



# Monitoring System Health

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Cisco® Prime Infrastructure 3.1

Job Aid



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*Monitoring System Health Job Aid*

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# Basics

## Overview

Your organization relies on Cisco Prime Infrastructure to oversee and manage day-to-day network operations.

Your organization relies on you to ensure that the Prime Infrastructure server is running optimally, reporting current operational data and statistics, and reporting any potential or existing issues. As the network grows, you need to monitor Prime Infrastructure server health to address any impacts that are occurring due to changing network size or demands proactively.

When evaluating issues, you also need the skills to correlate the environment in which the system is operating in relationship to the data that it is reporting. The ability to correlate and evaluate system information and recognize environmental or other factors that can affect system performance will help you evaluate and escalate issue more effectively, leading to faster resolution timelines.

This job aid introduces you to the data and statistics that Prime Infrastructure reports on itself and where to find that data in the application. It also answers commonly asked questions about monitoring system health.



**Important Note:** For Prime Infrastructure to run optimally, it needs to meet the installation criteria that Cisco recommends regarding network size, available memory, disk space, and other critical factors.

For more information, [refer to the system requirements in the Cisco Prime Infrastructure 3.1 Quick Start Guide](#).

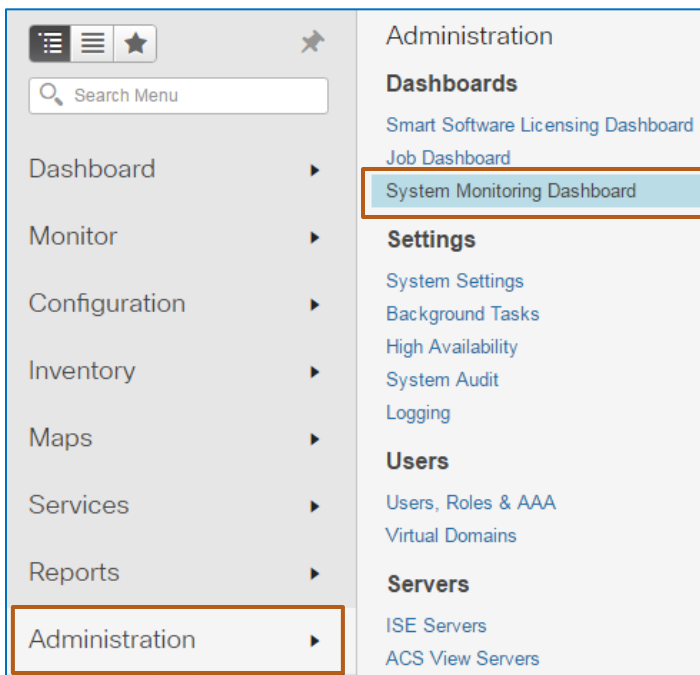
[The guide contains a scaling matrix](#), which includes the size parameters for each installation type.



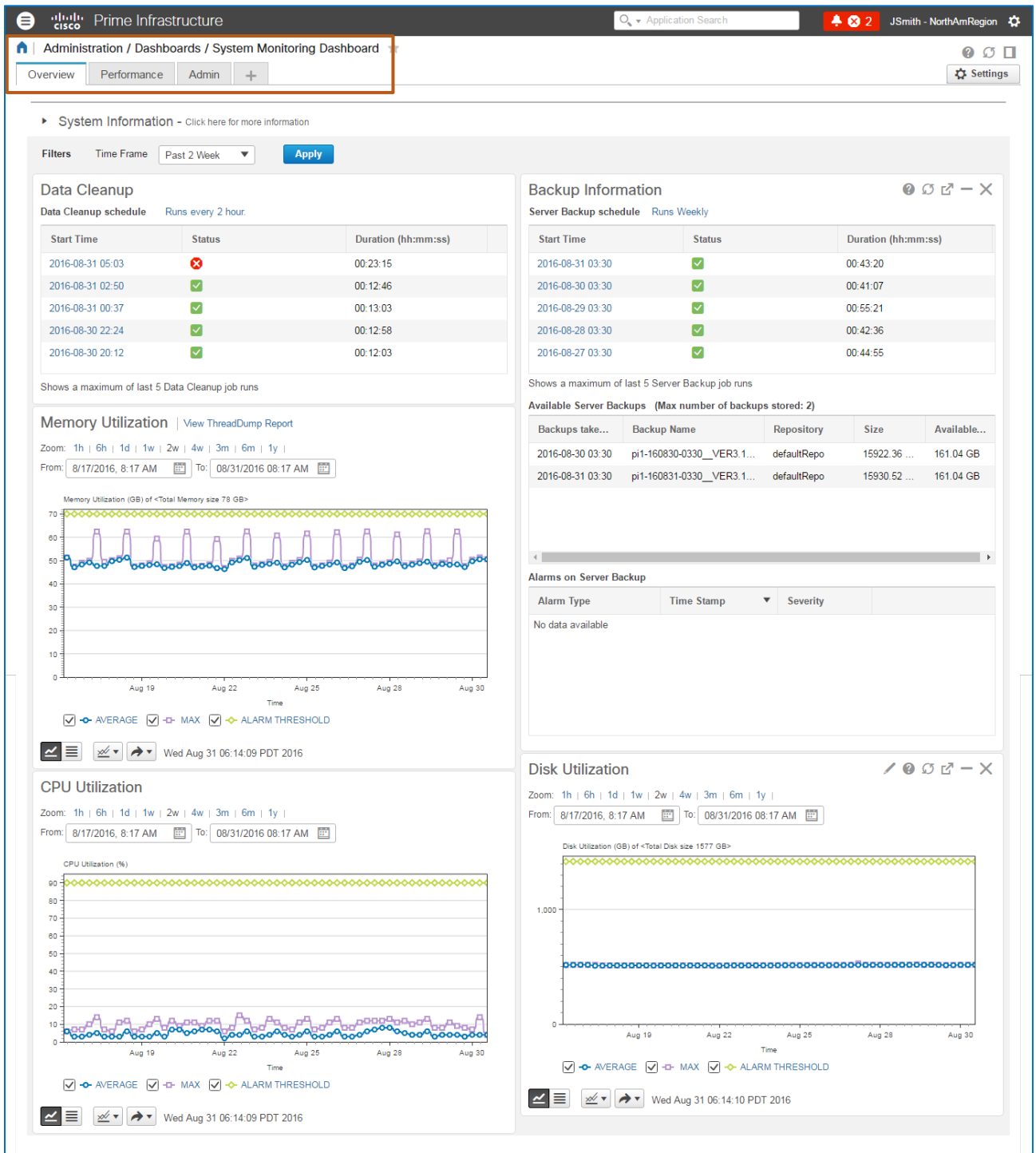
**Note:** The screenshots in this job aid are captured by using a Prime Infrastructure Pro version installation on a Gen 2 appliance and are for illustrative purposes only.

Your system installation type might be different and will report statistics and thresholds based on the system installation parameters and configuration.

Cisco Prime Infrastructure provides most system monitoring functionality on the **System Monitoring Dashboard** in **Administration**.



The **System Monitoring Dashboard** provides dashlets, organized on tabs, which report server data and statistics.



## Skills

To perform monitoring and management of the Prime Infrastructure server, you need to be an administrator with the following skills.

### Basic

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- ❖ Prime Infrastructure navigation
- ❖ Virtual domain concepts
- ❖ How to organize and manage data dashboards and dashlets

### Expert

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- ❖ Data evaluation and correlation to determine issues
- ❖ Issue reporting and escalation
- ❖ Server sizing and other installation factors that can affect server performance

## Terms

### Jobs

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Prime Infrastructure runs background processes and collects system and network data by using jobs.

### System

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In this job aid, the term 'system' refers to the Prime Infrastructure server.



# Reviewing System Monitoring Data

## System Monitoring Overview

Prime Infrastructure provides two key areas where you can monitor system health: the **Network Summary Dashboard** and the **System Monitoring Dashboard** pages.

- ❖ The **Network Summary Dashboard** provides metrics dashlets that report and provide access to data that might require immediate attention.
- ❖ The **System Monitoring Dashboard** provides a holistic view dedicated to reporting current Prime Infrastructure server configuration and performance under various loads.



**Tip:** Correlating the data that is available on these dashboards provides a holistic view of system health and can help you to identify and act on potential issues most effectively.

For guidance on where to find data for specific factors that can affect server performance, [refer to the Correlating Data thought map](#).

## The Network Summary Dashboard

### System Summary Dashlets

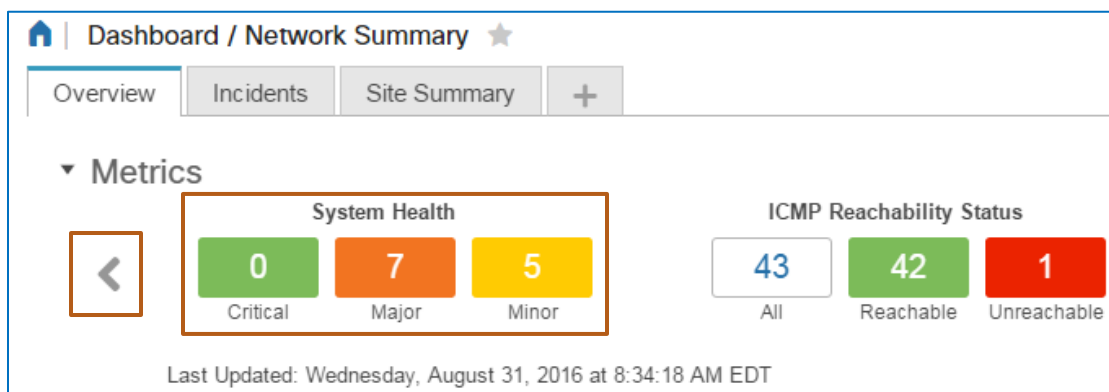
On the **Network Summary** dashboards, you can add and monitor the metrics dashlets, which report summarized system information.

Summary information provides an immediate view of two key system health indicators, system events and device manageability.

The system displays both metrics dashlets by default. You can add the dashlets to custom tabs, or remove them.

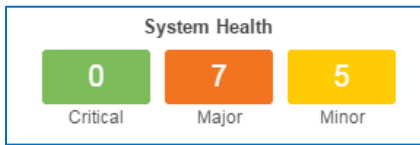
#### To see the dashlets:

- ❖ In the **Metrics** section, scroll left or right to see the dashlet that you want.



## Reviewing Summary System Health Metrics

Summary system health information provides an immediate indicator of active system events and their severity levels. That way, you can investigate the root cause of the alarm, and monitor it to help mitigate or avoid potentially emergent problems quickly.



**Note:** When the system is not reporting current alarms for a severity level, the indicator color-code is green.

When the system is reporting current alarms of a specific severity, the indicator for that severity changes to the applicable severity color code.

For example, the **Critical** indicator turns red when the system is reporting one or more critical alarms.

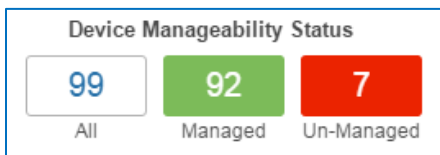
Refer to the **System Health** metrics dashlet to:

- ❖ See the number of critical, major, and minor events that the system is reporting on itself.
- ❖ Open a list of the events by clicking the number link of the category of interest.

## Reviewing Device Manageability Status Metrics

Device manageability summary information provides an immediate indicator of the number of devices that the system is or is not managing.

Unmanaged devices might require more attention to determine and resolve the problem that is causing the system's inability to manage them.



**Note:** On this dashlet, the indicator color-coded in green reports the number of devices that the system is managing successfully.

The indicator color-coded in red reports the number of devices that the system can communicate with but is not managing successfully. An unmanaged device can indicate that there is a problem, such as a communication issue, that needs to be resolved so that the system can manage the device.

The white **All** category indicates the total number of network devices that are in the system inventory.

Refer to the **Device Manageability Status** metrics dashlet to:

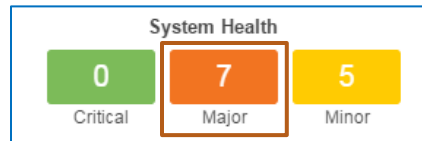
- ❖ See the total number of devices in the inventory and the number of those devices in the inventory that the system is or is not managing.
- ❖ Open a list of the devices by clicking the number link of the group of interest.

## Opening Summary Dashlet Details

The data elements in the metrics dashlets provide direct navigation to associated details, which allows you to access detailed information or take action in the system, as needed.

**To open a page filtered to display the associated information:**

- ❖ Click a data element in the dashlet.



The system navigates to and opens the filtered page.

[Home](#) | [Monitor](#) / [Monitoring Tools](#) / [Alarms and Events](#) / [Alarms](#) ★

Searched By - Category : System & Severity : major - [Reset](#)
Selected 0 / Total 7

<div> <div>Change Status ▾</div> <div>Assign ▾</div> <div>Annotation ▾</div> <div>✕ Delete</div> <div>Email Notification</div> <div>Troubleshoot ▾</div> </div>									
<input type="checkbox"/>	Severity	Failure Source	Owner	Time ▾	Message	Category	Condition	Acknowledged	
<input type="checkbox"/>	▶ Major ⓘ	192.168.139.197:pi1		August 31, 2016 6:28:16 AM PDT	Config Archive Failed for the Device : ...	System	System monitor	No	
<input type="checkbox"/>	▶ Major ⓘ	192.168.139.197:pi1		August 22, 2016 10:36:52 AM PDT	Config Archive Failed for the Device : ...	System	System monitor	No	
<input type="checkbox"/>	▶ Major ⓘ	192.168.139.197:pi1		August 11, 2016 9:09:59 PM PDT	Component: Health Monitor, Server: P...	System	MATLAB3_DOWN	No	

## The System Monitoring Dashboard

### Dashboard Overview

The **System Monitoring Dashboard** page in **Administration** provides a holistic view of how the Prime Infrastructure server is performing under various server loads. These loads can originate from the application, such as running [data cleanup or backup jobs](#), or from network activity.

The dashboard provides the **Overview**, **Performance**, and **Admin** tabs by default.



**Note:** While each tab provides certain data and statistics by default, you can add custom tabs and include the **Overview** and **Performance** dashlets that you want. You also can add dashlets to existing tabs.

For more information on organizing dashboards and dashlets, [refer to the Overview module in the Introducing Cisco Prime Infrastructure 2.2 E-Learning course](#).

### Managing Time Frames

The **Overview**, **Performance** and **Admin | Health** tabs provide a **Time Frame** drop-down list that defines the time period for which all of the dashlets on the page display data.

For the dashlet data that you are reviewing, ensure that you have the appropriate time period applied.

#### To change the applied time period:

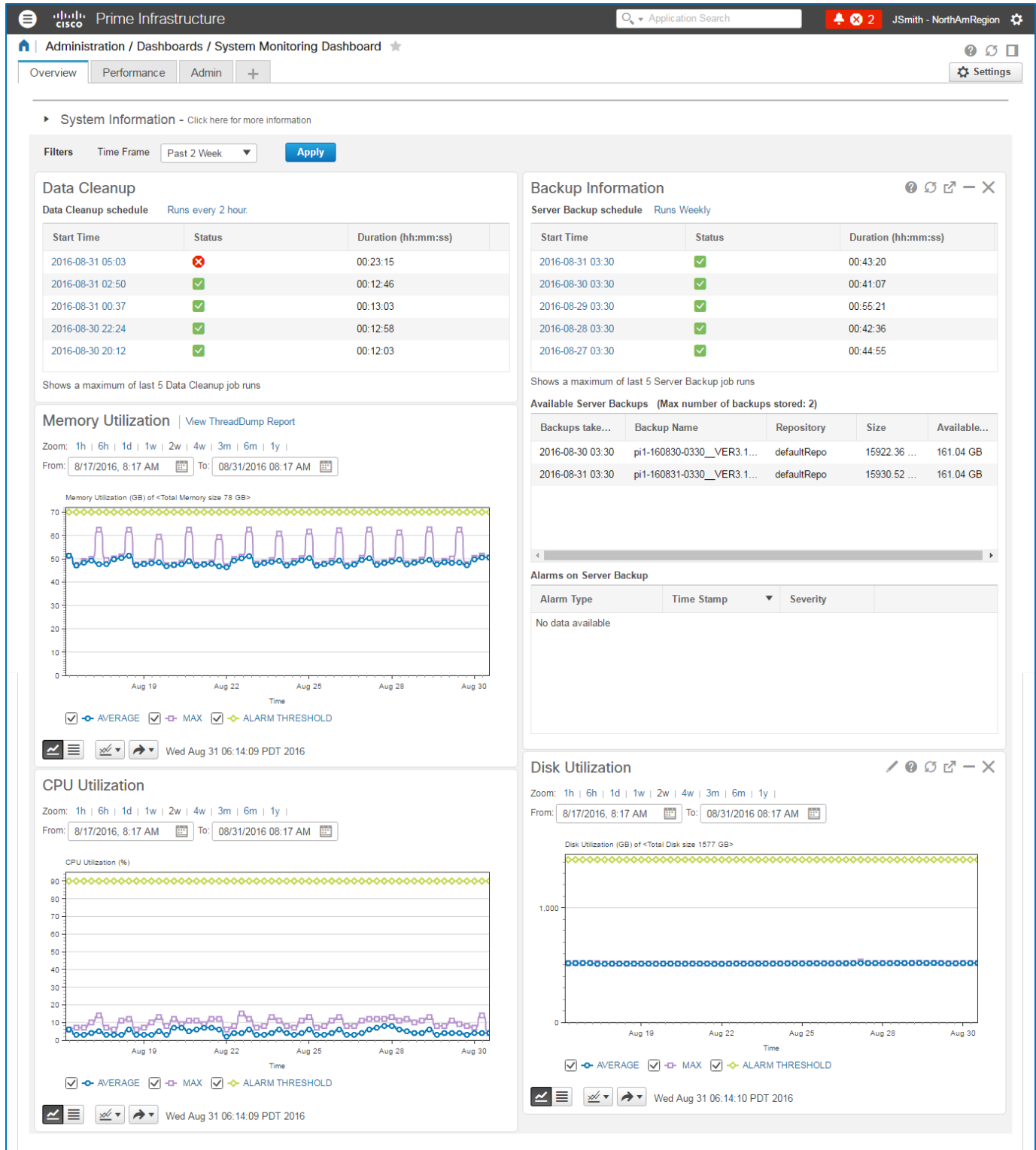
- ❖ On the applicable tab, in the **Time Frame** drop-down list, select the time period, and then click **Apply** or **Go**.

Filters
Time Frame
Past 2 Week ▼
Apply

Filters
⌚ \*Time Frame
Past 1 Hour ▼
Go

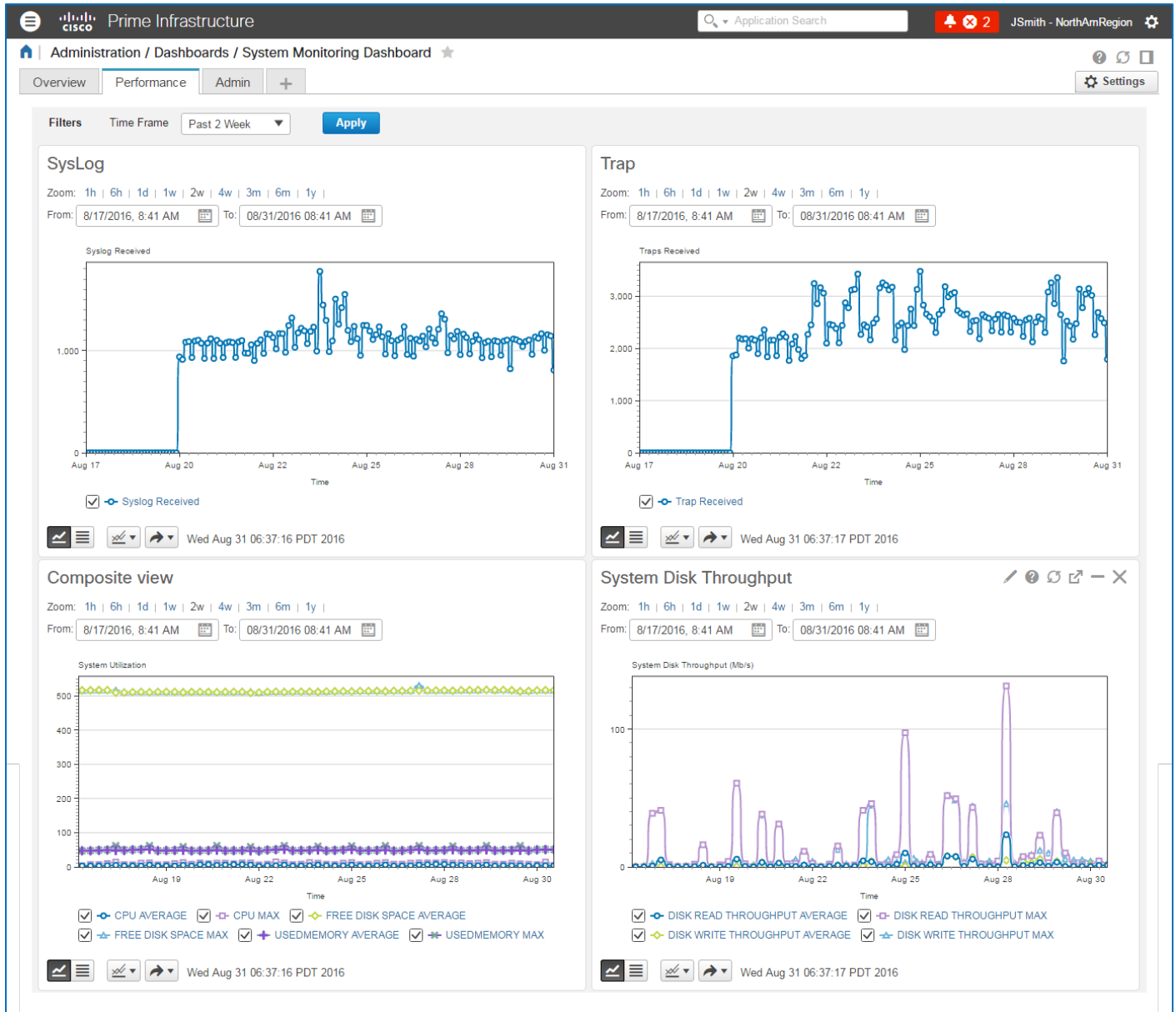
## The Overview Tab

Provides Prime Infrastructure server hardware and software details, overall utilization statistics, and file clearing (data cleanup) job statuses, and system backup job statuses



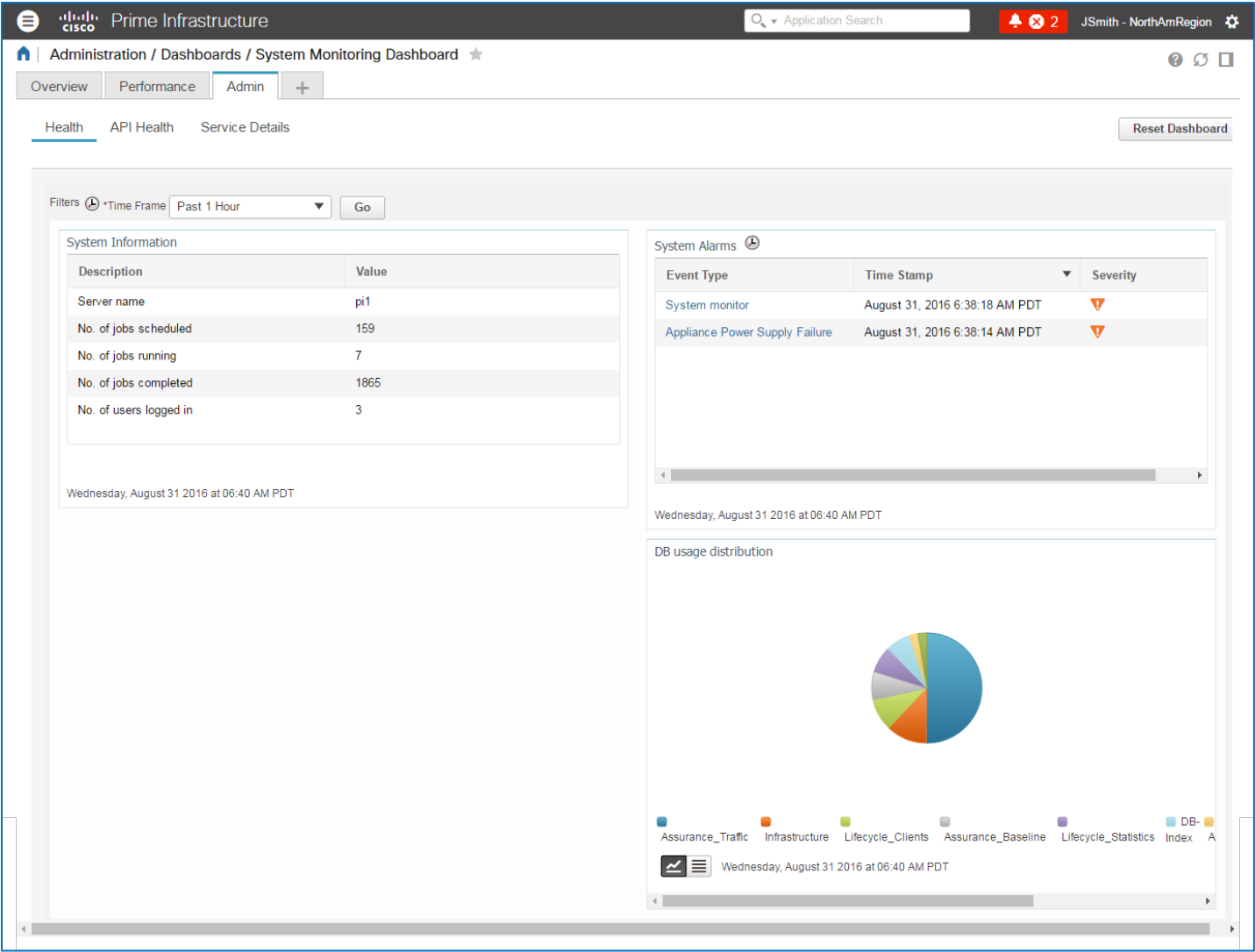
## The Performance Tab

Provides system performance data, including composite and detailed views of system operational statistics



### The Admin Tab

Provides health information on a series of subtabs, including events that are occurring on the system, and API health and API service statistics

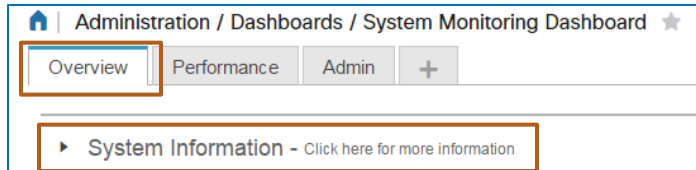


## Reviewing the Server Configuration Details

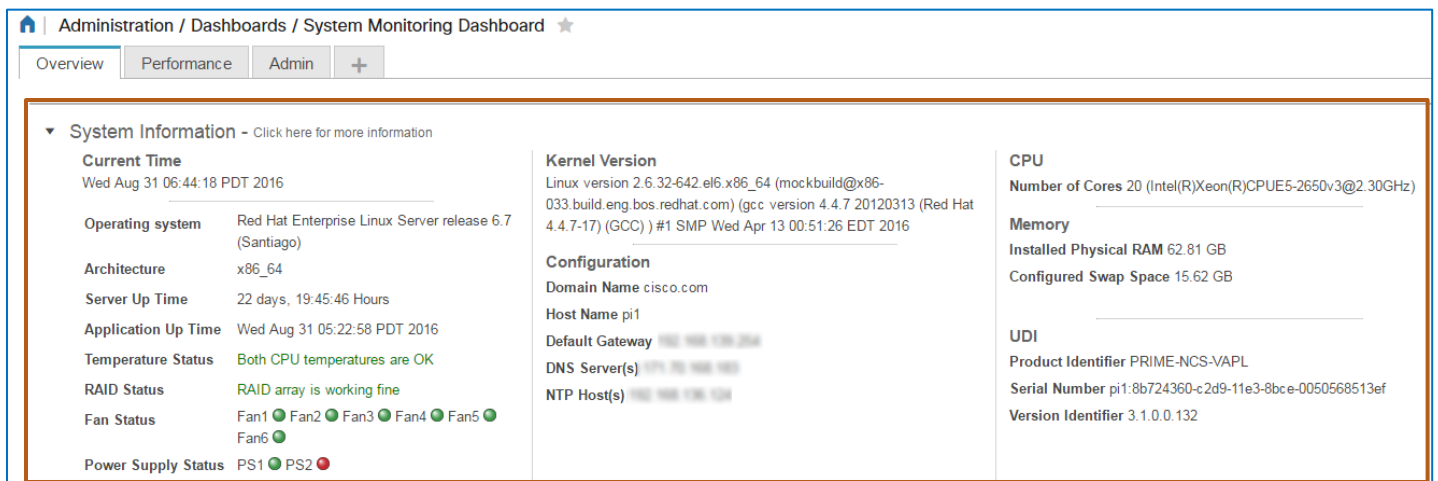
You can review server configuration information and server statistics on the **Overview** tab.

On the **Overview** tab, to see the server configuration summary:

- ❖ Expand **System Information**.



System information includes the following data.



### Current Time

The current time indicates the time that the server is using.

Validating that the system time is accurate helps ensure that data collection and reporting activities are following expected schedules.

Inaccurate system time can indicate such issues as:

- ❖ A problem with connectivity to the network time protocol (NTP) server or with the NTP server's configuration.
- ❖ Affecting job schedules or causing jobs not to run.
- ❖ Cause unexpected system behavior.



## Operating System and Kernel Versions

<b>Current Time</b> Wed Aug 31 06:44:18 PDT 2016	<b>Kernel Version</b> Linux version 2.6.32-642.el6.x86_64 (mockbuild@x86-033.build.eng.bos.redhat.com) (gcc version 4.4.7 20120313 (Red Hat 4.4.7-17) (GCC) ) #1 SMP Wed Apr 13 00:51:26 EDT 2016
<b>Operating system</b> Red Hat Enterprise Linux Server release 6.7 (Santiago)	

Knowing the versions of the operating system and kernel supports your ongoing monitoring of server security issues, server vulnerabilities, and availability of security or other server software updates.

Then, when you receive correspondence from Cisco that communicates issues related to the server operating system or kernel, you can evaluate the urgency of the situation and determine the action that you need to take.

## Temperature, RAID, Fan, and Power Supply Statuses

The status fields provide an immediate view of the status of the key elements that can affect system performance or cause downtime.

<b>Temperature Status</b>	Both CPU temperatures are OK
<b>RAID Status</b>	RAID array is working fine
<b>Fan Status</b>	Fan1 ● Fan2 ● Fan3 ● Fan4 ● Fan5 ● Fan6 ●
<b>Power Supply Status</b>	PS1 ● PS2 ●

## Server Up Time

Server up time indicates the length of time the physical server has been running since it was last powered off.

Server up time can help you determine whether a server reboot occurred. When you know the date that the server was started, and the server up time conflicts with the amount of time you expect to see, you might need to investigate what activity caused the reboot.

## Application Up Time

Application up time indicates the length of time that the Prime Infrastructure application and all of the applications and processes that support Prime Infrastructure have been running since the last system boot.

Application up time can help you determine if an unexpected application restart occurred.

## Configuration and Identifiers

The configuration and unique device identification information provides an overview of the current server configuration details. Identifiers are helpful when you need to communicate or order parts or services.

<b>Kernel Version</b> Linux version 2.6.32-642.el6.x86_64 (mockbuild@x86-033.build.eng.bos.redhat.com) (gcc version 4.4.7 20120313 (Red Hat 4.4.7-17) (GCC) ) #1 SMP Wed Apr 13 00:51:26 EDT 2016	<b>CPU</b> <b>Number of Cores</b> 20 (Intel(R)Xeon(R)CPU E5-2650v3@2.30GHz)
<b>Configuration</b> <b>Domain Name</b> cisco.com <b>Host Name</b> pi1 <b>Default Gateway</b> 192.168.136.254 <b>DNS Server(s)</b> 171.70.168.162 <b>NTP Host(s)</b> 192.168.136.124	<b>Memory</b> <b>Installed Physical RAM</b> 62.81 GB <b>Configured Swap Space</b> 15.62 GB
	<b>UDI</b> <b>Product Identifier</b> PRIME-NCS-VAPL <b>Serial Number</b> pi1:8b724360-c2d9-11e3-8bce-0050568513ef <b>Version Identifier</b> 3.1.0.0.132

## CPU Cores

The number of cores that are processing application instructions indicates the server computing power.

## Memory

The information indicates the physical memory available on the server, and the amount of available swap space.

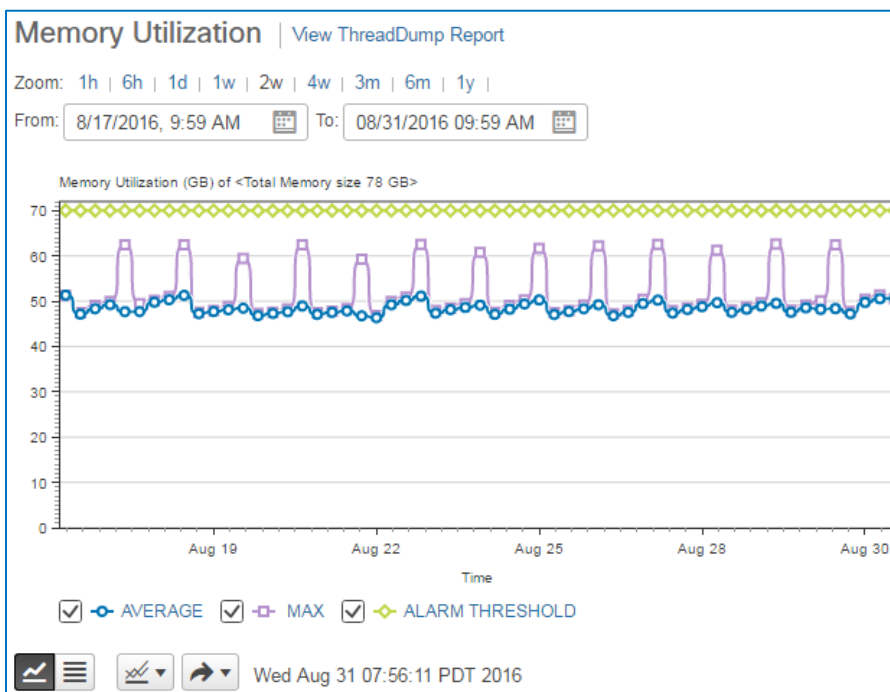
## Dashlet Basics

### What are Dashlets?

Dashlets are data elements that present operational and statistical information on dashboard tabs.

Following are examples of dashlets.

Backup Information		
Server Backup schedule <span>Runs Weekly</span>		
Start Time	Status	Duration (hh:mm:ss)
2016-08-31 03:30	✓	00:43:20
2016-08-30 03:30	✓	00:41:07
2016-08-29 03:30	✓	00:55:21
2016-08-28 03:30	✓	00:42:36
2016-08-27 03:30	✓	00:44:55



For system monitoring, Prime Infrastructure provides **Overview**, **Performance**, or **Admin** dashlets based on the active dashboard tab. While the dashboard tabs include specific dashlets by default, you can add dashlets to or remove them from existing tabs.

You also can add custom dashboards and include the **Overview** or **Performance** dashlets that you want. This way, you can organize information in a way that is most effective for you.



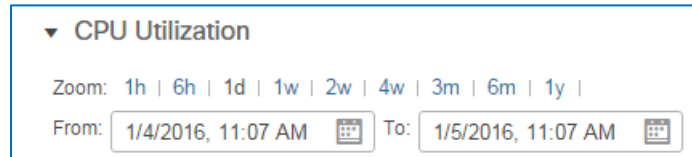
**Note:** For more information on managing dashboards and dashlets, including ways to change the data layout, the dashlet refresh rate, and other features, [refer to the Overview module in the Introducing Cisco Prime Infrastructure 2.2 E-Learning course](#).

When dashlets present graphical data in charts, you can open granular levels of detail, which can be helpful when investigating issues.

## Dashlet Features

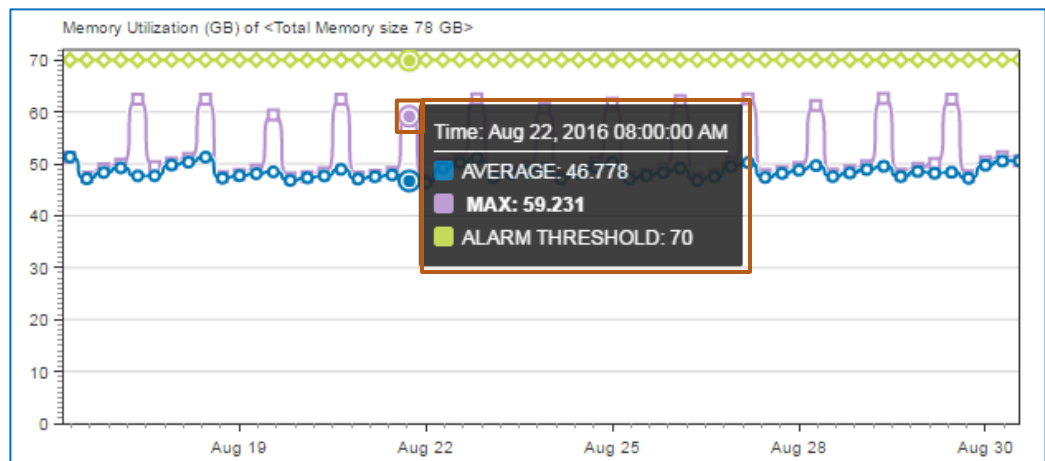
### To review data reported during a specific time period:

- ❖ Using the tools above the chart, select or customize the time period.



### To review detailed chart data:

- ❖ Point to a chart element, such as a line, bar, or pie chart slice. The system opens a tooltip with associated details.



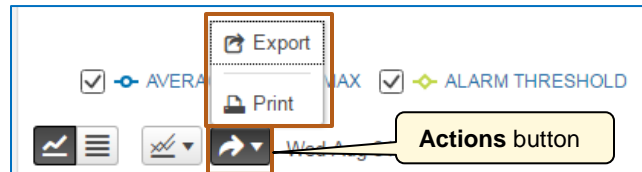
## Exporting Dashlet Data

For dashlets that support it, you can export or print the data that they are displaying.

Exporting or printing data captures historical or ongoing information and can be particularly helpful when requesting support from Cisco.

**To export or print dashlet data, in the dashlet:**

- ❖ Click **Actions**, and then select the **Export** or **Print**.



## Dashlet Reporting Concepts

### Polling Frequency and Timeline Controls

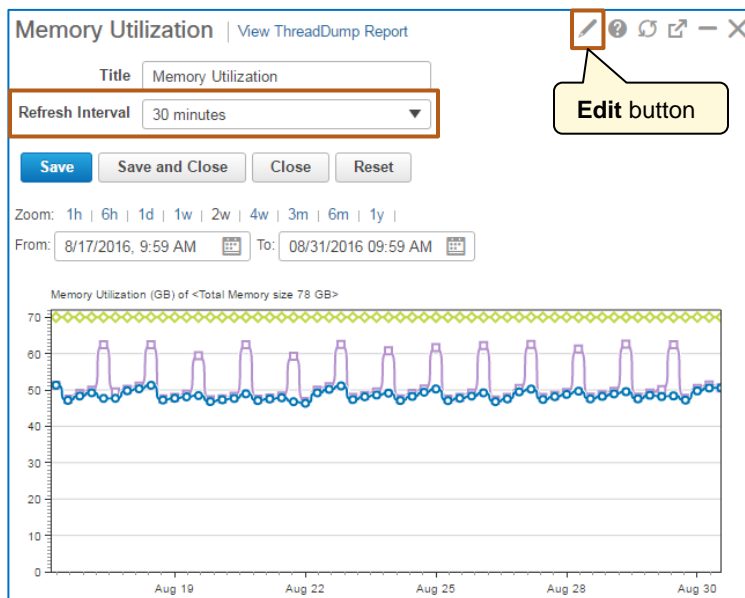
Component polling frequencies, dashlet refresh rates, and dashlet time settings work in combination, which affects how current the dashlet data is.



**Important Note:** While administrators can change polling frequencies for various components, use caution when changing default settings, which follow best practices.

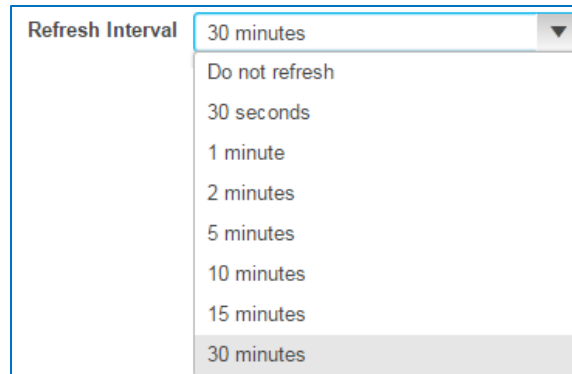
Increasing polling frequency causes additional server workload, which can affect server performance.

You also can set the data refresh rate on dashlets that provide an edit function.





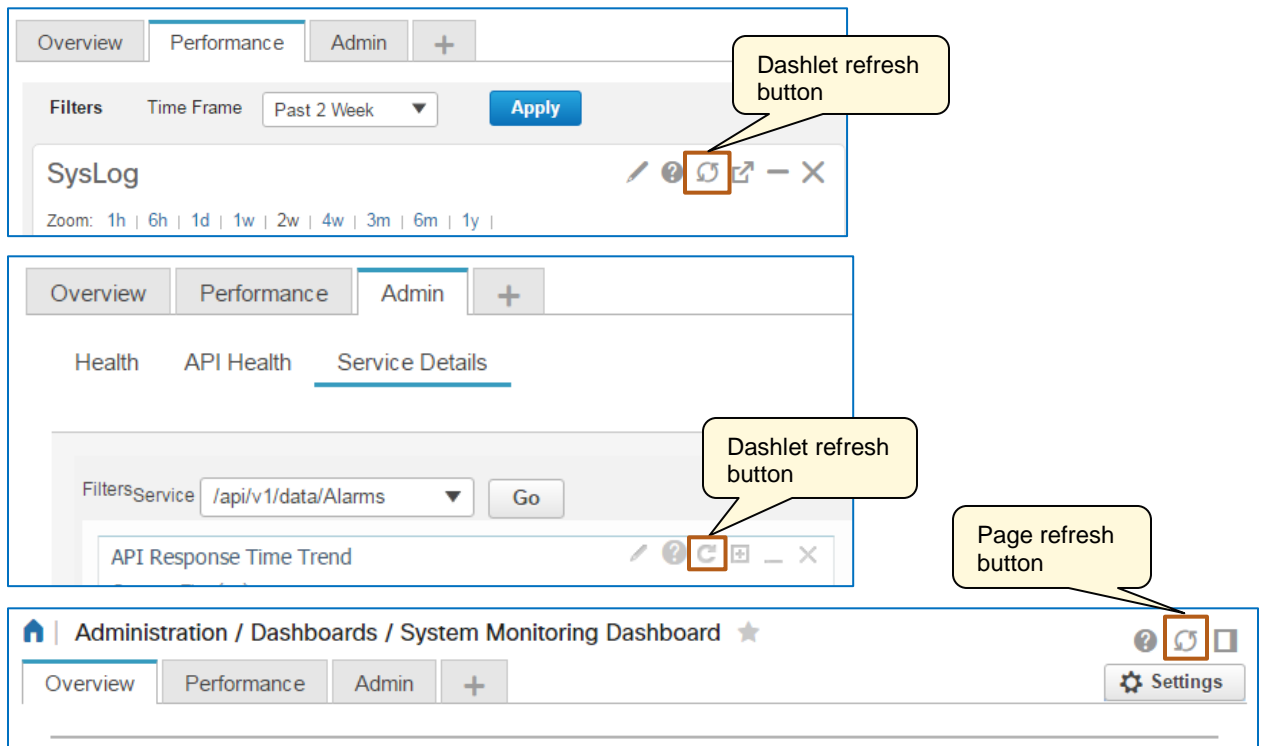
**Note:** If you set a refresh interval that is more frequent than the polling frequency, the dashlet can only display the data it collects at the most recent polling time.



Refresh Interval: 30 minutes

- Do not refresh
- 30 seconds
- 1 minute
- 2 minutes
- 5 minutes
- 10 minutes
- 15 minutes
- 30 minutes

You can manually refresh individual dashlet data, for dashlets that provide it, or all dashlet data at a page level at any time.



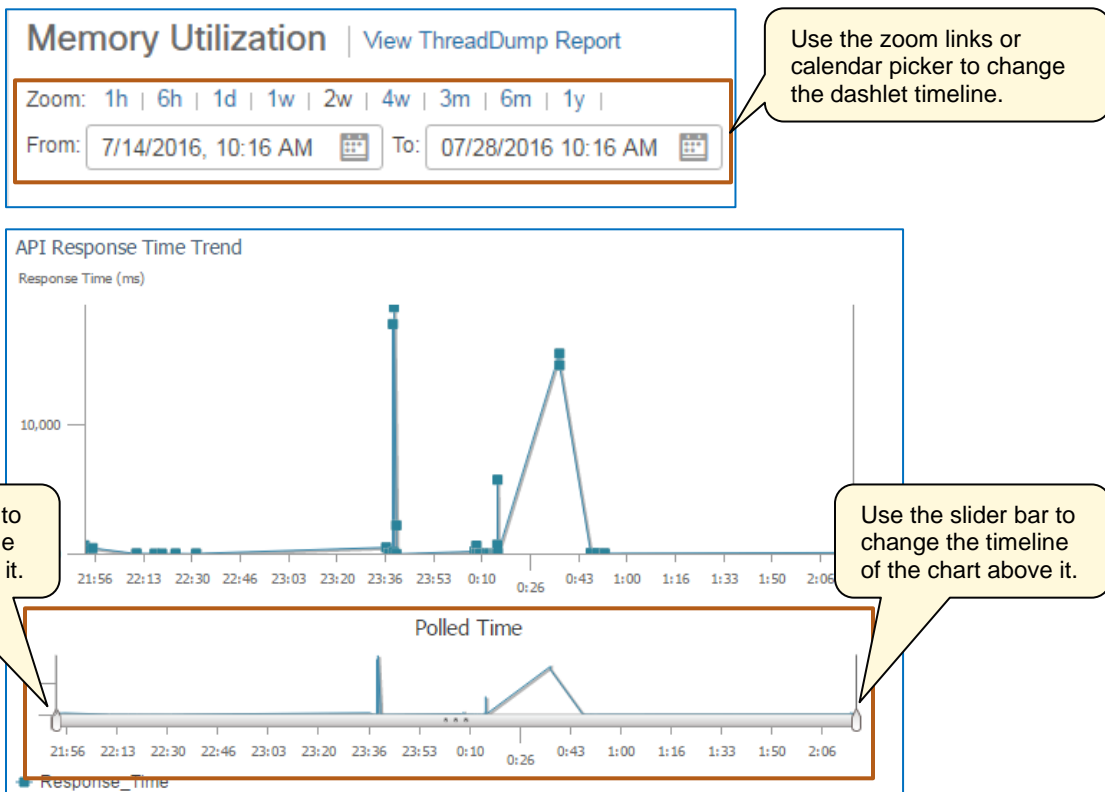
The first screenshot shows the 'SysLog' dashlet with a 'Dashlet refresh button' (circular arrow icon) highlighted. The second screenshot shows the 'API Response Time Trend' dashlet with a 'Dashlet refresh button' highlighted. The third screenshot shows the 'Administration / Dashboards / System Monitoring Dashboard' with a 'Page refresh button' (square arrow icon) highlighted.

Time period settings are another factor that affects the data that you are seeing. There is a time frame setting at a page level, and for dashlets that offer them, zoom links and a calendar picker or timeline sliders that control the time interval.



**Tip:** For more information on managing time frames, [refer to the Managing Time Frames topic](#).

Depending on the dashlet, you can use zoom links and a calendar picker or sliders to change the time period that the associated chart is displaying.



## Threshold Breach Reporting

Some system data have system-defined or administrator-defined threshold values, which help indicate that a component is reporting conditions that might require more attention.

Administrators define threshold values on the **System Event Configuration** page in **System Settings**.

Alarms and Events

System Event Configuration

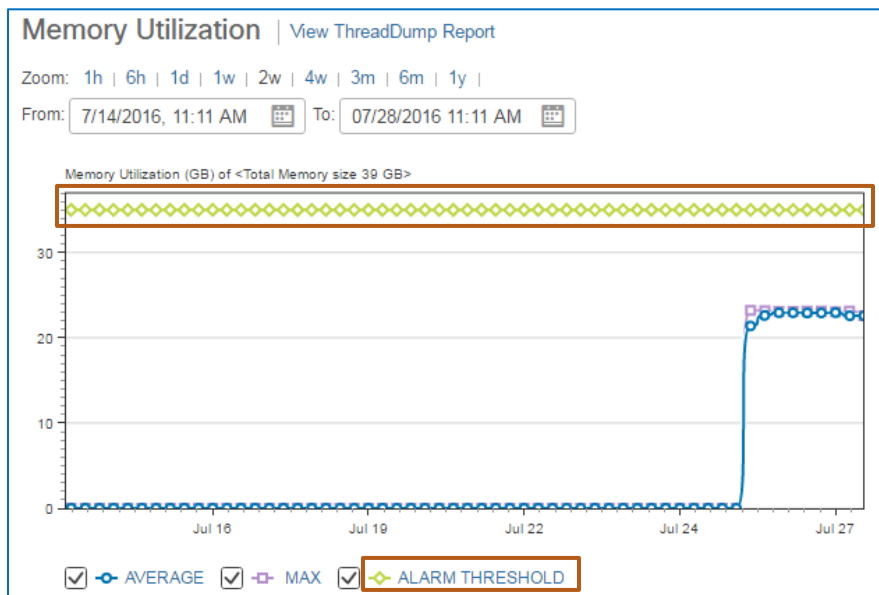
SNMP Traps and Events generated for the appliance events like Power Supply failure, CPU spikes can be configured.

Click on a row to edit and configure.

Events	Event Severity	Threshold	Event Status
CPU Utilization	Major	90	Enabled
Memory Utilization	Major	90	Enabled
Disk Utilization	Major	90	Enabled
PSU Failure	Major	NA	Enabled
Fan Failure	Major	NA	Enabled
Disk Failure	Major	NA	Enabled
HA Operations	Major	NA	Enabled
Appliance Process Failure	Major	NA	Enabled

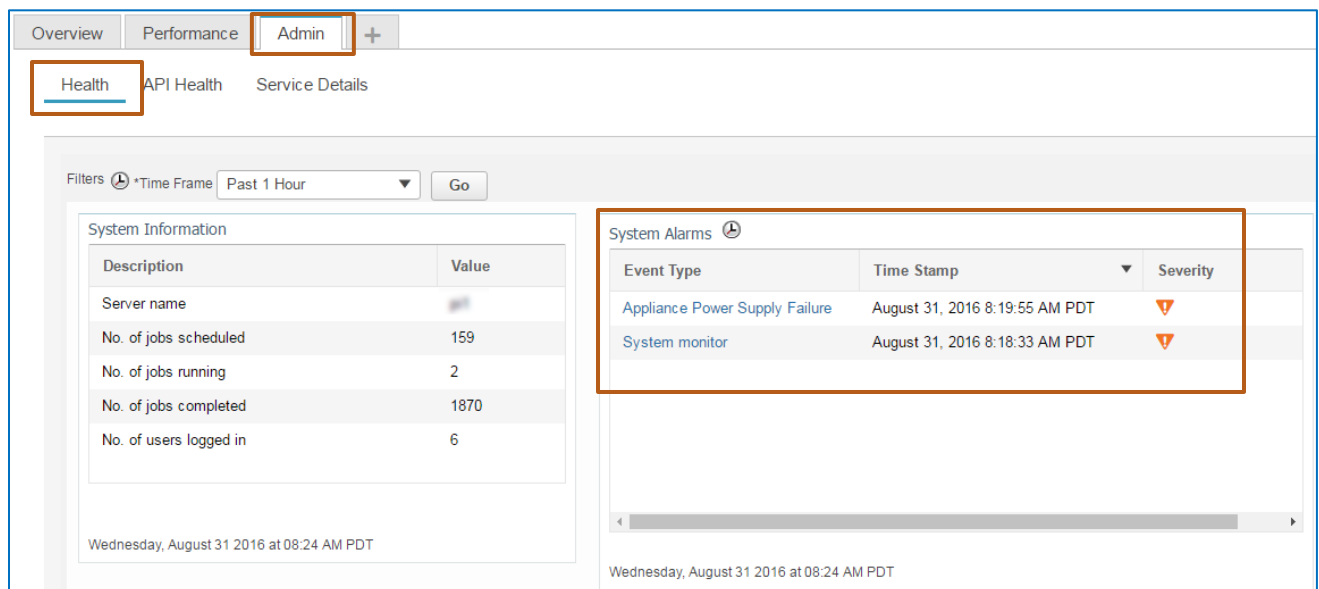
NA - Not Applicable.

Dashlet data with assigned threshold values display the threshold as a separate chart element for reference.



The system automatically evaluates the state of the component against the threshold value every twenty minutes.

You can review threshold breach alarms on the **System Alarms** dashlet.



The screenshot shows the 'Admin' tab selected in the top navigation bar. The 'Health' sub-tab is also selected. The 'System Information' table is displayed on the left, and the 'System Alarms' table is displayed on the right.

Description	Value
Server name	
No. of jobs scheduled	159
No. of jobs running	2
No. of jobs completed	1870
No. of users logged in	6

Event Type	Time Stamp	Severity
Appliance Power Supply Failure	August 31, 2016 8:19:55 AM PDT	Warning
System monitor	August 31, 2016 8:18:33 AM PDT	Warning



## Overview and Performance Dashlets

The **Overview** and **Performance** tabs provide dashlets that report various system information and health statistics.

You can add any combination of **Overview** or **Performance** dashlets to a custom tab, also.



**Note:** The dashlets available on the **Overview** or **Performance** tabs are not available to add to the **Admin** tab.

This topic addresses the dashlets available to you on **Overview**, **Performance**, or custom tabs, the data that each dashlet reports, and what the data might indicate.

## Monitoring Database Compacting Job Statuses

In order to reclaim disk space, the system runs jobs that compact the Prime Infrastructure application database, referred to as **Data Cleanup** jobs.

Data cleanup jobs remove information that system parameters indicate is aged beyond retention periods or as less significant, including:

- ❖ Temporary report files and their caches.
- ❖ Temporary backup archive directories.
- ❖ Aged or orphaned audit reports.
- ❖ The in-memory cache.
- ❖ Events that have aged beyond the retention period.
- ❖ Database tables entries that have aged beyond the retention period.

You can change how often the system runs these jobs.

Data Cleanup		
Data Cleanup schedule		Runs every 2 hour.
Start Time	Status	Duration (hh:mm:ss)
2016-08-31 07:26	✓	00:12:26
2016-08-31 05:03	✗	00:23:15
2016-08-31 02:50	✓	00:12:46
2016-08-31 00:37	✓	00:13:03
2016-08-30 22:24	✓	00:12:58
Shows a maximum of last 5 Data Cleanup job runs		

Refer to the **Data Cleanup** dashlet to:

- ❖ See or change the database clean up job schedule.
- ❖ See the last five jobs that have occurred and their statuses.

The system sets the default clean up job schedule to run every two hours. You can change the time period, as needed, to address specific circumstances.



**Important Note:** Cisco recommends that you retain the default time period setting, which follows Cisco best practices.

Use caution when changing the time period, particularly if you are reducing the time interval, which causes additional system load and can potentially affect system performance.

### To change the time interval that the system performs a cleanup job:

- ❖ Click the **Data Cleanup schedule** link that indicates the current time interval, and then configure the time period.

Data Cleanup		
Data Cleanup schedule	Runs every 2 hour.	
Start Time	Status	Duration (hh:mm:ss)
2016-08-31 07:26	✓	00:12:26

### To review job details:

- For the job of interest, click the **Start Time** link. The system navigates to the **Job Dashboard** in Administration.

Data Cleanup		
Data Cleanup schedule	Runs every 2 hour.	
Start Time	Status	Duration (hh:mm:ss)
2016-08-31 07:26	✓	00:12:26

The system navigates to the **Job Dashboard** page and in Administration and lists a single **Data Cleanup** job entry in the **System Jobs | Infrastructure** category.

- In the **System Jobs | Infrastructure** category, in the list, click the **Data Cleanup** name link in the list.

Administration / Dashboards / Job Dashboard
Job Approval | Settings

Metrics

User Job Status

0 Scheduled
0 Failed
0 Suspended

Poller Job Status

0 Scheduled
0 Failed
0 Suspended

System Job Status

11 Scheduled
3 Failed
11 Suspended

In Progress Jobs

0 User
0 System
0 Poller

Last Updated: Monday, June 20, 2016 at 10:45:19 AM EDT

Jobs

System Jobs

APIC-EM Integration
Assurance And Health Summary
Infrastructure
Inventory And Discovery Jobs
Status
Wireless Monitoring

Jobs / System Jobs
Infrastructure

Edit Schedule
Run
Pause Series
Resume Series

Show
Quick Filter

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm:ss)	Next Start Time
Mobility Service Status	Infrastructure	Scheduled	Success	2016-06-20 07:42	00:00:01	2016-06-20 07:47
Autonomous Client Status	Infrastructure	Scheduled	Success	2016-06-20 07:41	00:00:01	2016-06-20 07:46
Data Cleanup	Infrastructure	Scheduled	Success	2016-06-20 07:29	00:00:17	2016-06-20 09:29
Mobility Service Synchronization	Infrastructure	Scheduled	Success	2016-06-20 06:56	00:00:01	2016-06-20 07:56

Monitoring System Health Job Aid

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The page lists the 5 most recently occurring data cleanup jobs, and provides a link to see all of the cleanup jobs that have run.



**Note:** An administrator can define the time period that the system retains jobs in system settings.

Administration / Dashboards / Job Dashboard / Data Cleanup ☆

Recurrence Hourly  
Description Data Cleanup

Showing latest 5 Job Instances [Show All](#) Total 5

Show Quick Filter

Run ID	Status	Duration (hh:mm:ss)	Start Time	Completion Time
455395510	Running		2016-08-31 09:39	
455038043	Success	00:12:26	2016-08-31 07:26	2016-08-31 07:39
454838626	Interrupted	00:23:15	2016-08-31 05:03	2016-08-31 05:26
454770539	Success	00:12:46	2016-08-31 02:50	2016-08-31 03:03
454701348	Success	00:13:03	2016-08-31 00:37	2016-08-31 00:50

### Continue monitoring or take action when:

- Cleanup jobs are taking little or no time to run.

Cleanup jobs should take a consistent and reasonable amount of time to run based on such factors as system or data retention configurations.



**Note:** In initial or relatively new system installations, the system is likely capturing or storing a minimal amount of data, which can result in shorter cleanup job durations.

When a job is taking little or no time to run, even when indicating a successful job status, there might be a database or data retention issue that requires attention or mitigation.

- Cleanup jobs are taking an extensive time to run.

Long running jobs can affect system performance or indicate that database compacting is not occurring as expected.

- ❖ A single cleanup job reports a failure status.

A single cleanup job failure does not necessarily indicate that there is an issue. When you see a single failure, continue monitoring the dashlet to determine whether subsequent jobs run successfully or continue to fail.

- ❖ Cleanup jobs are consistently failing.

A series of consistently failing data cleanup jobs can indicate such issues as a server restart disruption or resources that are missing.



**Tip:** Long running or consistently failing jobs also can affect system performance, causing the system to exhibit slow, or sluggish, behavior. To review various information that can help you assess reasons for slow system performance, [refer to the FAQ](#).

Factors that can affect data clean up jobs can become complex. If you continue to see issues that you cannot resolve, gather supporting data and submit a support case to the Technical Assistance Center (TAC).



**Important Note:** To submit an effective and actionable support case, [refer to the FAQ](#).

## Monitoring Backup Jobs

Server backups are critical to ongoing operations and support more efficient system recovery in case of a failure.

Refer to the **Backup Information** dashlet to:

- ❖ See or change the backup job schedule.
- ❖ See the last five jobs that have occurred and their statuses.
- ❖ See a list of the backups that are available in the repository for restore or recovery processes.

Backup Information

Server Backup scheduleRuns Weekly

Start Time	Status	Duration (hh:mm:ss)
2016-08-31 03:30	✓	00:43:20
2016-08-30 03:30	✓	00:41:07
2016-08-29 03:30	✓	00:55:21
2016-08-28 03:30	✓	00:42:36
2016-08-27 03:30	✓	00:44:55

Shows a maximum of last 5 Server Backup job runs

Available Server Backups (Max number of backups stored: 2)

Backups take...	Backup Name	Repository	Size	Available...
2016-08-30 03:30	pi1-160830-0330__VER3.1...	defaultRepo	15922.36 ...	161.04 GB
2016-08-31 03:30	pi1-160831-0330__VER3.1...	defaultRepo	15930.52 ...	161.04 GB

Alarms on Server Backup

Alarm Type	Time Stamp	Severity
No data available		



**Note:** The dashlet only lists available backup files when they are stored in the Prime Infrastructure server repository. When stored on another server, the system cannot report on available backup files.

- ❖ See backup-related alarms that the system is reporting.



**Tip:** While you can monitor all of the system alarms that are occurring on the **Alarms** dashlet on the **Admin** tab, the **Backup Information** dashlet provides a list of alarms specifically generated during server backup jobs.



**Important Note:** Cisco recommends that you take immediate action on backup job alarms, which can mitigate or avoid data loss.

For more information on managing backup processes, [refer to the Prime Infrastructure 3.1 Administrator Guide](#).

**To review job details:**

1. For the job of interest, click the **Start Time** link.

Backup Information		
Server Backup schedule <small>Runs Weekly</small>		
Start Time	Status	Duration (hh:mm:ss)
2016-08-31 03:30	✓	00:43:20
2016-08-30 03:30	✓	00:41:07
2016-08-29 03:30	✓	00:55:21
2016-08-28 03:30	✓	00:42:36
2016-08-27 03:30	✓	00:44:55

Shows a maximum of last 5 Server Backup job runs

The system navigates to the **Job Dashboard** page in Administration and lists a single **Server Backup** job entry in the **System Jobs | Infrastructure** category.

2. In the **System Jobs | Infrastructure** category, in the list, click the **Server Backup** name link.

Administration / Dashboards / Job Dashboard

Job Approval | Settings

Metrics

User Job Status

18 Scheduled
110 Failed
0 Suspended

Poller Job Status

0 Scheduled
1 Failed
0 Suspended

System Job Status

10 Scheduled
21 Failed
10 Suspended

In Progress Jobs

0 User
2 System
1 Poller

Last Updated: Wednesday, August 31, 2016 at 11:58:29 AM EDT

Jobs

System Jobs

APIC-EM Integration
Assurance And Health Summary
Infrastructure
Inventory And Discovery Jobs
Status
Wireless Monitoring
Poller Jobs

Jobs / System Jobs

Infrastructure

Edit Schedule
Run
Pause Series
Resume Series

Show Quick Filter

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(h...	Next Start Time
Mobility Service Status	Infrastructure	Scheduled	✓ Success	2016-08-31 09:53	00:00:02	2016-08-31 09:58
Autonomous Client Status	Infrastructure	Scheduled	✓ Success	2016-08-31 09:52	00:00:01	2016-08-31 09:57
Data Cleanup	Infrastructure	Scheduled	✓ Success	2016-08-31 09:39	00:11:16	2016-08-31 11:50
wIPS Alarm Sync	Infrastructure	Scheduled	✓ Success	2016-08-31 09:27	00:00:01	2016-08-31 11:27
Mobility Service Synchronization	Infrastructure	Scheduled	✓ Success	2016-08-31 09:27	00:00:02	2016-08-31 10:27
OnDemandReportsCleanUp	OnDemand Cleanup	Scheduled	✓ Success	2016-08-31 04:22	00:00:01	2016-08-31 11:26
Server Backup	Infrastructure	Scheduled	✓ Success	2016-08-31 03:30	00:43:20	2016-09-01 03:30

The page lists the 5 most recently occurring server backup jobs and provides a link to see all of the cleanup jobs that have run.

Administration / Dashboards / Job Dashboard / Server Backup ★

Recurrence Daily  
Description Server Backup

Showing latest 5 Job instances [Show All](#)

Run ID	Status	Duration (hh:mm:ss)	Start Time	Completion Time
454789388	✓ Success	00:43:20	2016-08-31 03:30	2016-08-31 04:13
454036676	✓ Success	00:41:07	2016-08-30 03:30	2016-08-30 04:11
452774729	✓ Success	00:55:21	2016-08-29 03:30	2016-08-29 04:25
452029439	✓ Success	00:42:36	2016-08-28 03:30	2016-08-28 04:12
451273209	✓ Success	00:44:55	2016-08-27 03:30	2016-08-27 04:14



**Note:** While the system lists a series of server backup jobs, the system retains only the two most recent backup files.

An administrator can configure the number of backup files that the system retains by editing the **Server Backup** job properties on the **Job Dashboard** page.

Administration / Dashboards / Job Dashboard ★

Metrics

User Job Status: 0 Scheduled, 0 Failed, 0 Suspended

Poller Job Status: 0 Scheduled, 0 Failed, 0 Suspended

System Job Status: 11 Scheduled, 3 Failed, 11 Suspended

Last Updated: Thursday, July 14, 2016 at 9:29:04 AM EDT

Jobs

User Jobs

System Jobs

APIC-EM Integration

Assurance And Health Summary

Infrastructure

Inventory And Discovery Jobs

Status

Wireless Monitoring

Poller Jobs

Jobs / System Jobs

Infrastructure

Edit Schedule Run Pause Series Resume Series

Max UI backups to keep 2

Save Cancel

Server Backup Infrastructure Scheduled ✓ Success

On initial system installation, a configurator sets the server back up interval based on enterprise operational requirements, such as during a nightly maintenance window.

When administrators determine the average length of time that backups tend to take, they can adjust the back up schedule time interval, as needed.

**To change the time interval that the system performs a backup job:**

- ❖ Click the **Server Backup schedule** link that indicates the current time interval.

Backup Information

Server Backup schedule

Runs Weekly

Start Time	Status	Duration (hh:mm:ss)
2016-06-01 17:00	✓	00:37:30
2016-05-08 17:00	✗	1 Days 17:50:56
2016-05-07 17:00	✓	00:25:21

Shows a maximum of last 5 Server Backup job runs

Available Server Backups

(Max number of backups stored: 2)

Backups taken...	Backup Name	Repository	Size	Available ...
2016-05-08 17:00	pi3x-54-160508-1700__VE...	defaultRepo	443.09 MB	150.12 GB
2016-06-01 17:00	pi3x-54-160601-1700__VE...	defaultRepo	6099.97 MB	150.12 GB

Alarms on Server Backup

Alarm Type	Time Stamp	Severity
No data available		



### Continue monitoring or take action when:

- ❖ The duration of backup jobs does not remain consistent.

When backup durations are taking much longer periods of time than normal, the database might be storing larger amounts of data than normal.

Extended backup job durations can indicate activities such as client tracking, or lengthy data retention periods, which can cause the system to store significantly more data.

Long job durations also can indicate that one or more data cleanup jobs did not complete or failed, requiring more storage space. You can refer to the **Data Cleanup** dashlet to determine whether action is needed related to database cleanup jobs.

- ❖ In the list of backups, if you see that not enough space is available to support the next scheduled backup job.

Available Server Backups (Max number of backups stored: 2)				
Backups taken...	Backup Name	Repository	Size	Available Size
2016-06-19 03:30	srjaret-116-241-160619-...	defaultRepo	300.94 MB	40.31 GB
2016-06-20 03:30	srjaret-116-241-160620-...	defaultRepo	306.14 MB	40.31 GB

The **Available Server Backups** list indicates the number of backups that the system has stored, which is based on the backup file retention system setting in Administration.

The **Size** field indicates the size of the each stored backup file and the amount of server storage space available for backup files.

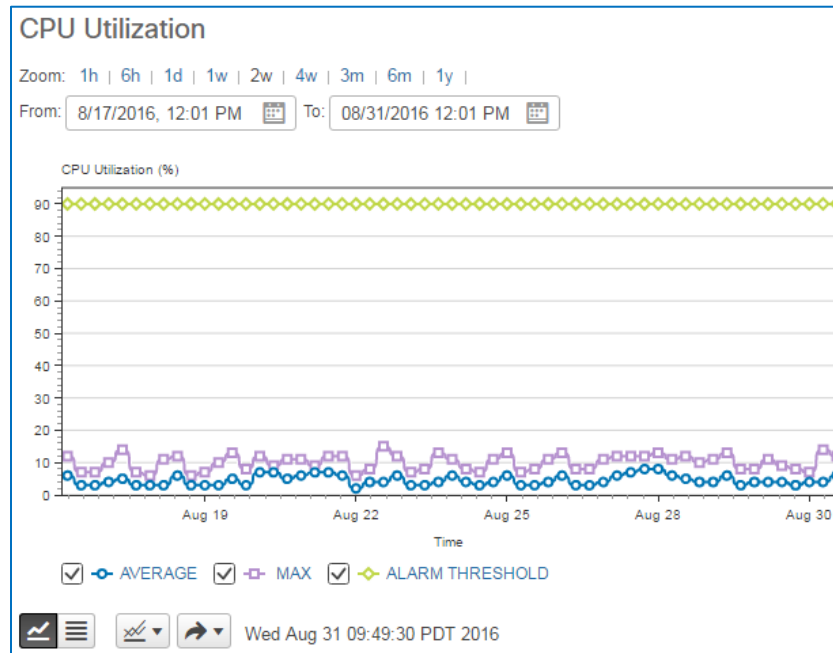
When it appears that there is not enough space to support an upcoming backup, take action to make space available, which helps avoid data loss.

## Monitoring CPU Usage

CPU usage indicates the amount of computing power that processes and jobs running in the system are consuming.

Refer to the **CPU Utilization** dashlet to see:

- ❖ Average and maximum CPU usage over time, which should remain in a relatively consistent, steady state.
- ❖ The relationship of average and maximum statistics to the usage alarm threshold.



## Continue monitoring or take action when:

- ❖ CPU usage statistics are consistently trending closely or peaking above the alarm threshold.

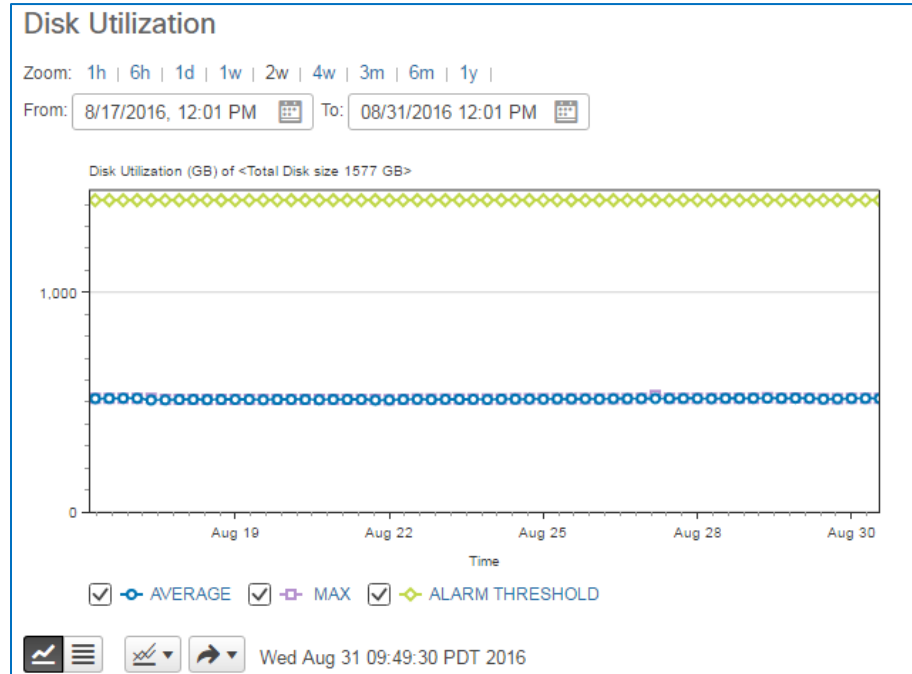
This situation indicates that one or more processes are consuming a majority of computing power, which can reduce the ability of other processes to run efficiently.

For example, the amount of CPU usage can peak based on the type of activity that is occurring, such as a flood of alarms or jobs that are running frequently.

## Monitoring Disk Usage

Refer to the **Disk Utilization** dashlet to see:

- ❖ Related usage statistics during the selected time period.



### Continue monitoring or take further action when:

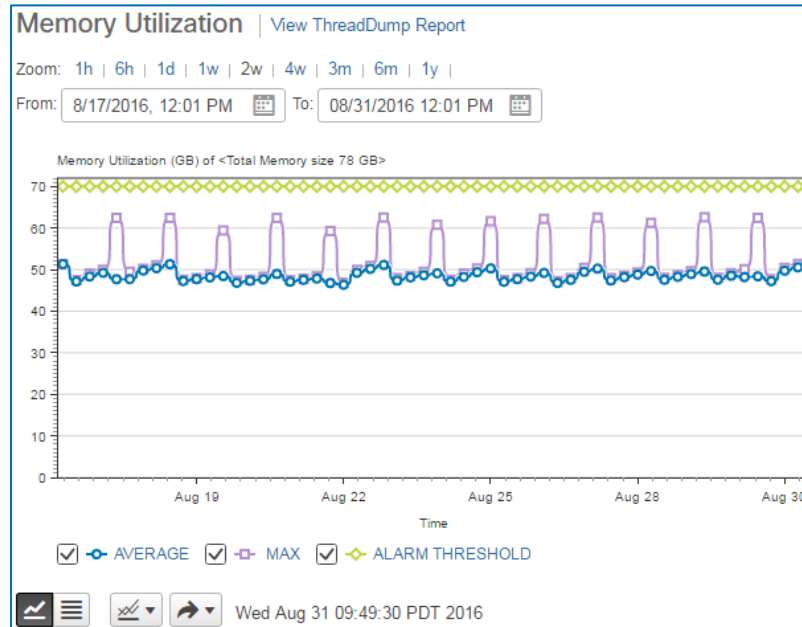
- ❖ The **Disk Utilization** dashlet begins to indicate excessive disk usage or alarms.
  - To review the volumes and the space they are occupying on the disk, [refer to the Disk Statistics dashlet](#), which can help you determine which volumes might be increasing or are too large in size.
  - To see if a backup job failed, which can cause excessive storage, [refer to the Backup Information dashlet](#).
  - To see if other jobs, including background processes or reports, are failing, which can cause excessive storage, refer to the **Jobs Dashboard** page.
  - To review the API call retention periods, which can affect the amount of disk space that the system requires to store call data, [refer to the FAQ](#).

## Monitoring Memory Usage

By design, Prime Infrastructure allows the database to consume as much memory as it requires.

Refer to the **Memory Utilization** dashlet to see:

- ❖ Average and maximum memory usage over time.
- ❖ The relationship of average and maximum statistics to the usage alarm threshold.



Continue monitoring or take action when:

- ❖ Memory usage statistics are consistently trending closely or peaking above the alarm threshold.
  - ◆ This situation might indicate that threads might not be responding to processing requests.

To evaluate the issue, you can generate a **Memory Threshold Breach Report** following the instructions below.



**Important Note:** If you plan to submit a TAC case to evaluate a memory usage problem, generate a **Memory Threshold Breach Report** that includes the time period in which the problem occurred.

The report lists the details for the thread activity occurring in the time period that you select, which can provide insight into threads that might be causing issues.

- ◆ When running the system in a VM environment, this situation might indicate that a configurator did not set the VM disk allocation to **Thick Provision Lazy Zeroed**.

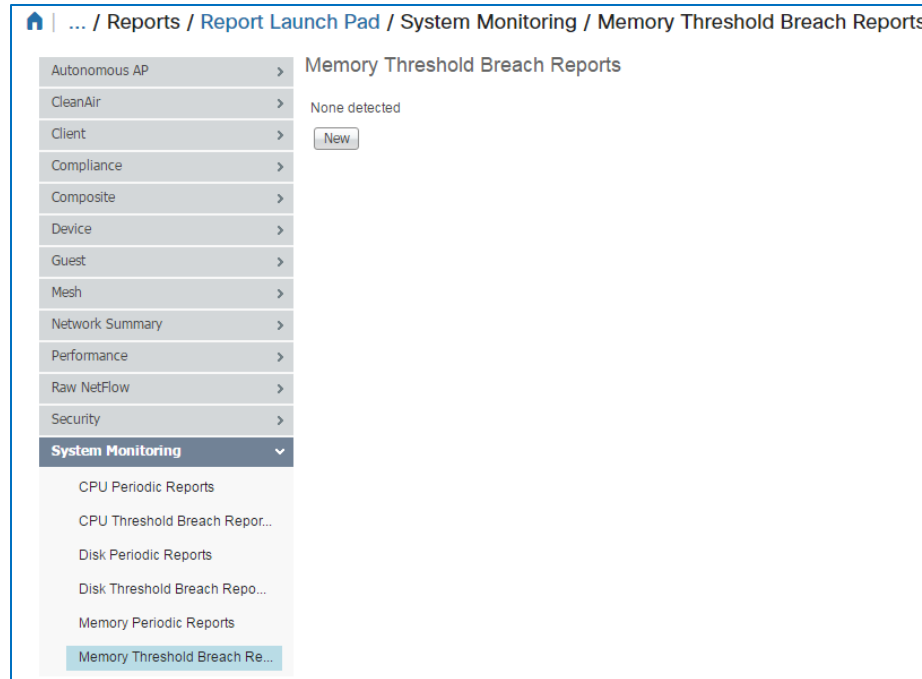
It is important to allocate memory for the system and not allow other processes to share it. On initial installation, a configurator should set the VM to apply the **Thick Provision Lazy Zeroed** disk allocation, which allocates the memory space.

If this setting is not configured correctly, the VM provides memory in 2 gigabyte increments, forcing the system to make ongoing requests for disk space during operations, which can significantly affect performance.

**To generate a Memory Threshold Breach Report:**

1. Beside the **Memory Utilization** dashlet heading, click **View ThreadDump Report**.

The system navigates to and opens the **Memory Threshold Breach Reports** page.

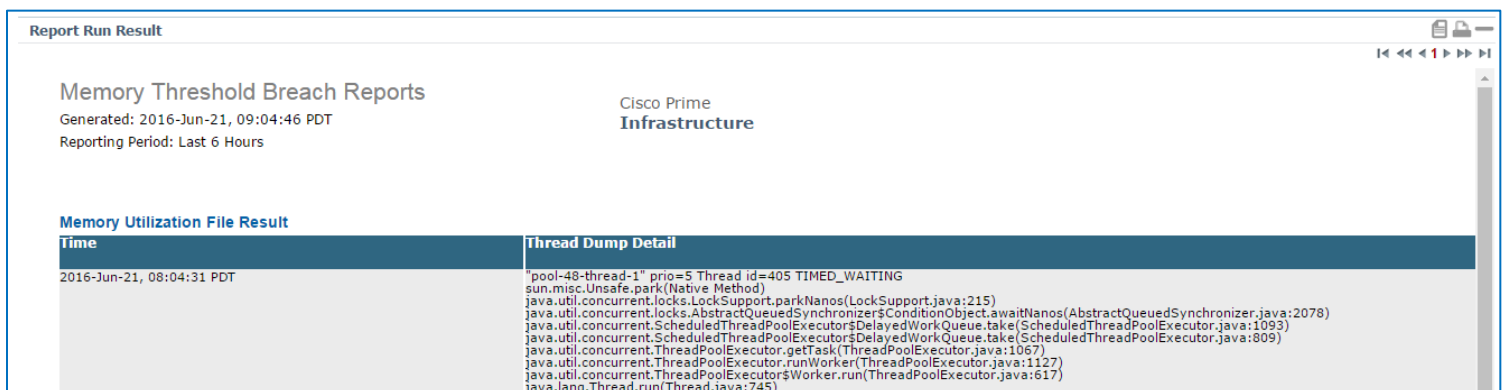


2. On the **Memory Threshold Breach Reports** page, click **New**.

The **New Memory Threshold Breach** page opens. You can configure the reporting period and data export parameters.

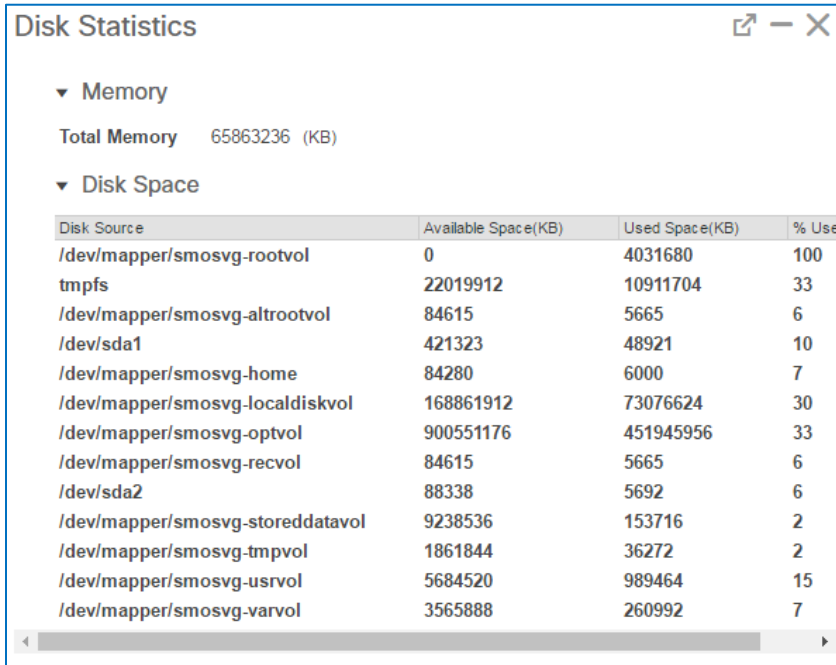
To capture the report information for submission in the TAC support case, you need to run and save, save and export, or save and e-mail the report.

For the time period that you define, the report provides a time stamp and the thread activity occurring at that time.



## Evaluating Disk Usage

When the [Disk Utilization dashlet](#) begins to indicate excessive disk usage or alarms, you can refer to the **Disk Statistics** dashlet **% Used** column to determine what volumes might be occupying large percentages of disk space.



Disk Source	Available Space(KB)	Used Space(KB)	% Use
/dev/mapper/smosvg-rootvol	0	4031680	100
tmpfs	22019912	10911704	33
/dev/mapper/smosvg-altrootvol	84615	5665	6
/dev/sda1	421323	48921	10
/dev/mapper/smosvg-home	84280	6000	7
/dev/mapper/smosvg-localdiskvol	168861912	73076624	30
/dev/mapper/smosvg-optvol	900551176	451945956	33
/dev/mapper/smosvg-recvol	84615	5665	6
/dev/sda2	88338	5692	6
/dev/mapper/smosvg-storedatavol	9238536	153716	2
/dev/mapper/smosvg-tmpvol	1861844	36272	2
/dev/mapper/smosvg-usrvol	5684520	989464	15
/dev/mapper/smosvg-varvol	3565888	260992	7

Refer to the **Disk Statistics** dashlet to see:

- ❖ The volumes that are occupying the disk and their mounting locations.
- ❖ Volume size statistics and usage.



**Note:** While you will not see direct mapping in the system to the disk volumes themselves, this information is particularly helpful to Cisco if you need to submit a TAC support case to evaluate disk space issues.

When evaluating disk usage, there are three key volumes that you should monitor, listed in the following section.

### To monitor the three key volumes:

- ❖ Refer to the **% Used** column. This percentage will indicate whether you need to take corrective action.

▼ Memory			
Total Memory 65863236 (KB)			
▼ Disk Space			
Disk Source	Available Space(KB)	Used Space(KB)	% Used
/dev/mapper/smosvg-rootvol	0	4031680	100
tmpfs	22019912	10911704	33
/dev/mapper/smosvg-altrootvol	84615	5665	6
/dev/sda1	421323	48921	10
/dev/mapper/smosvg-home	84280	6000	7
/dev/mapper/smosvg-localdiskvol	168861912	73076624	30
/dev/mapper/smosvg-optvol	900551176	451945956	33
/dev/mapper/smosvg-recvol	84615	5665	6
/dev/sda2	88338	5692	6
/dev/mapper/smosvg-storredatavol	9238536	153716	2
/dev/mapper/smosvg-tmpvol	1861844	36272	2
/dev/mapper/smosvg-usrvol	5684520	989464	15
/dev/mapper/smosvg-varvol	3565888	260992	7

### Continue monitoring these key volumes or take action when:

- ❖ **/dev/mapper/smosvg-optvol** nears or exceeds a range of 60% -70% of used space.

This volume contains the system data and software and maps to the **/opt** directory in the file system. When the volume consumes a large amount of space, the system response becomes slow.

If the percentage of space used is consistently nearing or above the threshold, run a data cleanup job, which might help resolve the issue.

Also, [refer to the Backup Information dashlet](#) to determine if backup jobs are running successfully. Failing backup jobs will cause the volume size to grow.

If the issue does not resolve, submit a TAC case and include your observations of disk usage behaviors.

- ❖ **/dev/mapper/smosvg-tmpvol** nears or exceeds a range of 30% -40% of used space.

This volume provides the ongoing space needs of system processes and maps to the **/tmp** directory in the file system.

The **/tmpvol** space allocation is roughly 2 gigabytes, so monitoring it is important to help ensure that system processes do not fail.

Software update failures can consume **/tmpvol** space. If you think that software updates are failing, contact the Technical Assistance Center to report the problem.

❖ **/dev/mapper/smosvg-localdiskvol nears or exceeds 50% of used space.**

This volume contains backup files and maps to the **/localdisk** directory in the file system.

The system stores backup files in the local disk volume. If space usage exceeds the threshold, most likely a backup file is stored there that needs to be transferred to external storage.



**Important Note:** An individual backup file can be large enough to consume much of the allocated disk space, which can jeopardize the success of a subsequent backup job.

It is best practice to store backup files outside of the Prime Infrastructure system to avoid data loss due to a lack of storage space.

This practice also helps protect the system from data corruption or loss due to a system failure by having the most recent backup available for recovery operations.

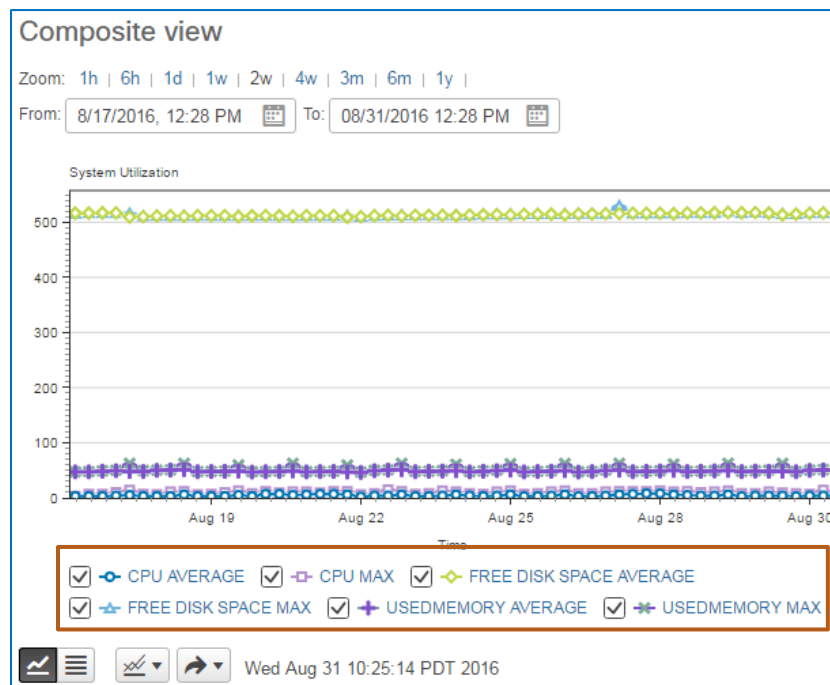
## Comparing CPU, Disk, and Memory Usage Statistics

When you see a peak or series of peaks in CPU, disk, or memory usage, you can review this dashlet to see if there were corresponding increases or decreases in usage occurring on other components around the same time.

For example, if you see disk usage peak, and, on the **Composite view** dashlet, you see that memory usage also peaked, you might investigate whether a power supply failed.

### To evaluate specific statistics:

- ❖ Clear the check boxes of those statistics that you are not using in your comparison.



### Continue monitoring or take action when:

- ❖ Statistics are consistently trending similarly in relationship to each other.



- ❖ One statistic is consistently trending higher than the other two statistics.

For example, when investigating exceedingly high disk usage and, on the **Composite view** dashlet, you see that the CPU and memory usages are not peaking, this activity might indicate that ongoing input / output operations are fluctuating.

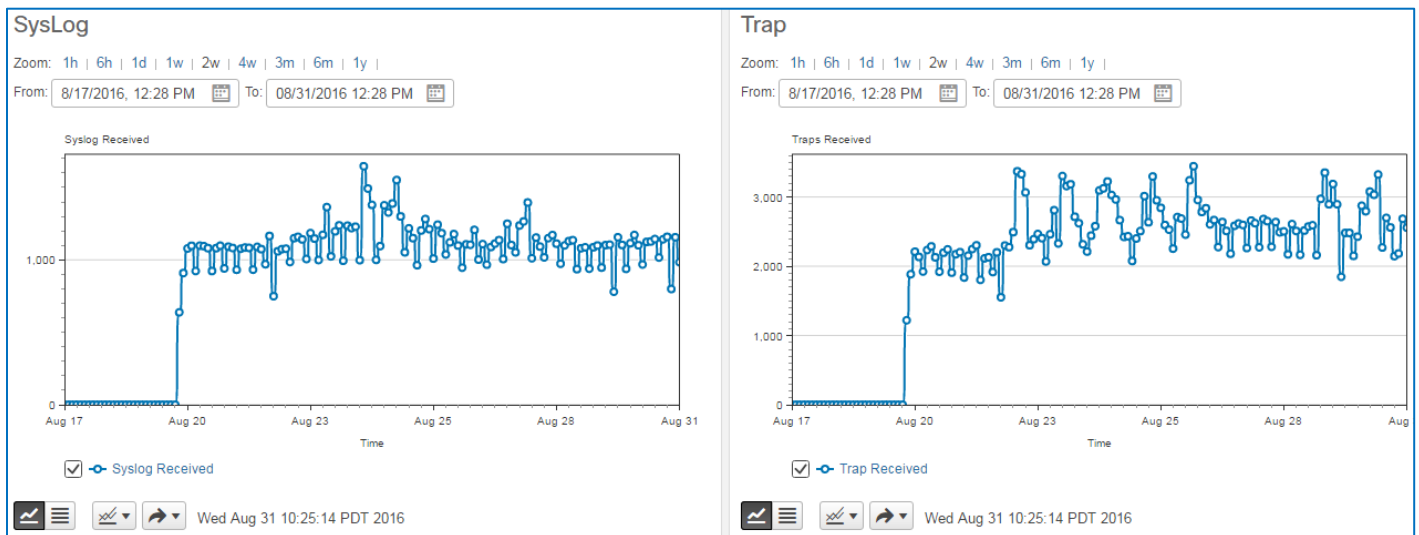
When disk space is not uniformly distributed, this fluctuation can occur, which would prompt you to optimize the disk to provide more input / output buffers.

In situations when you see anomalies that are ongoing, begin exporting or printing the corresponding data to capture historical behavior that you can include when requesting assistance from Cisco.

## Evaluating Incoming Syslogs or Traps

To get a clearer understanding of the system workload, you can evaluate the number of syslogs or traps that the system is processing currently or over time.

Refer to the **SysLog** and **Trap** dashlets to see the incoming syslogs or traps trends or peaks.



## Continue monitoring or take action when:

- ❖ You see consistently peaking or an ongoing peak of incoming messages, referred to as flooding.

Flooding of either message type can indicate that a device on the network or an area of the network is experiencing unusual activity.

When trap or syslog reporting occurs, the system begins data collection and polling jobs to gather information about the states of the device and the network to correlate what might be happening. When floods occur, the system might not be able to perform polling and collection processes quickly enough to keep pace, which can cause performance issues.

To stop flooding, you might change the device state to maintenance mode to allow the activity to complete without generating messages, and then return the device to an operational state when the activity is complete.

## Monitoring Disk Operations Throughput

Disk throughput statistics are a key indicator of system performance.

Refer to the **System Disk Throughput** dashlet to review read and write throughput peak and average statistics per second during the selected time period.



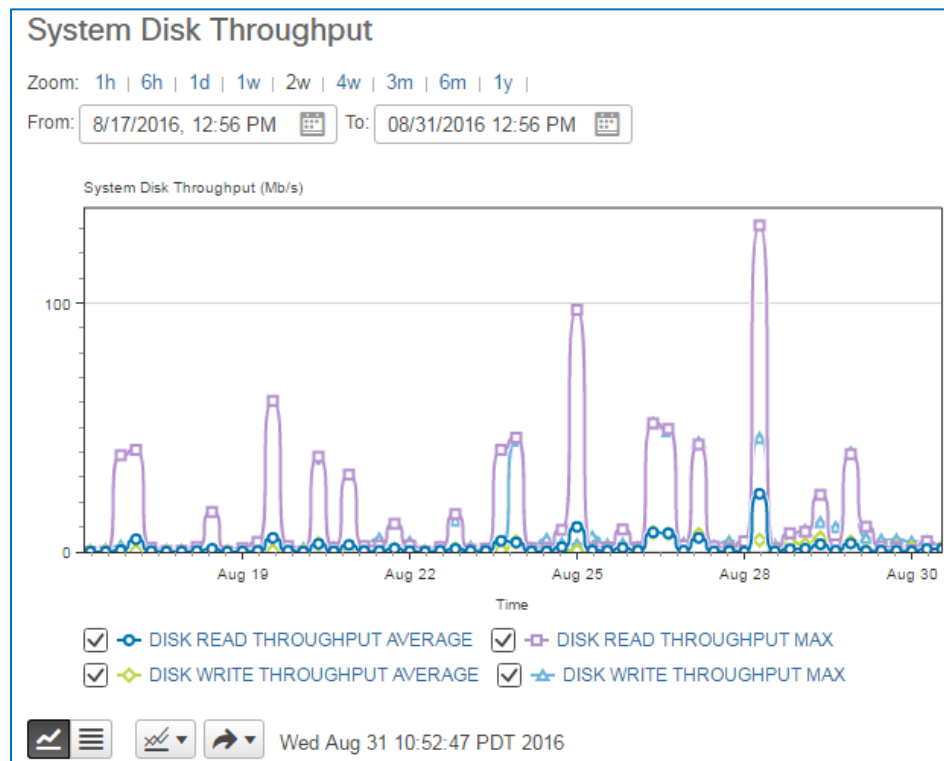
**Tip:** Keep in mind that write operations throughput is as critical as read operations throughput for evaluating overall throughput performance.

The dashlet reports read and write peak and average throughput statistics separately so that you can evaluate each operation type independently or in relationship or in relationship to each other.

Administrators define the threshold for throughput operations based on system installation and configuration.



**Note:** For more information on system sizing and installation requirements that affect disk operation thresholds, [refer to minimum server requirements in the Cisco Prime Infrastructure 3.1 Quick Start Guide](#).



### Continue monitoring or take action when:

- ❖ The chart indicates that read or write average throughput averages are running significantly below the system threshold.

Consistently running below the threshold indicates that expected levels of processing are not occurring, which can affect system performance.

In systems running in VM environments, ensure that the virtual machine is configured following Cisco recommended installation guidelines and throughput requirements, including configuration of the throughput requirements and configuration of the appropriate provisioning method.

- ❖ Conversely, if you notice slow system performance, you can refer to this dashlet to see if throughput is contributing to the problem.

## Administrative Dashlets

The **Admin** tab provides a series of subtabs with system information, events that are occurring on the system, and API health and service statistics.



**Note:** The dashlets available on the **Admin** tab are not available to add to the **Overview** or **Performance** tabs.

The **Health** tab reports system information, system alarms, and database usage.



**Important Note:** When you change the time frame, the reporting period applies to the **System Alarms** dashlet only. The time frame does not apply to any other dashlets on the tab.

Apply an appropriate time period to help ensure that the **System Alarms** dashlet displays all of the data that you need to see.

Administration / Dashboards / System Monitoring Dashboard

OverviewPerformanceAdmin+

HealthAPI HealthService DetailsReset Dashboard

Filters
Time Frame
Past 1 Hour
Go

System Information


Description	Value
Server name	
No. of jobs scheduled	159
No. of jobs running	4
No. of jobs completed	1870
No. of users logged in	8

Wednesday, August 31 2016 at 10:55 AM PDT

System Alarms

Event Type	Time Stamp	Severity
Appliance Power Supply Failure	August 31, 2016 10:52:27 AM PDT	
System monitor	August 31, 2016 10:48:56 AM PDT	
System monitor	August 31, 2016 10:36:38 AM PDT	

Wednesday, August 31 2016 at 10:55 AM PDT

DB usage distribution


Assurance\_Traffic Infrastructure Lifecycle\_Clients Assurance\_Baseline Lifecycle\_Statistics DB-Index

Wednesday, August 31 2016 at 10:55 AM PDT

## Reviewing System Information

System information provides a summary of current system activities.

Refer to the **System Information** dashlet, available on the **Health** tab, to see:

- ❖ The server name.
- ❖ The number of jobs scheduled, running, and completed.
- ❖ The number of users currently logged in to the system.

Description	Value
Server name	
No. of jobs scheduled	159
No. of jobs running	4
No. of jobs completed	1870
No. of users logged in	8

Wednesday, August 31 2016 at 10:55 AM PDT

Job activity can affect system performance. Keep in mind that jobs include:

- ❖ User-initiated jobs (user jobs).
- ❖ Automated system jobs (system jobs).
- ❖ Automated system jobs that poll for specific parameters (poller jobs).
- ❖ User-initiated and scheduled reports.

### Continue monitoring or take action when:

- ❖ The number of users who are logged in to the system is nearing the system session limit.  
The system restricts the number of active sessions. As the number of users nears the session limit, system performance can become slower.

## Monitoring System Alarms

Prime Infrastructure reports alarms that occurring on the server and their severity levels. This information helps you monitor the system for current or potential issues proactively, which can help you avoid system downtime.

Refer to the **System Alarms** dashlet, available on the **Health** tab, to see the alarms that the system is reporting and their severity levels.

Event Type	Time Stamp	Severity
System monitor	August 31, 2016 10:59:01 AM PDT	Warning
Appliance Power Supply Failure	August 31, 2016 10:57:32 AM PDT	Warning
System monitor	August 31, 2016 10:36:38 AM PDT	Warning

Wednesday, August 31 2016 at 11:00 AM PDT



**Important Note:** The dashlet presents only those events that have occurred during the time period that the **Time Frame** drop-down list indicates.

The time frame does not apply to any other dashlets on the **Admin | Health** tab.

Filters
Time Frame: Past 1 Hour
Go

System Information

Description	Value
Server name	pi1
No. of jobs scheduled	159
No. of jobs running	2
No. of jobs completed	1871
No. of users logged in	8

Wednesday, August 31 2016 at 11:00 AM PDT

System Alarms

Event Type	Time Stamp	Severity
System monitor	August 31, 2016 10:59:01 AM PDT	Warning
Appliance Power Supply Failure	August 31, 2016 10:57:32 AM PDT	Warning
System monitor	August 31, 2016 10:36:38 AM PDT	Warning

Wednesday, August 31 2016 at 11:00 AM PDT

When you review the event details, you will see all of the related events that have occurred regardless of the time period.

#### To review the alarm details:

- ❖ In the row of the event of interest, click the **System monitor** link. The system opens the **System Events** page and lists all of the related events that have occurred.

Administration / Dashboards / System Monitoring Dashboard / System Events					
System Events					
Seve...	Device	Description	Timestamp	Event Type	
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
▶ <input checked="" type="checkbox"/>	PI-ApicServerStatus(192.168...	ApicServer is Reachable. 192.168...	August 31, 2016 6:03:11 PM UTC	System monitor	
▶ <input checked="" type="checkbox"/>	ConfigArchive	Config Archive Success for the D...	August 31, 2016 6:01:36 PM UTC	System monitor	
▶ <input type="checkbox"/>	ConfigArchive	Config Archive Failed for the Devi...	August 31, 2016 5:59:01 PM UTC	System monitor	
▶ <input checked="" type="checkbox"/>	PI-ApicServerStatus(192.168...	ApicServer is Reachable. 192.168...	August 31, 2016 5:58:10 PM UTC	System monitor	

#### Continue monitoring or take action when:

- ❖ An alarms or series of alarms are reporting activities that can affect system performance.

## Reviewing Database Usage

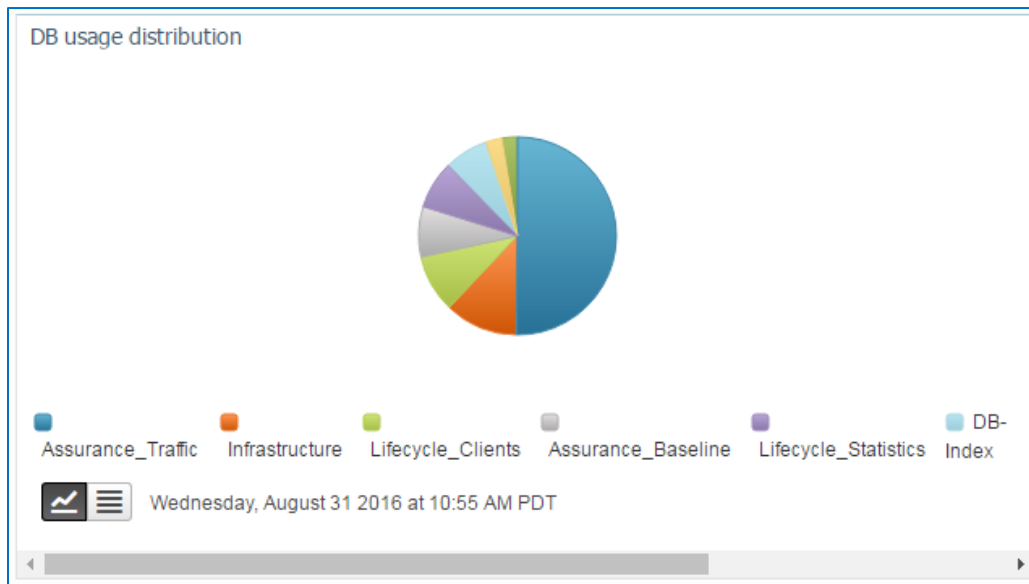
Reviewing database usage provides insight into how database content is distributed.

Refer to the **DB usage distribution** dashlet, available on the **Health** tab, to see a chart that illustrates the amount of the server database occupied by the network inventory and device performance data, and the server's own system data:



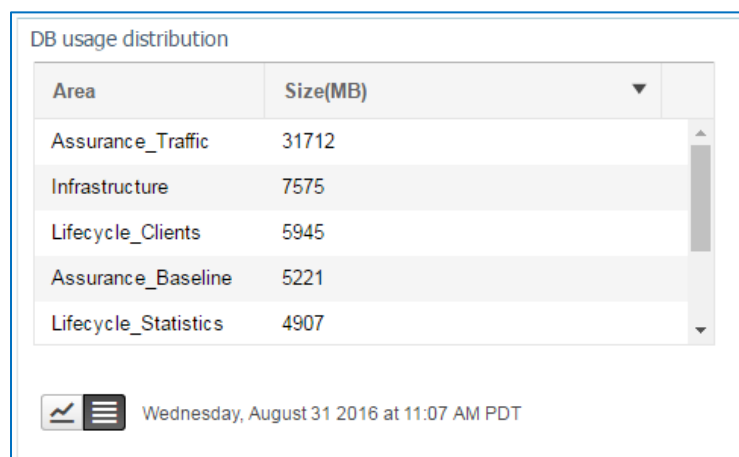
**Note:** The data categories that you see in the application might differ from those illustrated in the screenshot below.

Databases differ based on the types of licenses that the specific installation of Prime Infrastructure includes.



To see the space that the process is occupying in the database:

- ❖ Toggle to the table view.



The screenshot shows the 'DB usage distribution' dashlet in table view. The table has two columns: 'Area' and 'Size(MB)'. The data is as follows:

Area	Size(MB)
Assurance_Traffic	31712
Infrastructure	7575
Lifecycle_Clients	5945
Assurance_Baseline	5221
Lifecycle_Statistics	4907

At the bottom left of the dashlet are icons for a line chart and a table view. The timestamp at the bottom is 'Wednesday, August 31 2016 at 11:07 AM PDT'.

Continue monitoring or take action when:

- ❖ Areas of Prime Infrastructure functionality that occupy database space are growing significantly or are excessive based on what you expect to see.

If changes occur, you can refer to data and report retention periods to help determine whether you need to make adjustments to manage database size.

## Monitoring Summarized API Response Times

Monitoring API response times provides insight into the system's performance when handling API calls from northbound systems, or endpoints, including the application data that the APIs are requesting and the average, fastest (minimum), and slowest (maximum) times that the system takes to respond.

You also gain insight into the areas of Prime Infrastructure that APIs are accessing consistently and how well the system is responding to calls in each area.



**Tip:** When you need to submit an API-related support case, provide the API response time summary data that the system is reporting, which can help Cisco more quickly determine areas of the system that might need attention.

For more information on submitting actionable support cases, [refer to the FAQ](#).

Refer to the **API Response Time Summary** dashlet, available on the **API Health** tab, to see a list of the APIs that are sending data to northbound systems and their response time statistics.



**Tip:** Exceedingly long data retention time periods configured for APIs can affect system performance, particularly if you have a large number of APIs making calls to the system.

When you are evaluating system performance, you can review data retention periods to see if they might be contributing to the issue.

For more information, [refer to the FAQ](#).

Overview

Performance

Admin

+

Health

API Health

Service Details

API Response Time Summary

Service Name	Latest (ms)	Min (ms) ▲	Avg (ms)	Max (ms)
/api/v1/search/index	3	1	2407	15064
/api/v1/op/topology/device/filte...	3	1	3	15
/api/v1/op/topology/links/defau...	2	1	2	46
/api/v1/op/topology/links/filter/...	5	2	32	158
/api/v1/op/topology/groupHiera...	5	2	4	9
/api/v1/op/userDefinedTrapTra...	2	2	2	2
/api/v1/op/userDefinedTrapTra...	3	3	3	3
/api/v1/op/enablement/metrics...	6	3	7	73
/api/v1/data/QosDeviceProfile...	6	4	9	63

2016 August 31, 11:08:57 PDT

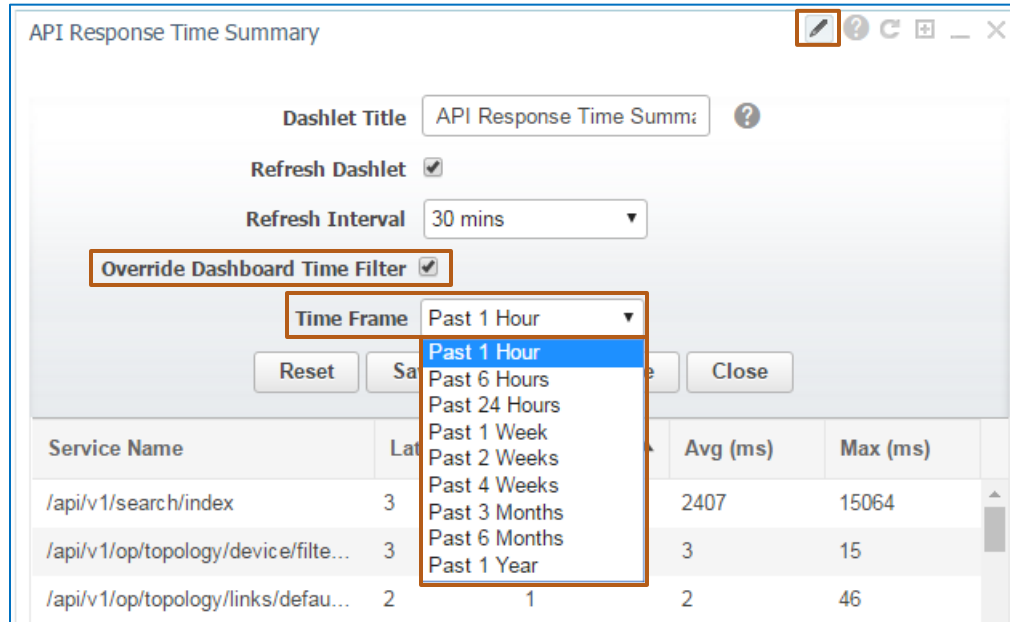


**Important Note:** By default, the dashlet reports statistics for the past hour. When monitoring the dashlet, ensure that the dashlet is reporting for data for the time period that is most relevant for you.

...continued below

### To change the data reporting time period:

- ❖ On the dashlet toolbar, click **Dashlet Options**, select the **Override Dashboard Time Filter** check box, and then, in the **Time Frame** drop-down list, select the reporting time period that you need.



API Response Time Summary

Dashlet Title: API Response Time Summ: ?

Refresh Dashlet: ☒

Refresh Interval: 30 mins

Override Dashboard Time Filter: ☒

Time Frame: Past 1 Hour

Reset Save Close

Service Name	Latency	Avg (ms)	Max (ms)
/api/v1/search/index	3	2407	15064
/api/v1/op/topology/device/filte...	3	3	15
/api/v1/op/topology/links/defau...	2	2	46

### Continue monitoring or take action when:

- ❖ You see a response time trend for a specific endpoint that you need to investigate.

### To evaluate performance statistics for calls from a specific endpoint:

- ❖ Refer to the [Service Details](#) tab on the [System Monitoring Dashboard](#) page, described below in the [Monitoring Individual API Behaviors](#) topic.

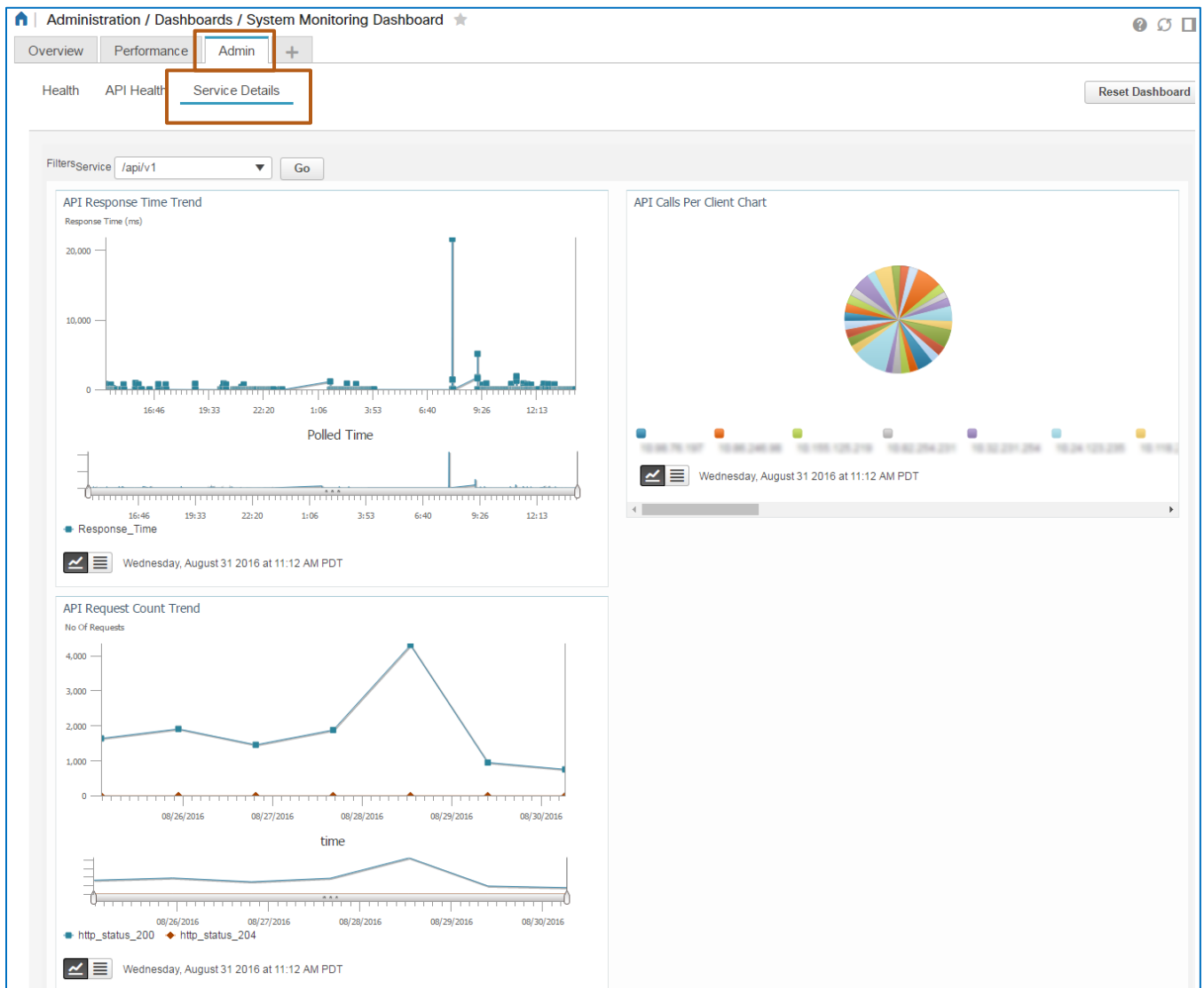


## Monitoring Individual API Behaviors

Evaluating API behavior can provide insight into the behaviors of northbound systems that are requesting data from various areas in the system.

Prime Infrastructure provides several dashlets for monitoring the behaviors of an individual API.

The API dashlets are available on the **Service Details** tab.



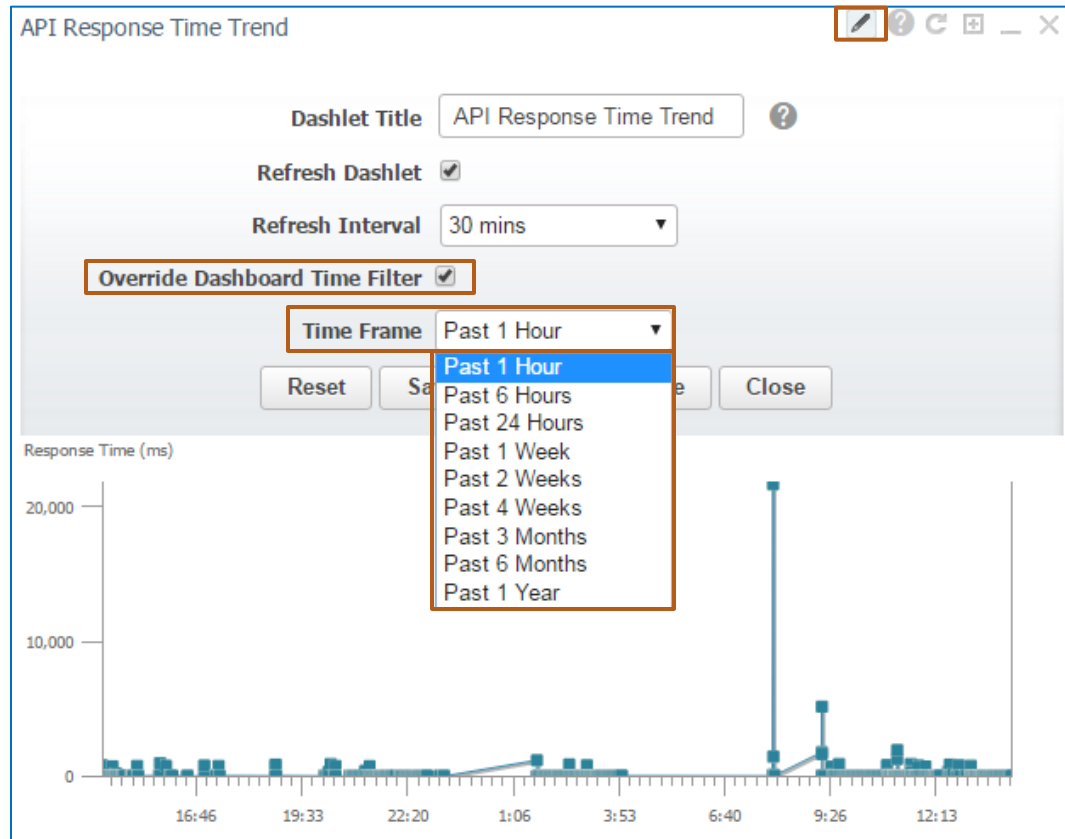
**Important Note:** By default, the **Service Details** dashlets report statistics for the past hour.

When monitoring the dashlet, ensure that the dashlet is reporting for data for the time period that is most relevant for you.

...continued below

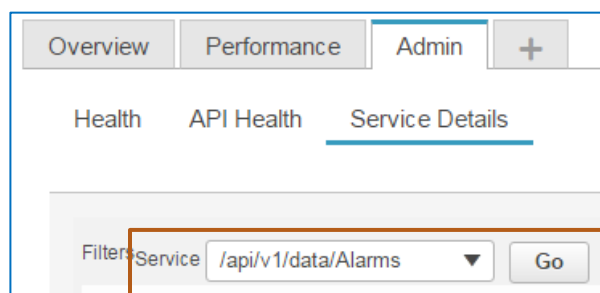
**To change the data reporting time period for a dashlet:**

- ❖ On the dashlet toolbar, click **Dashlet Options**, select the **Override Dashboard Time Filter** check box, and then, in the **Time Frame** drop-down list, select the reporting time period that you need.



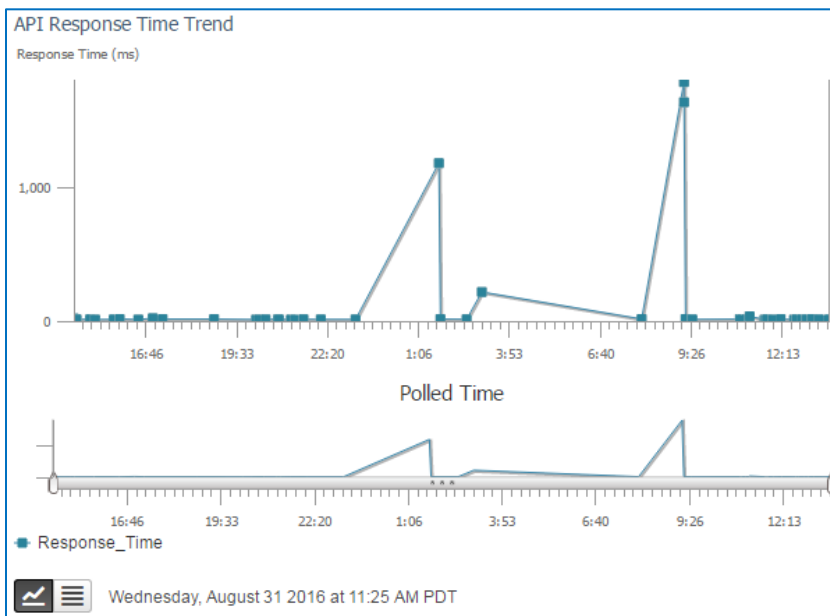
**To display the statistics for a specific API:**

- ❖ In the **Service** drop-down list, select the API service, and then click **Go**.



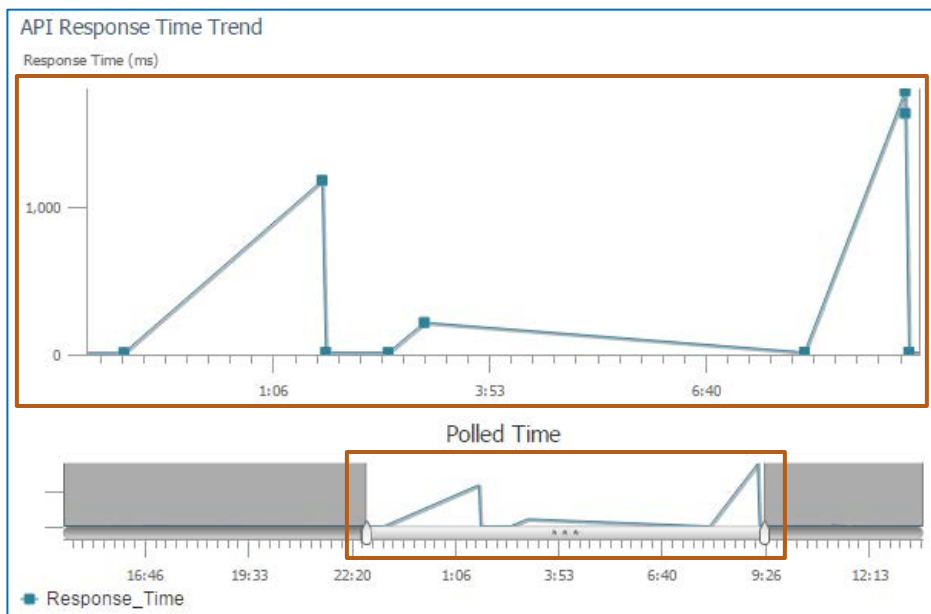
All of the dashlets that are active on the page update to display the statistics for the API that you selected.

Refer to the **API Response Time Trend** dashlet to see the time it takes the server to respond to the API's calls over time.



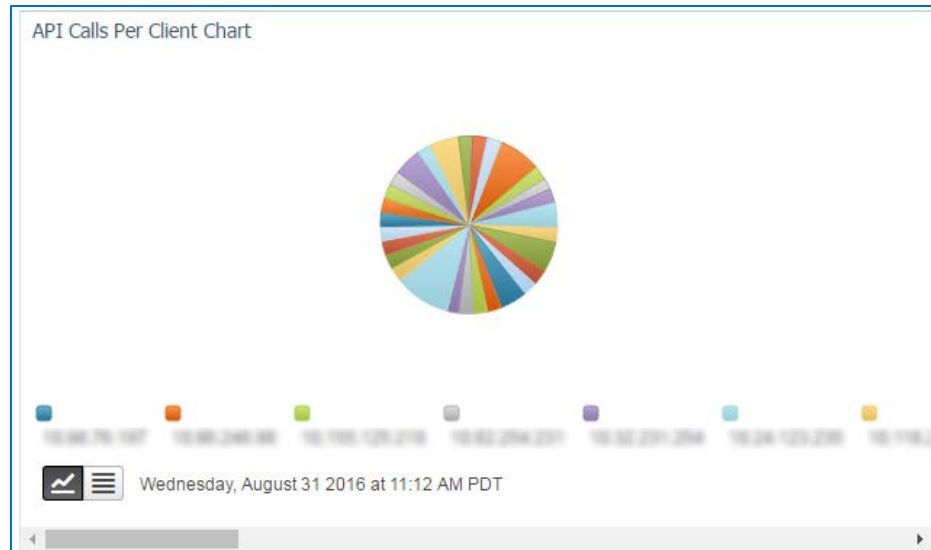
To evaluate a more specific group of data points in the chart:

- ❖ Zoom the timeline by using the slider.



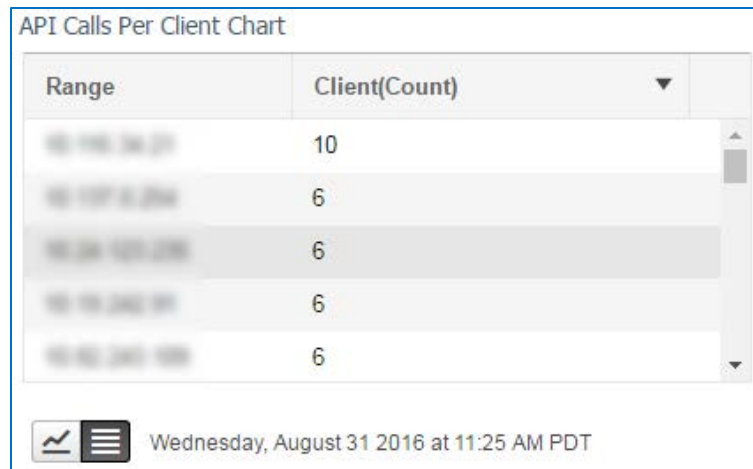
Refer to the **API Calls Per Client Chart** dashlet to see:

- ❖ The northbound system IP addresses that are calling the API.
- ❖ The proportion of calls each IP address is making in relationship to other IP addresses.



To see the number of API calls each client is making:

- ❖ Toggle to the table view.



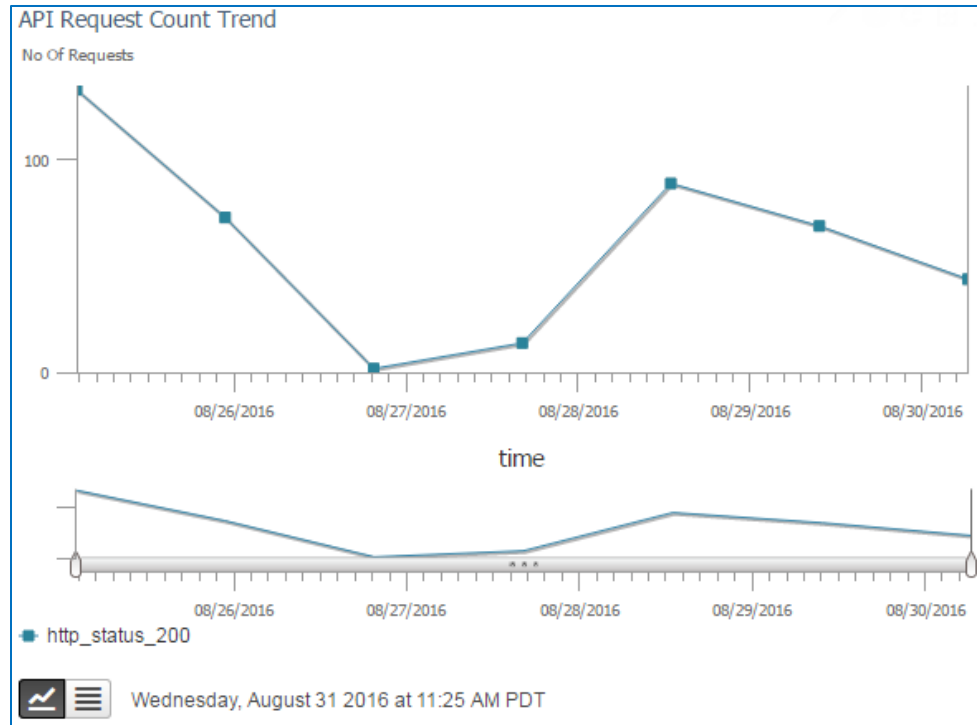
The figure shows the same "API Calls Per Client Chart" dashlet but in table view. The table has two columns: "Range" and "Client(Count)". The data is as follows:

Range	Client(Count)
10.100.100.101	10
10.100.100.102	6
10.100.100.103	6
10.100.100.104	6
10.100.100.105	6

At the bottom left, there is a toggle icon for a chart view. At the bottom right, the timestamp "Wednesday, August 31 2016 at 11:25 AM PDT" is displayed.

Refer to the **API Request Count Trend** dashlet to see:

- ❖ The number of successful responses (`https_status_200`) and the number of responses with errors (`http_status_500`) that Prime Infrastructure sent to the northbound system.



**Continue monitoring or take action when:**

- ❖ Calls from northbound system client IP addresses are occurring outside of their expected schedules or are experiencing delays.

Northbound system tend to initiate calls for data during regular job runs.

If you notice that requests from an API are occurring later than expected, or irregularly, you might investigate if there are problems occurring on the northbound system or with the data collection jobs that it is running.

- ❖ Repeated or ongoing calls for data are occurring.

If you see repeated calls to collect inventory data, for example, you might want to see why the northbound system is making repeated or ongoing calls for data about network devices.

This situation also can indicate that activities, such as maintenance activities, are occurring in Prime Infrastructure that are prompting the northbound calls.

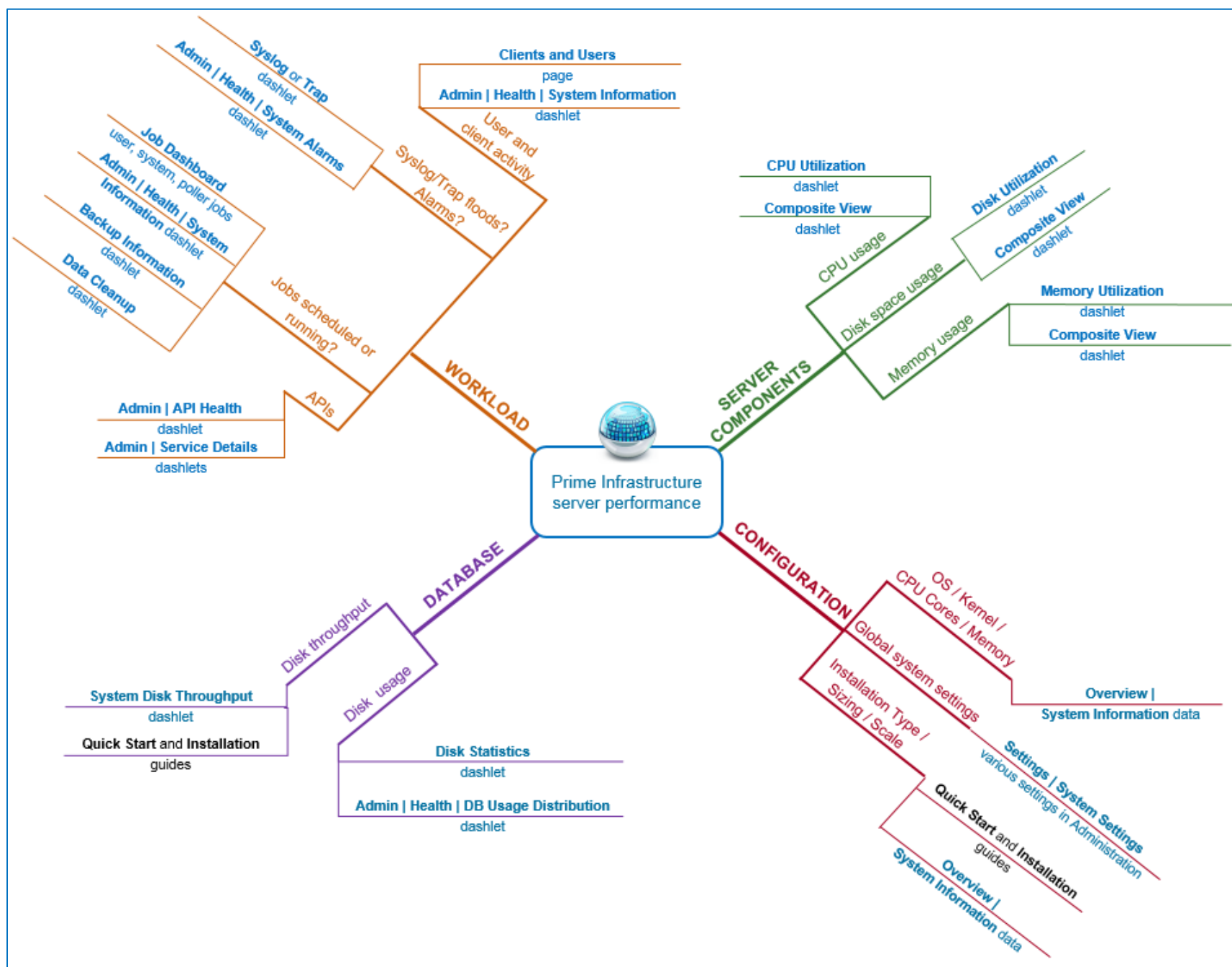
## Correlating Data Thought Map

The thought map illustrates factors that can affect server performance and how you can investigate a server performance issue more effectively by finding the data applicable to the factor that you investigate.

By correlating data that communicates various aspects of a performance factor, you can gain critical insight into a performance issue.



**Tip:** For optimal legibility, set the PDF zoom level to 100%.



# Video Demonstration

## *Watching the Demonstration*

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### To watch a demonstration:

- ❖ Click a link, which opens an MP4 file.

Based on your system and configuration, you might need to start the video manually.



**Notes:** Video download and streaming times can vary.  
Demonstrations do not include narration.

## Correlating System Performance Data

### Watch the Demonstration



After you have oriented yourself to the types of data available to you on the System Monitoring Dashboard, [watch the \*\*Correlating System Performance Data\*\* video](#) for considerations that you can make when monitoring the system or evaluating potential issues.

Approximate runtime: **5:00**

# Frequently Asked Questions

## Monitoring the System

[Is there enough computing power in the hardware to run the application optimally?](#)

[What are the key data that I should monitor regularly?](#)

[How do time frame settings affect the data I am seeing in a dashlet?](#)

## Evaluating Issues

[How can data retention periods affect system performance?](#)

[What information is helpful to evaluate when assessing slow system performance?](#)

## Reporting Issues or Feedback

[How do I report system issues to Cisco that I need help to resolve?](#)

[How do I submit feedback on using system monitoring features?](#)

[Are there automated features that support the reporting of product feedback?](#)

[When submitting a support case, what information should I include to make the case most actionable?](#)

## Have Another Question?

For more information, [visit the Cisco Web site to review or download technical documentation.](#)



### Is there enough computing power in the hardware to run the application optimally?

Verifying that the system installation follows Cisco sizing guidelines is key consideration to ensure that the system has enough computing power.



**Note:** To review Cisco guidelines for the size and scale of each type of Prime Infrastructure installation, [refer to the Cisco Prime Infrastructure 3.1 Quick Start Guide](#).

#### **In virtual machine (VM) installations, key factors for best performance include:**

- ❖ On installation, the correct amount of disk space for the installation type must be allocated.
- ❖ The disk must be provisioned in the **Thick Provision Lazy Zeroed** format.



**Important Note:** If thin provisioning is applied during installation, when the virtual machine determines there is not enough free disk space for processes to run, the system will fail.

#### **To correct a provisioning problem in a VM environment:**

- ❖ You can apply the **Thick Provision Lazy Zeroed** formatting and restart Prime Infrastructure.
- ❖ The VM host machine must be compatible with the Prime Infrastructure software version.
- ❖ The CPU and memory allocations are tuned to the requirements of the virtual machine.



**Important Note:** Monitoring CPU and memory usage is critical to maintaining optimal system performance. On installation, administrators can allocate disk space size below the maximum supported size for the installation type.

When you see performance decreasing and have room to allocate disk space, you can extend the CPU or memory allocations, as needed.

#### **In physical appliance installations, key factors for best performance include:**

- ❖ If the installation is running on a general appliance, Cisco recommends that you upgrade to a Gen 2 appliance for better performance.
- ❖ If you have not upgraded Prime Infrastructure from version 2.x, Cisco recommends that you upgrade to 3.1 or more recent version to help ensure optimal performance.

[Return to questions](#)

### What are the key data that I should monitor regularly?

The following table lists factors that you should proactively monitor to help reduce or avoid slow system performance.

Common Monitoring Factors	Where To Go
How are backup jobs running? ♦ Slow or failing?	<a href="#">Backup Information dashlet</a> <a href="#">Disk Utilization dashlet</a>
How are data cleanup jobs running? ♦ Slow or failing?	<a href="#">Data Cleanup dashlet</a> <a href="#">Disk Utilization dashlet</a>
How many users are logged on to the system? ♦ Near capacity?	<a href="#">System Information dashlet</a> on <b>Admin   Health</b> tab
Which APIs have called the system in the last 24 hours? What is the system's response to API calls? ♦ Application or system latency? ♦ Other business or network operations affected?	<a href="#">API Summary dashlet</a> <a href="#">Service Details dashlet</a> for individual API analysis
Are any jobs are running excessively? ♦ Partially or completely failing?	<b>Job Dashboard</b> page <a href="#">Disk Utilization dashlet</a>
How are CPU and memory usage trending? ♦ Nearing or exceeding thresholds?	<a href="#">Memory Utilization dashlet</a> <a href="#">CPU Utilization dashlet</a> <a href="#">Composite view dashlet</a>
Are database searches performing as expected? ♦ Database indexing okay?	<a href="#">Disk Utilization dashlet</a> <a href="#">Disk Statistics dashlet</a>
Are data retention periods too long? Log collection excessive?	<a href="#">Disk Utilization dashlet</a> <a href="#">Disk Statistics dashlet</a>
Is the system reporting alarms? ♦ Are alarm thresholds being exceeded? ♦ Are backup or power supply failures occurring? ▪ What type? ▪ How severe? ▪ How often?	<a href="#">System Alarms dashlet</a> <a href="#">Memory Utilization dashlet</a> <a href="#">CPU Utilization dashlet</a> <a href="#">Disk Utilization dashlet</a>

[Return to questions](#)

### How do time frame settings affect the data I am seeing in a dashlet?

The **Overview** and **Performance** tabs provide a **Time Frame** drop-down list that defines the time period for which all of the dashlets on the page display data.

The **Admin | Health** tab provides a **Time Frame** drop-down list that applies to the **System Events** dashlet only.

For the dashlet data that you are reviewing, ensure that you have the appropriate time period applied.

#### To change the applied time period:

- ❖ On the applicable tab, in the **Time Frame** drop-down list, select the time period, and then click **Apply** or **Go**.

Filters
Time Frame
Past 2 Week
Apply

astructure
Application Search
DOMAIN

Administration / Dashboards / System Monitoring Dashboard

Overview
Performance
Admin

Health
API Health
Service Details
Reset Dashboard

Filters
Time Frame
Past 1 Hour
Go

System Information

Description	Value
Server name	srjaret-116-241
No. of jobs scheduled	77
No. of jobs running	0
No. of jobs completed	82
No. of users logged in	1

System Alarms

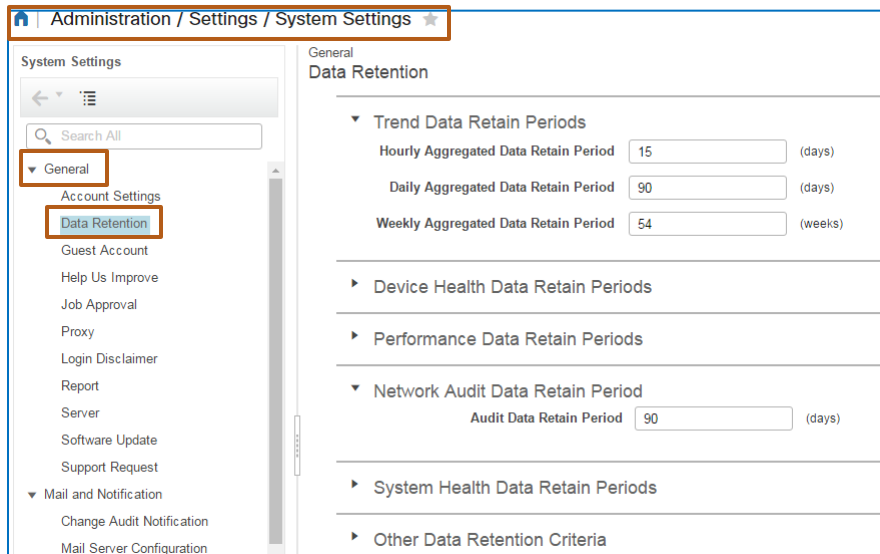
Event Type	Time Stamp	Severity
Memory Utilization Threshold Violated	July 8, 2016 7:51:14 AM PDT	

[Return to questions](#)

## How can data retention periods affect system performance?

The number of records that the system must retain and the length of time that it must retain them directly affect system performance. Accumulating unnecessary numbers of records for extensive time periods can particularly affect disk usage and memory.

Administrators can configure data retention periods following compliance and business requirements in Administration in the data retention system settings.

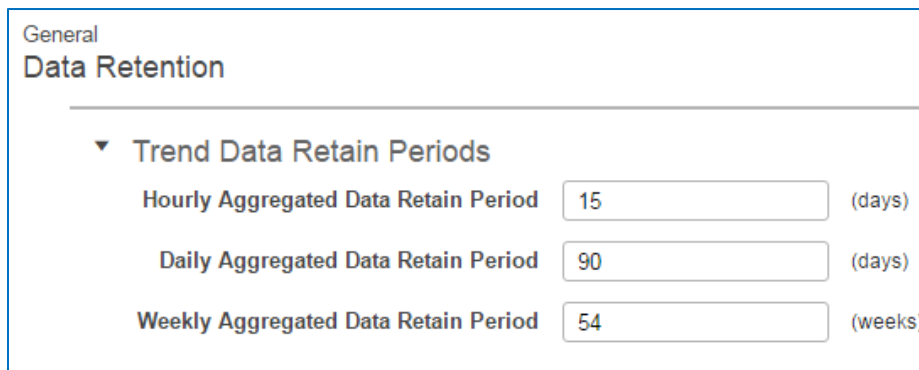


On initial installation, administrators often configure these settings for longer periods until expected trends are established for the enterprise. At that point, administrators can consider reducing data retention periods for better system performance.



**Important Note:** When using Prime Infrastructure as a headless server, which generally means significant numbers of API calls, accurately configuring data retention periods to meet needs without excessive data retention is key to better server performance.

Administrators can configure data retention time periods at a data type level, such as trend, device health, or system health data...



...or at a table level by record age, attribute, and the maximum number of record to retain.

▼ Other Data Retention Criteria

▶ Optical Devices

▼ Admin

Total 6

Show

Quick Filter

▼

	Table Name	Age(In hours)	Age Attribute	Max Records
1	APIHEALTHRECORD	168	requestReceivedTime	50,000
2	AUDITTRAIL	744	auditTime	NA
3	LOBBYAMBAUDITTRAIL	2160	eventTime	NA
4	APCRASHDETAILS	2160	lastUpdatedTime	10000
5	RADIOCOREDUMPDETAILS	2160	lastUpdatedTime	10000

Evaluate data retention periods when you are working to determine system performance issues.

[Return to questions](#)

### What information is helpful to evaluate when assessing slow system performance?

Information that can be helpful for you to evaluate when you are assessing slow system performance includes:

- ❖ Active system alarms
- ❖ API and northbound system activities
- ❖ Backup job activity
- ❖ Client activity
- ❖ CPU and memory utilization
- ❖ Data cleanup activity
- ❖ Disk space usage
- ❖ Disk throughput
- ❖ System settings, such as data retention and archiving settings
- ❖ System installation and scale
- ❖ Trap reporting
- ❖ User activity



**Tips:** Memory usage does not necessarily provide an effective indicator of system performance. The Oracle database consumes space dynamically, as needed, based on varying system demands.

#### Active System Alarms

Refer to the [System Alarms dashlet](#) to evaluate the type or frequency of alarms that the system is reporting on itself. Reviewing alarms can help indicate where in the system you might find additional information to indicate the root cause of slow performance.

#### API and Northbound System Activities

Refer to the [API Health summary](#) and [individual API Service Details](#) dashlets to evaluate the type, frequency at which, and number of, clients are making calls by using various APIs. Excessive API activity can provide insight into whether northbound systems or Prime Infrastructure are behaving as expected.

#### Backup Job Activity

Refer to the [Backup Information dashlet](#) to determine whether a job is running. Backup jobs can consume significant amounts of disk space while they are running, which affect available disk space, and consequently, system performance.



**Important Note:** As part of the backup process, the system purges archive logs automatically as part of a cleanup task. While you cannot proactively monitor whether archive logs are accumulating, they can contribute to slow system performance.

If you are having trouble resolving a system performance issue, you can submit a support case and request that Cisco evaluate whether archive logs are accumulating, which can indicate that there is a problem with the system, such as a failure in the data cleanup process related to backup jobs.

### Client Activity

Refer to the [System Information dashlet](#) and the **Client and Users** page in Prime Infrastructure to evaluate the amount of client activity for which the system is tracking and exchanging information.

Extensive client activity directly affects system performance.

### CPU and Memory Utilization

Refer to the [CPU Utilization](#) and [Memory Utilization](#) dashlets to determine if there are ongoing peaks near or above alarm thresholds.

To evaluate background processes that are running, you can navigate to the **Job Dashboard** page.

In environments in which Prime Infrastructure is running on a VM host, you can evaluate whether enough computing power (CPU) and enough memory space are allocated to support running the system.

### Data Cleanup Activity

Refer to the [Data Cleanup dashlet](#) to determine whether database compacting jobs are occurring as expected. Reclaiming disk space is key to sustaining optimal system performance.



**Important Note:** As part of the backup process, the system purges archive logs automatically as part of a data cleanup task. If this process fails, archive logs will accumulate beyond expected sizes, which can cause slow system response and data cleanup job failures.

In high availability environments, archive log size can affect whether the primary and secondary servers can synchronize. If they fail to synchronize, then the primary server is not able to remove the archive logs, increasing disk space usage and system performance.

While you cannot proactively monitor the accumulation of archive logs, they can contribute to slow system performance.

If you think archive log accumulation might be an issue, you can submit a support case and request that Cisco evaluate whether archive logs are accumulating and contributing to performance issues.

### Disk Space Usage

Refer to the [Disk Statistics dashlet](#) to see how current capacity looks.

If disk space is low or trending to less and less space, then refer to the [Data Cleanup dashlet](#) to determine whether data cleanup jobs are occurring too quickly or failing. This indicator can help you determine whether there is a disk space management problem, which can cause poor system performance.



**Important Note:** The accumulation of archive logs also can contribute to increasing disk space usage.

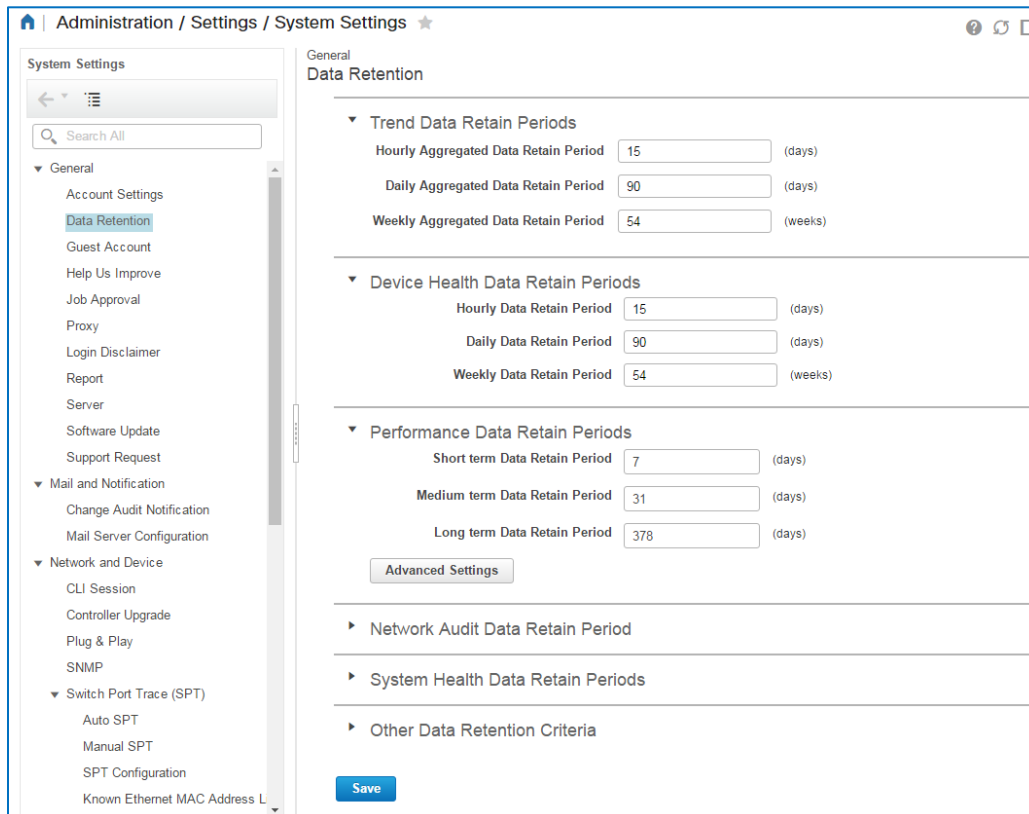
For more information, refer to the **Backup Job Activity** and **Data Cleanup Activity** important notes in this FAQ.

## Disk Throughput

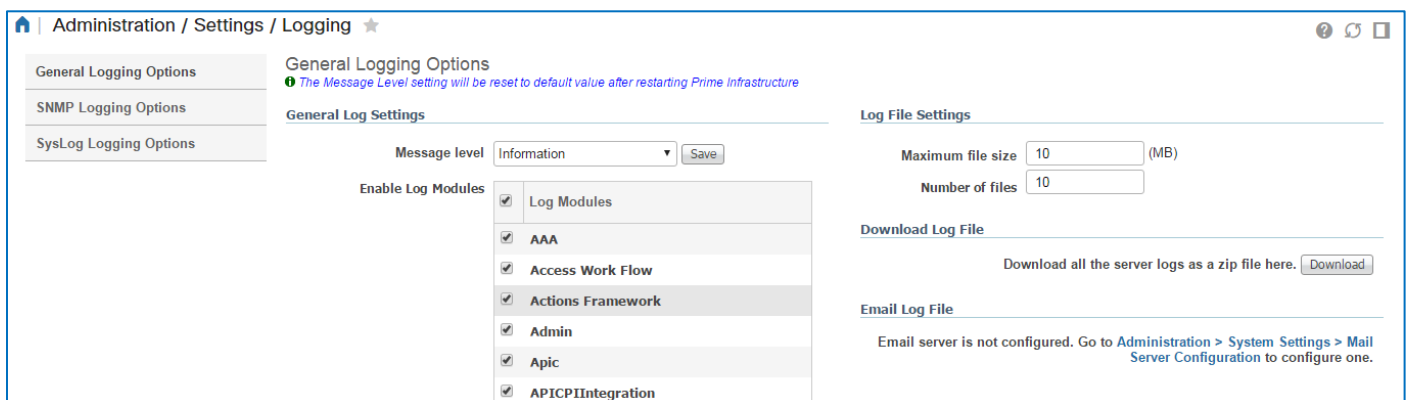
Refer to the [System Disk Throughput dashlet](#) to determine if there is a reduction in read write throughput over time, which also can indicate a disk space management problem and resulting poor system performance.

## System Settings

When configuring system settings, administrators can set data retention periods and log retention maximums on various types of information. Protracted retention periods can cause high consumption of disk storage space, affecting system performance.



The screenshot shows the 'Administration / Settings / System Settings' page. The left sidebar lists various settings categories, with 'Data Retention' selected under the 'General' section. The main content area is titled 'General Data Retention' and contains three expandable sections: 'Trend Data Retain Periods', 'Device Health Data Retain Periods', and 'Performance Data Retain Periods'. Each section has input fields for 'Hourly', 'Daily', and 'Weekly' aggregated data retain periods. The 'Performance Data Retain Periods' section also includes 'Short term', 'Medium term', and 'Long term' data retain periods. A 'Save' button is located at the bottom right of the main content area.



The screenshot shows the 'Administration / Settings / Logging' page. The left sidebar lists logging options: 'General Logging Options', 'SNMP Logging Options', and 'SysLog Logging Options'. The main content area is titled 'General Logging Options' and contains a 'General Log Settings' section. This section includes a 'Message level' dropdown menu set to 'Information' and a 'Save' button. Below this is a table of 'Enable Log Modules' with checkboxes for 'Log Modules', 'AAA', 'Access Work Flow', 'Actions Framework', 'Admin', 'Apic', and 'APICPIIntegration'. To the right of the table is a 'Log File Settings' section with input fields for 'Maximum file size' (10 MB) and 'Number of files' (10). Below this is a 'Download Log File' section with a 'Download' button. At the bottom is an 'Email Log File' section with a message indicating that the email server is not configured and providing a link to 'Administration > System Settings > Mail Server Configuration' to configure it.



## System Installation and Scale

If after reviewing various system information, you cannot identify the root cause of slow system response, evaluating the system installation and correlating that information to the data you are seeing might provide insight into the issue. For example, system sizing or minimum requirements can change due to network growth or increasing network demands.

Factors that can affect system performance include:

- ❖ System Installation.

Prime Infrastructure is available pre-installed on a physical appliance or in an OVA file that is installed on a virtual machine running on customer-supplied hardware.

- ◆ Customer-Supplied Hardware

Because virtual machines are installed on customer-supplied hardware, determine whether the installation meets all minimum system requirements, for example, the correct VMware version, number of CPUs, or memory size.

All virtual machine installations must be provisioned by using the **Thick Provision Lazy Zeroed** format.

In installations that are running the ESXi hypervisor, determine whether the RAID controller settings are configured following Cisco recommendations.

- ◆ Physical Appliance

Determine whether the appliance was optimized during installation by configuring the virtual drive write policy.

- ❖ System scale.

Maximum management capacities vary based on the type of server installation that you have, such as the number of devices, access points, or wired or wireless clients that it can support.

Evaluate that the system is scaled appropriately for current size and demands.



**Note:** For more information on installation requirements, [refer to the Cisco Prime Infrastructure 3.1 Quick Start Guide](#).

## Trap Reporting

[Refer to the Traps dashlet](#) to review the number of traps coming into the system. Trap reporting causes data collection and polling processes so that the system can evaluate device and network states related to the trap.

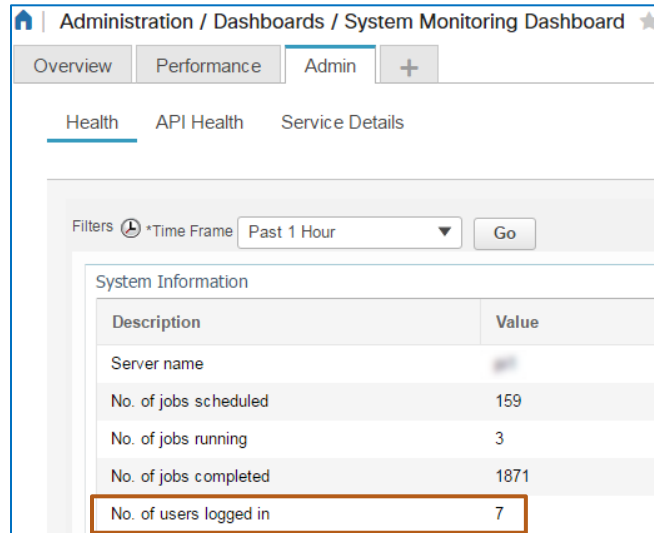
Excessive trap reporting, or flooding, causes ongoing data collection processes, which can affect system performance.

## User Activity

The number of active system users can affect system performance.

To evaluate user activity, you can:

- ❖ Open the **System Health Monitoring Dashboard | Admin** page, **Health** tab, and, in the **System Information** dashlet, see the number of users currently logged in to the system.



System Information	
Description	Value
Server name	
No. of jobs scheduled	159
No. of jobs running	3
No. of jobs completed	1871
No. of users logged in	7

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## How do I report system issues to Cisco that I need help to resolve?

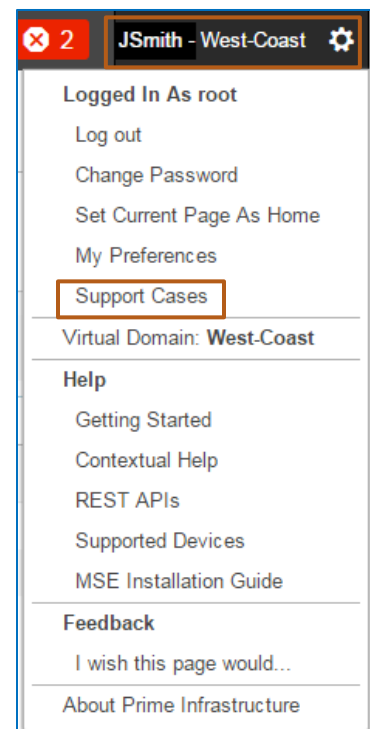
Prime Infrastructure provides access to submitting or escalating support cases, which are managed by the Cisco Technical Assistance Center (TAC).

To open a case or review ongoing cases:

- ❖ On the application toolbar, on the settings menu, click **Support Cases**.

Then, you can log in to Cisco.com and manage your support cases.

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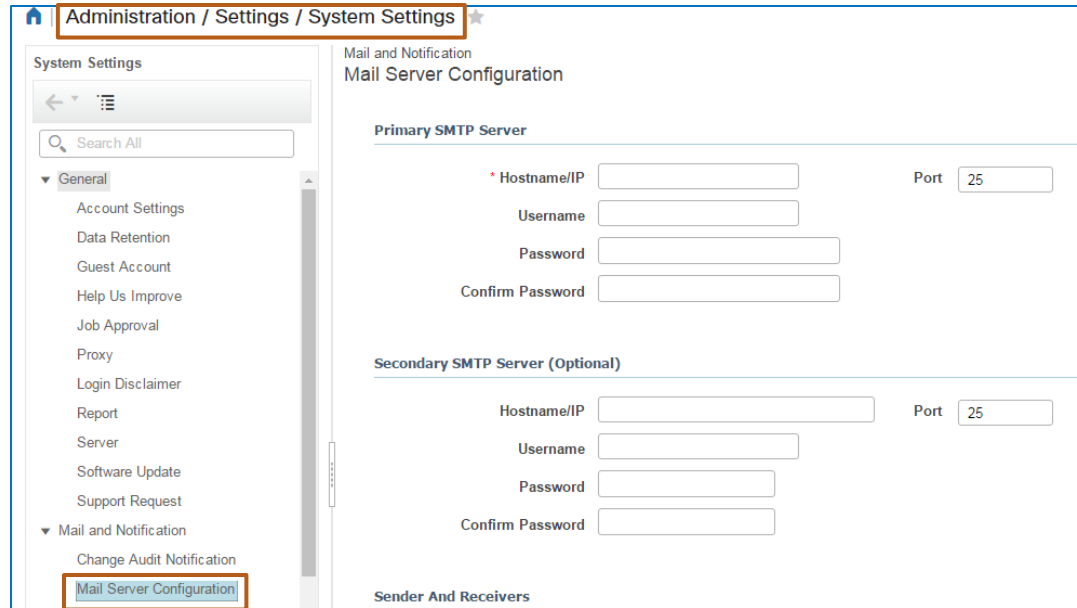


### How do I submit feedback on using system monitoring features?

Prime Infrastructure provides access for you to send an e-mail message to Cisco with feedback about the specific application page that have open.



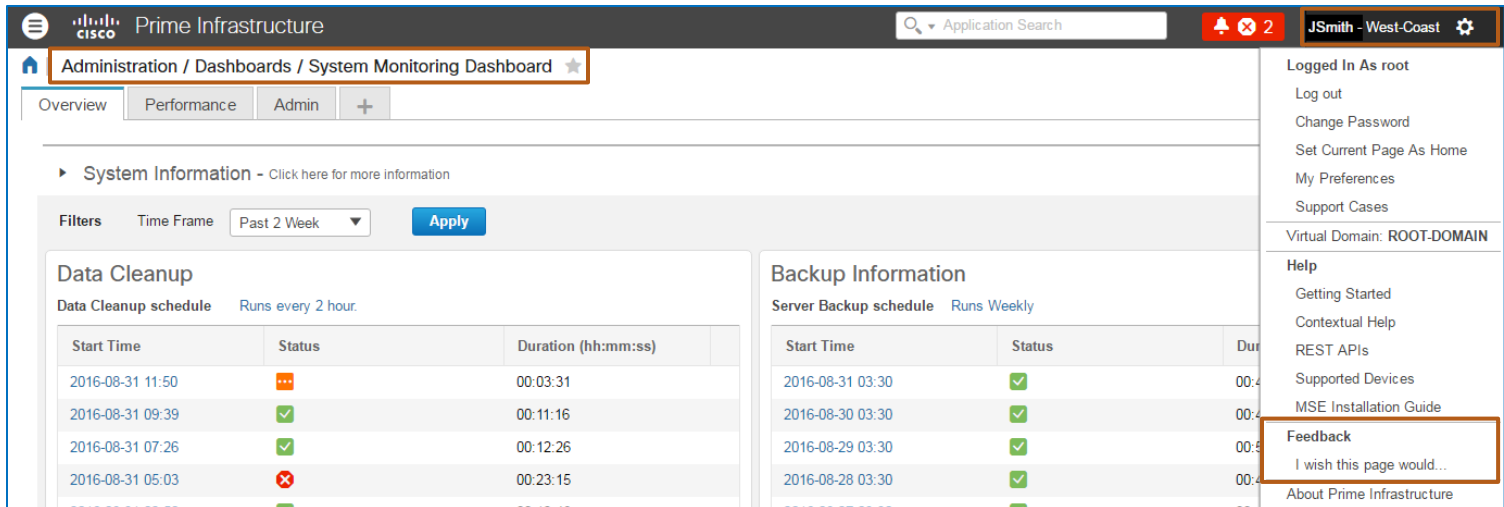
**Note:** To support this feature, an administrator needs to configure a mail server in **Administration | System Settings**.



The screenshot shows the 'Administration / Settings / System Settings' page. The left sidebar contains a 'System Settings' menu with a search bar and a list of categories: General, Mail and Notification, and others. Under 'Mail and Notification', 'Mail Server Configuration' is highlighted. The main content area is titled 'Mail and Notification' and 'Mail Server Configuration'. It contains two sections: 'Primary SMTP Server' and 'Secondary SMTP Server (Optional)'. Each section has fields for 'Hostname/IP', 'Port' (set to 25), 'Username', 'Password', and 'Confirm Password'. The 'Sender And Receivers' section is partially visible at the bottom.

**To submit contextual feedback about Prime Infrastructure:**

- ❖ With the **System Monitoring Dashboard** open, on the application toolbar, on the settings menu, under **Feedback**, click **I wish this page would....**



The system opens an e-mail message in which you can type a free-form message about changes that you would like to see on a specific application page. The message includes the path to the page on which you opened the message, but does not include details about the page.



**Important Note:** Cisco recommends that you do not include screen captures (images) or any information that could expose proprietary data related to your enterprise or Cisco, or your use of Prime Infrastructure.

For example, you do not want to include IP addresses in your correspondence.

When Cisco needs additional information to clarify your request, we will contact you separately.

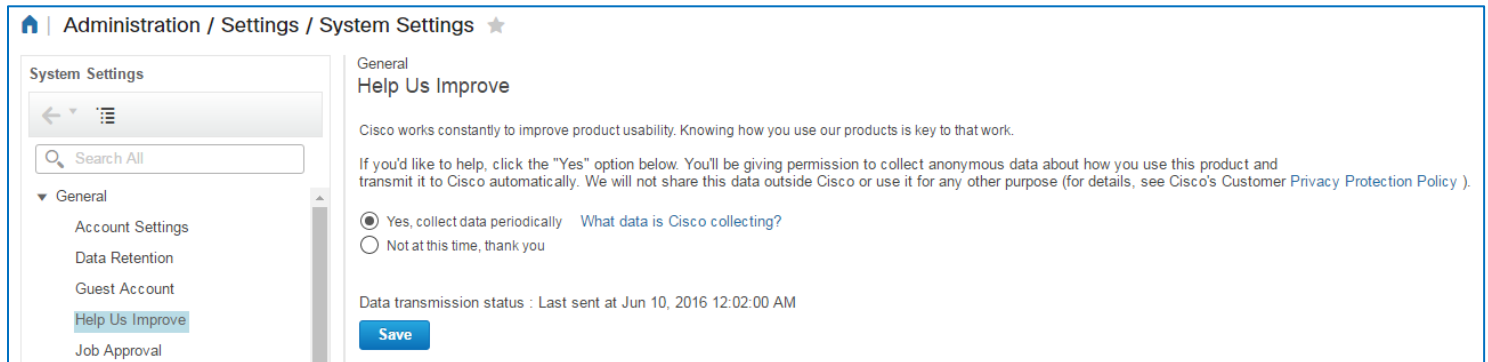
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### Are there automated features that support the reporting of product feedback?

Yes! During initial installation, an administrator can configure the system so that Cisco can collect data on how your organization uses Prime Infrastructure. Cisco reviews this anonymously collected data to improve usability and evaluate features.

#### To configure system usage reporting:

- ❖ In **Administration | System Settings**, under **General**, on the **Help Us Improve** page, click the **Yes** option button.



Administration / Settings / System Settings ★

System Settings

General

Help Us Improve

Cisco works constantly to improve product usability. Knowing how you use our products is key to that work.

If you'd like to help, click the "Yes" option below. You'll be giving permission to collect anonymous data about how you use this product and transmit it to Cisco automatically. We will not share this data outside Cisco or use it for any other purpose (for details, see Cisco's Customer [Privacy Protection Policy](#) ).

☒ Yes, collect data periodically [What data is Cisco collecting?](#)

☐ Not at this time, thank you

Data transmission status : Last sent at Jun 10, 2016 12:02:00 AM

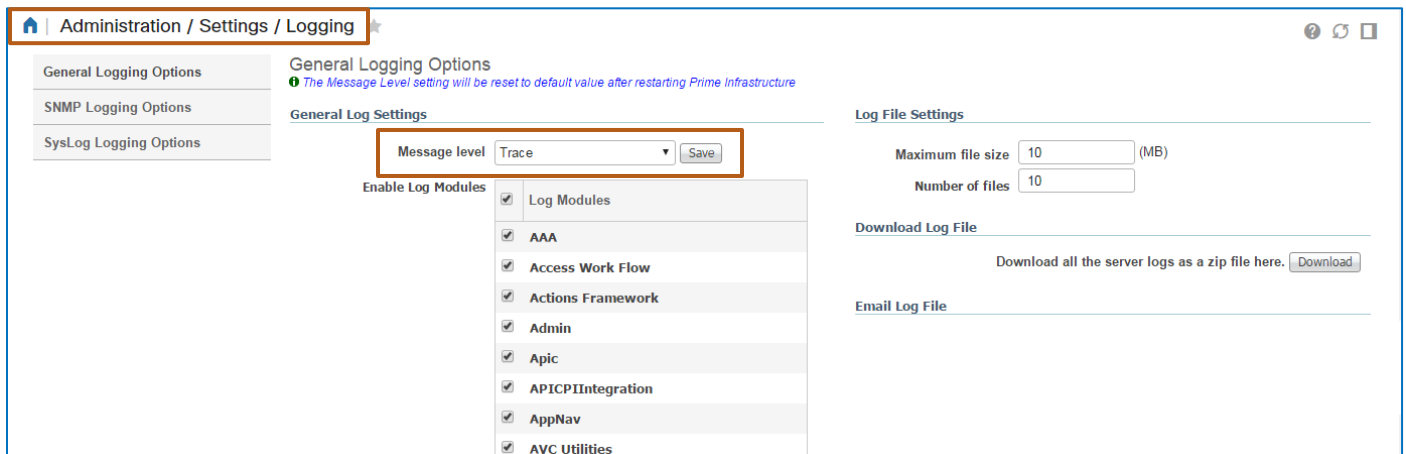
[Save](#)

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## When submitting a support case, what information should I include to make the case most actionable?

To submit and escalate actionable and effective support cases to the Cisco Technical Assistance Center (TAC), you need to:

- ❖ Identify the dashboards that report data associated with the issue or behavior that you are seeing, and export relevant data to files.
- ❖ When applicable, capture the issue by:
  1. In Administration, open the **Logging** page.



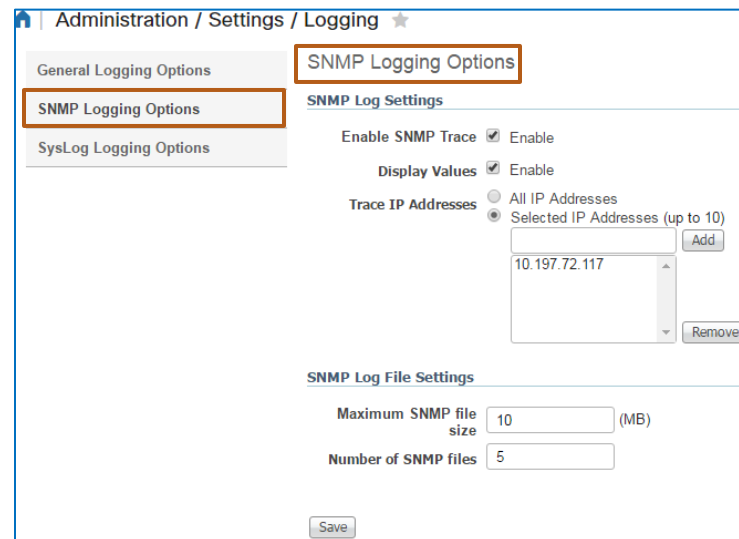
2. In the **Message level** drop-down list, select **Trace**, and then click **Save**. The action enables the system to begin capturing log files for those modules that might be contributing to the issue.



**Tip:** When submitting a support case, you can work with TAC when you need help determining the modules on which to run traces.



**Note:** For device-related issues, enable SNMP logging and identify the device.



3. Execute the action that prompted the issue or caused the behavior.

4. After capturing the action, open the **Logging** page.
5. In the **Message level** drop-down list, select **Information**, and then click **Save**.
6. In the **Download Log File** section, click **Download**, and then browse to and download the log files that you captured.



**Tip:** When submitting a support case, you can work with TAC when you need help determining the log files that you need to download.

In the support case:

- ❖ Include the Prime Infrastructure version that you are running by capturing two screenshots of the **Administration | Licenses and Software Updates | Software Update** page, one with the **Updates** tab active, and one with the **Files** tab active.

[Home](#) / [Administration](#) / [Licenses and Software Updates](#) / [Software Update](#)

Use this page to install the latest published updates. You can [download](#) the latest updates from cisco.com or [upload](#) an update file to your server.

▼ Status of Updates
 

Updates
 Files

Name	Type	Version	Status	Date
Prime Infrastructure 3.1 Device Pack 1	Device Support	1.0	Installed	2016-07-25 18:31 PDT
Prime Infrastructure 3.1 Device Pack 2	Device Support	2.0	Installed	2016-08-04 19:22 PDT
PI 3.1.2 Maintenance Release	Critical Fixes	2.0.0	Installed	2016-08-04 20:56 PDT

- ❖ Describe the issue or behavior that you were investigating or the action that you were taking when you observed the issue.
- ❖ Attach all of the applicable dashboard data and log files that you captured to the support case.

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# Links

## To Product Information

[Visit the Cisco Web site to learn more about Cisco® Prime Infrastructure.](#)

[Visit the Cisco Web site to review or download technical documentation.](#)

[Visit the Cisco Web site to review Prime Infrastructure white papers](#), which address best practices, and network management trends and concepts.

## To Training

[Visit the Cisco Web site to access other Cisco® Prime Infrastructure learning opportunities.](#)

[Visit the Cisco Web site to access learning opportunities for other Cisco products.](#)

## To Contact Us

[Send us a message with questions or comments about this job aid.](#)



**Note:** Please send messages that address the content of this job aid or other training questions only.

Please follow your regular business process to request technical support or address technical or application-related questions.