

Foglight™ for Capacity Management 5.6.15.4
User Guide



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Legend

- **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

- ! **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

- i **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

Foglight for Capacity Management User Guide
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Cartridge Version - 5.6.15.4

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Using Foglight for Capacity Management

Virtual machines (VMs) are quickly becoming the industry norm in IT infrastructures. IT managers find themselves with hundreds, if not thousands of VMs or physical machine hosts in their infrastructures. VMs can be added quickly, making it necessary to plan for the addition of virtual machines to the physical machines that host them. This can be a challenge for administrators. IT managers lack the required tools to accurately forecast projected CPU, memory, and network consumption, or project storage requirements. Monitoring virtual machine environments with Foglight™ for Capacity Management simplifies the planning process and allows administrators to obtain projected, accurate metrics for virtual or physical machine capacity management.

- [Getting Started](#)
- [Using Foglight for Capacity Management in a Hyper-V Environment](#)
- [Using Capacity Management Charts](#)

Getting Started

The sections following provides details on:

- [Installation Requirements](#) on page 5
- [Capacity Management Data Collection](#) on page 5
- [Locating the Capacity Management Dashboard](#) on page 6

Installation Requirements

Foglight™ for Capacity Management utilizes data collected by Foglight for Hyper-V. While Foglight for Virtualization, Enterprise Edition comes with Foglight for Capacity Management and Foglight for Hyper-V pre-installed and enabled, a stand-alone Foglight release requires that these components be installed on the Foglight Management Server.

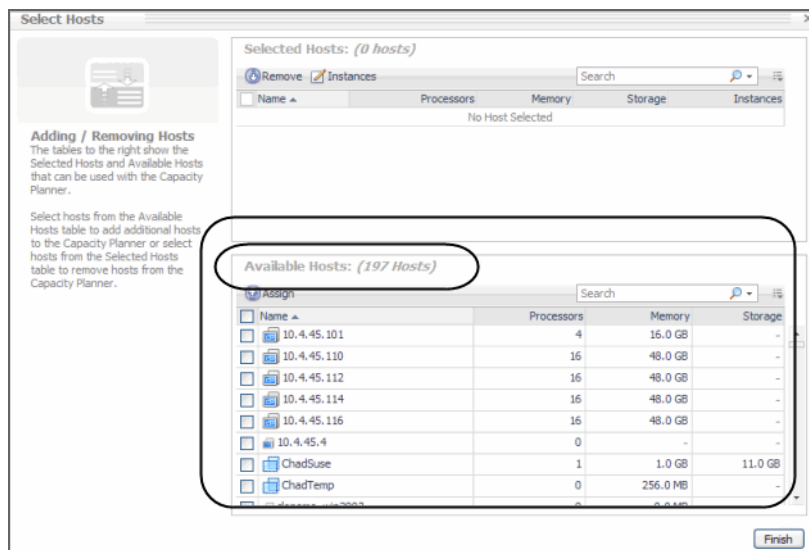
- **NOTE:** Foglight™ Capacity Manager replaces the functionality previously offered in Foglight Capacity Management in the VMware environment. For more information about Foglight Capacity Manager, see the *Foglight Capacity Manager User Guide*.

For more information about installing the Foglight for Capacity Management on the Management Server, see the *Administration and Configuration Help*.

Capacity Management Data Collection

Any virtual or physical hosts VMware® or Hyper-V® servers (target machines) being monitored by Foglight™ for Virtualization, Enterprise Edition, automatically display in the Hyper-V Environment dashboard. No further setup is required.

Figure 1. Environment dashboard



Locating the Capacity Management Dashboard

After installing Foglight™ for Capacity Management, the **Capacity Management** tab appears in the Hyper-V Environment dashboard.

After installing Foglight™ Capacity Manager, the Capacity Management tab appears in the VMware Environment dashboard. For the information about using Foglight Capacity Manager in a VMware Environment, see the *Foglight Capacity Manager User Guide*.

To access the Capacity Management dashboard:


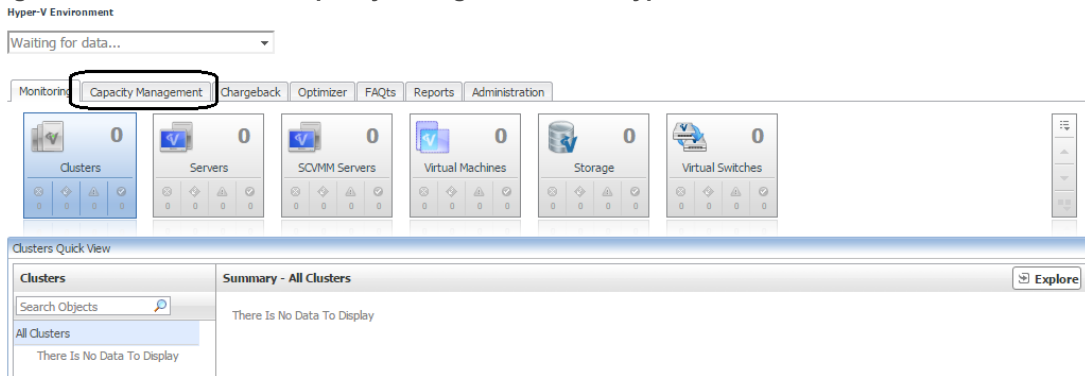
- 1 Log in to the Foglight browser interface.
 - 2 Ensure that the navigation panel is open.
To open the navigation panel, click the right-facing arrow  on the left.
 - 3 On the navigation panel, under *Dashboards*, click **VMWare > VMware Environment**.
- or
- On the navigation panel, under *Dashboards*, click **Hyper-V > Hyper- V Environment**.
- The selected dashboard appears with the **Capacity Management** tab.

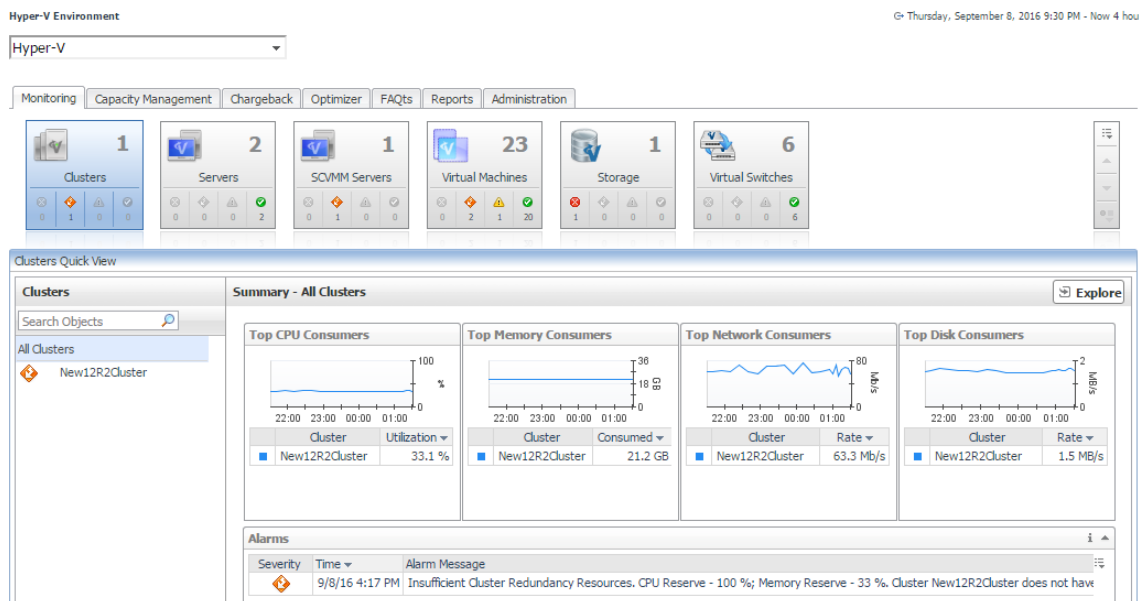
Figure 2. Dashboard with Capacity Management tab in Hyper-V



Using Foglight for Capacity Management in a Hyper-V Environment

Foglight™ for Capacity Management provides a broad platform of tools to project capacity changes to your IT Infrastructure. Using the [Capacity Management Tab](#), addition of VMs to servers can easily be projected. Reports can be generated providing details of server capacity limitations.

Figure 3. Hyper-V Environment



The VMware Environment dashboard provides the following tabs:

- [Monitoring Tab](#) on page 8
- [FAQs Tab](#) on page 8
- [Reports Tab](#) on page 9
- [Administration Tab](#) on page 15
- Capacity Management
 - [Capacity and Bottlenecks](#) on page 17

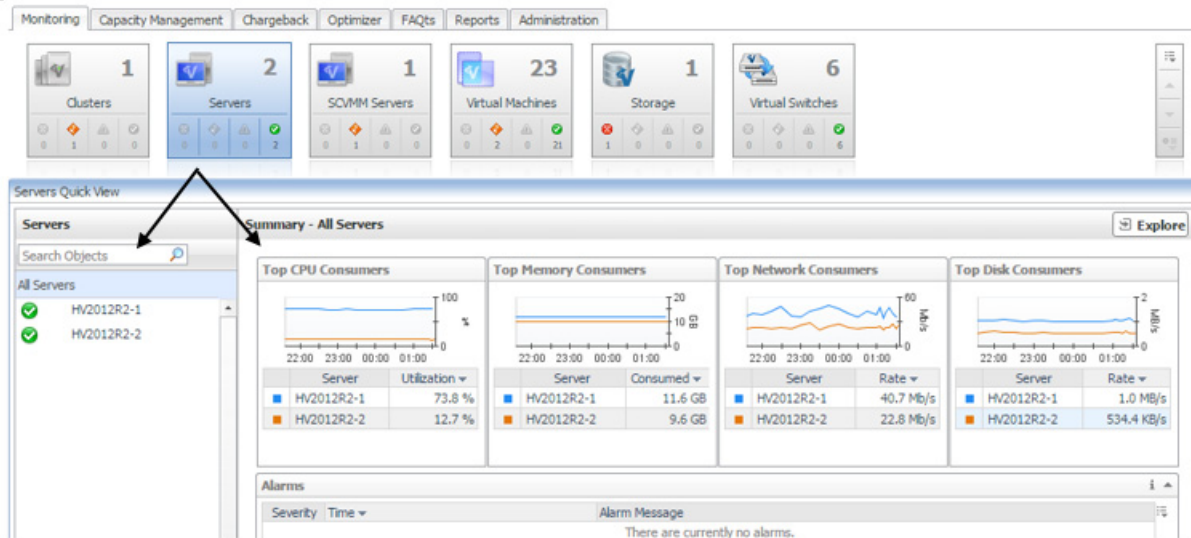
- [Scenario Modeler](#) on page 26

NOTE: Any hosts being monitored by Foglight are automatically displayed in the Hyper-V Environment dashboard.

Monitoring Tab

This tab provides an overall analysis of all components in your Hyper-V® environment. Tiles representing a virtual environment type (for example, Virtual Machines, Servers, Clusters, and so on, on the Hyper-V Environment dashboard) display along with status alarm of the environment health state severity (Normal, Warning, Critical, Fatal). The Quick View displays information about the monitored virtual components just below the tile collection, reflecting the tile selection.

Figure 4. Quick View

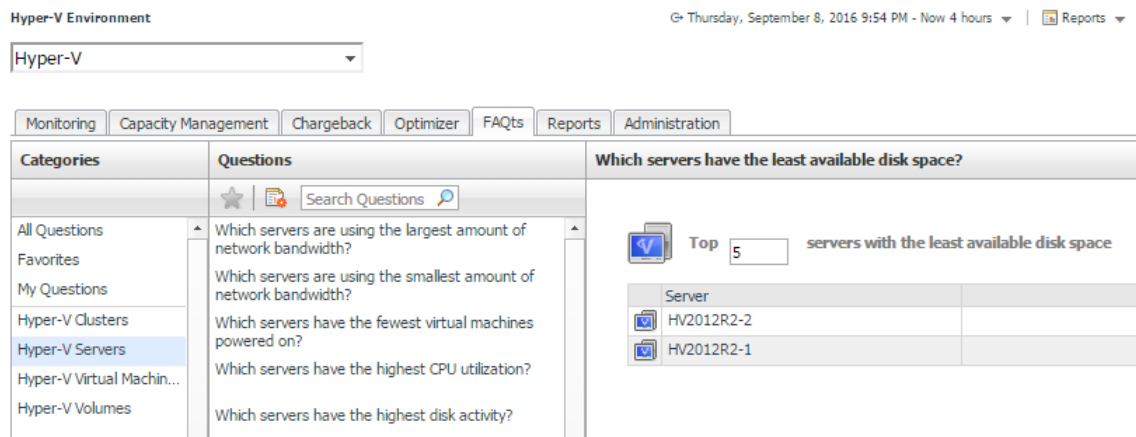


For more information about the VMware Environment or Hyper-V Environment dashboard, see the *Foglight™ for VMware User and Reference Guide* or the *Foglight for Hyper-V User and Reference Guide*.

FAQs Tab

This tab provides predefined questions and answers about the monitored virtual and physical components in your infrastructure.

Figure 5. FAQts tab



For more information about the **FAQts** tab, see the *Foglight™ for VMware User and Reference Guide* or the *Foglight for Hyper-V User and Reference Guide*.

Reports Tab

The **Reports** tab allows you to create, copy, and edit reports created from predefined templates. This tab provides the following sections:

- [Tasks](#) on page 9
- [Recent Report History](#) on page 13
- [About Reports](#) on page 14
- [Reports](#) on page 14

Tasks

From Tasks you can:

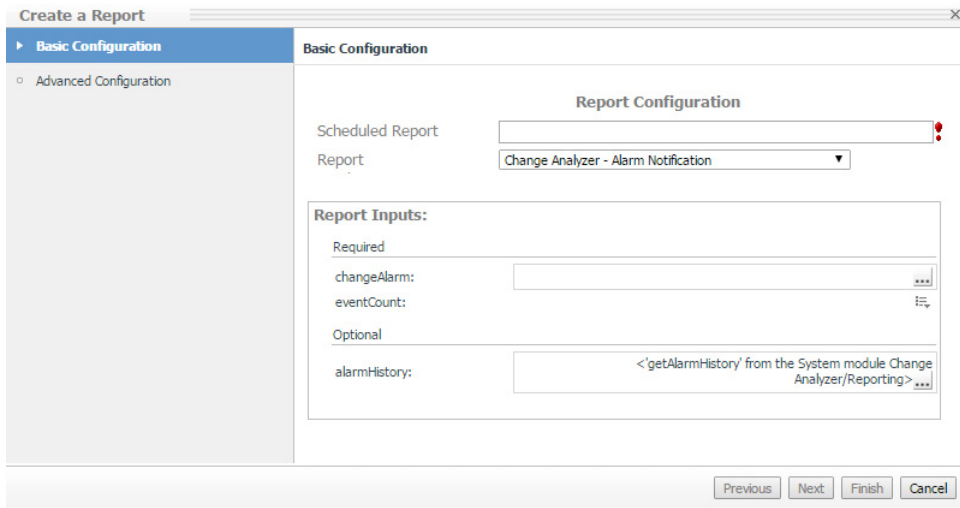
- [Create New Report](#) on page 9
- [Copy Existing Report](#) on page 12
- [Edit Existing Report](#) on page 12

Create New Report

The Create New Report wizard allows you to name reports, choose report templates, add required services, and select time ranges to tailor capacity management reporting requirements.

To create a new report:

- 1 Click **Create New Report**.
The Create New Report wizard appears.

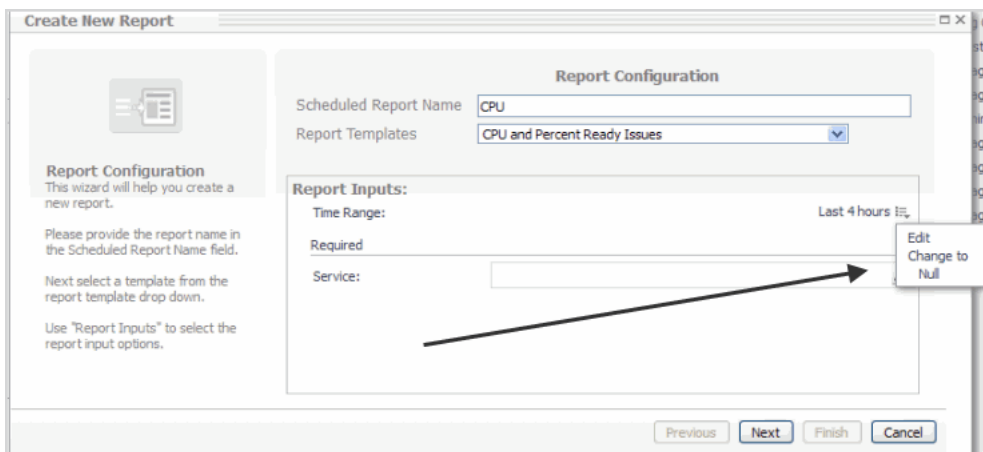


2 In the Scheduled Report box, type the name of the report.

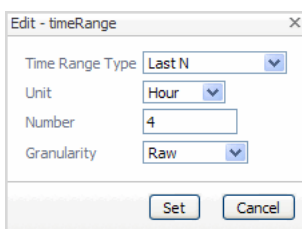
3 From the Report list, selected the required template.

For details on using Foglight™ for VMware report templates or using Foglight™ for Hyper-V report templates, see the *Foglight for VMware User and Reference Guide* or the *Foglight for Hyper-V User and Reference Guide*.

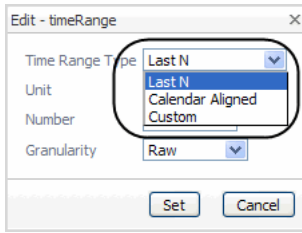
4 From the changeAlarm drop-down, select the required alarm parameters.



- **Edit**—displays the Edit-time Range dialog.



- **Time Range Type**—sets the time range type.



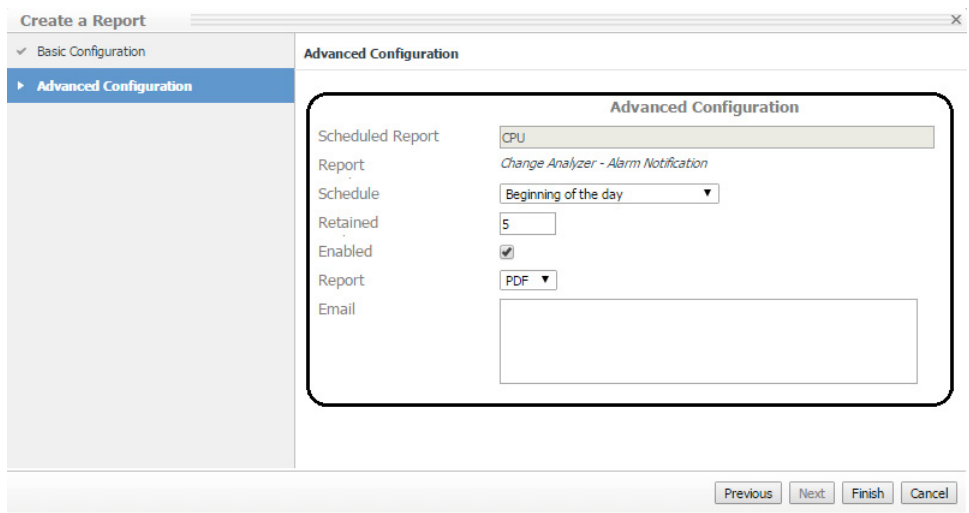
Last N—the last type of time range used (hour, day, week, etc.).

Calendar Aligned—the time range aligns itself with the previous time ranges.

Custom—displays a calendar allowing you to set a customized time range period.

- **Unit**—sets the unit of the time range (Year, Month, Week, Day, Hour, Minute, Second).
- **Number**—sets the time range length.
- **Granularity**—sets the granularity level of the time range, for example 5 minutes.
- **Change to Null**—changes the time range to a null value.

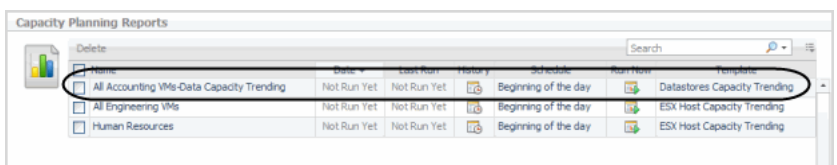
5 Click **Next**.



- **Scheduled Report**—name assigned to the report.
- **Report**—report template chosen in the previous dialog.
- **Schedule**—when the report runs.
- **Retained**—the number of reports retained.
- **Enabled**—enables the report to run on its selected schedule.
- **Report**—allows you to select a report format: PDF, Excel, or XML.
- **Email**—email addresses are separated by a comma; do not use semi-colons. To receive the reports in email, configure the email server parameters in the Administration dashboard (**Administration > Setup & Support > Email Configuration**).

6 Click **Finish**.

The report is generated and is listed in the reports table.



Copy Existing Report

The Copy Existing Report option allows you to create a new scheduled report by copying an existing one and changing one or more of the report settings.

To copy an existing report:

- 1 Click **Copy Existing Report**.
- 2 Click the required report.
- 3 Click **Next**.

Make the required report changes.

Copy Existing Report

Current Report Settings

Scheduled Report Name: All Human Resources VMs Plus Two Additional VMs

Report Template: Datastores Capacity Trending

Schedule: Beginning of the day

Retained Results: 5.0

Enabled:

Report Format: PDF

Email Recipients:

Report Inputs:

Time Range: Last 2 days

Required

service: Data (FSMCategory: User Host Groups)

Previous Next Finish Cancel

- 4 Click **Finish**.

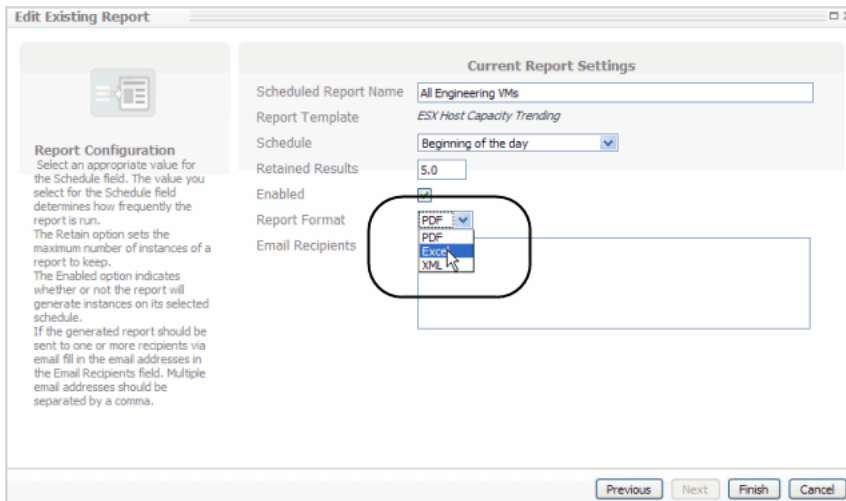
Name	Date	Last Run	History	Schedule	Run Now	Template
All Engineering VMs	11/1/10 9:15 AM	PDF		Beginning of the day		ESX Host Capacity Trending
All Accounting VMs-Data Capacity Trending	11/1/10 9:14 AM	PDF		Beginning of the day		Datastores Capacity Trending
Copy of All Accounting VMs-Data Capacity Trending	Not Run Yet	Not Run Yet		Beginning of the month		Datastores Capacity Trending
Human Resources	Not Run Yet	Not Run Yet		Beginning of the day		ESX Host Capacity Trending

Edit Existing Report

This view allows you to edit report settings, for example report schedule or format.

To edit an existing report:

- 1 Click **Edit Existing Report**.
The Edit Existing Reports view appears.
- 2 Select the required report.
- 3 Click **Next**.
The Current Report Settings view appears.
- 4 Make the required changes.



- 5 Click **Finish**.

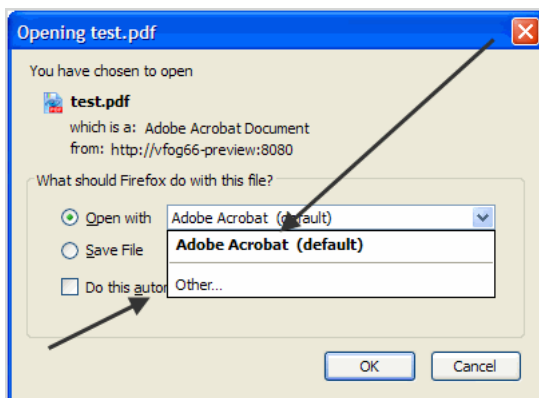
The updated report settings is displayed in the reports table.

Recent Report History

The Recent Report History table lists all of the the most recently run reports.

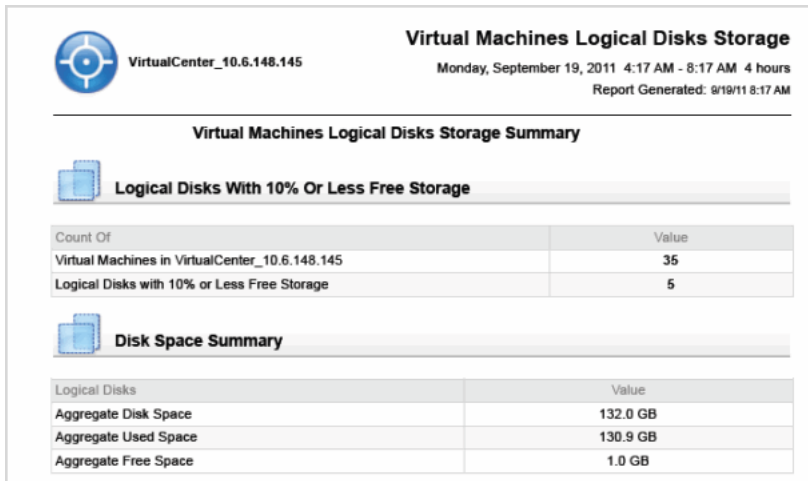
To view a report:

- 1 Click on the required report.
The Opening dialog appears.
- 2 Select the default viewing application or select **Other to view the report in another application**.
Click **Save File**.



- 3 Click **OK**.

Figure 6. If opened, view the report



If saved, navigate to and save the report in the required location.

About Reports

This section displays tooltip help topics on the creation of capacity management reports.

Figure 7. About Reports help topics

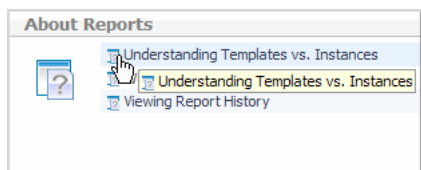
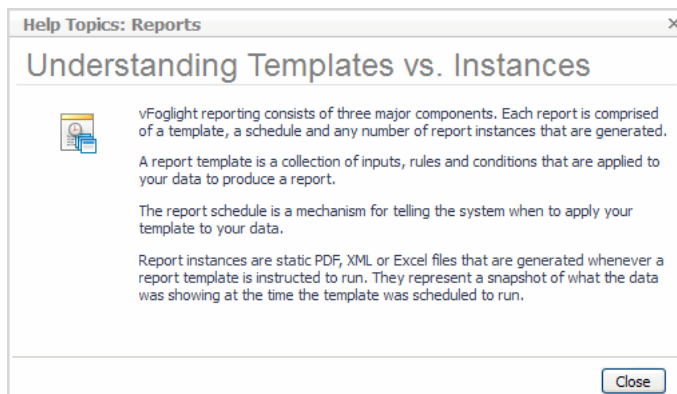


Figure 8. Clicking on a topic displays the tooltip



Reports

The Capacity Management reports table provides a list of all the reports created, generated, and scheduled. In addition, you can review the history of a report and run individual reports.

Figure 9. Capacity Management reports table

Name	Date	Last Run	History	Schedule	Run Now	Template
All Engineering VMs	11/1/10 9:23 AM	Excel	[History Icon]	Beginning of the day	[Run Now Icon]	ESX Host Capacity Trending
All Accounting VMs-Data Capacity Trending	11/1/10 9:14 AM	PDF	[History Icon]	Beginning of the day	[Run Now Icon]	Datstores Capacity Trending
Copy of All Accounting VMs-Data Capacity Trending	Not Run Yet	Not Run Yet	[History Icon]	Beginning of the month	[Run Now Icon]	Datstores Capacity Trending
Human Resources	Not Run Yet	Not Run Yet	[History Icon]	Beginning of the day	[Run Now Icon]	ESX Host Capacity Trending

- **Name**—report name.
- **Date**—date the report was last run.
- **Last run**—report format the report was last run in, PDF, Excel, XML.
- **History**—clicking on a report shows the Report History and the complete run history of the report. Click **Delete** to remove a report.

Date	Size	Report Name	Generated	Run By
9/23/10 12:00 AM	19.0 KB	Dev VMs Report	Schedule	foglight
9/22/10 12:00 AM	19.0 KB	Dev VMs Report	Schedule	foglight
9/21/10 12:00 AM	19.0 KB	Dev VMs Report	Schedule	foglight
9/16/10 1:45 PM	19.0 KB	Dev VMs Report	Manual	foglight

- **Schedule**—when the report is scheduled to run.
- **Run Now**—clicking this icon displays the Run Now tool tip and the report runs. After run completion, you can download the report for viewing.
- **Template**—the current report template selected.

To delete scheduled reports, use the checkboxes in the Reports view to select the report. Click the **Delete** button at the top of the view.

IMPORTANT: This action deletes the scheduled report and it will no longer generate the report instance. Any existing report instances already created for this scheduled report will not be removed from the system.

Name	Date	Last Run	History	Schedule	Run Now	Template
CPU and Percent Ready Report	9/20/11 7:29 AM	PDF	[History Icon]	Beginning of the day	[Run Now Icon]	CPU and Percent Ready Issues
CPU	9/20/11 12:00 AM	PDF	[History Icon]	Beginning of the day	[Run Now Icon]	CPU and Percent Ready Issues

Administration Tab

The Administration view allows you to configure the level of alarm sensitivity, operating system (OS) mapping, review instance limits, and review expired data.

Figure 10. Administration tab

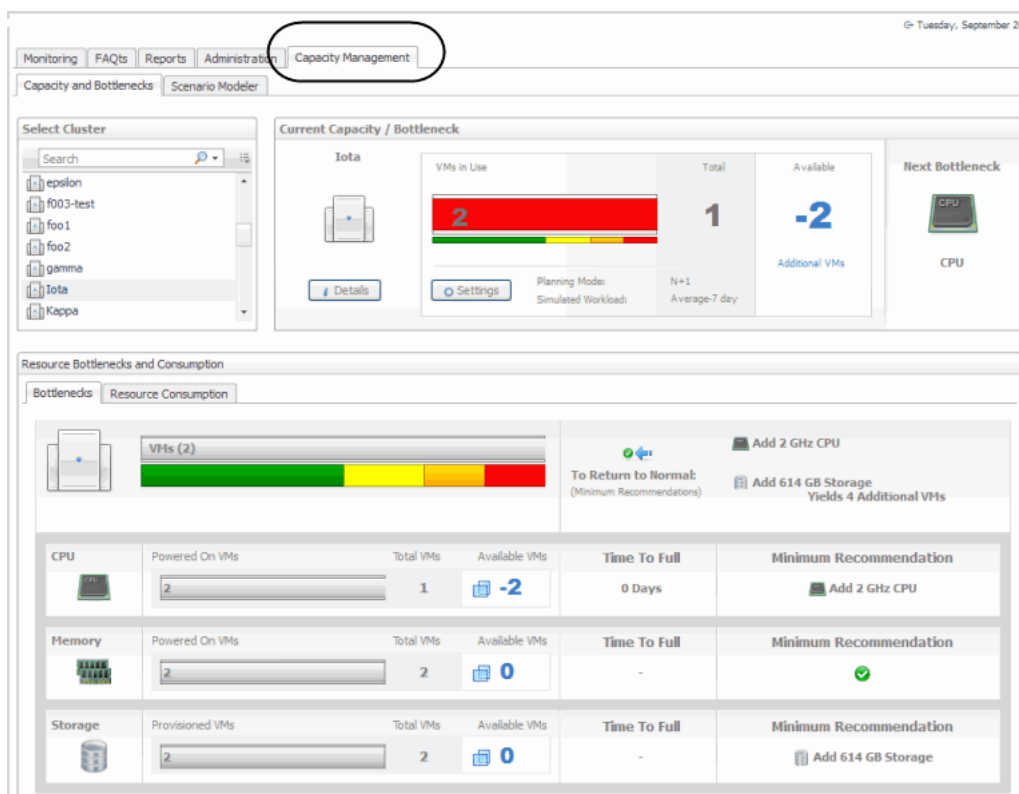


For details on using the Administration view, see the *Foglight™ for VMware Virtualized Environments User and Reference Guide* or the *Foglight for Hyper-V User and Reference Guide*.

Capacity Management Tab

The Capacity Management view in Hyper-V Environment allows you to view detailed capacity management graphs/metrics and create capacity management scenarios. For the information about using Foglight for Capacity Director in a VMware Environment, see the *Foglight for Capacity Director User Guide*.

Figure 11. Capacity Management view



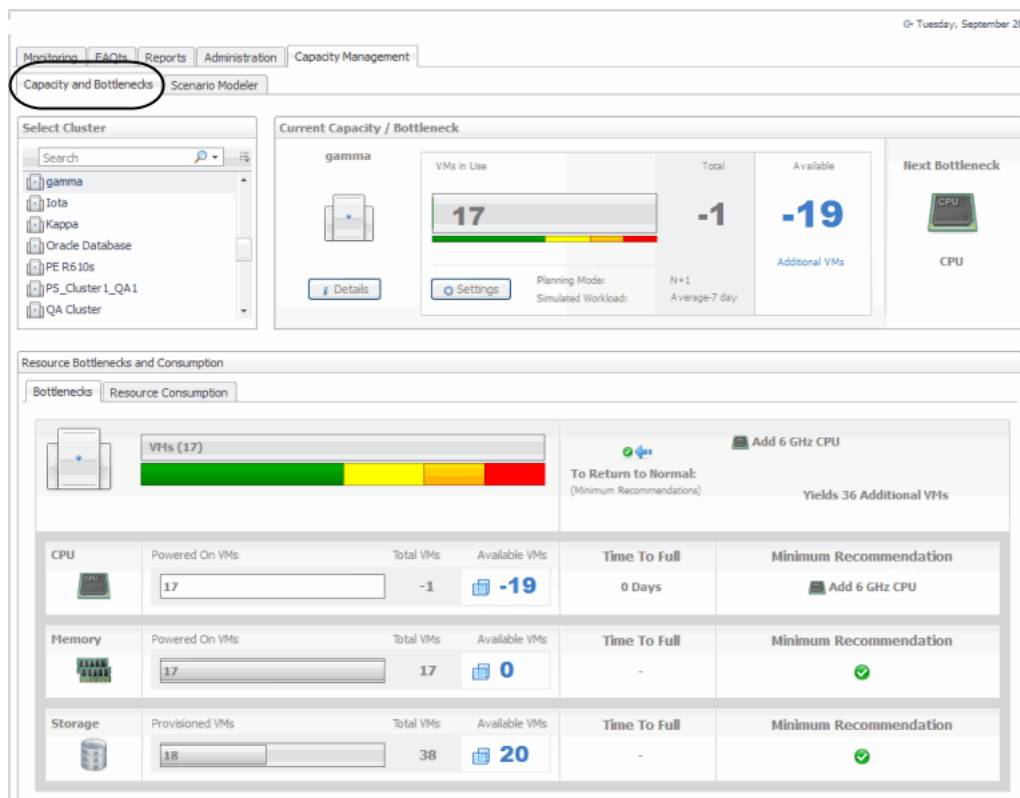
The Capacity Management view provides the following tabs:

- [Capacity and Bottlenecks](#) on page 17
- [Scenario Modeler](#) on page 26

Capacity and Bottlenecks

This tab allows you to select clusters and review capacity management details of your virtual environment. You can review current capacity and the next bottleneck affecting that capacity. It also displays the order of the next capacity management resource (CPU, Memory, Storage) affecting your environment and provides minimum recommendations to avoid the reported bottleneck.

Figure 12. Capacity and Bottlenecks tab



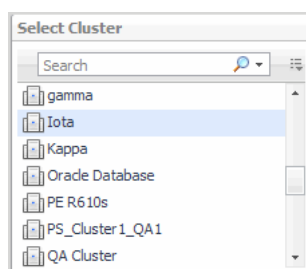
This tab displays the following sections:

- [Select Cluster](#) on page 17
- [Current Capacity/Bottlenecks](#) on page 18
- [Resource Bottlenecks and Consumption](#) on page 22

Select Cluster

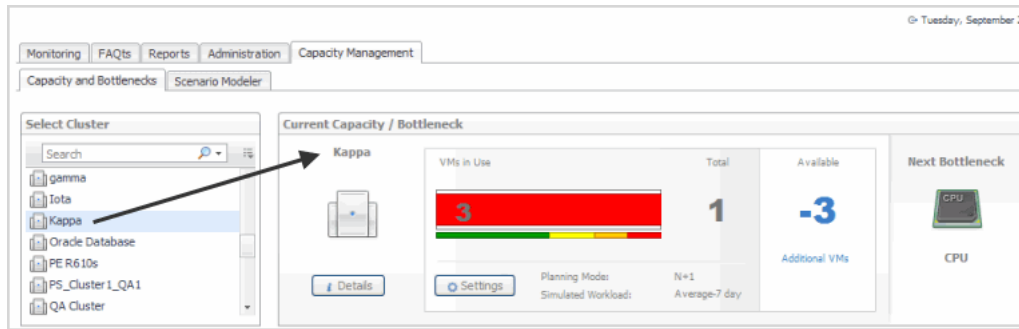
Use this view to search for and select clusters you want to view capacity management details on.

Figure 13. Select Cluster view



Selecting a cluster in this list populates the adjacent [Current Capacity/Bottlenecks](#) view.

Figure 14. Current Capacity/Bottlenecks view



Current Capacity/Bottlenecks

This view provides a visual readout of the selected cluster based on a simulated workload (virtual machine) and the available resources.

Figure 15. Visual readout of selected cluster

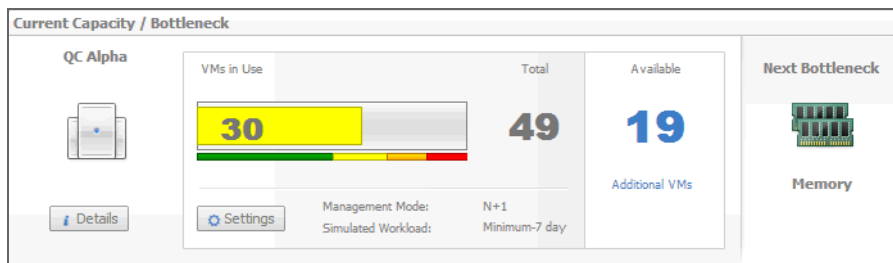


Table 1. Cluster details provided

Cluster	The name of the selected cluster. Displays the Cluster Detail dialog box, showing additional information about the selected cluster.
----------------	--

Figure 16. Cluster Details.

Details	Cluster Detail: QC Alpha								
	<p>CPU 58 GHz</p> <p>Memory 128 GB</p> <p>Storage 7 TB</p> <p>Hypervisors 4</p> <p>VMs 65</p>	<p>Peak CPU Performance</p> <table border="1"> <tr> <td>vCPU/Core Ratio</td> <td>3.0:1</td> </tr> <tr> <td>Physical CPU Cores</td> <td>28</td> </tr> <tr> <td>Powered On vCPUs</td> <td>83</td> </tr> <tr> <td>Average % Ready</td> <td>1%</td> </tr> </table>	vCPU/Core Ratio	3.0:1	Physical CPU Cores	28	Powered On vCPUs	83	Average % Ready
vCPU/Core Ratio	3.0:1								
Physical CPU Cores	28								
Powered On vCPUs	83								
Average % Ready	1%								
	<p>Current Virtual Machines</p> <p>Powered On VMs (30) Other (35)</p> <p>Provisioned 65</p>								

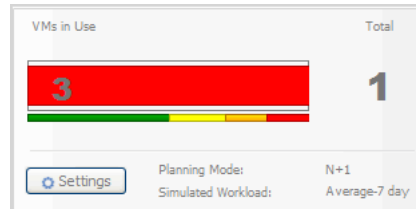
For more information, see [Viewing Cluster Details](#) on page 20.

Table 1. Cluster details provided

The number of virtual machines that are currently in use. The color-coded bar provides a visual reference for the capacity thresholds of the virtual machines in the selected cluster.

Figure 17. VMs in use.

VMs in Use



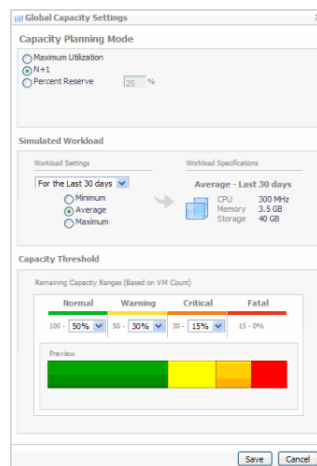
- **Green**—Normal
- **Yellow**—Warning
- **Orange**—Critical
- **Red**—Fatal

The threshold values are configurable using capacity setting that span all clusters. Click [Settings](#) to display these values, and configure them, as required.

Displays the **Global Capacity Settings** dialog box, showing the values Foglight for Capacity Management uses to calculate the available resources.

Figure 18. Global Capacity Settings.

Settings



For more information, see [Configuring Global Capacity Settings](#) on page 21.

A mode indicating how Foglight for Capacity Management determines the percentage of resources that are available for allocation. The following modes are available:

Management Mode

- **Maximum Utilization**
- **N+1**
- **Percent Reserve**

Click [Settings](#) to display these values, and configure them, as required. For more information, see [Configuring Global Capacity Settings](#) on page 21.

Simulated Workload

A combination of workload settings that are used to calculate the resources that need to be allocated to a virtual machine, based on previous resource consumption levels.

For example, you can use the average amount of resources used in the last seven days as a reference point.

Click [Settings](#) to display these values, and configure them, as required. For more information, see [Configuring Global Capacity Settings](#) on page 21.

Table 1. Cluster details provided

Total	The total number of virtual machines. This value represents the virtual machines that are currently in use plus those that are available to users, given the current global capacity settings. Click Settings to display these values, and configure them, as required. For more information, see Configuring Global Capacity Settings on page 21.
Available	The number of virtual machines that are available for use in the cluster, and are not currently in use, based on the current Capacity Management settings. Click Settings to display these values, and configure them, as required. For more information, see Configuring Global Capacity Settings on page 21.
Next Bottleneck	A visual indicator of the next anticipated bottleneck for increasing capacity on this cluster. Bottlenecks vary based on environment and workloads and may be cumulative in nature.

Viewing Cluster Details

The **Cluster Detail** dialog box displays additional metrics about the selected cluster and its current configuration. To display it, in the **Current Capacity/Bottleneck** view, click **Details**.

Figure 19. Cluster Details dialog

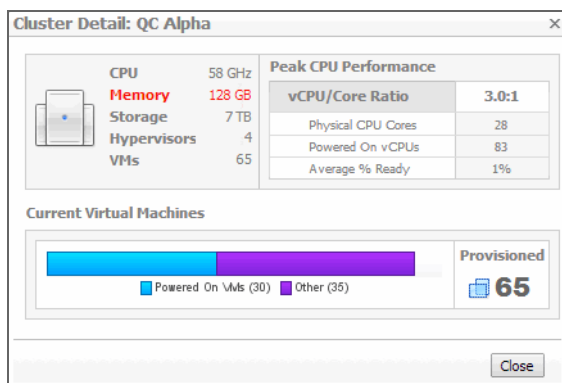


Table 2. Cluster Detail metrics

Displays the CPU, memory, and storage resources reserved for use in the selected cluster. The value in red represents the next projected bottleneck. This view also shows the numbers of hosts and virtual machines associated with this cluster.

Resources in use

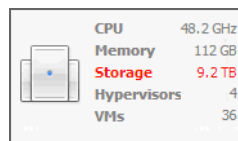


Table 2. Cluster Detail metrics

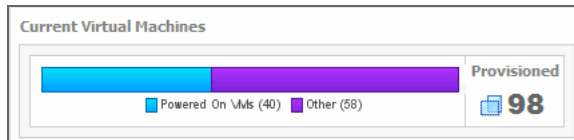
Allows you to examine in more detail the virtual CPU and core ratio details.

Peak CPU Performance

Peak CPU Performance	
vCPU/Core Ratio	0.38:1
Physical CPU Cores	8
Powered On vCPUs	3
Average % Ready	0%

Displays the total number of provisioned virtual machines in the selected cluster. The bar represents a visual representation indicating the ratio of powered on virtual machines in the entire collection of provisioned virtual machines.

Current Virtual Machines



Configuring Global Capacity Settings

The **Global Capacity Settings** dialog box allows you to configure utilization, simulated workload, and capacity thresholds of a cluster. These settings apply to all clusters. To display it, in the **Current Capacity/Bottleneck** view, click **Settings**.

Figure 20. Global Capacity Settings dialog

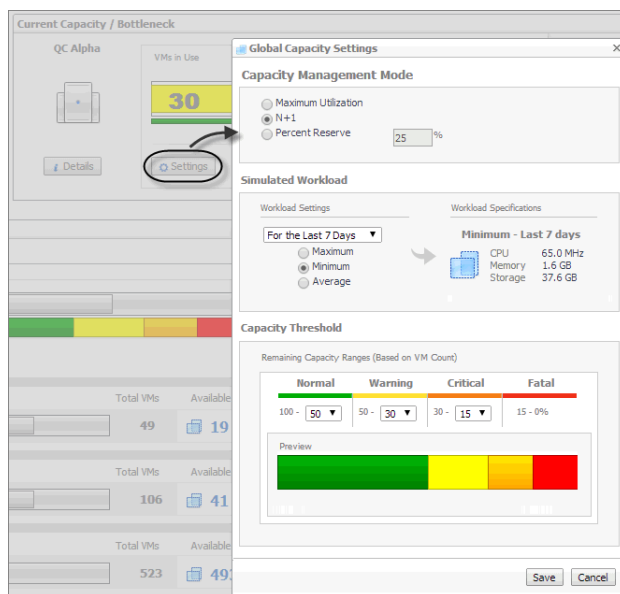


Table 3. Global Capacity details.

	Maximum Utilization	Allows all the available memory, CPU, and storage that is available to the cluster to be used to calculate the virtual machine capacity. No reserves are set aside and there is no redundancy.
Capacity Management Mode	N+1	Allows the cluster to calculate its overall virtual machine capacity, while reserving enough resources for an extra host to be used for redundancy purposes. For example, if the cluster currently contains six hosts in this mode, the capacity of the cluster is calculated using the resources for only five hosts, leaving one host for redundant failover purposes.
	Percent Reserve	Allows you to set aside a custom percentage of the cluster's total capacity. The percentage entered represents the amount to hold in reserve, with the balance being allotted to calculate total capacity. For example, entering 20% means that this percentage of the cluster's resources is not used to calculate virtual machine capacity, and that 80% will be used to calculate the cluster's capacity.
Simulated Workload	Simulated Workload	A simulated workload represents a typical virtual machine running on the cluster. The Simulated Workload area allows the system to capture the characteristics of a typical virtual machine used to simulate virtual machine workloads on the cluster. The simulated workload represents whatever resources that a common or typical virtual machine uses within this environment.
	Workload Settings	Specifies the timeframe over which the minimum, maximum, or average value is collected. The common setting is the last 30 days of data available. NOTE: Settings of 24 hours or less provide little value to most administrators.
	Maximum Minimum Average	Specify if the system should use the maximum, minimum, or average virtual machine workload found within the time range specified.
Capacity Threshold	Workload Specifications	Displays the a typical set of resources needed to allocate to a virtual machine, given the supplied Workload Settings . The displayed values are used to calculate the Available VMs counts on the Bottlenecks Tab .
	Normal (green)	The amount of available capacity ranging from 100% (totally available) to whatever value is specified at the end of the normal zone.
	Warning (yellow)	The range of available capacity that is less than normal, but not yet critical. Its upper limit is set by the value of the Normal (green) zone.
	Critical (orange)	The range of the remaining available capacity that is less than Warning, but not yet fatal. Its upper limit is set by the value of the Warning (yellow) zone.
	Fatal (red)	The range of remaining available capacity that is less than critical, and continues until all capacity has been used (zero). It is set automatically based on the lower limit of the Critical (orange) zone.

Resource Bottlenecks and Consumption

This view provides detailed views on the resource constraints for the selected cluster. It contains the following tabs:

- [Bottlenecks Tab](#) on page 22
- [Resource Consumption Tab](#) on page 24

Bottlenecks Tab

This tab displays a detailed view of the resource constraints for the selected cluster.

Figure 21. Bottleneck tab details

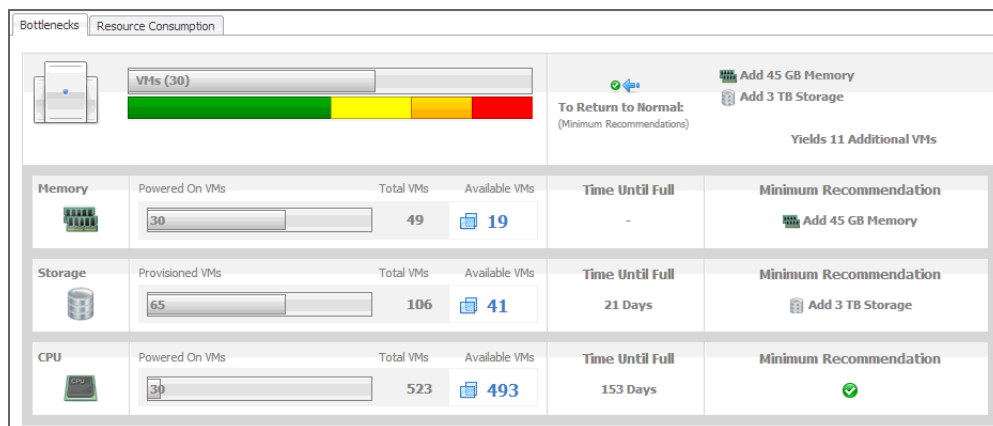
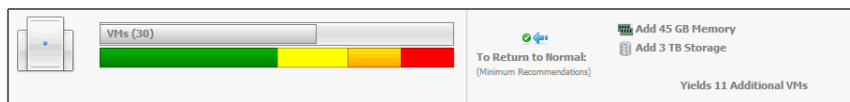


Table 4. Bottlenecks tab details

Provides an overall summary and is a visual readout of the current capacity mapped against the configured thresholds, as well as a set of suggested actions required to return to Normal (green) capacity settings.

Summary

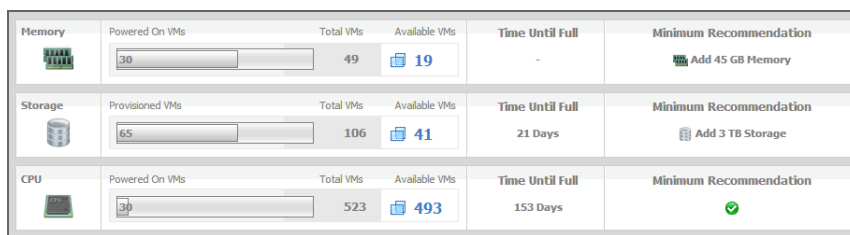


- The bar graph is displayed for the resource with the lowest available virtual machines.
- **To Return to Normal** area displays one or more recommendations that, when followed, bring the system back to the Normal state.

Each resource row (**Memory**, **Storage**, and **CPU**) shows a visual representation of the powered on virtual machines relative to the total number of virtual machines that are considered available based on the levels of used resources. The levels of usage for each resource, gives you a good indication of what can limit the cluster's overall capacity, allowing you to target only specific upgrades to achieve desired capacity.

**Memory
Storage
CPU**

The resources are listed in the order of constraining effect. The most constraining resource is shown on top, with the least constraining resource appearing at the bottom.



- Powered on VMs** The number in the graph is the number of powered on virtual machines, compared to the **Total VMs** value.
- Provisioned VMs** The number of powered on virtual machines (**Powered on VMs** or **Provisioned VMs**) plus the number of available virtual machines (**Available VMs**).
- Total VMs** The number of available virtual machines, as calculated using the Global Capacity Settings (see page 21). It is the total memory capacity minus the **Amount Reserved** and minus the amount of memory currently in use.
- Available VMs** The period of time after which the resource is fully consumed, based on the last seven days of observed values.
- Time to Full**

Table 4. Bottlenecks tab details

The recommended amount of resources that need to be added to the cluster to bring the cluster to the *Normal* state. It represents the amount obtained using the following formula:

Minimum Recommendation - $\text{Resource Capacity} + \text{Amount Reserved} + \text{Normal Capacity} + \text{Resource Used}$

If the recommended amount is less than zero '0', a green check mark is displayed.

Values used in calculations

Determined by the **Capacity Management Mode** (see page 22):

- If **Maximum Utilization** is selected, no reserves are set aside, so the amount reserved is zero.
 - If **N+1** is selected, resources are set aside for one extra host, so the amount reserved is calculated using this formula:
 $\text{Resource Capacity} * (1 / \# \text{ of Hypervisors}) * 100$
 - If **Percent Reserve** is selected, the amount reserved equals the total resource capacity times the percent reserved.
- Normal Capacity** Calculated using this formula:
 $(\text{Resource Capacity} - \text{Amount Reserved}) * \text{Capacity Threshold Normal Value}$

Resource Consumption Tab

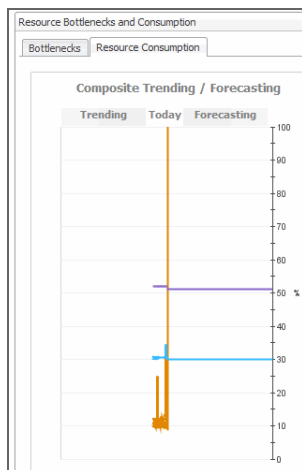
This tab consists of the following views:

- [Composite Trending/Forecasting](#) on page 24
- [Projections By Resource](#) on page 25

Composite Trending/Forecasting

This view contains a consolidated chart showing each constraining resource of the cluster mapped over time.

Figure 22. Composite Trending and Forecasting view



The chart includes historical information, current values, and predictions of what the resource usage may look like in the future based on current trends and displays how quickly the rate of consumption or the available capacity can change over time. As these changes occur, a cluster's resources can easily shift from being the most limiting to the least limiting over a period of time. For example, a cluster can be initially limited by memory, but given rapid storage depletion, storage may actually surpass memory as the most constraining resource in the long term. The composite graphing of historical, current, and predicted consumption provides a more accurate picture of what is happening in the cluster and better information on what steps to take in resolving issues.

Table 5. Trending and Forecasting details

Trending	This part of the chart displays the levels of resource usage based on historical data. The chart is more accurate when sufficient historic data is available.
Today	Current levels of resource usage.
Forecasting	Forecasted levels of resource usage, for the next three months, based on historical data.

Projections By Resource

This view provides a detailed breakdown of the current status of each resource, projected consumption, growth rate, and remaining time of each until each of the key resources is fully consumed.

The colors to the left of the resource icons match the lines plotted on the [Composite Trending/Forecasting](#) chart appearing to the left of this view. For more information about this chart, see page 24.

The color of the bar charts shown in this view changes to black, indicating that the capacity threshold is reached. The resources are listed in order of bottleneck severity, with the most limiting resource shown first, and the least limiting resource shown last.

Figure 23. Resources in order of bottleneck severity



Table 6. Projection details

	Used	The amount of resources that are currently in use.
Current Utilization	Capacity	The total amount of resources in the selected cluster, including the amount of resources currently in use (Used) and the remaining available resources.
	Utilized	The percentage of total amount of resources (Capacity) that are currently in use.
Projected Memory Use	Projected Storage Use	The projected amount of resource usage over the next 90 days, based on the last seven days of observed values.
Projected CPU Use		
Time to Full		The period of time after which the resource is fully consumed, based on the last seven days of observed values.
Growth Rate		The projected resource usage growth rate, based on the last seven days of observed values.

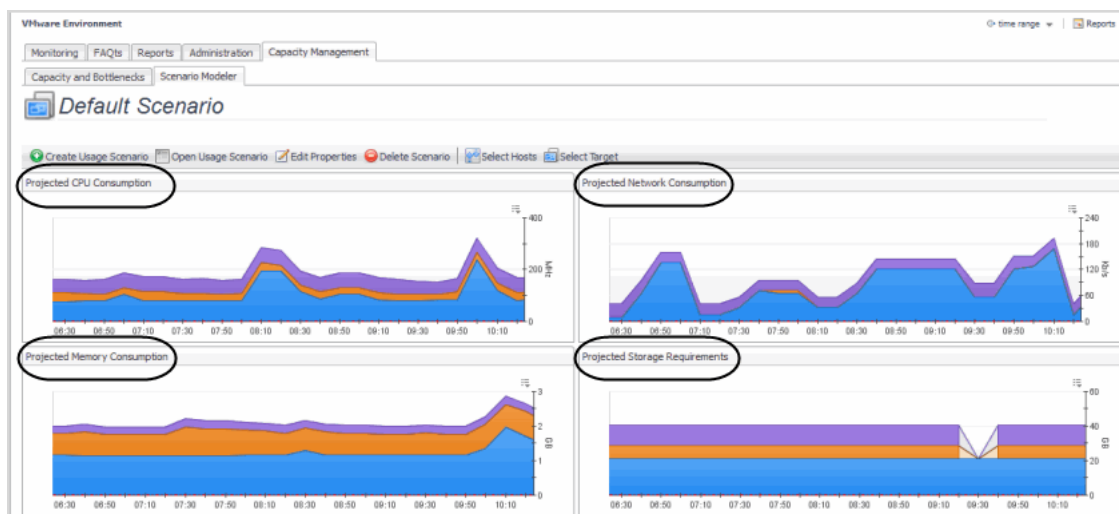
Scenario Modeler

The Scenario Modeler view allows you to project what happens if virtual machines are added to or moved among the servers supporting an IT infrastructure. Using this view you obtain the following projections:

- Projected CPU Consumption
- Projected Memory Consumption
- Projected Network Consumption
- Projected Storage Consumption requirements

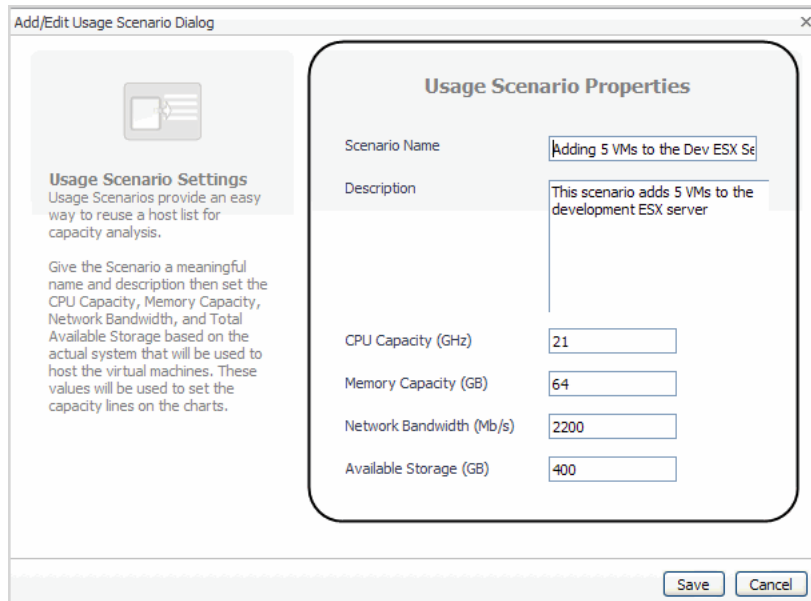
Capacity management scenarios allow you to select host machines and target those machines against servers to project what happens if hosts are added or removed. Charts are generated, showing the result of the addition or removal of the hosts. You can select any number of hosts and predict their combined impact on the targeted server's resources. You can also select any server to see the resource impact caused by all of its resident hosts.

Figure 24. Scenario Modeler



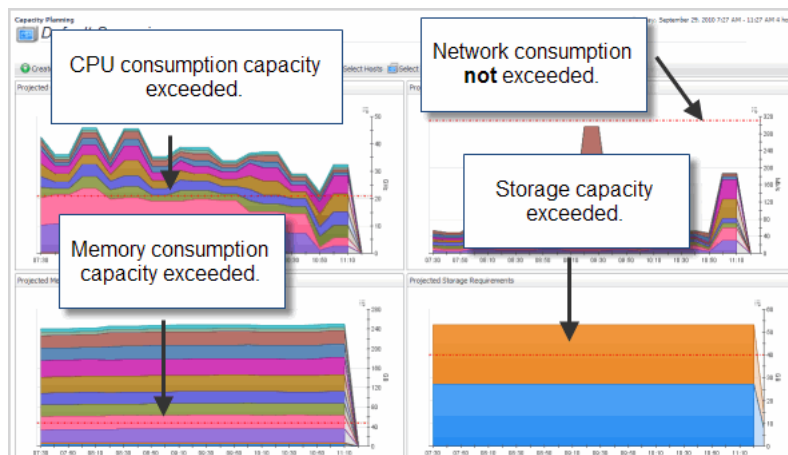
Thresholds are user-configurable. You change the hardware configuration of the server to learn about the effects of different hypothetical configurations. For example, what if you had four more CPUs? What if you had 3.6 gigahertz CPUs? What if you had twice as much memory? You create and model what the capacity loads could look like on a hypothetical server.

Figure 25. Usage Scenario Settings



The Scenario Modeler view allows you to set scenario properties, select available hosts, choose a target server, and view the projected capacity metrics in the resulting graphs. When creating capacity management scenarios, you set the CPU capacity, memory capacity, network bandwidth, and total available storage based on the actual system used to host the virtual machines. These values are used to set the capacity lines on the charts that show the server's capacities.

Figure 26. Scenario Modeler capacity lines



To create capacity management scenarios, charts, and generate a report:

- 1 You first create a capacity management usage scenarios to project how adding hosts to a server affects CPU capacity, memory capacity, network bandwidth, and available storage. For more information, see [Create Usage Scenario](#) on page 28.
- 2 Select the hosts. Hosts are selected and added to a capacity management scenario to determine if a server's capacity is exceeded. For more information, see [Select Hosts](#) on page 31.
- 3 Select the target server—you select a target server to represent the type of server the selected hosts (VMs) is targeted against. For more information, see [Select Target](#) on page 33.
- 4 Open and manage usage scenarios—after creating capacity management usage scenarios, they are saved and can be opened to edit and enter new properties for CPU capacity, memory capacity, network

bandwidth and available storage. For example, raising the bandwidth to 4000 megabytes per second. For more information, see [Open Usage Scenario](#) on page 29.

- 5 Modifying time range criteria—prior to moving a host to a server, it is recommended to look at a longer historical timeframe (for example, last month or this year) to get a broader view of the server’s resource availability rather than using the default setting of the last four hours. If you end up with a large list of excluded hosts, or VMs with insufficient data, you can experiment with shorter time intervals. For more information, see [Modifying Time Range Criteria](#) on page 35.

The Scenario Modeler tab provides the following views:

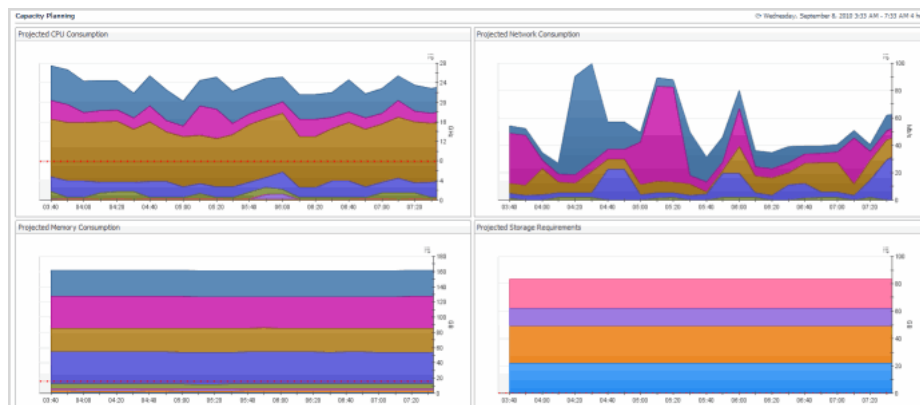
- [Create Usage Scenario](#) on page 28
- [Open Usage Scenario](#) on page 29
- [Edit Properties](#) on page 30
- [Delete Scenario](#) on page 31
- [Select Hosts](#) on page 31
- [Select Target](#) on page 33
- [Included Hosts](#) on page 34
- [Excluded Hosts](#) on page 35
- [Modifying Time Range Criteria](#) on page 35

Create Usage Scenario

You begin by creating usage scenarios. These scenarios allow you to select available host machines, then target those machines to available servers to determine:

- Projected CPU consumption
- Projected Network consumption
- Projected Memory consumption
- Projected Storage requirements

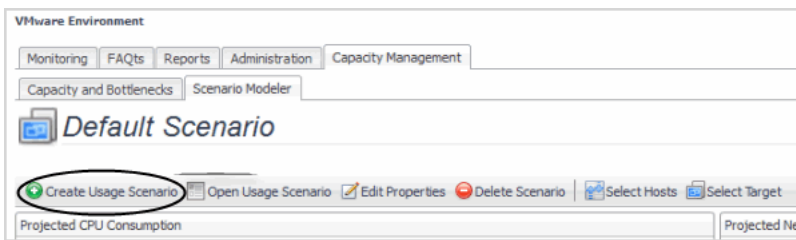
Figure 27. Usage scenarios



To create a capacity management usage scenario:

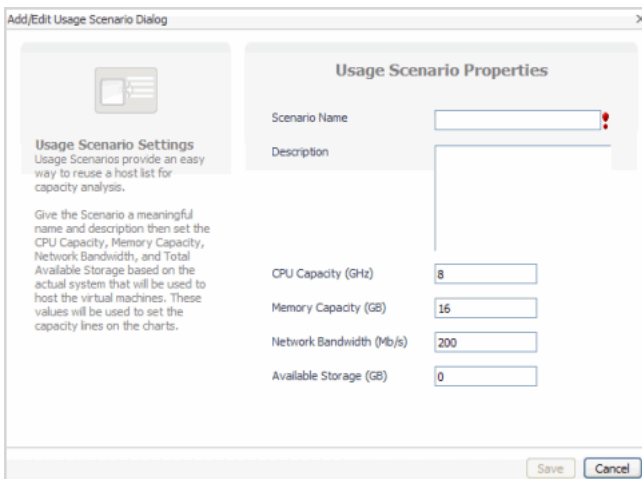
- 1 Click **Create Usage Scenario**.

Figure 28. Create Usage Scenario



The Add/Edit Usage Scenario view appears with default property values entered.

Figure 29. Add/Edit Usage Scenario view



- **Scenario Name**—name assigned to the scenario.
 - **Description**—detailed description of scenario properties.
 - **CPU Capacity (GHz)**—CPU capacity of the server in gigahertz.
 - **Memory Capacity (GB)**—memory capacity of the server in gigabytes.
 - **Network Bandwidth (Mb/s)**—network bandwidth of the server in megabits per second.
 - **Available Storage (GB)**—available storage of the server in gigabytes.
- 2 Enter the required scenario properties.
 - 3 Click **Save**.

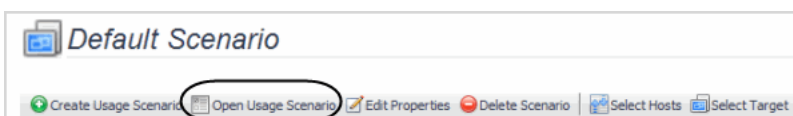
Open Usage Scenario

After creating a capacity management usage scenario, you can open the scenario to change the originally entered properties to tailor capacity management needs.

To open a usage scenario:

- 1 Click **Open Usage Scenario**.

Figure 30. Open Usage Scenario button

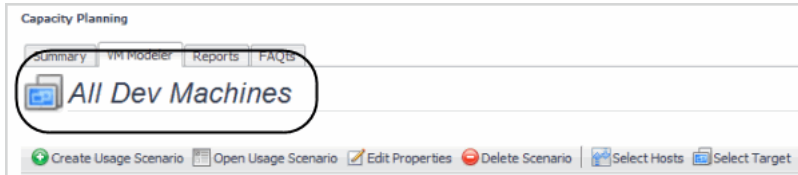


The Select Usage Scenario view appears.

- 2 Select the required usage scenario.
- 3 Click **OK**.

The selected usage scenario appears in the Scenario Modeler view.

Figure 31. Scenario Modeler view



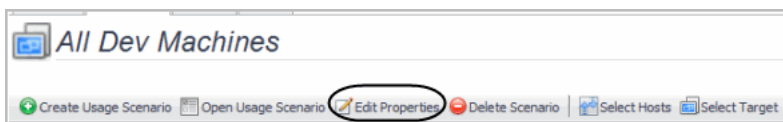
Edit Properties

After opening a usage scenario, Edit Properties allows you to edit a scenario already created and tailor its properties to change capacity management scenarios.

To edit a capacity management usage scenario:

- 1 Click **Edit Properties**.

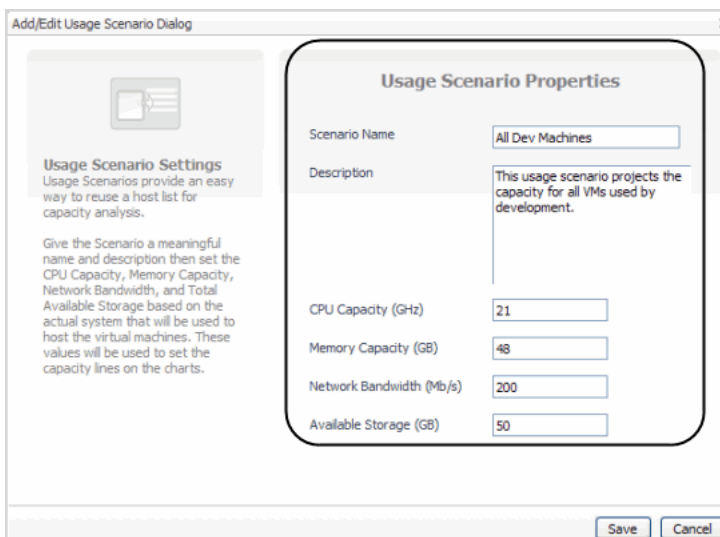
Figure 32. Edit Properties button



The Add/Edit Usage Scenario Properties view appears.

- 2 Make the required capacity management usage scenario property changes.

Figure 33. Usage Scenario Properties to edit



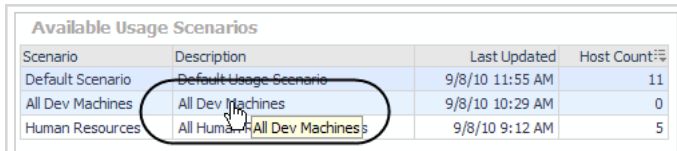
- 3 Click **Save**.

Delete Scenario

From the VM Capacity Planner dashboard, you can delete scenarios no longer required.

To delete a capacity management scenario:

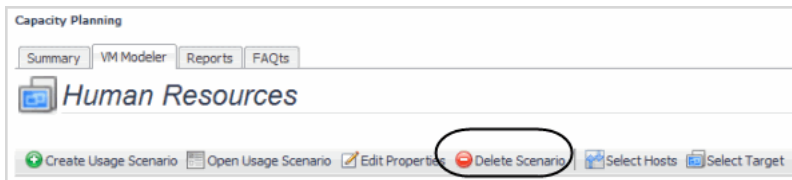
- 1 If the Usage Scenario you want to delete is open, click **Delete Scenario** and then click **OK**.
 - a If the Usage Scenario is not open, click **Open Usage Scenario**.
 - b Select the usage scenario to delete.



Scenario	Description	Last Updated	Host Count
Default Scenario	Default Usage Scenario	9/8/10 11:55 AM	11
All Dev Machines	All Dev Machines	9/8/10 10:29 AM	0
Human Resources	All Human Resources	9/8/10 9:12 AM	5

- c Click **OK**.
- d Click **Delete Scenario**.

Figure 34. Delete Scenario button



The Delete Usage Scenario view appears.

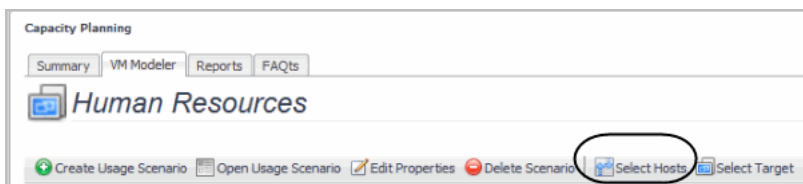
- e Click **OK**.

Select Hosts

After creating a scenario, you select and assign the hosts. Tables provide available hosts to select and list hosts already selected for the open scenarios.

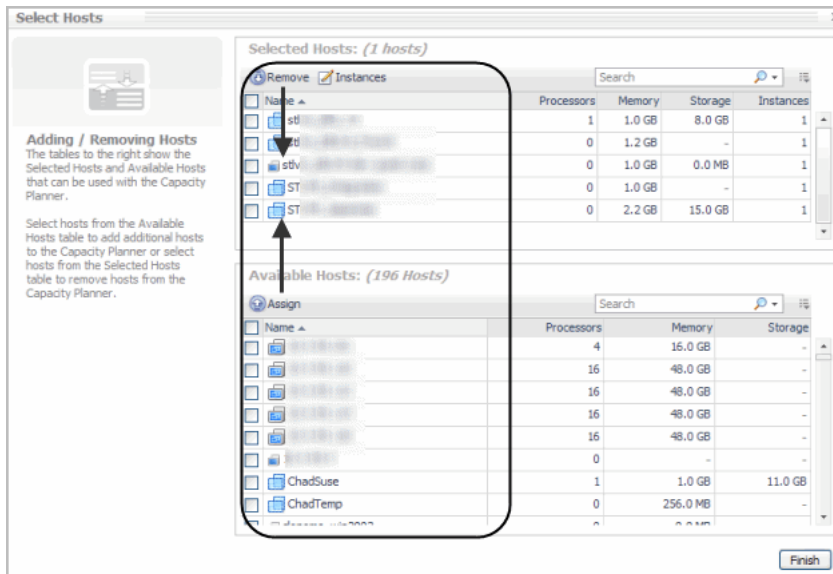
To select and assign hosts:

- 1 Click **Select Hosts**.



The Select Hosts view appears.

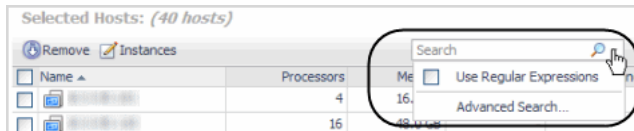
- 2 From this view you can:
 - **Assign Hosts**—you select the required hosts in the Available Hosts table and move them to the Selected Hosts table. To assign hosts, check the required hosts in Available Hosts, and click **Assign**. To remove hosts, check the required hosts and click **Remove**.



- **Add host instances**—you add host instances to replicate a particular host. To add an instance(s), check the required host and click Instances . The host instance tool tip appears. Fill in the required number of instances and click **Apply**.



- **Search**—use the Search box to type in a partial or the full name of the hosts of interest (if their names share a common string of characters). Clicking the **Search** lists provides the options of using regular expressions in the search or using advanced search features.

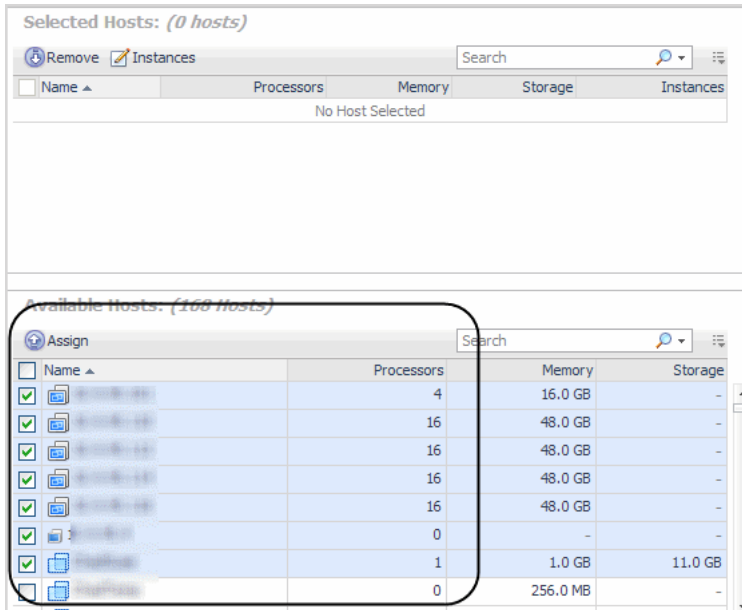


The Selected and Available Hosts views provides an Advanced Search option to order searches by name, host type, processors, memory, storage, or instances. You can also search for matching rules based on name, host type, processors, memory, storage, or instances.



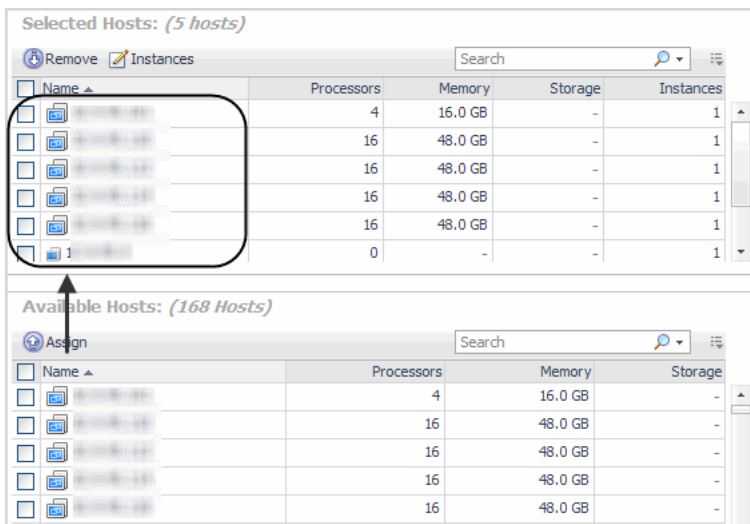
- **Sort columns**—click any of column headers to do an ascending or descending sort.
- **Selecting or Deselecting All hosts**—selecting the box next to Name selects all the hosts. Unchecking this box deselects the hosts.

3 Select the required hosts from the Available Hosts table.



4 Click **Assign**.

The hosts are moved to the Selected Hosts table.



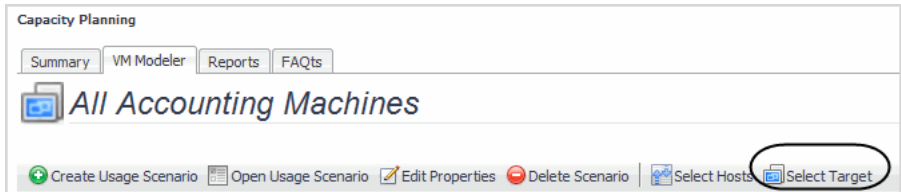
5 Click **Finish**.

Select Target

After selecting and assigning the required hosts, you select the server to run those hosts against. The target server can be changed at any time to analyze different capacity management usage scenarios.

To select a target:

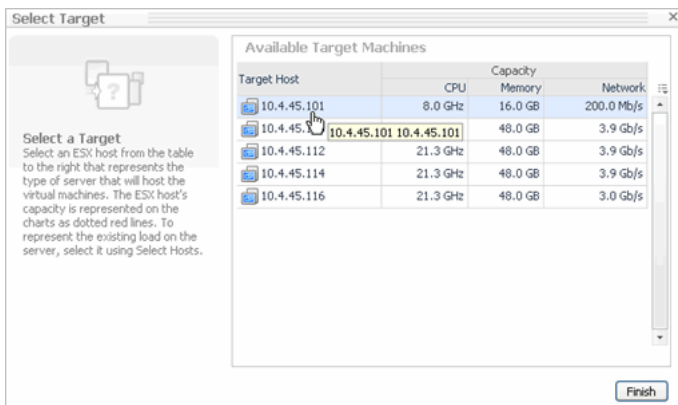
1 Click **Select Target**.



The Select Target view appears.

- 2 Select the required target machine.

i | IMPORTANT: Selecting a target overrides whatever was set for the capacity when the usage scenario was created.



- 3 Click **Finish**.

The VM Modeler view updates the graphs to reflect the changes caused by the selection of the new target machine.

Included Hosts

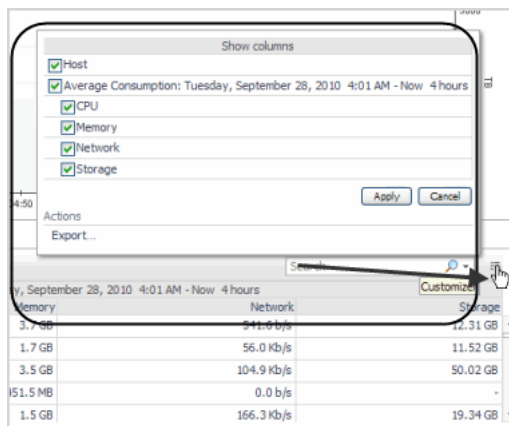
The Included host view shows the number of hosts in the capacity management scenario that provide sufficient data to contribute to the charts displayed in the Scenario Modeler.

Figure 35. Included Host view

Host	CPU	Memory	Network	Storage
svlmu01.dev.quest.com	117.8 MHz	3.7 GB	341.6 b/s	12.31 GB
svlabagent	268.6 MHz	1.7 GB	56.0 kb/s	11.52 GB
svlvc.dev.quest.com	115.8 MHz	3.5 GB	104.9 kb/s	90.02 GB
svlvc_rmsq2005	15.8 MHz	451.5 MB	0.0 b/s	-
ex2k7-sr1.ex2k7eb.st	56.6 MHz	1.5 GB	166.3 kb/s	19.34 GB

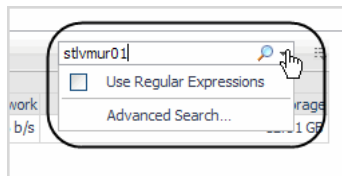
Clicking the **Customizer** icon, allows you to customize columns.

Figure 36. Customizer icon



The Search box allows you to search individual hosts.

Figure 37. Search box



Excluded Hosts

The Excluded Hosts view show in tabular form those hosts that did not provide sufficient data to contribute to the capacity management graphs created.

Figure 38. Excluded Hosts view

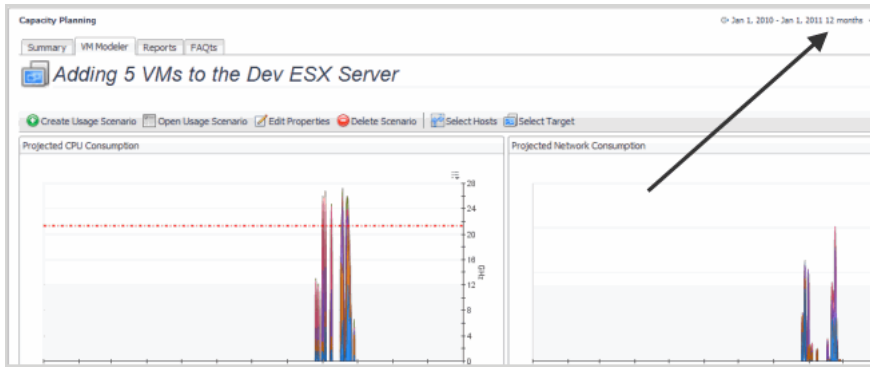
Host	CPU	Memory	Network	Storage
ex2k10-dc-ex2k-20ab.vfl	0.0 Hz	0.0 MB	0.0 b/s	21.7 GB
chaduse	n/a	1.0 GB	n/a	1.44 GB
astfms03-2embd6	0.0 Hz	0.0 MB	n/a	-
chadtemp	n/a	256.0 MB	n/a	-
fr-demo-dev.quest.com	0.0 Hz	0.0 MB	0.0 b/s	8.06 GB

Modifying Time Range Criteria

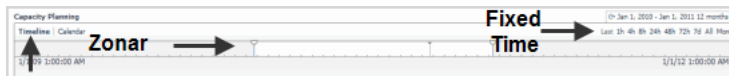
The default time range setting is four hours. When only looking at the last four hours, the server may appear to have enough CPU, memory, network, or disk resources to accommodate your new host(s). Looking at a longer time frame may reveal that the current hosts consume large quantities of resources at specific times. They may run during the weekend and the addition of hosts during those periods would negatively impact the server. Prior to moving a host to a new server, it is recommended to look at a longer historical timeframe to get a broader view of the server's resource availability. If you end up with a large list of excluded hosts, or VMs with insufficient data, experiment with shorter time intervals.

To modify the capacity management time range:

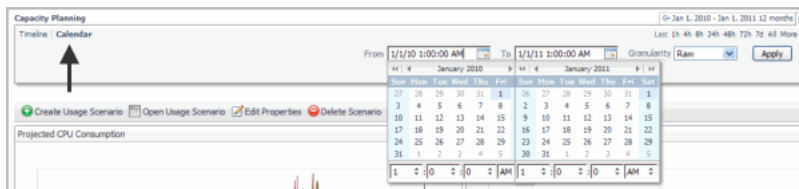
- 1 In the upper right corner of the dashboard, click the down arrow to view more time range options.



- 2 You can adjust the timeline of a capacity management usage scenario using the:
- **Timeline**—allows you to set a fixed time range or use a zonar to select a specific time range.



- **Calendar**—allows you to select a specific date range.

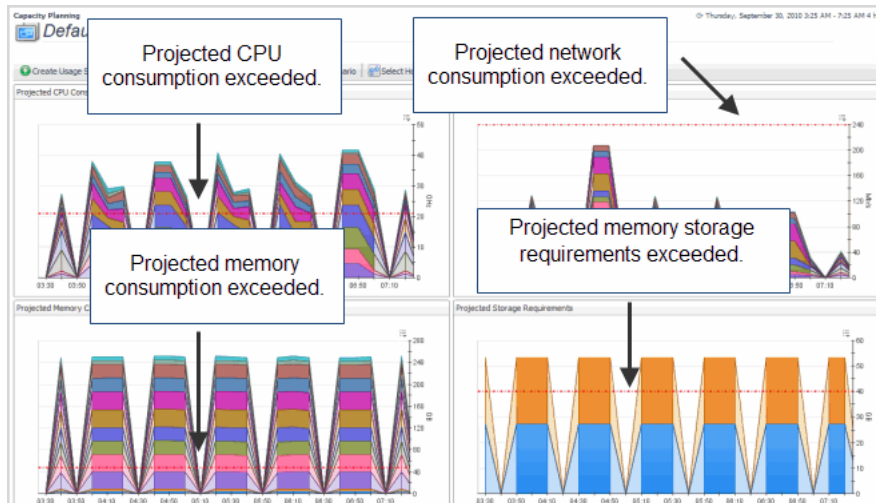


- 3 After selecting the time range, the capacity management charts update, displaying the new projected capacities.

Using Capacity Management Charts

After creating capacity management scenarios, the charts show the potential impact of moving the selected hosts to a particular server. The red dotted threshold lines show if the a projected capacity has been exceeded. If any of the charts (CPU, memory, network, storage) climb above these threshold lines, the selected server may not be a good candidate to receive these hosts. The server will not have enough spare resources to accommodate the requirements. The following graphic shows how capacity management planning helps prepare for the impact of adding hosts to a server machine for the time range selected.

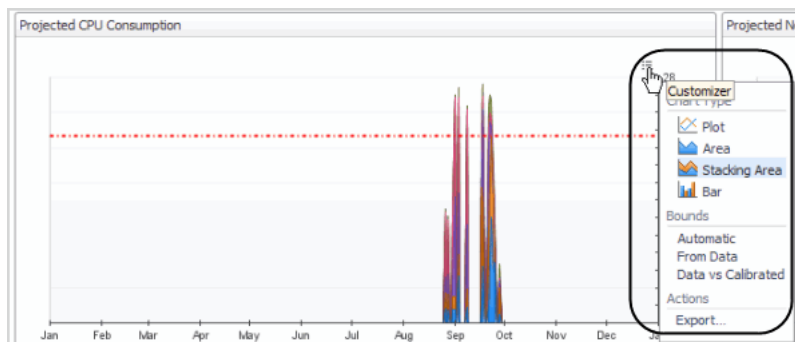
Figure 39. Capacity planning graphs



Changing Chart Types

Cartridge for Capacity Management charts allow you to change chart types and export capacity management data and graphics by clicking the **Customizer** list in the upper-right corner of each chart view.

Figure 40. Change Chart types with Customer button



From this drop-down, you can:

- [Change Chart Types](#) on page 37
- [Export Capacity Management Results](#) on page 39

Change Chart Types

Changing chart types allows you to closely and accurately analyze capacity management results. The following chart types are provided:

Figure 41. Plot

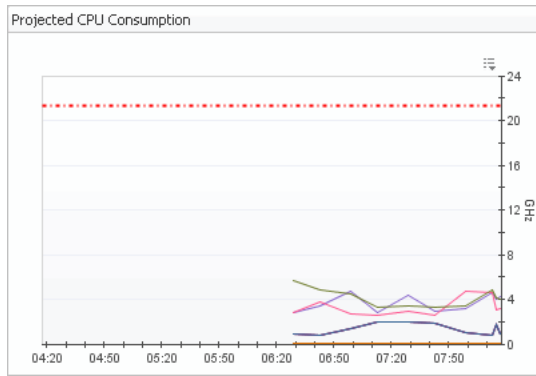


Figure 42. Area

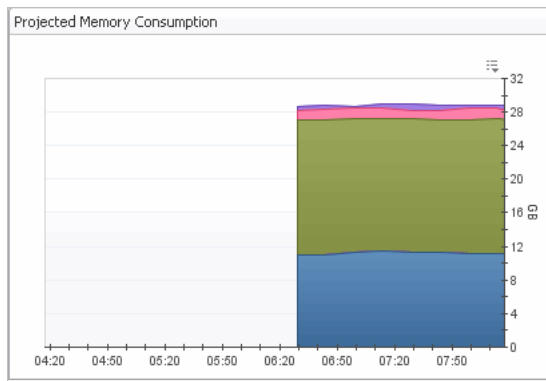


Figure 43. Stacking Area

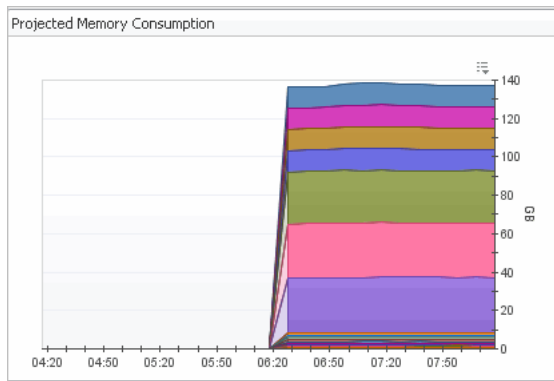
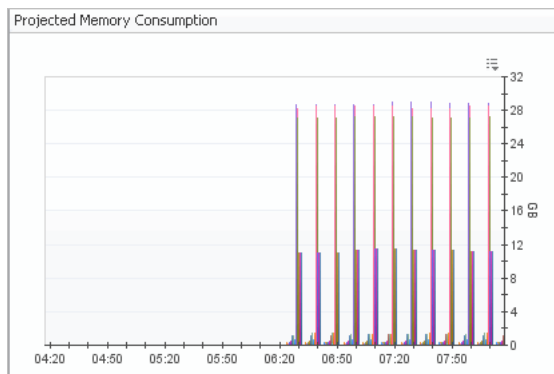
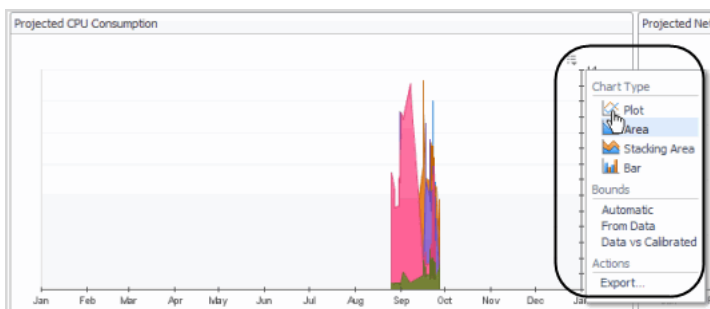


Figure 44. Bar



To change a chart type:

- In the upper-right corner of any chart, click the **Customizer** list and select the required chart type.



The newly selected chart type appears.

Export Capacity Management Results

You can export capacity management results in the following formats:

- PDF
- CSV
- Excel
- XML
- Chart image (PDF format)

To export capacity management results:

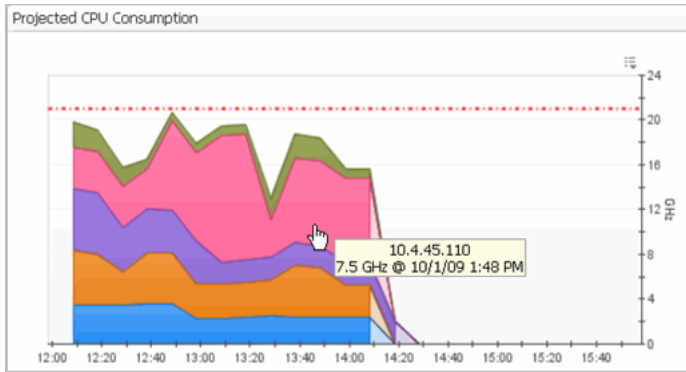
- 1 Click the **Customizer** list.
- 2 Select **Export**.
- 3 Select the required format type.

The selected export type displays, allowing you to view, download, or save.

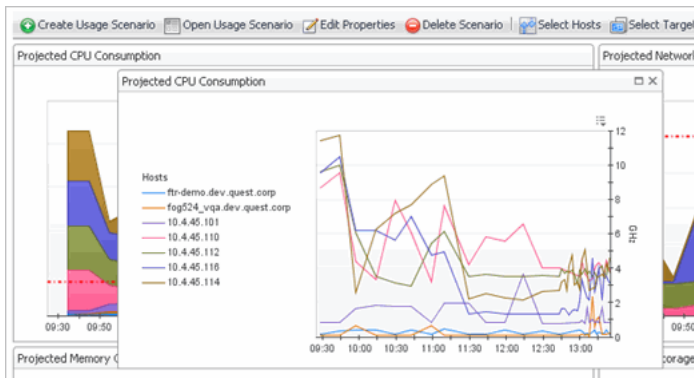
Gathering Additional Data from Charts

You can gather additional data from capacity management charts by:

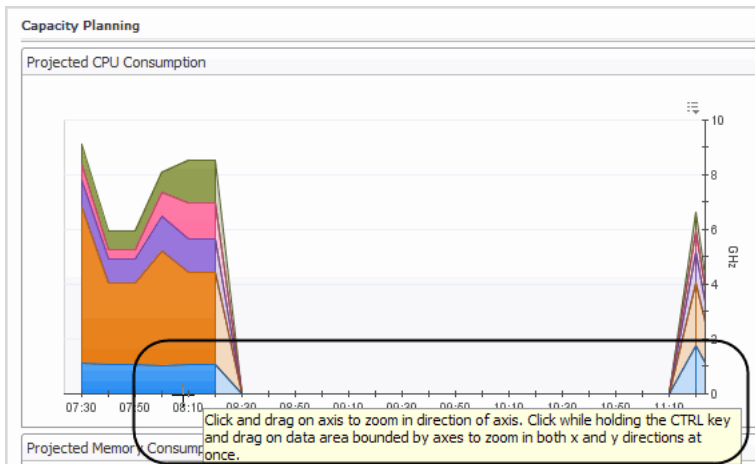
- Hovering the mouse pointer over a chart.



- Clicking on a chart displays a popup view that can be expanded allowing for closer investigation into the data it provides.



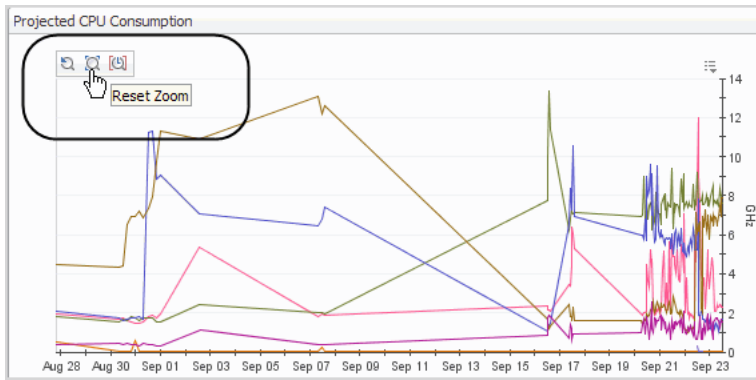
- Dragging the mouse along the x-axis or y-axis to zooms in on a time range. Hold the **Ctrl** key and drag the mouse to expand both axes at once.



The Reset Zoom tool tip allows you to:

- **Previous Zoom**—go back to the prior zoom.
- **Reset Zoom**—return to an un-zoomed state.
- **Update Range with Zoomed Time Range**—changes the time range at the top of the page to a custom value corresponding to the zoom.

Figure 45. Reset Zoom tool



We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece—you—to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit <https://www.quest.com/company/contact-us.aspx> or call +1-949-754-8000.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product.