

# vCenter CapacityIQ Installation Guide

vCenter CapacityIQ 1.5

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**VMware, Inc.**  
3401 Hillview Ave.  
Palo Alto, CA 94304  
[www.vmware.com](http://www.vmware.com)

# Contents

|  |           |
|--|-----------|
| About This Book  | 5         |
| <b>1 About vCenter CapacityIQ</b>                            | <b>7</b>  |
| CapacityIQ Main Tasks  | 7         |
| CapacityIQ Architecture                                      | 7         |
| Administrator Process Overview for CapacityIQ                | 9         |
| Licensing CapacityIQ   | 9         |
| <b>2 Installing the CapacityIQ Virtual Appliance</b>         | <b>11</b> |
| CapacityIQ Installation Requirements                         | 12        |
| Deploy the Virtual Appliance                                 | 13        |
| Configure the Virtual Appliance                              | 14        |
| Configure Network and Time Zone Settings                     | 15        |
| Configure SMTP Settings                                      | 16        |
| CapacityIQ Configuration                                     | 16        |
| Grant Access to CapacityIQ                                   | 20        |
| Verify the CapacityIQ Installation                           | 20        |
| <b>3 Updating or Replacing a CapacityIQ Instance</b>         | <b>21</b> |
| Update CapacityIQ  | 21        |
| Replace a Registered Instance of CapacityIQ                  | 22        |
| <b>4 Post-Installation Tasks for CapacityIQ</b>              | <b>23</b> |
| Convert a CPU Evaluation License to a CPU Full License       | 23        |
| Optimizing the CapacityIQ Setup                              | 23        |
| <b>5 Troubleshooting Installation</b>                        | <b>25</b> |
| DHCP Address Avoidance at Startup                            | 25        |
| Restarting the vSphere Client is Required After Registration | 26        |
| Registration Fails Because of Existing Registration          | 26        |
| Data Unavailable During Initial Startup                      | 26        |
| Wrong Time Zone Setting                                      | 27        |
| System Time Synchronization                                  | 27        |
| Virtual Appliance Password Forgotten                         | 28        |
| No Volume Groups Found                                       | 28        |
| DHCP Not Available Causes Network Connection Failure         | 28        |
| Cannot Remove SSH Keys                                       | 29        |
| <b>Index</b>   | <b>31</b> |



# About This Book

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The *vCenter CapacityIQ Installation Guide* describes how to install the VMware vCenter™ CapacityIQ virtual appliance.

## Intended Audience

CapacityIQ is a capacity planning and management tool for VMware vSphere environments. This book is intended for administrators of vSphere who are familiar with virtual machine technology and datacenter operations, and who are responsible for administering CapacityIQ. This book offers instructions for installing CapacityIQ and information that helps resolve installation issues.

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## VMware CapacityIQ Documentation

The documentation set for VMware CapacityIQ consists of the following documents.

- *vCenter CapacityIQ Installation Guide*. Explains installation of CapacityIQ.
- *vCenter CapacityIQ Release Notes*. Late-breaking news and descriptions of known issues and workarounds.
- vCenter CapacityIQ online help. Conceptual and procedural information to help you complete a task.
- vCenter CapacityIQ Administration Portal online help. Conceptual and procedural information to help you complete an administrative task.

The vCenter CapacityIQ landing page provides release notes that contain current information about the release. You can find the landing page, as well as documentation for vSphere, at <http://www.vmware.com/support/pubs>.

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# About vCenter CapacityIQ

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VMware vCenter™ CapacityIQ helps vSphere system administrators monitor and manage the capacity of virtualized environments.

Install CapacityIQ as a vCenter Server plug-in. CapacityIQ ensures that virtualized infrastructure capacity is efficient and predictable.

The what-if scenario feature allows administrators to model changes to the virtualized environment and assess the effect of a change without implementation costs or time-consuming trial and error.

This chapter includes the following topics:

- [“CapacityIQ Main Tasks,”](#) on page 7
- [“CapacityIQ Architecture,”](#) on page 7
- [“Administrator Process Overview for CapacityIQ,”](#) on page 9
- [“Licensing CapacityIQ,”](#) on page 9

## CapacityIQ Main Tasks

CapacityIQ collects performance information about managed objects, such as hosts and virtual machines in the virtual infrastructure. CapacityIQ stores the information in the CapacityIQ database.

You query the database to understand available capacity in the virtual infrastructure. CapacityIQ performs these tasks.

- Collects performance statistics about managed objects in the virtual infrastructure.
- Stores the statistics in the CapacityIQ database and builds a performance history for each object.
- Collects and stores inventory history for each object, such as moving a virtual machine from one host to another.
- Retrieves and presents the statistics on demand through the CapacityIQ user interface.
- Filters the information presented according to objects, time periods, or types of activity.
- Provides scenarios to model potential changes to the virtual infrastructure.

## CapacityIQ Architecture

CapacityIQ is a virtual appliance that you install on vCenter Server. A virtual appliance is a virtual machine image that contains software designed to run in a virtual machine.

CapacityIQ does not affect the performance of vSphere. The CapacityIQ virtual appliance processes the vCenter Server data.

You must have one vCenter Server instance for each CapacityIQ instance. If you have vCenter Server Linked Mode groups in your environment, install a separate instance of CapacityIQ for each vCenter Server system.

The virtual appliance includes the following components as illustrated in [Figure 1-1](#).

**CapacityIQ Administrative Server** The CapacityIQ administrative server provides the Administration Portal user interface for the CapacityIQ system administrator to configure and maintain the virtual appliance.

**CapacityIQ Server** The CapacityIQ server hosts an operating system and the CapacityIQ application. A monitoring feature called watchdog tracks whether CapacityIQ processes are operating properly. The watchdog logs exceptions such as services stopping and starting. Events are posted in the `ciq_watchdog.log` file.

**Database Server** The CapacityIQ virtual appliance includes its own PostgreSQL database. The database server stores data collected from objects managed in vCenter Server.

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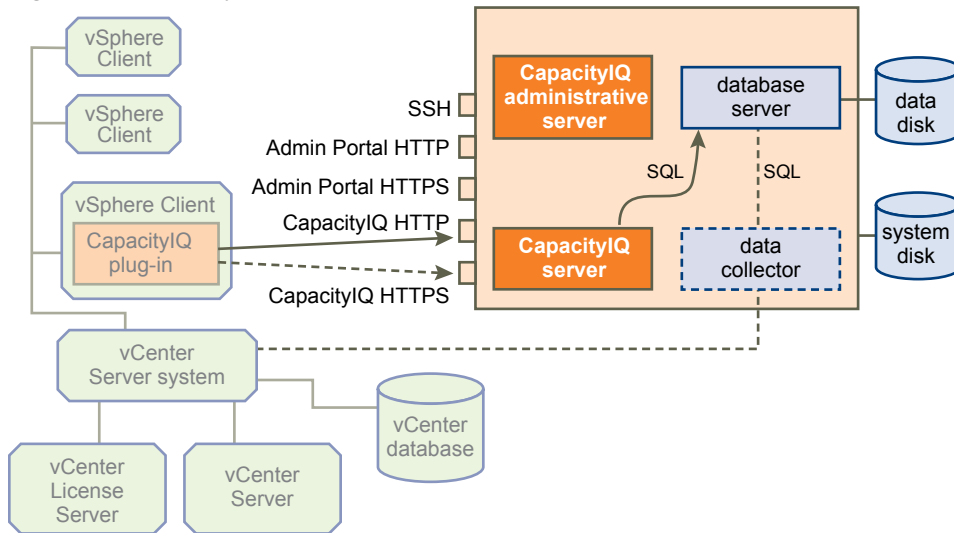
**NOTE** CapacityIQ does not support storing data in an external database.

---

**Data Collector** The data collector collects inventory and performance data. Configure the data collector to access vCenter Server through port 443 on vCenter Server.

Each instance of the vSphere Client installed on vCenter Server can use CapacityIQ. CapacityIQ does not require changes to your vCenter Server setup, such as modifying the logging levels.

**Figure 1-1.** CapacityIQ Architecture Components



CapacityIQ begins collecting performance data shortly after installation. Updates to performance statistics in the CapacityIQ database occur using standard vSphere APIs. Data collection remains continuous unless you stop CapacityIQ.

CapacityIQ begins to populate the dashboard within an hour or so after you install the virtual appliance. To generate meaningful information in views and reports, wait until you have collected at least three days of performance data.

## Administrator Process Overview for CapacityIQ

The person administering CapacityIQ is responsible for installation, maintenance, and troubleshooting.

### Setup

The initial setup includes the following tasks.

- 1 In the vSphere Client, import the CapacityIQ appliance.
- 2 Deploy the CapacityIQ appliance, which means that CapacityIQ completes an initialization sequence. This process includes entering account credentials for the virtual appliance services and CapacityIQ Administration Portal access.
- 3 Configure the network and time zone settings.
- 4 Open a browser and log in to the CapacityIQ Administration Portal.
- 5 Configure the settings to register CapacityIQ with vCenter Server.
- 6 Apply the CapacityIQ license.
- 7 Verify that CapacityIQ populates the dashboard with data.

The process of populating the dashboard might take a few hours.

If you already have an instance of CapacityIQ installed, you can update the virtual appliance to the latest release.

### Maintenance

After initial setup is complete, perform ongoing administrator tasks.

- Stop or restart CapacityIQ, for example, during a vCenter Server maintenance cycle.
- Check the status of CapacityIQ on the **Status** tab in the Administration Portal.
- Apply patches and updates to the CapacityIQ application.
- Manage license changes and renewals.
- Troubleshoot any problems and send diagnostic data to VMware technical support.

## Licensing CapacityIQ

CapacityIQ supports license management through vCenter Server or through the CapacityIQ Administration Portal depending on the license type and version of vCenter Server that CapacityIQ is registered to.

### CPU Licenses for CapacityIQ

The Administration Portal supports the management of only CPU-based licenses for CapacityIQ. If you have an existing CPU-based license, it will continue to function with vCenter Server 4.1.

### Virtual Machine Licenses for CapacityIQ

If you obtain a virtual machine-based license for CapacityIQ, install and manage the license from vCenter Server. Virtual machine-based licenses for CapacityIQ require vCenter Server 4.1 or later versions. For information about assigning license keys to assets in vCenter Server, see the VMware vSphere documentation.

## Evaluation and Full Licenses

You can download a free evaluation version of CapacityIQ that offers a trial period. For more information about licensing, see the VMware licensing portal.

# Installing the CapacityIQ Virtual Appliance

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# 2

Only the CapacityIQ administrator performs installation and setup tasks. Installation includes using the vSphere Client interface for importing the appliance, deploying the appliance by running a Linux-based installation script, and configuring the virtual appliance.

## Procedure

- 1 [CapacityIQ Installation Requirements](#) on page 12  
Before you install CapacityIQ, your vSphere environment must meet virtual appliance, port access, and listening port requirements.
- 2 [Deploy the Virtual Appliance](#) on page 13  
You use the vSphere Client user interface to deploy the CapacityIQ appliance. VMware distributes the appliance as a .zip file that includes an Open Virtualization Format (OVF) file.
- 3 [Configure the Virtual Appliance](#) on page 14  
After you import the CapacityIQ OVF file, configure the virtual appliance to set up access to the CapacityIQ Administration Portal.
- 4 [Configure Network and Time Zone Settings](#) on page 15  
When you configure the virtual appliance, you can configure optional network and time zone settings. Time zone settings affect the scheduling of reports, the time stamp generated in reports for CapacityIQ, and the daily and weekly dates that appear in the dashboard and views.
- 5 [Configure SMTP Settings](#) on page 16  
Configure an optional SMTP server to activate email service for CapacityIQ reports.
- 6 [CapacityIQ Configuration](#) on page 16  
Configuring CapacityIQ includes registering CapacityIQ, installing the license, and optionally installing a custom SSL certificate.
- 7 [Grant Access to CapacityIQ](#) on page 20  
The vSphere administrator grants users access to CapacityIQ by assigning the **CapacityIQ** privilege to a role.
- 8 [Verify the CapacityIQ Installation](#) on page 20  
Verify that CapacityIQ is properly installed so that you can start working with CapacityIQ.

## CapacityIQ Installation Requirements

Before you install CapacityIQ, your vSphere environment must meet virtual appliance, port access, and listening port requirements.

### vCenter Server/ESX Requirements

CapacityIQ supports vCenter Server 4.0 or later versions. For more information about the scalability limits and the vCenter Server and ESX Server versions that CapacityIQ supports, see the CapacityIQ release notes.

You must have one vCenter Server instance for each CapacityIQ instance. If you have vCenter Server Linked Mode groups in your environment, install a separate instance of CapacityIQ for each vCenter Server system.

vCenter Server includes a service called VMware VirtualCenter Management Webservices. CapacityIQ requires vCenter Server to run this service.

### CapacityIQ Virtual Appliance Requirements

[Table 2-1](#) lists the requirements for the CapacityIQ virtual appliance.

**Table 2-1.** Requirements for the CapacityIQ Virtual Appliance

| Component  | Minimum Requirement  |
|------------|--|
| CPU        | 2vCPU on a 2.4GHz or faster CPU  |
| Memory     | 3600MB   |
| Disk space | 258GB for vSphere 4.0 with thick disk provisioning<br>258GB for vSphere 4.1 with thick disk provisioning<br>Approximately 12GB for vSphere 4.1 with thin disk provisioning |
| ESX host   | ESX 3.0.2  |

The CapacityIQ virtual appliance uses the Community ENTerprise Operating System (CentOS) 5.2 operating system.

### CapacityIQ Port Requirements

[Table 2-2](#) describes CapacityIQ port access requirements for TCP connection. Configure your external firewalls so that these ports are open.

**NOTE** You cannot customize the server ports for CapacityIQ.

**Table 2-2.** CapacityIQ Port Access Requirements

| Port Number | Description  |
|-------------|--|
| 22          | Must be open to enable SSH access to the CapacityIQ virtual appliance        |
| 80          | Administration Portal HTTP server port (forwards to port 8080)               |
| 443         | Administration Portal HTTPS server port (forwards to port 9443)              |
| 5480        | HTTPS server port for the VMware Studio version of the Administration Portal |
| 8080        | CapacityIQ HTTP port   |
| 8443        | CapacityIQ HTTPS port  |

## CapacityIQ Listening Ports

Table 2-3 describes the local listening ports that CapacityIQ requires. These ports do not require an opening in your firewall.

**Table 2-3.** CapacityIQ Listening Ports

| Port Number | Description   |
|-------------|---|
| 5432        | PostgreSQL server port. Listens to connections from localhost only.                       |
| 5488, 5489  | Ports that the VMware Studio version of the Administration Portal use                     |
| 8005, 9005  | Apache Tomcat management ports for the Administration Portal                              |
| 8080, 8443  | These CapacityIQ ports are listening ports and ports that are required for TCP connection |
| 9080        | Administration Portal HTTP server port  |
| 9443        | Administration Portal HTTPS server port   |

## Administration Portal Supported Browsers

Access the CapacityIQ Administration Portal using these browsers.

- Internet Explorer 6.0.x, 7.0.x, and 8.0.x
- Mozilla Firefox 2.0.x and 3.x

## Deploy the Virtual Appliance

You use the vSphere Client user interface to deploy the CapacityIQ appliance. VMware distributes the appliance as a .zip file that includes an Open Virtualization Format (OVF) file.

### Prerequisites

- Use vSphere 4.1. If you use vSphere 4.0, perform this procedure only when you can deploy CapacityIQ with thick disks instead of thin disks. For information about deploying CapacityIQ with thin disks in a vSphere 4.0 environment, see [“Deploy the Virtual Appliance with Thin Disks in vSphere 4.0,”](#) on page 14.
- You are in the vSphere Client and your assigned role and permissions allow you to import a virtual appliance.

### Procedure

- 1 Download and extract the CapacityIQ .zip file.
- 2 In the vSphere Client that is connected to a vCenter Server system or an ESX host, select **File > Deploy OVF Template**.
- 3 Locate the extracted .ovf file.

For information about how to complete the wizard, see the vSphere documentation. The network switch that you select must have access to vCenter Server and the datastore must have enough capacity to deploy the virtual appliance.

The virtual appliance appears in the vSphere Client inventory panel as a virtual machine.

**What to do next**

Configure the virtual appliance.

**Deploy the Virtual Appliance with Thin Disks in vSphere 4.0**

To deploy CapacityIQ with thin disks instead of thick disks in a vSphere 4.0 environment, use the VMware OVF tool to deploy the CapacityIQ appliance.

vSphere 4.0 prevents you from deploying CapacityIQ with thin disk provisioning despite the default thin disk setting for the CapacityIQ OVF disks. You might prefer thin disks in a small environment with limited storage space.

**Prerequisites**

- Download the VMware OVF utility version 2.0.1.
- Use vSphere 4.0.
- Use an ESX host 4.0 with VMFS 3 or later version of the datastore.

**Procedure**

- 1 Download and install the VMware OVF tool version 2.0.1.
- 2 Download CapacityIQ to the same computer and extract the zip file.
- 3 Open a command prompt and navigate to the directory that the OVF tool is installed in.
- 4 Deploy CapacityIQ with thin disks.

```
ovftool --name=CapacityIQ_virtual_machine_name --datastore=datastore_name --diskMode=thin --
powerOn unzipped_OVF_file_path
vi://vCenter_Server_user_name:vCenter_Server_password@vCenter_Server_IP_address/?
ip=ESX_host_IP_address
```

- 5 Accept the license agreement and refer to the OVF tool help to complete the deployment process.
- 6 In the vSphere Client, open the CapacityIQ virtual machine console and follow the instructions in the console.

CapacityIQ uses thin disks in a vSphere 4.0 environment.

**What to do next**

Configure the virtual appliance.

**Configure the Virtual Appliance**

After you import the CapacityIQ OVF file, configure the virtual appliance to set up access to the CapacityIQ Administration Portal.

**Prerequisites**

You imported the OVF file. The appliance appears as a virtual machine in the vSphere Client inventory panel.

**Procedure**

- 1 Select the virtual appliance icon in the vSphere Client inventory panel.
- 2 Power on the virtual machine.

- 3 Click the **Console** tab.

The deployment process begins.

- 4 Specify the passwords for the configuration process.

- A password for the root user.
- A password for the ciqadmin user.

When the process completes, the appliance console interface displays the URL to the Administration Portal.

The virtual appliance is configured.

### What to do next

On the **Console** tab, configure the network and time zone settings.

## Configure Network and Time Zone Settings

When you configure the virtual appliance, you can configure optional network and time zone settings. Time zone settings affect the scheduling of reports, the time stamp generated in reports for CapacityIQ, and the daily and weekly dates that appear in the dashboard and views.

### Prerequisites

You deployed and configured the CapacityIQ virtual appliance, and you are on the **Console** tab in the console interface.

---

**NOTE** The CapacityIQ virtual appliance uses DHCP (Dynamic Host Configuration Protocol) by default, and the CapacityIQ clock synchronizes with the ESX host on which it is running. Clock synchronization uses VMware Tools.

---

### Procedure

- 1 Navigate to **Configure Network**.
- 2 Select an IP address for the CapacityIQ virtual appliance.
  - Use a DHCP server to select an IP address by domain name, such as `ciq.vmware.com`.

---

**NOTE** CapacityIQ does not provide an interface to set the host name. If you use a DHCP IP address and it changes when you restart the virtual appliance, you might lose the connection to CapacityIQ from the vSphere Client.

---

- Use a static IP address for the CapacityIQ address. Static IP is the recommended choice. Either choice works. This choice is left to administrator preference or policies in your organization.
- 3 Navigate to **Set Timezone**, select the time zone from the list of zones, and click **OK**.  
If any time zones are missing from your view of the list, press Shift+PgUp or Shift+PgDn to scroll through the zones.
  - 4 Open a browser window and navigate to the URL that appears in the console interface to start the Administration Portal.
  - 5 For changes to network and time zone settings that occur after registering CapacityIQ, click **Restart** in the **Status** tab of the Administration Portal to restart CapacityIQ.

The first time you configure network and time zone settings, the **Restart** button is dimmed until you register CapacityIQ.

You configured the network and time zone settings. You are finished working in the vSphere Client for now.

---

**NOTE** These time zone settings do not affect the monthly, quarterly, and yearly dates in the dashboard and views that depend on UTC time. Time zones set in the virtual appliance affect the daily and weekly dates in the dashboard and views and all of the recurring time intervals for scheduled reports.

---

### What to do next

Configure optional SMTP server settings for CapacityIQ email service.

## Configure SMTP Settings

Configure an optional SMTP server to activate email service for CapacityIQ reports.

### Prerequisites

Log in to the Administration Portal with the user name `ciqadmin` and the password you selected during installation. The Administration Portal is accessible using the IP address shown in the virtual appliance console interface.

### Procedure

- 1 On the **SMTP** tab, select the **Enable report email service** check box.
- 2 Type the SMTP server address and port number.
- 3 Type the name and email address of the sender for the reports.
- 4 If the SMTP server requires SSL or TLS protocols, select the **Server requires an encrypted connection** check box and select the protocol.
- 5 If the SMTP server requires credentials, select the **Outgoing SMTP server requires authentication** check box and type the user name and password.
- 6 Click **Update**.

The SMTP server setup activates CapacityIQ options to email reports.

### What to do next

Configure CapacityIQ.

## CapacityIQ Configuration

Configuring CapacityIQ includes registering CapacityIQ, installing the license, and optionally installing a custom SSL certificate.

### Register CapacityIQ

Register the CapacityIQ appliance to establish communications and credentials for the vCenter Server system to which CapacityIQ connects.

#### Prerequisites

- Log in to the Administration Portal.
- Because the registration process involves assigning permissions at the root vCenter Server folder level and propagating them to child objects in the inventory tree, verify that the user who registers CapacityIQ does not have conflicting permissions that are set outside of the registration process and might block access to any objects. For more information about creating roles and assigning users to roles, see the vSphere documentation.

## Procedure

- 1 In the vSphere Client, create a role, such as `CIQ_ADMIN`, and assign the **Manage custom attributes**, **Set custom attribute**, and **Licenses** global privileges, and the **Register extension**, **Unregister extension**, and **Update extension** extension privileges.
- 2 Right-click the root vCenter Server folder in the inventory tree and select **Add Permission**.
- 3 In the Assign Permissions dialog box, assign the `CIQ_ADMIN` role to the user who is registering CapacityIQ and propagate the privileges to child objects.
- 4 In the Administration Portal, click **Register** on the **Setup** tab to configure the registration settings.
- 5 In the vCenter CapacityIQ - Register dialog box, specify whether to use the CapacityIQ IP address or fully qualified domain name.

If you register CapacityIQ with a fully qualified domain name, and you use DHCP, make sure vCenter Server and every instance of the vSphere Client that requires access to CapacityIQ can resolve the name to the IP address.

- 6 Specify the client connection type.
  - Select HTTPS to improve security. You must use HTTPS to establish a connection in a vCenter Server 4.1 environment.

---

**NOTE** HTTPS uses a self-signed SSL certificate unless you install a customized certificate.

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- Select HTTP if speed is more important than security in a vCenter Server environment that is earlier than version 4.1.
- 7 Type the server address, user name, and password for vCenter Server for which you want to analyze capacity.

---

**NOTE** The user name and password must give you privileges associated with the `CIQ_ADMIN` role in the vSphere Client. vCenter Server checks the credentials each time CapacityIQ starts up. If a change occurs, such as an expired password, you must update the credentials on the **Setup** tab of the Administration Portal.

---

- 8 Click **Apply** to complete the setup.  
The vCenter CapacityIQ - Register dialog box closes.
- 9 Restart the vSphere Client.

If you do not restart the vSphere Client after registration, the **CapacityIQ** button does not appear in the vSphere Client toolbar.

## Managing CapacityIQ Licenses

From the Administration Portal, you can install a CPU-based license or convert a CPU-based license to a virtual machine-based license.

If you obtain a virtual machine-based license for CapacityIQ, install and manage the license from vCenter Server. Virtual machine-based licenses require vCenter Server 4.1 or later versions. For information about assigning license keys to assets in vCenter Server, see the VMware vSphere documentation.

### Install a CPU-Based License for CapacityIQ

Install a CPU-based license that you can manage from the **License** tab of the Administration Portal.

#### Prerequisites

Log in to the Administration Portal.

## Procedure

- 1 On the **License** tab, type your CapacityIQ license key in the space provided and click **Apply**.  
CapacityIQ populates the License information area.
- 2 Verify that the License information is correct.

| Option                    | Description  |
|---------------------------|--|
| <b>License Type</b>       | License type is Demo if you installed an evaluation version, or Valid for a full license.  |
| <b>License Capacity</b>   | This value is based on the number of physical CPUs you are using. For example, if you have 689 ESX physical hosts that are visible to vCenter Server, you might have a license capacity of 1000 to allow for growth. |
| <b>License Used</b>       | Number of licenses that are deployed.  |
| <b>License Remaining</b>  | License Capacity minus License Used.   |
| <b>License Expires on</b> | Date and time of license expiration.   |
| <b>License Expires in</b> | Remaining number of days before expiration.  |

You installed and verified the CPU-based license. CapacityIQ updates the license information on the **Setup** tab.

## What to do next

Install the SSL certificate if you plan to use one. Otherwise, grant access to CapacityIQ.

## Convert a CPU License to a Virtual Machine License

You can convert an existing CPU-based license for CapacityIQ to a virtual machine-based license that you manage through vCenter Server instead of through the Administration Portal.

### Prerequisites

- Use a permanent virtual machine-based license.
- Log in to the Administration Portal.
- If your vCenter Server system is earlier than 4.1, unregister CapacityIQ and register it with a vCenter Server system that is 4.1 or later.
- In the vSphere documentation, review the process of adding license keys and assigning the keys to assets. If CapacityIQ does not appear as a license asset in vCenter Server, unregister and reregister CapacityIQ to the vCenter Server system.

## Procedure

- 1 In vCenter Server, add the virtual machine-based license and assign it to the CapacityIQ asset.
- 2 On the **Status** tab of the Administration Portal, click **Restart** to restart CapacityIQ.

CapacityIQ prevents you from managing the original CPU-based license through the Administration Portal.

## What to do next

Install the SSL certificate if you plan to use one. Otherwise, grant access to CapacityIQ.

## Request and Install a Custom SSL Certificate

CapacityIQ installs a self-signed SSL certificate on the virtual appliance. The self-signed certificate generates security warnings. If you do not want to use the self-signed security certificate, you can install a custom SSL certificate for CapacityIQ at the command line. This task is optional and does not affect CapacityIQ capabilities. If you are familiar with SSL certificate handling, you can use other methods.

### Procedure

- 1 Log in as the `ciqadmin` user to the CapacityIQ appliance by using an SSH client such as PuTTY.
- 2 Open a command-line prompt.
- 3 Enter the `ciq-admin` command to create the certificate request.

Use the following syntax.

```
ciq-admin ssl genkey
--org-unit organizationUnit --org-name organizationName
--city city name --state state/province name --country two-letter country code
[--use IP] [--validity certificate validity in days]
```

The certificate signing request (CSR) appears on your screen.

---

**NOTE** Type your entries with care. You cannot regenerate the CSR without restarting the process.

---

- 4 (Optional) If you must start over, include the `--force` flag to regenerate the CSR.
 

```
ciq-admin ssl genkey --force
--org unit ...certificate validity in days]
```
- 5 Copy the CSR and send it to a certifying authority to obtain your SSL certificate.
 

The certificate must be in X509 or .PK7 format.
- 6 When you have the authorized certificate, use a file-copying tool to upload the certificate file to the virtual appliance.
 

This step must be completed correctly. If it is not, you might not be able to install the certificate.
- 7 Use the `install --cert` option of the `ciq-admin` command to install the certificate.
 

```
ciq-admin ssl install --cert filename
```
- 8 Confirm the certificate details.

The certificate details appear in the SSL certificate information area of the **HTTPS** tab in the Administration Portal.

The custom certificate replaces the default self-signed certificate that CapacityIQ installed. Installing the custom certificate restarts CapacityIQ and the `ciqadmin` processes.

On the **Setup** tab in the Administration Portal, CapacityIQ updates the HTTPS certificate information with the new certificate name and certificate expiration date.

### What to do next

Grant access to CapacityIQ.

## Grant Access to CapacityIQ

The vSphere administrator grants users access to CapacityIQ by assigning the **CapacityIQ** privilege to a role.

When you configure CapacityIQ, the virtual appliance generates a **CapacityIQ** global privilege in the vSphere Client.

### Prerequisites

Restart the vSphere Client before you assign privileges.

### Procedure

- 1 Restart the vSphere Client.
- 2 Add the **CapacityIQ** global privilege to a new or existing role.
- 3 Right-click the root vCenter Server folder in the inventory tree and select **Add Permission**.
- 4 In the Assign Permissions dialog box, assign the new or existing role to the user who accesses CapacityIQ.

After a user gains privileges, the user can log in to the vSphere Client and access CapacityIQ. The CapacityIQ icon appears in the vSphere Client.

## Verify the CapacityIQ Installation

Verify that CapacityIQ is properly installed so that you can start working with CapacityIQ.

### Prerequisites

You installed the virtual appliance and configured settings on the Administration Portal.

### Procedure

- 1 Log in to vCenter Server and locate the **CapacityIQ** icon on the vSphere Client toolbar.
- 2 Click the icon to open CapacityIQ.
- 3 Look at the inventory panel and verify that the objects you expect to see in the inventory panel appear.

CapacityIQ starts collecting data. As it becomes available, data populates the Dashboard. This process might take a few minutes.

---

**NOTE** If you were already logged in to the vSphere Client when you registered CapacityIQ, reconnect the vSphere Client to see the CapacityIQ icon.

---

# Updating or Replacing a CapacityIQ Instance

# 3

Update or replace a CapacityIQ instance if the original instance is deleted or you need to register a new instance with the vCenter Server.

This chapter includes the following topics:

- [“Update CapacityIQ,”](#) on page 21
- [“Replace a Registered Instance of CapacityIQ,”](#) on page 22

## Update CapacityIQ

VMware vCenter Update Manager does not manage updates to CapacityIQ. Periodically monitor the VMware CapacityIQ Web site to check for updates.

### Prerequisites

- Check the CapacityIQ Release Notes for the latest information about upgrading CapacityIQ. CapacityIQ supports upgrading version 1.0.x to version 1.5. If you have CapacityIQ 1.0 and vCenter Server 2.5, you must first update CapacityIQ from 1.0 to a 1.0.x version, and upgrade vCenter Server 2.5 to vCenter 4.0.x. You must adhere to the strict sequence of steps depending on your versions.
- To ensure that CapacityIQ can complete the upgrade process and avoid the need to start over, complete the prerequisite tasks that appear in the release notes text box on the **Update** tab after you browse for and upload the package. These prerequisites include such tasks as backing up the virtual appliance, verifying the percentage of free space on Hard disk 2 and increasing the space to support the upgrade, and closing any instances of the vSphere Client that access CapacityIQ. You cannot roll back a CapacityIQ update.
- Decide when to apply the update. CapacityIQ services are unavailable until the update completes. The update process can take up to two days depending on the amount of data.

### Procedure

- 1 On the **Update** tab of the Administration Portal, verify the current version of CapacityIQ and the last update applied.
- 2 Consult the VMware CapacityIQ Web site to find available updates that you have not yet applied.  
The update package is distributed as a .pak file.
- 3 Download the update package to your computer.
- 4 On the **Update** tab, click **Browse** to find the update package.
- 5 To upload the .pak file, click **Update**.
- 6 Review the prerequisite tasks for the upgrade process that CapacityIQ displays in the text box.

- 7 Accept the license agreement and confirm to proceed with the update.  
CapacityIQ logs you out of the Administration Portal and restarts services.
- 8 After the update completes, log in to the Administration Portal to view the status of the data migration on the **Update** tab.  
If the login page appears blank, press F5 to refresh the page.  
The **Update** tab displays the status of the update.

## Replace a Registered Instance of CapacityIQ

Replacing a registered instance of CapacityIQ involves unregistering the original instance and switching to the new CapacityIQ Administration Portal to register the new instance.

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**NOTE** Do not register more than one instance of CapacityIQ to the same vCenter Server system. VMware does not support multiple instances of CapacityIQ that increase the load on the vCenter Server system.

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### Prerequisites

Understand the registration process described in [“Register CapacityIQ”](#) on page 16.

### Procedure

- 1 Log in to the Administration Portal with the user name `ciqadmin` and the password you selected during the installation.  
The Administration Portal is accessible using the IP address that appears in the virtual appliance console interface.
- 2 On the **Status** tab, click **Unregister** to unregister the original CapacityIQ instance from the vCenter Server system.
- 3 Access the Administration Portal for the new CapacityIQ instance and register it with the vCenter Server system.  
The new portal might require different credentials.
- 4 (Optional) Discard the original instance of CapacityIQ.  
The registration status changes to Registered and the vCenter connection status changes to Connected.

## Post-Installation Tasks for CapacityIQ

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Post-installation tasks include converting evaluation licenses and adjusting resources to optimize the CapacityIQ setup.

For information about maintenance tasks, such as stopping and restarting CapacityIQ services or downloading log files for VMware technical support, see the online help in the Administration Portal.

This chapter includes the following topics:

- [“Convert a CPU Evaluation License to a CPU Full License,”](#) on page 23
- [“Optimizing the CapacityIQ Setup,”](#) on page 23

### Convert a CPU Evaluation License to a CPU Full License

You can convert an CPU-based evaluation license to a full license without losing data in the CapacityIQ database.

If you obtain a virtual machine-based license for CapacityIQ, install and manage the license from vCenter Server. Virtual machine-based licenses for CapacityIQ support vCenter Server 4.1 or later versions. For information about assigning license keys to assets in vCenter Server, see the VMware vSphere documentation.

#### Prerequisites

Purchase a full CPU license for CapacityIQ.

#### Procedure

- ◆ On the **License** tab of the Administration Portal, type the new CPU-based license key in the License key text box and click **Apply**.

When the conversion process is complete, the new license information appears. The new number of days until expiration appears in the CapacityIQ License field on the **Setup** tab.

For information about updating an existing valid license, see the Administration Portal online help.

### Optimizing the CapacityIQ Setup

You might adjust CPU, memory, or disk resources to improve resource utilization.

An upgraded environment that is based on older installation requirements might require you to adjust the resources.

#### Allocating CPU for CapacityIQ

[Table 4-1](#) describes the effect of different numbers of CPU.

**Table 4-1.** Changing the CPU Count in CapacityIQ

| Number of CPUs | Result   |
|----------------|--|
| 1vCPU          | In an environment with an inventory of a few hundred objects, the CapacityIQ views might render slowly because of data collection, computation, and scheduled report activities. |
| 2vCPU          | VMware ships with and recommends this number of CPUs.  |
| 4vCPU          | The CapacityIQ environment can handle additional concurrent users.   |

## Allocating Memory for CapacityIQ

A new installation of the CapacityIQ appliance is configured with 3.6GB of RAM. To increase the number of objects and the time range that CapacityIQ can analyze, add more RAM.

If the CapacityIQ appliance uses virtual machine version 7, the optimal amount of configured memory is 3GB and any larger amount causes the guest operating system to utilize less memory. For information about virtual machine versions, see the VMware vSphere documentation.

## Allocating Disk Space for CapacityIQ

A new installation of the CapacityIQ appliance includes 8GB for the first hard disk and 250GB for the second hard disk that stores CapacityIQ data. [Table 4-2](#) describes the data retention level that different amounts of disk space support.

**Table 4-2.** Changing the Disk Space Allocation in CapacityIQ

| Disk Space on Hard disk 2 | Result  |
|---------------------------|---|
| 100GB                     | Capacity IQ can support the maximum data retention level for about 2700 objects.<br>The maximum data retention level is 52 weeks, 24 months, 16 quarters, and 10 years.   |
| 200GB                     | CapacityIQ can support the maximum data retention level for about 5500 objects.<br>The maximum data retention level is 52 weeks, 24 months, 16 quarters, and 10 years.  |
| 220GB                     | CapacityIQ can support the maximum data retention level for about 6000 objects.<br>The maximum data retention level is 52 weeks, 24 months, 16 quarters, and 10 years.  |
| 250GB                     | CapacityIQ can support either the maximum data retention level for about 6900 objects or the default data retention level for about 8000 objects.<br>The maximum data retention level is 52 weeks, 24 months, 16 quarters, and 10 years.<br>The default data retention level is 52 weeks, 24 months, 8 quarters, and 4 years. |
| 290GB                     | CapacityIQ can support the maximum data retention level for about 8000 objects.<br>The maximum data retention level is 52 weeks, 24 months, 16 quarters, and 10 years.  |

# Troubleshooting Installation

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Troubleshooting information can help you with problems you might encounter when you install CapacityIQ.

This chapter includes the following topics:

- [“DHCP Address Avoidance at Startup,”](#) on page 25
- [“Restarting the vSphere Client is Required After Registration,”](#) on page 26
- [“Registration Fails Because of Existing Registration,”](#) on page 26
- [“Data Unavailable During Initial Startup,”](#) on page 26
- [“Wrong Time Zone Setting,”](#) on page 27
- [“System Time Synchronization,”](#) on page 27
- [“Virtual Appliance Password Forgotten,”](#) on page 28
- [“No Volume Groups Found,”](#) on page 28
- [“DHCP Not Available Causes Network Connection Failure,”](#) on page 28
- [“Cannot Remove SSH Keys,”](#) on page 29

## DHCP Address Avoidance at Startup

When CapacityIQ starts for the first time, it attempts to obtain a DHCP address for vCenter Server that is hosting the appliance.

### Problem

After startup, you can configure a static IP address, but the first attempt to use a DHCP address might generate errors. The workaround is to disable the virtual appliance network interface card (NIC) before you start the virtual appliance. To configure a static IP address, see [“Configure Network and Time Zone Settings,”](#) on page 15. For information about how to deploy a virtual appliance, see [“Configure the Virtual Appliance,”](#) on page 14.

### Solution

- 1 Deploy the virtual appliance.
- 2 Select the CapacityIQ virtual machine in the inventory panel but do not start the machine yet.
- 3 Right-click the virtual machine and select **Edit Settings**.
- 4 On the **Hardware** tab of the Virtual Machine Properties dialog box, select **Network adapter 1**.
- 5 In the Device Status area of the Virtual Machine Properties dialog box, deselect **Connect at power on** and click **OK**.

- 6 Power on the virtual machine.
- 7 Click the **Console** tab.  
The Linux-based installation script runs.
- 8 When the script completes, configure a static IP address.
- 9 Reverse the change to the NIC settings for Network adapter 1 by selecting **Connect at power on**.
- 10 Restart the virtual machine.

## Restarting the vSphere Client is Required After Registration

After you register CapacityIQ with the vSphere Client or you update a registered instance, you must restart the vSphere Client.

### Problem

If you do not restart the vSphere Client after registration, the **CapacityIQ** button does not appear in the vSphere Client toolbar.

### Cause

You must restart the vSphere Client to discover the new plug-in.

### Solution

- 1 Install and register CapacityIQ at a time when it is convenient to restart the vSphere Client.
- 2 Restart the vSphere Client.

## Registration Fails Because of Existing Registration

The CapacityIQ registration process fails because it detects another registered instance of CapacityIQ.

### Problem

When you register CapacityIQ, the operation fails and prompts you to force the registration because another instance of CapacityIQ is registered to the vCenter Server system.

### Cause

An administrator might delete a registered instance of CapacityIQ without unregistering it or recording the IP address.

### Solution

- ◆ When the Registration Failed dialog box appears, click **OK** to overwrite the original registration and force the registration of the new CapacityIQ instance.

## Data Unavailable During Initial Startup

When you first open CapacityIQ, it might take up to an hour for the Dashboard to populate with data.

### Problem

The Dashboard might appear blank when you first open CapacityIQ.

### Cause

CapacityIQ needs time to collect the initial inventory and performance data before it can display the data on the Dashboard.

**Solution**

- ◆ Check the vCenter Connection Status on the **Setup** tab of the Administration Portal to verify that CapacityIQ is running. Wait for the information to appear on the Dashboard.

## Wrong Time Zone Setting

Setting the time zone incorrectly during installation of the CapacityIQ appliance results in time stamping errors for views and reports.

**Problem**

If the time zone for Capacity IQ does not match the time zone on the vCenter Server, the collected data does not reflect the time zone in which you are located.

**Cause**

Capacity IQ might collect data across numerous time zones that use standard or Daylight Savings Time. To view data as if it comes from one time zone, CapacityIQ uses the **Set Timezone** setting to adjust the date and time associated with the collected inventory and performance data. Daily and weekly data are time stamped with the date and time of the vCenter Server location where CapacityIQ is installed. Data for monthly and greater intervals uses UTC time.

**Solution**

- 1 In the vSphere Client, select the VMware CapacityIQ appliance in the inventory panel.
- 2 Click the **Console** tab.
- 3 Navigate to **Set Timezone**, select the time zone from the list of zones, and click **OK**.  
  
Select the time zone that matches the local time for vCenter Server where the CapacityIQ virtual appliance is installed. If any time zones are missing from your view of the list, press Shift+PgUp or Shift+PgDn to scroll through the zones.
- 4 Open a browser window and navigate to the URL that appears in the console interface to start the Administration Portal.
- 5 On the **Status** tab of the Administration Portal, click **Restart** to restart CapacityIQ.

## System Time Synchronization

As a best practice, synchronize the time of CapacityIQ with the time of the ESX host that is hosting CapacityIQ.

**Problem**

If CapacityIQ is not synchronized with the ESX host, the system time is not synchronized with the time on other systems in your datacenter.

**Cause**

You disable the time synchronization feature.

**Solution**

- 1 In the vSphere Client, right-click the CapacityIQ virtual machine and select **Edit Settings**.
- 2 In the Virtual Machine Properties dialog box, click the **Options** tab.
- 3 Select the **VMware Tools** setting.
- 4 Under Advanced options, select **Synchronize guest time with host**.
- 5 Click **OK**.

## Virtual Appliance Password Forgotten

If you forget your password for logging in to the Administration Portal, reset and make a record of the new password.

### Problem

You manage the CapacityIQ administrator password on the **Account** tab in the Administration Portal. If you forget your password, you cannot log in to the Administration Portal to update to a new password.

### Solution

- 1 Boot the virtual appliance and navigate to the console for the virtual machine in the vSphere Client.
- 2 Press any key to display the GRUB menu in the console.
- 3 On the GRUB menu, select CentOS (<version\_number>).
- 4 Type **e** to edit the line.  
A list of items in the CentOS configuration file appears.
- 5 Select the line that starts with `kernel` and type **e** to edit the line.
- 6 At the end of the line, press the spacebar and type **single** to indicate single-user mode.
- 7 Press Enter to exit edit mode.
- 8 On the GRUB screen, type **b** to boot into single-user mode.  
The virtual appliance boots in single-user mode.
- 9 To change the `ciqadmin` user password, type **passwd ciqadmin**.
- 10 To restart the virtual appliance, type **shutdown -r now**.  
When the virtual appliance starts, you can log in using the new password.

## No Volume Groups Found

During the CapacityIQ installation, you might see a `No volume groups found` error message that the Linux Logical Volume Manager displays on the console.

### Problem

This message might imply that a problem exists with the installation.

### Cause

CapacityIQ uses CentOS, which by default uses logical volumes. Because CapacityIQ configurations do not include logical volumes, the `No volume groups found` error message appears.

### Solution

Ignore this message.

## DHCP Not Available Causes Network Connection Failure

During the CapacityIQ installation, you might see an error message on the console that your connection fails because DHCP is unavailable.

### Problem

The CapacityIQ virtual appliance uses DHCP by default.

**Cause**

If DHCP is not available, an error appears after ten attempts to connect with DHCP.

**Solution**

- ◆ Ignore the message, continue the installation, and reconfigure the network connection for static IP at another time.

## Cannot Remove SSH Keys

During the CapacityIQ installation, you might see the `rm: cannot remove [...] /ssh_host_*',: No such file or directory` error message on the console.

**Problem**

CapacityIQ generates SSH keys for the self-signed certificate when you first open the virtual appliance.

**Cause**

SSH keys must be unique. The installation process assumes that you have existing SSH keys installed for the virtual appliance and tries to remove them. Because no SSH keys are installed, an error message appears.

**Solution**

Ignore this message.



# Index

## A

Administration Portal  
  activating email for reports **16**  
  configuring SMTP servers **16**  
  licensing **9, 17, 18, 23**  
  passwords **14, 28**  
  registering CapacityIQ **16, 26**  
  updating CapacityIQ **21**  
  viewing SSL certificates **19**  
administrative server **7**  
Apache Tomcat management ports **12**  
APIs, data collection **7**  
architecture of CapacityIQ **7**  
audience **5**

## B

browsers, Administration Portal **12**

## C

CentOS configuration file **28**  
certificate signing request (CSR) **19**  
configuring  
  CapacityIQ virtual appliance **14**  
  network **15**  
  tasks **16**  
  time zones **15, 27**  
configuring SMTP servers **16**  
converting  
  CPU license to virtual machine license **18**  
  evaluation license to full license **23**  
CPU  
  optimizing **23**  
  requirement **12**  
customizing SSL certificates **19**

## D

Dashboard data **26**  
data collector **7**  
data unavailable during initial startup **26**  
database server **7**  
deploying, CapacityIQ virtual appliance **13, 14**  
DHCP  
  address for hosting appliance **25**  
  impact on network connection **28**

disk space  
  optimizing **23**  
  requirement **12**  
document feedback **5**

## G

granting access to CapacityIQ **20**

## I

installation  
  overview of tasks **9**  
  requirements **12**  
  troubleshooting **25**  
  verifying completion **20**

## L

licensing  
  capacity **17**  
  converting from CPU to virtual machine **18**  
  converting from evaluation to full **23**  
  CPU **9, 17**  
  evaluation **9**  
  full **9**  
  managing from vCenter Server or  
    Administration Portal **9, 17**  
  virtual machine **9, 17**

## M

maintenance process overview **9**  
memory  
  optimizing **23**  
  requirement **12**

## N

network, configuring **15**

## O

Open Virtualization Format (OVF) **13**

## P

password for Administration Portal **28**  
performance impact on vSphere **7**  
ports, requirements **7, 12**  
post-installation tasks **23**

- privileges
  - accessing CapacityIQ **20**
  - registering CapacityIQ **16**

## **R**

- registration
  - overriding existing instance **26**
  - process **16**
  - replacing registered instance **22**
  - restarting the vSphere Client **26**

- replacing CapacityIQ **21**

- reports
  - activating email service **16**
  - time stamp errors **27**

- resources, optimizing **23**

- roles

- accessing CapacityIQ **20**
  - registering CapacityIQ **16**

## **S**

- security
  - forgotten password **28**
  - SSL certificates **19**

- server hosting CapacityIQ **7**

- setup
  - optimizing resources **23**
  - overview of tasks **9**

- SMTP, configuring for email reports **16**

- SSH keys **29**

- SSL certificates, customizing **19**

- system administrator tasks **9**

- system time synchronization **27**

## **T**

- tasks in CapacityIQ **7**

- technical support **5**

- thin disks

- deploying CapacityIQ **14**
  - requirements **12**

- time, synchronizing CapacityIQ with ESX hosts **27**

- time zones, configuring **15, 27**

- trial period for CapacityIQ **9**

- troubleshooting, overriding registration **26**

## **U**

- updating CapacityIQ **21**

## **V**

- vCenter Server
  - plug-in **7**
  - supported versions **12**

- virtual appliance
  - configuring **14**
  - defining **7**

- deploying **13**
- deploying with vSphere 4.0 **14**
- installing **11**

- VMware licensing portal **9**

- volume groups **28**

## **W**

- watchdog **7**