vFoglight™ 6.0
Planning for Capacity in Virtual Environments
User Guide
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Introduction to this Guide

This chapter provides information about what is contained in the vFoglight Cartridge for Capacity Planning User Guide. It also provides information about the vFoglight documentation suite and Quest Software. This chapter contains the following sections:

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About vFoglight

vFoglight helps IT organizations understand the virtual infrastructure by managing the relationships and interaction between all the components in the environment, including data centers, data stores, clusters, resource pools, hosts and virtual machines. With vFoglight Cartridge for Capacity Planning, administrators can quickly determine the root-cause of an incident or problem, track virtual machine (VM) movements and understand their impact, and identify contention for resources between virtual machines.

About this Cartridge

The vFoglight Cartridge for Capacity Planning provides projected consumption metrics of virtual and physical machines for CPU, network, memory, and storage requirements. Hosts can be selected and metrics can be compared. Graphics are generated showing the consumption results of adding a new physical or virtual machines to an ESX server.

About this Guide

This User Guide provides an overview of the vFoglight Cartridge for Capacity Planning. This guide is intended for any user who wants to use the Cartridge for Capacity Planning browser interface. This User Guide is organized as follows:

Chapter 1, Introducing the Cartridge for Capacity Planning—provides an overview of the Cartridge for Capacity Planning.

Chapter 2, Interacting with the Cartridge for Capacity Planning—takes you through the various dashboards and associated views that make up the Cartridge for Capacity Planning user interface.

vFoglight Documentation Suite

The vFoglight documentation suite is made up of the core documentation set, plus the documentation set for each vFoglight cartridge that you deploy. Documentation is provided in a combination of online help, PDF, and HTML.
• **Online Help:** You can open the online help by selecting the Help tab from vFoglight Cartridge for Capacity Planning’s action panel.

![Online Help Image]


• **HTML:** Release Notes are provided in HTML.

**Core Documentation Set**

The core documentation set consists of the following files:

• *Release Notes* (HTML)
• *Getting Started Guide* (PDF)
• *What’s New Guide* (PDF)
• *System Requirements and Platform Support Guide* (PDF)
• *Installation and Setup Guide* set (all in PDF format):
  • Installation and Setup Guide—*Installing on Windows with an Embedded MySQL Database*
  • Installation and Setup Guide—*Installing on Windows with an External MySQL Database*
Cartridge Documentation Sets
When you deploy a cartridge, the documentation set for the cartridge is installed. The online help for the cartridge is integrated automatically with the core vFoglight Cartridge for Capacity Planning help. When you open the help, the name of the cartridge is displayed in a top level entry within the table of contents.

The documentation set for this cartridge consists of the following documents:

- vFoglight Cartridge Planning for Capacity Release Notes (HTML format)
- vFoglight Planning for Capacity in Virtual Environments User Guide (PDF and online help)
- vFoglight Planning for Capacity in Virtual Environments Reference Guide (PDF and online help)

Feedback on the Documentation
We are interested in receiving feedback from you about our documentation. For example, did you notice any errors in the documentation? Were any features undocumented? Do you have any suggestions on how we can improve the documentation? All comments are welcome. Please submit your feedback to the following email address:

info@vizioncore.com

Please do not submit Technical Support related issues to this email address.
Text Conventions

The following table summarizes how text styles are used in this guide:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Code</strong></td>
<td>Monospace text represents code, code objects, and command-line input. This includes:</td>
</tr>
<tr>
<td></td>
<td>• Java language source code and examples of file contents</td>
</tr>
<tr>
<td></td>
<td>• Classes, objects, methods, properties, constants, and events</td>
</tr>
<tr>
<td></td>
<td>• HTML documents, tags, and attributes</td>
</tr>
<tr>
<td><strong>Variables</strong></td>
<td>Monospace-plus-italic text represents variable code or command-line objects that are replaced by an actual value or parameter.</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Bold text is used for interface options that you select (such as menu items) as well as keyboard commands.</td>
</tr>
<tr>
<td><strong>Files, components, and documents</strong></td>
<td>Italic text is used to highlight the following items:</td>
</tr>
<tr>
<td></td>
<td>• Pathnames, file names, and programs</td>
</tr>
<tr>
<td></td>
<td>• The names of other documents referenced in this guide</td>
</tr>
</tbody>
</table>

**About Vizioncore Inc.**

Vizioncore was formed in July 2002 as a consulting and software-development company with the mission to create easy-to-use software solutions that performed reliable and repeatable automation of datacenter functions specifically for the Citrix platform. A main corporate goal was to enable business partners to offer solutions that targeted real-world IT issues and provided the best possible installation and automation for their clients’ systems.

Vizioncore's solutions have proved successful in organizations from small to mid-sized businesses to large enterprises, in a wide variety of vertical industries, including Financial Services, Government, Healthcare, Manufacturing, and High Tech. Vizioncore, Inc. can be found in offices around the globe and at [www.vizioncore.com](http://www.vizioncore.com).
Contacting Vizioncore

Email: info@Vizioncore.com

Mail:
Vizioncore, Inc.
975 Weiland Ave
Buffalo Grove, IL 60089

Web site: www.vizioncore.com

Refer to our Web site for regional and international office information.

Contacting Vizioncore Support

Vizioncore Support is available to customers who have a trial version of a Vizioncore product or who have purchased a commercial version and have a valid maintenance contract.

Vizioncore Support is easily accessed in the following ways:

• Email support directly at support@vizioncore.com for automatic case creation.
• Contact Vizioncore support directly via our global and local telephone numbers.
• Log and create/update your case, and check its status via the Vizioncore Support Case Management portal.

View the Vizioncore Support Guide for a detailed explanation of support programs, online services, contact information, and policy and procedures. The guide is available at:


Contacting Quest Support

Quest Support is available to customers who have a trial version of a Quest product or who have purchased a commercial version and have a valid maintenance contract. Quest Support provides around the clock coverage with SupportLink, our web self-service. Visit SupportLink at: http://support.quest.com.

From SupportLink, you can do the following:

• Quickly find thousands of solutions (Knowledgebase articles/documents).
• Download patches and upgrades.
• Seek help from a Support engineer.
• Log and update your case, and check its status.

View the *Global Support Guide* for a detailed explanation of support programs, online services, contact information, and policy and procedures. The guide is available at: [http://support.quest.com/pdfs/Global Support Guide.pdf](http://support.quest.com/pdfs/Global Support Guide.pdf).
Introducing the Cartridge for Capacity Planning

This chapter provides an overview of how the Cartridge for Capacity Planning works. Complete, step-by-step procedures are available in subsequent chapters (For more information, see “Steps to Configure and Use the Cartridge for Capacity Planning” on page 24.)

This chapter contains the following sections:

- Why You Use the Cartridge for Capacity Planning ............................................................... 14
- The Cartridge for Capacity Planning Dashboard at a Glance ............................................... 14
Why You Use the Cartridge for Capacity Planning

A host is a computer which can be a physical or virtual machine. Virtual machines (VMs) are quickly becoming the industry norm in IT infrastructures. Planning the addition of virtual machines to an Elastic Sky X (ESX) server can be a challenge for IT administrators. They lack the required metrics to accurately forecast projected CPU, memory, network consumption, and storage requirements. Monitoring virtual machine environments with the vFoglight Cartridge for Capacity Planning simplifies the planning process and allows administrators to obtain projected, accurate metrics for virtual or physical machine capacity planning.

The Cartridge for Capacity Planning Dashboard at a Glance

You use the Cartridge for Capacity Planning to project consumption metrics of virtual and physical machines when targeted to ESX servers. From this dashboard you obtain:

- Projected CPU Consumption (gigahertz)
- Projected Network Consumption (gigabytes)
- Projected Memory Consumption (kilobytes per second)
- Projected Storage Consumption requirements (gigabytes)
Introducing the Cartridge for Capacity Planning

The Cartridge for Capacity Planning Dashboard at a Glance

Hosts are selected and metrics are compared. Charts are generated showing what happens when new physical or virtual machines are added to an ESX server. The Cartridge for Capacity Planning allows you to select any number of VMs and predict their combined impact on the target ESX host’s resources. You can also select an ESX host to see the resource impact caused by all of its resident VMs.

The Capacity Planning cartridge provides two dashboards:

- VM Capacity Planner (with storage requirements)
- VM Capacity Planner (without storage requirements)
The VM Capacity Planner (No Storage) dashboard excludes the disk consumption in situations where you want to focus on the ESX host itself and exclude the impact on external shared storage.

The Cartridge for Capacity Planning thresholds are user-configurable. You can change the hardware configuration of the physical ESX host to learn about the effects of different hypothetical configurations (e.g., what if I had four more CPUs? What if I had...
3.6 gigahertz CPUs? What if I had twice as much memory?, etc.). You can create and model what the capacity loads look like on a hypothetical ESX server.

You access the Capacity Planning dashboard from navigation panel by clicking Dashboards > Capacity Planning.
Note: Any hosts being monitored by Foglight are automatically displayed in the Cartridge for Capacity Planning dashboard.

An Overview of Creating Capacity Planning Usage Scenarios and Viewing Results

The following provides the basic steps required to create a hypothetical capacity planning usage scenario and view charts reporting capacity testing results. For more information, see “Steps to Configure and Use the Cartridge for Capacity Planning” on page 24.

1. Create a Usage Scenario—you create usage scenarios to project CPU, network, memory consumption, and storage requirements when hosts are targeted to ESX servers. Click Create Usage Scenario.
Introducing the Cartridge for Capacity Planning

An Overview of Creating Capacity Planning Usage Scenarios and Viewing Results

The Create Usage Scenario dialog appears. Here you set the capacities of the system used to host the virtual machines and click **Save**.

2. **Assign host**—you next assign the hosts used to test against the ESX server being tested for capacity. Click **Select Hosts**.
The Select Hosts dialog appears. Here you select and assign the hosts for the capacity planning scenario being created and click **Finish**.

3. Select target— you next set the target host machine you want to test against. Click **Select Target**.
The Select Target dialog appears. You select the target host you want to test against and click **Finish**.

**Note**  Selecting a target overrides whatever was set for the capacity when the usage scenario was created.

Viewing results—after selecting the target machine and host the charts appear showing if any capacity was exceeded for the created usage scenario. Red dotted lines represent capacity lines indicating if a projected consumption or requirement was exceeded for the capacity planning usage scenario created.
Modifying time range criteria—prior to moving a VM to a new ESX host, it is recommended to look at a longer historical timeframe (e.g., Last Month, This Year, All Time) to get a broader view of ESX host resource availability rather than using the default of the last four hours. If you end up with a large list of excluded hosts, or VMs with insufficient data, then experiment with shorter time intervals.
Interacting with the Cartridge for Capacity Planning

This chapter takes you through the various dashboards and associated views in the Cartridge for Capacity Planning. This chapter contains the following sections:

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- How Targets and Hosts Show up in the Cartridge for Capacity Planning to Build Scenarios.....26
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Steps to Configure and Use the Cartridge for Capacity Planning

The Cartridge for Capacity Planning dashboards allow users to project what will happen if virtual machines are added to EXS servers. The following procedure provides the workflow required to select available hosts, choose a target EXS server, and view the projected capacity planning metrics:

1. Confirm that the Cartridge for Capacity Planning has been installed and enabled:
   a. Refer to the vFoglight 5.5.0 Administration and Configuration Guide for cartridge installation instructions.
   b. After Cartridge for Capacity Planning installation, the enabled cartridge displays in the Foglight Cartridge Inventory dashboard.

2. Create capacity planning usage scenarios—you create capacity planning usage scenarios to project how adding virtual machines to an ESX server affects CPU capacity, memory capacity, network bandwidth, and available storage. For more information, see “Create Usage Scenario” on page 27.

3. Select the hosts—hosts are selected and added to a capacity planning usage scenario to determine if an ESX server’s capacity is exceeded. For more information, see “Selecting Hosts” on page 32.

4. Select the target—you select a target ESX host to represent the type of server the selected host (VMs) will be targeted against. For more information, see “Select Target” on page 36.

5. Open and manage scenarios properties—after creating a usage scenario, you can tailor that scenario to determine what affect changing VM properties will have on an ESX server. For example, what if bandwidth was raised to 4000 megabytes per second. For more information, see “Open Usage Scenario” on page 29.
Navigating to Capacity Planning Dashboards

After installing the Cartridge for Capacity Planning, the Capacity Planning dashboards appear in the navigation panel.

**Note** If the Capacity Planning dashboard is not present, refer to the *vFoglight Administration and Configuration Guide* or the *vFoglight Installation and Setup Guide* for installation procedures.

To view the Cartridge for Capacity Planning dashboards:

1. On the navigation panel click **Dashboards > Capacity Planning > VM Capacity Planner**.
How Targets and Hosts Show up in the Cartridge for Capacity Planning to Build Scenarios

Any virtual or physical hosts and ESX servers (target machines) being monitored by Foglight automatically display in the Cartridge for Capacity Planning dashboards. No further setup is required.
Using the VM Capacity Planning Dashboard

You use the VM Capacity Planning dashboard to set scenario properties, select available hosts, choose a target ESX server, and view the projected capacity planning metrics in the dashboard charts. The VM Capacity Planning dashboard provides the following tabs:

- Create Usage Scenario (See page 27.)
- Open Usage Scenario (See page 29.)
- Scenario Properties (See page 30.)
- Delete Scenarios (See page 32.)
- Selecting Hosts (See page 32.)
- Select Target (See page 36.)
- Modifying Time Range Criteria (See page 37.)

Create Usage Scenario

You begin the capacity planning process by creating usage scenarios. You use these scenarios to pick host machines you want to target against an ESX server. When creating capacity planning 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.
To create a capacity planning usage scenario:

1. On the VM Capacity Planner dashboard, click Create Usage Scenario.

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

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

2. Enter the required scenario properties.

3. Click Save.
Open Usage Scenario

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

To open a usage scenario:

1. Click **Open Usage Scenario**.

   ![Open Usage Scenario](image)

   The Select Usage Scenario dialog appears.

2. Select the required usage scenario.

3. Click **OK**.

   The selected usage scenario appears in the VM Capacity Planner dashboard.
Scenario Properties

Once you have opened a usage scenario, Edit Properties allows you to edit a scenario already created and tailor its properties to project capacity planning.

To edit a capacity planning usage scenario:

1. Click **Edit Properties**.

The Add/Edit Usage Scenario Properties dialog appears.

2. Make the required capacity planning usage scenario property changes.
3 Click Save.

Delete Scenarios

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

To delete a capacity planning scenario:

1 Open the scenario you want to delete. (See Open Usage Scenario.)

2 Click Delete Scenario.
The Delete Usage Scenario dialog appears.

3 Click **OK**.

**Selecting Hosts**

After creating the usage scenario, you select and assign the hosts you want to use for the capacity planning scenario.

To select and assign hosts:

1 Click **Select Hosts**.

The Select Hosts dialog appears.
2 From this dialog you:

- **Assign hosts**—you select the required hosts in the Available Hosts list and move them to the Selected Hosts to create a usage scenario. 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 **Instance**. The host
instance popup appears. Fill in the required number of instances and click Apply.

- Search—you use Search to type a partial name of the VMs of interest in the Search box (if their names share a common string of characters), click Search to generate the VM list, click Select All to select the VMs in that list, and then click Assign to add them to the Selected Hosts list.
- Clear—click Clear to empty the Search box.
- Advanced—click Advanced to see additional search options.

The available operators are:
< (less than)
= (less than or equal)
= (equal)
? (not equal)
= (greater than or equal)
> (greater than).
- 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 Available Hosts.

4 Click Assign.
The hosts are moved to the Selected Hosts list.

5 Click **Finish**.

**Select Target**

After selecting and assigning the required hosts, you select the ESX server you want to run those host against. The target server can be changed at anytime to analyze capacity planning usage scenarios.

To select a target:

1 Click **Select Target**.

The Select Target dialog appears.

2 Select the required target machine.

**Note** Selecting a target overrides whatever was set for the capacity when the usage scenario was created.
3 Click **Finish**.

The VM Capacity Planner dashboard updates with graphs reflecting the addition or changes of the new target machine.

### Modifying Time Range Criteria

Prior to moving a VM to a new ESX host, it is recommended to look at a longer historical timeframe (e.g., Last Month, This Year, All Time) to get a broader view of ESX host resource availability rather than using the default of the last four hours. If you
end up with a large list of excluded hosts, or VMs with insufficient data, then experiment with shorter time intervals.

When only looking at the last four hours, the ESX host may appear to have enough CPU, memory, network, or disk resources to accommodate your new VM. But looking at a longer time frame may reveal that the already-present VMs may consume large quantities of resources at specific times. They may run week-end and month-end reports and the addition of one more VM during those periods would negatively impact the ESX host.

To modify the capacity planning time range:

1. Click the Timeline dropdown in the upper right corner of the dashboard.

2. You can adjust the timeline of a capacity planning usage scenario using the:
   - Timeline—the timeline allows you to set a fixed timeframe or use a zonar to select a specific timeframe.
   - Calendar—the calendar tab allows you to select a specific date range.

3. After selecting the time range, the Capacity Planning charts update, displaying the new projected capacities.
VM Capacity Planner (No Storage) Dashboard

The VM Capacity Planner (No Storage) dashboard has the same views and functionality as the VM Capacity Planner dashboard. The only difference is that the Projected Storage Requirements view does not have the Projected Storage Requirements chart. Virtual hard disk storage is usually separate from the ESX server. By not displaying the projected storage, a separate view of the projected metrics can be given, providing a clearer view of ESX server capacity.

Using Capacity Planning Charts

After creating capacity planning scenarios, the charts show the potential impact of moving the selected VMs to a particular host. 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 ESX host is not a good candidate to receive these VMs. The ESX host will not have enough spare resources to accommodate them. The following graphic shows how the Cartridge for Capacity Planning impacts the addition of VMs to an ESX host machine for the time range selected.
Capacity Planning charts allow you to change chart types and export capacity planning data and graphics by clicking the **Chart Type** list in the upper-right corner of each chart view.

From this drop-down, you can:

- Change Chart Types ([See page 41.](#))
- Export Capacity Planning Results ([See page 43.](#))
Change Chart Types

Changing chart types allows you to closely and accurately analyze capacity planning results. The Cartridge for Capacity Planning provides the following chart types:

- Plot

![Plot Chart](image)

- Area

![Area Chart](image)
• Stacking Area

To change chart type:

1. In the upper-right corner of any chart, click the Customizer list.
2 Select the required chart type.

The newly selected chart type appears.

**Export Capacity Planning Results**

You can export capacity planning results in the following formats:

- PDF
- CSV
- Excel
- XML
- Chart image

To export capacity planning results:

1 Click the **Customizer** list.
2 Select Export.

3 Select the required type of format. The selected format appears.

**Gathering Additional Data from Charts**

You can gather addition data from Capacity Planning charts by:

- Hovering your mouse pointer over a graph.
• Double-clicking a graph.

• Dragging the mouse along the x-axis or y-axis to zoom in on a time range. Hold the Ctrl key and drag the mouse to expand both axes at once.
The Reset Zoom popup 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**—change the time range at the top of the page to a custom value corresponding to the zoom.
Capacity Planning Reports

The Cartridge for Capacity Planning provides the following reports templates:

- **ESX Host Capacity Trending**—this template is used to generate a report that shows projected CPU, memory and network usage values for the next 90 days for each ESX Host in the service. The projected values are calculated based on data observed for the past three months.

- **Datastores Capacity Trending**—this template can be used to generate a report that shows the capacity trending (used space, total space, growth rate per week, and time to full) for each datastore of each ESX host in the service. The projected values are calculated based on data observed for the past three months.

For procedures on generating Capacity Planning reports, refer to the *Managing Virtualized Environments User Guide*. 
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