check the %Cpu(s) value.</p> <p>Unit: percent</p>	0-100 %	BMS	1 minute
load_averge5	(Agent) 5-Minute Load Average	<p>CPU load averaged from the last 5 minutes</p> <p>Obtain its value by dividing the load5/ value in /proc/loadavg by the number of logical CPUs.</p> <p>Run the top command to check the load5 value in the /proc/loadavg file.</p>	≥ 0	BMS	1 minute
mem_usedPercent	(Agent) Memory Usage	<p>Memory usage of the monitored object</p> <p>Obtain its value by checking the file /proc/meminfo.</p> <p>Memory Usage = (MemTotal - MemAvailable)/MemTotal</p> <p>Unit: percent</p>	0-100 %	BMS	1 minute
mountPointPrefix_disk_free	(Agent) Available Disk Space	<p>Available disk space of the monitored object</p> <p>Run the df -h command to check the data in the Avail column.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: GB</p>	≥ 0 GB	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_usedPercent	(Agent) Disk Usage	<p>Disk usage of the monitored object. It is calculated as follows: Disk Usage = Used Disk Space/ Disk Storage Capacity.</p> <p>Disk Usage = Used Disk Space/Disk Storage Capacity</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: percent</p>	0-100 %	BMS	1 minute
mountPointPrefix_disk_ioUtils and volumePrefix_disk_ioUtils	(Agent) Disk I/O Usage	<p>Disk I/O usage of the monitored object</p> <p>Obtain its value by checking data changes in the thirteenth column of the corresponding device in the /proc/diskstats file in a collection period.</p> <p>The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~).</p> <p>Unit: percent</p>	0-100 %	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
mountPointPrefix_disk_inodeUsedPercent	(Agent) Percentage of Total Inode Used	Percentage of used index nodes on the disk Run the df -i command to check data in the IUse% column. The path of the mount point prefix cannot exceed 64 characters. It must start with a letter, and contain only digits, letters, hyphens (-), dots (.), and swung dashes (~). Unit: percent	0-100 %	BMS	1 minute
net_bitRecv	(Agent) Inbound Bandwidth	Number of bits received by this NIC per second Check metric value changes in the /proc/net/dev file in a collection period. Unit: bit/s	≥ 0 bit/s	BMS	1 minute
net_bitSent	(Agent) Outbound Bandwidth	Number of bits sent by this NIC per second Check metric value changes in the /proc/net/dev file in a collection period. Unit: bit/s	≥ 0 bit/s	BMS	1 minute
net_packetRecv	(Agent) NIC Packet Receive Rate	Number of packets received by this NIC per second Check metric value changes in the /proc/net/dev file in a collection period. Unit: count/s	≥ 0 counts/s	BMS	1 minute
net_packetSent	(Agent) NIC Packet Send Rate	Number of packets sent by this NIC per second Check metric value changes in the /proc/net/dev file in a collection period. Unit: count/s	≥ 0 counts/s	BMS	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
net_tcp_total	(Agent) TCP TOTAL	Total number of TCP connections of this NIC	≥0	BMS	1 minute
net_tcp_established	(Agent) TCP ESTABLISHED	Number of ESTABLISHED TCP connections of this NIC	≥0	BMS	1 minute

1.6 FAQs

1.6.1 Why Does Not the Cloud Eye Console Display Monitoring Data or Why Is There a Delay in Data Display After Agent Is Installed and Configured?

1. After the Agent is installed successfully, server monitoring data is displayed on the Cloud Eye console after two minutes. If **BMS** is not displayed on the **Monitoring Overview** page after five minutes, check whether the time of the BMS is the same as that of the client where you are using the management console.

The time when the Agent reports data depends on the local time of the BMS. The time when the console delivers requests is related to the browser time of the client. If the two are inconsistent, no monitoring data is displayed on the Cloud Eye console.

2. Log in to the BMS and run the **service telescoped status** command to check the status of Agent. If the following information is displayed, Agent is running properly:

```
Telescope process is running well.
```

If monitoring data is still not displayed, check the configuration as instructed in [Manually Configuring the Agent for Linux](#).

1.6.2 How Do I Create an Agency for Server Monitoring of the BMS?

1. On the management console, choose **Service List > Identity and Access Management**.
2. In the navigation pane on the left, choose **Agencies** and then click **Create Agency** in the upper right corner.
 - **Agency Name:** Enter **bms_monitor_agency**.
 - **Agency Type:** Select **Cloud service**.

- **Cloud Service:** Select **Elastic Cloud Server (ECS) and Bare Metal Server (BMS)** from the drop-down list.
 - **Validity Period:** Select **Unlimited**.
 - **Description:** Enter **Support BMS server monitoring**.
3. Click **Next**. On the **Select Policy/Role** page, search for and select **CES Administrator**.
 4. Click **Next**. On the **Select Scope** page, select **All resources** or **Region-specific projects**.

 **NOTE**

If the BMS belongs to a sub-project, ensure that the sub-project has the CES Administrator permission.

5. Click **OK**.

A Change History

Table A-1

Release On	Description
2023-03-30	This issue is the first official release.