CA Unified Infrastructure Management

Probe Guide for CPU, Disk, and Memory Monitoring
cdm v5.0 series

ca technologies

Copyright Notice

Contact CA

Contact CA Support

For your convenience, CA Technologies provides one site where you can access the information that you need for your Home Office, Small Business, and Enterprise CA Technologies products. At http://ca.com/support, you can access the following resources:

- Online and telephone contact information for technical assistance and customer services

- Information about user communities and forums

- Product and documentation downloads

- CA Support policies and guidelines

- Other helpful resources appropriate for your product

Providing Feedback about Product Documentation

Send comments or questions about CA Technologies product documentation to nimsoft.techpubs@ca.com.

To provide feedback about general CA Technologies product documentation, complete our short customer survey which is available on the support website at http://ca.com/docs.

Contents

Chapter 5: Known Issues 41

Documentation Changes

This table describes the version history for this document.

Version	Date	What's New?
5.0	December 2014	■ Updated the **Upgrades and Migrations** topic. ■ Updated the **Disks, Physical Memory Configuration,** and **Network** topics. ■ Updated the **QoS Metrics** topic.
5.0	October 2014	■ Added the **Network** and **Known Issues** topics. ■ Updated the **Disks** and **Physical Memory Configuration** topics. ■ Updated the QoS Metrics. ■ Removed the **Disks 2** topic and its content is added to the **Disks** topic.
4.9	June 2014	■ Added the **About This Guide** topic.
4.8	March 2014	■ Added the **Iostat** topic. ■ Updated the **cdm QoS Metrics** topic. ■ Updated the **cdm Alert Metrics Default Settings** topic.
4.7	June 2013	Online help restructured for consistency with other probe documentation.
4.7	February 2013	Initial documentation release to cover addition of this probe's web-based GUI (previously Infrastructure Manager and raw configure were the only configuration options). Version 4.7 of the cdm probe added these features: ■ Timeout option to avoid hang situations ■ Information for memory and paging properties ■ Updated information for CPU usage options and space monitoring ■ Information for memory usage graphs ■ Support for Debian and Ubuntu Linux distributions.

Chapter 1: cdm Overview

The CPU, Disk, and Memory Monitoring probe (cdm) monitors load and usage of the local system resources. The probe provides two main benefits:

- Generate alarm--based on configured threshold values, it generates alarms that can trigger corrective action immediately.

- Generate trending data--quality of Service (QoS) data is measured and sent to the **data_engine** probe, which processes it and stores it in the database. This historical data facilitates capacity planning for monitored systems in the IT environment. For example, see disks filling rate over the time, plan batch jobs according to the CPU utilization, and upgrade systems which consistently operate near capacity.

About This Guide

This guide is for the CA Unified Infrastructure Management Administrator to help understand the configuration of the CPU, Disk, and Memory Monitoring probe and provides following information:

- Overview of the CPU, Disk, and Memory Monitoring probe and related documentation for previous probe versions.

- Configuration details of the probe.

- Field information and common procedures for configuring the probe.

Important! Description for intuitive GUI fields is not included in the document.

Related Documentation

Related Documentation

Documentation for other versions of the cdm probe

The Release Notes for the cdm probe

User documentation for the Admin Console

Monitor Metrics Reference Information for CA Unified Infrastructure Management Probes (http://docs.nimsoft.com/prodhelp/en_US/Probes/ProbeReference/index.htm)

Preconfiguration Requirements

The cdm probe requires the following software environment:

- Nimsoft Monitor Server 7.1 to 7.6 or CA Unified Infrastructure Management 8.0 or later

- Robot 7.60 or later

- Probe Provisioning Manager (PPM) probe version 2.38 or later (for Admin Console GUI only)

- Java Virtual Machine 1.6 or later

- sysstat package must be installed on Linux and Unix platforms for iostat monitoring.

Considerations

- You can configure the probe to monitor shared disks as well as local disks. When monitoring shared disks (such as NFS mounts) over slow network links, be aware that monitoring response may be slow as well.

- If *quota* is turned on for a disk on a Windows system, the size reported is the total size, and the free disk space is calculated after quota.

Supported Platforms

Refer to the Compatibility Support Matrix for the latest information about supported platforms. See also the Support Matrix for Probes for more specific information about the probe.

Chapter 2: Upgrades and Migrations

On upgrading the probe from a previous version to 5.00, the new metrics are not visible on the probe GUI. Distribute the (PPM) probe version 2.38 or later on the main robot to view the new metrics.

Note: The new metrics are supported only on the Windows, Linux, and AIX platforms.

Chapter 3: cdm Configuration Details

You can configure the cdm probe by selecting the green icon next to the probe icon in Admin Console and choosing **Configure**. This opens the cdm configuration dialog.

The left navigation pane displays the configurable items on the physical machine being monitored. To view all of the configuration nodes, expand the tree structure in the left navigation pane.

At the root level is cdm (see page 14), where you can configure the fundamental attributes for the cdm probe itself.

The next level down is the host on which cdm is installed, and which it is monitoring. Here you can enable quality of service (QoS) metrics and alarms that relate directly to host itself, separately from its disk, memory, and processor resources.

Beneath the host are three sections, one each for Disks (see page 16), Memory (see page 22) and Processor (see page 27) respectively. The Disks section contains a subnode for each disk that is mounted and monitored on the host.

Node	Subnode	Available settings
cdm		Probe information and logging attributes; view alarm messages
	<hostname>	Computer Uptime and System Reboot alarms for the cdm host system
Disks		Defaults applied to all newly-discovered disks
	<diskname1>	'disk missing' alarm message attributes
	Disk Usage	Usage alarms and threshold values for the <diskname1> disk
	Disk Usage Change	Change in usage alarms and threshold values for <diskname1>
	<diskname2>	Settings for <diskname2> (same as above)
Memory		Memory attributes (interval, samples, QoS interval, QoS target)
	Memory Paging	Alarms and threshold values
	Physical Memory	Alarms and threshold values
	Swap Memory	Alarms and threshold values
	Total Memory	Alarms and threshold values
Processor		Processor attributes (CPU configuration, queue length)
	Individual CPU	Alarms and threshold values
	Total CPU	Alarms and threshold values

This section contains the following topics:

Probe Configuration

Navigation: cdm (top-level node)

The Probe Configuration section allows you to configure the log level and log size. You can also specify if you want to send alarms for each sample, send the short name for the QoS source and allow the QoS source to be the target.

View or modify the following values based on your requirements:

cdm > **Probe Information**

This section provides basic probe information and is read-only.

cdm > **General Configuration**

This section covers general probe configuration.

- Log Level: Sets the amount of detail to be logged to the log file. Log as little as possible during normal operation to reduce disk consumption, and increase the level of detail when debugging.

  Default: 0 - Fatal

- Log size (KB): Sets the maximum size of the log. You can enter a number in this field or use the up and down arrows to increase and decrease the number by 5.

  Default: 100 (KB)

- Send alarm on each sample: The probe generates an alarm on each sample where there is a threshold breach. If not selected, the probe waits for the number of samples (specified in **Samples** in the **cdm > Disk Configuration**, **cdm > Memory** or **cdm > Processor** configuration screens) before sending the alarm. The sample count is cleared on de-activation of the probe.

  Default: Selected

- Send short name for QoS source: Sends only the host name. If not selected, sends the full host name with domain.

  Default: Not selected

■ Allow QoS source as target: A number of QoS messages by default use the host name as their target. If selected, the target name is changed to be the same as the QoS source name.

Default: Not selected

■ Monitor iostat: enables the iostat monitoring of the host system devices. This option is available only for Linux and Solaris operating systems.

Default: Not selected

■ Count Buffer-Cache as Used Memory: counts the buffer and cache memory as used memory while monitoring the physical and system memory utilization. If not selected, the buffer and cache memory is counted as free memory. This option is available only for Linux and Solaris operating systems.

cdm > **Messages**

This section provides a listing of alarm messages issued by the cdm probe and is read-only. Selecting a row displays additional alarm message attributes below the main list, including Message Token, Subsystem, and I18N Token.

Navigation: cdm > <hostname> (first sub-level node)

Beneath the root (cdm) level, you can configure whether or not to enable computer uptime QoS data and system reboot alarms.

cdm > <probe hostname> **Computer Uptime Hourly**

■ Publish Data: Publishes QoS data on computer uptime; unchecked by default. All other fields are read-only.

cdm > <probe hostname> **System Reboot**

■ Publish Alarms: Generates an alarm when the system reboots; unchecked by default

■ Alarm Message for Detected Reboot: Choose the desired alarm message from the pull-down menu.

How to Configure Alarm Thresholds

Some Quality of Service measurement probes allow you to set different types of alarm thresholds. These threshold options allow you to more broadly control when alarm messages are sent for each QoS probe.

For more information about the different alarm thresholds and their configuration requirements, refer to the *General Probe Configuration* section of the Admin Console Help.

Disks

The **Disks** node lets you configure the global monitoring metrics and default attribute values for each individual disk. The **Disks** node also includes the shared drives of the host system. For example, cifs a shared windows disk which is mounted on the Linux environment, and gfs which is a shared disk of a clustered environment.

Navigation: cdm > Disks

Set or modify the following values as required:

Disks > Disk Configuration

This section lets you configure the time interval and number of samples for fetching metric values from the system. These properties are applicable for all the monitoring disks of the system.

- Interval (minutes): specifies the time in minutes for how often the probe retrieves sample data.

  Default: 15

- Samples: specifies how many samples the probe is keeping in memory for calculating average and threshold values.

  Deafult: 4

  Note: In case, the **Send alarm on each sample** option is not selected, the probe waits for the number of samples then sends the alarm. Do not specify 0 (Zero) in this field.

- QoS Interval (Multiple of 'Interval'): specifies the time in minutes for how often the probe calculates QoS. For example, the interval is set to 5 minutes and number of samples is set to 5, the CPU utilization is the average for the last 25 minutes.

  Default: 1

- Ignore Filesystems: defines the filesystem to be excluded from monitoring. For example, specifying the regular expression ***C:*** in this field excludes the C drive of the system from monitoring and also stops displaying the disk in navigation pane.

- Timeout: specifies the time limit in seconds for the probe for collecting the disk-related data. This option is useful at time of disk fail/crash in stale File system and avoid a hang situation for the probe.

  Default: 10

Note: The first three fields are common to Memory and Processor configuration sections.

Disks > Disk Missing Defaults

This section lets you configure alarms when a specific disk is missing (not mounted or available) for monitoring.

- Disk Missing Alarm: enables the alarm when a monitored disk becomes unavailable.

- Alarm Message: specifies the alarm message when a monitored disk is unavailable.

Disks > Disk Usage Defaults

This section lets you configure default thresholds and alarm messages for disk usage in MB and percent.

- Publishing Alarm Based on: specifies the usage measurement units. Select either percent or Mbytes.

- Enable High Threshold: lets you define a threshold for generating a higher severity alarm.

- Threshold: defines the high threshold value.

- Alarm Message: specifies the alarm message when the high threshold value breaches.

  Note: Similarly, you can configure the low threshold value where the alarm severity is lower.

- Publishing Data in MB: measures the QoS for Disk Usage MBytes.

- Publishing Data in Percent: measures the QoS for Disk Usage in percentage.

Disks > Inode Usage Defaults

This section lets you configure default alarms and inode usage by number of files (count) and percent. This section is applicable for UNIX platforms only.

- Inode Usage Alarm Based on Threshold for: indicates the usage measurement units. Select either percent or Mbytes.

  Note: You can also configure high and low threshold values as in the **Disk Usage Defaults** section.

Disks > Disk Usage Change Defaults

This section lets you configure default thresholds and alarms for changes in disk usage.

- Type of Change: specifies the type of change you want to monitor: increasing, decreasing, or both.

- Change Calculation: specifies the way of calculating the disk change. Select one of the following values:

    - Summarized over all samples: calculates the difference between the first and last sample values. The number samples are specified in the **Disk Configuration** section.

    - Between each sample: calculates the change in disk usage by comparing the values of two successive intervals.

    Note: You can also configure high and low threshold values as in the **Disk Usage Defaults** section.

Disks > Disk Read (B/S)

This section lets you activate the monitoring of disk read throughput and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Note: The disk read throughput monitoring is supported only on the Windows, Linux, and AIX platforms.

Disks > Disk Write (B/S)

This section lets you activate the monitoring of disk write throughput and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Note: The disk write throughput monitoring is supported only on the Windows, Linux, and AIX platforms.

Disks > Disk Read and Write (B/S)

This section lets you activate the monitoring of total throughput of the disk and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Note: The disk total throughput monitoring is supported only on the Windows, Linux, and AIX platforms.

<diskname> Configuration

The *disk name* node lest you configure alarms and QoS for disk availability and size for an individual disk.

Navigation: cdm > Disks > *disk name*

Set or modify the following values as required:

***disk name* > Disk Missing**

This section lets you configure QoS disk availability status and generate alarm when the probe fails to connect with the disk.

***disk name* > Disk Size**

This section lets you configure QoS disk size and generate alarm when the probe fails to calculate the disk size.

<diskname> Disk Usage Configuration

You can configure disk usage individually for each monitored disk (diskname1, diskname2, etc). You can set attributes for alarm thresholds, disk usage (%) and disk usage (MB).

Navigation: **cdm** > **Disks** > <diskname1> **Disk Usage > Alarm Thresholds**

■ Send Alarm Based on Threshold for: indicates the usage measurement units. Select either percent or Mbytes.

■ Thresholds and alarms attributes are the same as listed in Disk Usage Change Defaults (see page 21).

cdm > **Disks** > <diskname1> **Disk Usage** > **Disk Usage (%)**

■ Publish Data: sends the QoS data. Other fields are read-only.

cdm > **Disks** > <diskname1> **Disk Usage** > **Disk Usage (MB)**

■ Publish Data: sends the QoS data. Other fields are read-only.

<diskname> Disk Usage Change Configuration

You can individually configure thresholds for, and alarm messages sent with, changes in disk usage for each monitored disk.

Navigation: **cdm** > **Disks** > <diskname1> **Disk Usage Change** > **Disk Usage Change (MB)**

- ■ Publish Data: sends the QoS data.

  - ■ Type of Change: indicates the type of change you want to monitor: increase, decrease, or both.

- ■ Change Calculation: indicates how you want to calculate the disk change. Select from the drop-down menu either of the following:

  - ■ Summarized over all samples - The change in disk usage is the difference between the latest sample and the first sample in the "samples window," which is configured at the Disk Configuration level.

  - ■ Between each sample - The change in disk usage is calculated after each sample is collected.

- ■ Thresholds and alarms attributes are the same as listed under Disk Usage Change Defaults (see page 21).

<diskname> Inode Usage Configuration

You can individually configure inode usage for each monitored disk on a Unix host.

Navigation: **cdm** > **Disks** > <diskname1> **Inode Usage > Alarm Thesholds**

- ■ Inode Usage Alarm Based on Threshold for: indicates the usage measurement units. Select either percent or count.

- ■ Thresholds and alarms attributes are the same as listed in Disk Usage Change Defaults **(see page 21).**

cdm > **Disks** > <diskname1> **Inode Usage (%)**

- ■ Publish Data: sends the QoS data. Other fields are read-only.

cdm > **Disks** > <diskname1> **Inode Usage (Count)**

- ■ Publish Data: sends the QoS data. Other fields are read-only.

Note: The following six attributes are common to many probe configuration fields in the cdm user interface. Here they pertain to disk usage, elsewhere they pertain to memory or CPU usage, depending on context.

- Enable High Threshold: enables the high threshold for disk usage change. This threshold is evaluated first and if it is not exceeded, then the low threshold is evaluated.

- Threshold: indicates the value in Mbytes of the free space on the disk. When disk free space gets below this value, an alarm message is sent.

- Alarm Message: sends the alarm message when the free space on the disk is below the high threshold.

- Enable Low Threshold: enables the low threshold for disk usage change. This threshold is evaluated only if the high threshold has not been breached.

- Threshold: indicates the value in Mbytes of the free space on the disk. When disk free space gets below this value, an alarm message is sent.

- Alarm Message: sends the alarm message when the free space on the disk is below the low threshold.

■ QoS for Disk Change: measures the QoS for Disk Change.

Add a Shared Disk for Monitoring

As a system administrator you want to monitor the availability and usage of the shared disk. You want to get an alarm when The disk availability ensures that it is accessible to authorized users and application. You want get an alarm, when the disk is not available and QoS data on disk usage. The CPU, Disk, and Memory Monitoring probe lets you add a shared disk or folder which can be configured for monitoring for generating QoS data and alarms as you do for a local disk.

Follow these steps:

1. Click the **Options** icon next to the **Disks** node in the navigation pane.

2. Select the **Add New Share** option.

3. Configure following fields in the **Add New Share** dialog:

   ■ Share: defines the network path of the shared disk for folder. The network location is specified in the **\\computer\share** format.

   ■ User: defines the user name for authenticating the probe to have appropriate access to the shared disk or folder. Define the user name in **<domain name>\<user name>** when the shared disk is available on a domain.

- Password: defines the password for authenticating the user.

- Alarm Message: specifies the alarm message when the disk is not available.

  Default: ConnectionError

- Enable Folder Availability Monitoring: activates the QoS data on shared disk availability.

  Default: Not selected

4. Click **Submit**.

   The shared disk is added under the **Disks** node in the navigation pane. You can select the shared disk and update user name, password, and disk availability monitoring properties.

Memory

The left navigation pane displays a system memory node and lets you configure attributes for:

- Memory Paging (see page 23)
- Physical Memory (see page 24)
- Swap Memory (see page 25)
- Total Memory (see page 25)

At the **Memory** level, set or modify the following global memory attributes based on your requirements.

Navigation: cdm > **Memory** > **Memory Configuration**

Note that the first three fields are common to all three probe configuration sections (Disks, Memory, Processor).

- Interval (minutes): specifies the time in minutes for how often the probe retrieves sample data.

  Default: 5

- Samples: specifies how many samples the probe should keep in memory to calculate average and threshold values.

  Default: 5

  Note: If you did not select the **Send alarm on each sample** checkbox in the Probe Configuration pane, the probe waits for the number of samples (specified in this field) before sending the alarm. Do not specify 0 (Zero) in this field.

- QoS Interval (Multiple of 'Interval'): specifies the time in minutes for how often the probe calculates QoS. For example, If the interval is set to 5 minutes and number of samples is set to 5, the CPU utilization reported will be the average for the last 25 minutes.

  Default: 1

- Set QoS Target as 'Memory': sets the QoS target to Memory.

  Default: Not selected

Memory Paging Configuration

Navigation: **cdm** > **Memory** > **Memory Paging** > **Alarm Thresholds**

- Send Alarm Based on Threshold for: indicates the usage measurement units. Select either pages per second or kilobytes per second.

- Enable High Threshold: enables the high threshold for memory paging. This threshold is evaluated first and if it is not exceeded, then the low threshold is evaluated.

- Threshold: sends a alarm message when the memory exceeds this value. The value in pages or Kbytes per second. This is based on the selection in the alarm based on threshold setting.

- Alarm Message: sends the alarm message when the memory paging exceeds the high threshold.

- Enable Low Threshold: enables the low threshold for memory paging. This threshold is evaluated only if the high threshold has not been exceeded.

- Threshold: sends a alarm message when the memory exceeds this value. The value in pages or Kbytes per second. This is based on the selection in the alarm based on threshold setting.

- Alarm Message: sends the alarm message when the memory paging breaches the low threshold.

Navigation: **cdm** > **Memory** > **Memory Paging** > **Memory Paging (KB/s)**

- Publish Data: sends the QoS data. Other fields are read-only.

Navigation: **cdm** > **Memory** > **Memory Paging** > **Memory Paging (Pg/s)**

- Publish Data: sends the QoS data. Other fields are read-only.

Physical Memory Configuration

The **Physical Memory** node lets you monitor the memory utilization of the system for generation QoS data and configure threshold for generating alarms. The memory utilization is directly related to the system performance. In case, the memory utilization is high the system performance goes down and the application response time increases. The increased response time of critical business applications can adversely impact the user interaction. Monitoring the system memory lets you helps diagnosing the issue, for example, identifying the closing the unwanted applications. You can also consider system upgrade when the memory utilization is consistently high.

This node lets you monitor the following memory metrics:

- Physical Memory

- System Memory

- User Memory

Note: The system and user memory metrics are supported only on the Windows, Linux, and AIX platforms.

Navigation: cdm > Memory > Physical Memory

Set or modify the following values as required:

Physical Memory > Physical Memory (%)

This section lets you monitor the physical memory usage in percent and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Physical Memory > **Physical Memory (MB)**

This section lets you monitor the physical memory usage in MB and generate QoS at scheduled interval. This metric does not allow configuring low and high thresholds for generating alarms.

Physical Memory > System Memory Utilization (%)

This section lets you monitor the system memory usage in percent and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Physical Memory > User Memory Utilization (%)

This section lets you monitor the user memory usage in percent and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Swap Memory Configuration

A swap memory is a reserved space on hard drive which is used by the system when the physical memory (RAM) is full. However, the swap memory is not a replacement of the physical memory due to lower data access rate.

The CPU, Disk, and Memory Monitoring probe calculates the swap memory similar to the **swap -l** command of Solaris. However, the probe use pages instead of blocks. You can compare the swap memory information of the probe and the **swap -l** command by using the following formula:

Swap Memory (calculated by probe) in MB = (Blocks returned by the swap -l command * 512)/ (1024*1024).

Navigation: **cdm** > **Memory** > **Swap Memory** > **Swap Memory (%)**

- Publish Data: sends the QoS data.

- Thresholds and alarm attributes are the same as listed in Memory Paging Alarm Thresholds **(see page 23).**

Navigation: **cdm** > **Memory** > **Swap Memory** > **Swap Memory (MB)**

- Publish Data: sends the QoS data. Other fields are read-only.

Total Memory Configuration

Navigation: **cdm** > **Memory** > **Total Memory** > **Memory Usage (%)**

- Publish Data: sends the QoS data.

- Thresholds and alarm attributes are the same as listed in Memory Paging Alarm Thresholds **(see page 23).**

Navigation: **cdm** > **Memory** > **Total Memory** > **Memory Usage (MB)**

- Publish Data: sends the QoS data. Other fields are read-only.

Network

This node lets you monitor the outbound and inbound traffic of your system Network Interface Card (NIC). The NIC monitoring lets you analyze the network bandwidth that is being utilized which can impact the overall network performance. For example, your NIC capacity is 100 MBPS and aggregated traffic is more than 90 MBPS then it can slow down the data transfer rate. This monitoring helps you take preventive actions before the network goes down. For example, upgrade your NIC or install more NICs and implement the load-balancing solution.

This node lets you monitor the following network metrics:

- Inbound Traffic: Monitors the traffic coming from LAN or a public network to the monitored system in bytes per second.

- Outbound Traffic: Monitors the traffic going from the monitored system to LAN or a public network in bytes per second.

- Aggregated Traffic: Monitors both inbound and traffic in bytes per second.

  Important! The probe monitors only physical NICs of system and sum up the metric values when multiple NICs are installed on the monitored system.

Note: These network metrics are supported only on the Windows, Linux, and AIX platforms.

Navigation: cdm > Network

Set or modify the following values as required:

Network > Network Configuration

This section lets you define the interval for fetching the network metrics of the system. The default value is 5 minutes.

Network > Network Inbound Traffic (B/S)

This section lets you activate the monitoring of inbound traffic and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Network > Network Outbound Traffic (B/S)

This section lets you activate the monitoring of outbound traffic and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Network > Network Aggregated Traffic (B/S)

This section lets you monitor the aggregated traffic and generate QoS at scheduled interval. You can also configure low and high thresholds for generating alarms.

Processor

The **Processor** node lets you configure processor-related metrics and their corresponding time interval for fetching the monitoring data. The probe lets you configure the number of samples and returns the average of computed values. All calculations are based on the number of CPU ticks returned, for example, the **/proc/stat** command returns in Linux. The probe adds the column values (user, nice, system, idle, and iowait) for calculating the total CPU ticks. In a multi-CPU environment, the total for all CPU column values are added.

Similarly, the delta values are calculated by comparing the total CPU tick values of last and current interval. Then, the percentage values are calculated for each column based on the total CPU ticks value. The QoS for total CPU value is the sum of CPU System, CPU User, and (if configured) CPU Wait.

The left navigation pane displays the processor nodes on your system and allows you to configure:

-

-

Navigation: cdm > Processor

Set or modify the following values as required:

cdm > Processor > Processor Configuration

Note that the first three fields are common to all three probe configuration sections (Disks, Memory, Processor).

- Interval (minutes): specifies the time in minutes for how often the probe retrieves sample data.

    Default: 5

- Samples: specifies how many samples the probe should keep in memory to calculate average and threshold values.

    Default: 5

    Note: If you did not select the **Send alarm on each sample** checkbox, in the Probe Configuration pane, the probe waits for the number of samples (specified in this field) before sending the alarm. Do not specify 0 (Zero) in this field.

■ QoS Interval (Multiple of 'Interval'): specifies the time in minutes for how often the probe calculates QoS. For example, If the interval is set to 5 minutes and number of samples is set to 5, the CPU utilization reported will be the average for the last 25 minutes.Set QoS Target as 'Total': Select this checkbox if you want the QoS target to be set to Total.

Default: 5

■ Include CPU Wait in CPU Usage: includes the CPU Wait in the CPU Usage calculation.

■ Number of CPUs: displays the number of CPUs. This is a read-only field.

cdm > **Processor** > **Processor Queue Length**

■ Publish Data: sends the QoS data.

■ Publishing Alarms: publishes the alarms.

■ Maximum Queue Length: indicates the maximum number of items in the queue before an alarm is sent.

■ Alarm Message: sends the alarm message when the queue has been exceeded.

Individual CPU Configuration

The **Individual CPU** node lets you configure metrics for monitoring each CPU node of the host system.

Navigation: cdm > Processor > Individual CPU

Set or modify the following values as required:

Individual CPU > CPU Usage Difference

This section lets you monitor the difference in percent of CPU usage between two successive intervals.

■ Publish Alarm: activates the monitor for generating alarm.

Default: Not Selected

■ Threshold (%): defines the threshold in CPU usage difference for generating alarms.

Default: 50

■ Alarm: specifies the alarm message, when the threshold breaches.

Individual CPU > Individual CPU Idle

This section lets you generate QoS data on the amount of time when CPU is not busy. In other words, CPU is running the System Idle Process.

Individual CPU > Individual CPU System

This section lets you generate QoS data on the amount of time during which CPU executed processes in kernel mode.

Individual CPU > Individual CPU Usage

This section lets you generate QoS data for monitoring CPU usage in percent as compared to the CPU capacity.

Individual CPU > Individual CPU User

This section lets you generate QoS data on the amount of time during which CPU executed processes in kernel mode.

Individual CPU > Individual CPU Wait

This section lets you generate QoS data on the amount of time during which CPU is waiting for I/O process to complete.

Individual CPU > Maximum CPU Usage

This section lets you generate alarm when the CPU usage percent breaches the maximum usage limit.

- Threshold (%): defines the maximum CPU usage limit in percent.

- Alarm Message: defines the alarm message when the CPU usage on the disk exceeds the threshold.

Total CPU Configuration

Navigation: **cdm** > **Processor** > **Total CPU** > **Total CPU Idle**

- Publish Data: sends the QoS data. Other fields are read-only.

Navigation: **cdm** > **Processor** > **Total CPU** > **Total CPU System**

- Publish Data: sends the QoS data. Other fields are read-only.

Navigation: **cdm** > **Processor** > **Total CPU** > **Total CPU Usage**

- Publish Data: sends the QoS data.

- Enable High Threshold: sets the high threshold for disk usage. This threshold is evaluated first and if it is not exceeded, then the low threshold is evaluated.

- Threshold: sends an alarm message when the CPU usage gets below this value. The value in percent of the CPU usage.

- Alarm Message: sends the alarm message when the CPU usage on the disk is below the high threshold.

- Enable Low Threshold: sets the low threshold for disk usage. This threshold is evaluated only if the high threshold has not been exceeded.

- Threshold: sends an alarm message when the CPU usage gets below this value. The value in percent of the CPU usage.

- Alarm Message: sends the alarm message when the CPU usage on the disk breaches the low threshold.

Navigation: **cdm** > **Processor** > **Total CPU** > **Total CPU User**

- Publish Data: sends the QoS data. Other fields are read-only.

Navigation: **cdm** > **Processor** > **Total CPU** > **Total CPU Wait**

- Publish Data: sends the QoS data. Other fields are read-only.

Iostat

The **iostat** node lets you monitor the input and output statistics (iostat) on the respective devices.

This node appears only when the following two conditions are met:

- Probe is installed on the Linux, Solaris, and AIX environments.
- The **Monitor iostat** option is selected in the **General Configuration** section of the **cdm** node.

    Note: The **Monitor iostat** option is disabled, by default.

The probe executes the **iostat** command for fetching the iostat monitors value. The QoS values are obtained from the second sample value of the devices.

Navigation: cdm > iostat

Set or modify the following values as required:

iostat > Iostat Configuration

This section lets you configure basic iostat configuration for fetching the relevant data.

- Interval (minutes): defines the time interval for fetching the sample values from the device.

    Default: 5

- Sample: defines the time interval in seconds, which is used with iostat command for fetching the iostat data for that time duration. This value must be less than **Interval (minutes)** field value.

    Default: 10

Device Iostat Configuration

The *device iostat* node lets you configure the iostat monitors on the selected device. The list of iostat monitors differ for each operating system (OS) as follows:

Operating System	Iostat Monitors
Linux	■ Iostat Average Queue Length ■ Iostat Average Request Size ■ Iostat Average Service Time (Linux) ■ Iostat Average Wait Time (active, by default) ■ Iostat Read Requests Merged Per Second ■ Iostat Reads Per Second ■ Iostat Sector Reads Per Second ■ Iostat Sector Writes Per Second ■ Iostat Utilization Percentage (active, by default) ■ Iostat Write Requests Merged Per Second ■ Iostat Writes Per Second
Solaris	■ Iostat Active Transactions ■ Iostat Average Service Time (Solaris) ■ Iostat Disk Reads Per Second ■ Iostat Disk Writes Per Second ■ Iostat Kilobytes Read Per Second ■ Iostat Kilobytes Written Per Second ■ Iostat Percentage Of Time Busy ■ Iostat Percentage Of Time Waiting For Service (active, by default) ■ Iostat Queue Length (active, by default)
AIX	■ Iostat Kilobytes Read ■ Iostat Kilobytes Transferred Per Second ■ Iostat Kilobytes Written ■ Iostat Percentage Of Time Active (active, by default) ■ Iostat Transfers Per Second

The probe detects the underlying OS and filters the list of monitors.

Navigation: cdm > iostat > *device name*

Set or modify the following values as required:

device name **> Device Configuration**

This section lets you enable the iostat monitoring for the device. This option is disabled, by default.

device name > monitor name

This section represents the actual monitor name of the device for configuration.

- QoS Name: identifies the QoS name of the monitor.

- Units: identifies a unit of the monitor. For example, % and Mbytes.

- Publish Data: publishes the QoS data of the monitor.

- Enable High Threshold: lets you configure the high threshold parameters.

  Default: Disabled

- Threshold: defines the threshold value for comparing the actual value.

  Default: 90

- Alarm Message: specifies the alarm message when the threshold value breaches.

  Default: IostatError

- Enable Low Threshold: lets you configure the low threshold parameters.

  Default: Disabled

- Threshold: defines the threshold value for comparing the actual value.

  Default: 90

- Alarm Message: specifies the alarm message when the threshold value breaches.

  Default: IostatWarning

  Note: Typically, the low threshold generates a warning alarm and the high threshold generates an error alarm.

Similarly, you can configure other monitors because each monitor contains the same set of fields.

Chapter 4: cdm QoS Threshold Metrics

Many CA UIM probes ship with default QoS threshold values set. The default threshold values provide an idea of the type of values to be entered in the fields and are not necessarily recommended best-practice values. To aid in tuning thresholds and reducing false-positive alarms, this section describes the QoS metrics and provides the default QoS thresholds.

cdm QoS Metrics

This section contains the QoS metrics for the cdm probe.

Monitor Name	Units	QoS Metric
CPU		
QOS_CPU_IDLE	Percent	CPU idle
QOS_CPU_MULTI_USAGE (all of these metrics are calculated from this monitor)	Percent	Individual CPU idle
	Percent	Individual CPU system
	Percent	Individual CPU usage (total)
	Percent	Individual CPU user
	Percent	Individual CPU wait
QOS_CPU_USAGE (all of these metrics are calculated from this monitor)	Percent	CPU system
	Percent	CPU usage
	Percent	CPU user
	Percent	CPU wait
Disk		
QOS_DISK_DELTA	Megabytes	Disk usage change
QOS_DISK_USAGE	Megabytes	Disk usage
QOS_DISK_USAGE_PERC	Percent	Disk usage in percent
QOS_DISK_READ_THROUGHPUT	Bytes/Second	Disk bytes read per second **Note:** This metric is supported only on the Windows, Linux, and AIX platforms.

Monitor Name	Units	QoS Metric
QOS_DISK_WRITE_THROUGHPUT	Bytes/Second	Disk bytes written per second **Note:** This metric is supported only on the Windows, Linux, and AIX platforms.
QOS_DISK_TOTAL_THROUGHPUT	Bytes/Second	Disk bytes read and written per second **Note:** This metric is supported only on the Windows, Linux, and AIX platforms.
QOS_DISK_SIZE	Gigabytes	Total size of the disk
QOS_DISK_AVAILABLE	Available	Disk availability
QOS_INODE_USAGE	Inodes	Inode usage
QOS_INODE_USAGE_PERC	Percent	Inode usage in percent
Memory		
QOS_MEMORY_USAGE	Megabytes	Memory usage
QOS_MEMORY_PAGING	Kilobytes/Second	Memory paging in kilobytes per second
QOS_MEMORY_PAGING_PGPS	Pages/Second	Memory paging in pages per second
QOS_MEMORY_PERC_USAGE	Percent	Memory usage in percent
QOS_MEMORY_PHYSICAL	Megabytes	Physical memory usage
QOS_MEMORY_PHYSICAL_PERC	Percent	Physical memory usage in percent
QOS_MEMORY_SWAP	Megabytes	Swap memory usage
QOS_MEMORY_SWAP_PERC	Percent	Swap memory usage in percent
QOS_MEMORY_SYS_UTIL	Percent	System memory utilization **Note:** This metric is supported only on the Windows, Linux, and AIX platforms.
QOS_MEMORY_USR_UTIL	Percent	User memory utilization **Note:** This metric is supported only on the Windows, Linux, and AIX platforms.
Miscellaneous		
QOS_PROC_QUEUE_LEN	Processes	Processor queue length
QOS_SHARED_FOLDER	Available	Folder availability
QOS_COMPUTER_UPTIME	Seconds	Computer uptime
Network **Note:** These metrics are supported only on the Windows, Linux, and AIX platforms.		
QOS_NETWORK_INBOUND_TRAFFIC	Bytes/Second	Total number of bytes per second received by the server

Monitor Name	Units	QoS Metric
QOS_NETWORK_OUTBOUND_TRAFFIC	Bytes/Second	Total number of bytes per second sent by the server
QOS_NETWORK_AGGREGATED_TRAFFIC	Bytes/Second	Total number of bytes per second sent and received by the server
Iostat Monitors: Linux Platform		
QOS_IOSTAT_RRQM_S	ReadReqMerged/Sec	Iostat read requests merged per second
QOS_IOSTAT_WRQM_S	WriteReqMerged/Sec	Iostat write requests merged per second
QOS_IOSTAT_RS	Reads/Sec	Iostat reads per second
QOS_IOSTAT_WS	Writes/Sec	Iostat writes per second
QOS_IOSTAT_SEC_RS	SectorReads/Sec	Iostat sector reads per second
QOS_IOSTAT_SEC_WS	SectorWrites/Sec	Iostat sector writes per second
QOS_IOSTAT_AR_SZ	Sectors	Iostat average request size
QOS_IOSTAT_AQ_SZ	QueueLenght	Iostat average queue length
QOS_IOSTAT_AWAIT	Milliseconds	Iostat average wait time
QOS_IOSTAT_SVCT	Milliseconds	Iostat average service time
QOS_IOSTAT_PU	Percent	Iostat utilization percentage
Iostat Monitors: Solaris Platform		
QOS_IOSTAT_RS	Reads/Sec	Iostat disk reads per second
QOS_IOSTAT_WS	Writes/Sec	Iostat disk writes per second
QOS_IOSTAT_KRS	Kilobytes/Sec	Iostat kilobytes read per second
QOS_IOSTAT_KWS	Kilobytes/Sec	Iostat kilobytes written per second
QOS_IOSTAT_QLEN	QueueLength	Iostat queue length
QOS_IOSTAT_ACT	Transactions	Iostat active transactions
QOS_IOSTAT_SVCT	Milliseconds	Iostat average service time
QOS_IOSTAT_PCTW	Percent	Iostat percentage of time waiting for service
QOS_IOSTAT_PCTB	Percent	Iostat Percentage Of Time Busy
Iostat Monitors: AIX Platform		
QOS_IOSTAT_PCTA	Percent	Iostat percentage of time active
QOS_IOSTAT_KBPS	Kilobytes/Sec	Iostat kilobytes transferred per second
QOS_IOSTAT_TPS	Transfers/Sec	Iostat transfers per second
QOS_IOSTAT_KR	Kilobytes	Iostat kilobytes read

Monitor Name	Units	QoS Metric
QOS_IOSTAT_KW	Kilobytes	Iostat kilobytes written

cdm Alert Metrics Default Settings

This section contains the Alert Metrics Default Settings for the cdm probe.

Alert Metric	Warning Threshold	Warning Severity	Error Threshold	Error Severity	Description
CPU Usage	75%	Warning	90%	Major	Total CPU above error threshold
Memory Usage in percent	50%	Warning	90%	Major	Memory Percent Usage
Physical memory usage	85%		95%		
Swap memory usage	60%		85%		
Memory Paging Activity	150KB/ sec	Warning	2000 KB/ sec	Major	Amount of paging that is occurring
Disk Usage and Thresholds (Disk Error)					
Disk usage (%)	20%	Major	10%		
Disk usage (Mb)	default should be 20% of total disk space		default should be 10% of total disk space		
Disk Usage Change and Thresholds (Delta Error)					
Disk usage	8		200		
Inode Usage and Thresholds					
Inode usage (%)	20		10		
Inode usage (inodes)	20		10		
Inode Free	20		10		
Disk Metric delta	5		10		
	Max Queue Length				
Processor Queue Length	4	Warning	-	-	The number of processes waiting to run
			Maximum		

Alert Metric	Warning Threshold	Warning Severity	Error Threshold	Error Severity	Description
MultiCPU CPU usage of single cpu	-		90		
			Difference		
MultiCPU Difference in CPU usage between CPUs	-		50		
Iostat					
IostatError	-	-	90	Major	The Iostat monitor value of the device is above the threshold value
IostatWarning	90	Warning	-	-	The Iostat monitor value of the device is above the threshold value

Chapter 5: Known Issues

The probe returns only first eight characters of the system host name when deployed on *HP-UX 11i v1* or earlier. For example, if your system host name is **hpuxsys123**, then the probe returns **hpuxsys1**. The probe uses this trimmed host name as the QoS target.