HyTrust® CloudControl™

Installation Guide

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HyTrust® CloudControl™ Installation Guide

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PREFACE

HyTrust® CloudControl™ (HTCC) provides a centralized point of control for hypervisor configuration, compliance, and access management.

This guide describes how to prepare and deploy the HyTrust CloudControl (HTCC) virtual machine on an ESX or ESXi host.

This guide does not discuss configuration of HTCC. See the *HyTrust CloudControl Administration Guide* for more information.

Audience

This guide is intended for information technology personnel who are reasonably proficient in the following areas:

- Using VMware vSphere, including the ability to install a virtual appliance and configure virtual networks.
- Networking and route configuration.

Document Organization

This guide is organized into the following sections:

- Chapter 1, Installation Overview—Provides an overview of the HTCC installation process.
- Chapter 2, Selecting the Deployment Architecture—Provides information on the network deployments supported by the HTCC.
- Chapter 3, Installing the Appliance—Describes the HTCC installation tasks.
- Chapter 4, Mapped Mode—Describes how to configure HTCC for Mapped Mode.
- Chapter 5, Router Mode—Describes how to configure HTCC for Router Mode.
- Chapter 6, Post Installation Tasks—Describes the process of verifying HTCC network configuration and adding HTCC-protected hosts.
- Chapter 7, High Availability—Describes how to setup and configure two HTCC instances for high availability.
- Appendix A, Resource Tables and Checklists—Provides various worksheets for planning and installing HTCC.
- Appendix B, Configuring the Windows Server 2008 Firewall—Describes how to configure the Windows Server 2008 Firewall for HTCC.
- Appendix C, Network Access Requirements—Provides network protocol and port requirements for HTCC.
- Appendix D, VMware vSphere 5.1/5.5 Support—Describes HTCC support for VMware vSphere 5.1/5.5.

Document Conventions

The table below summarizes the call-outs and icons used in this guide.

Call-outs and Icons

Call-out or Icon	Meaning
✎ **Note:**	Indicates '**Note**' that provides information supporting the document text.
IMPORTANT:	Provides important information that users must know.

The table below summarizes the typographical conventions used in this guide.

Typographical conventions

Style	Meaning
Bold	Menu items.
Italic	Provides emphasis and identifies user interface items and document titles.
`Monospace`	Command names, console text, and file names.
`< >`	Contains information for which you must supply a value.
`|`	Separates a set of choices from which only one may be chosen.
`{ }`	Required command parameters that must be specified.
`[ ]`	Optional command parameters.

Related References

For more information about HTCC refer to the following resources:

- HyTrust website: http://www.hytrust.com
- The *HyTrust CloudControl Administration Guide*

Contacting HyTrust

If you require additional information or technical support, contact us at:

Phone: (650) 681-8100

Email: info@hytrust.com

Website: http://www.hytrust.com

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CHAPTER 1

Installation Overview

This chapter contains the following sections:

- Introduction
- System Requirements
- Appliance Installation Overview
- Obtaining the Software

Introduction

Note: All references to hosts refer to ESX, ESXi, or KVM hosts. All references to *ESX hosts* refer to both ESX and ESXi hosts. Other host types which HTCC supports are vSphere vCenter Server, vSphere Web Client Server (WCS), Cisco Nexus 1000V Virtual Supervisor Module (VSM), Cisco Unified Computing System (UCS) Manager, and Cisco Nexus 5000 and 7000 series switches.

HyTrust CloudControl (HTCC) offers system managers and administrators an end-to-end virtualization security platform to manage access, standardize and control configuration, and protect a virtual infrastructure within a customer's environment. HTCC is designed to fit easily within the configuration and architecture of most data centers and is installed as a virtual appliance.

The following illustration shows the basic operations of the HTCC in a virtual infrastructure environment.

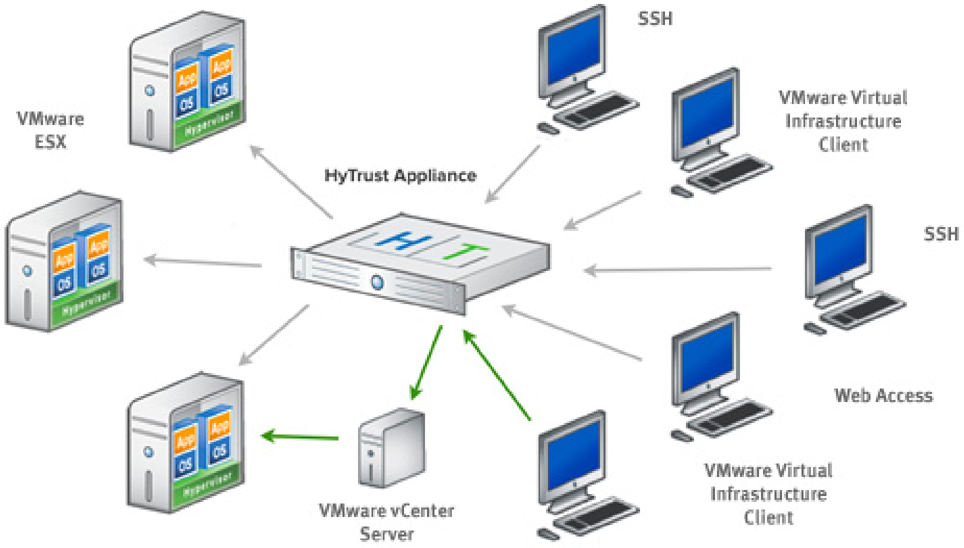


Figure 1-1 HTCC in a virtual infrastructure

HTCC allows corporate users to perform management operations on virtual machines and underlying infrastructure using their current identity as defined in a user directory service such as Microsoft Active Directory. With HTCC, users can also continue using the same management client software and other agent programs to which they are accustomed, such as VMware vSphere Client, an SSH client, and web browser applications.

HTCC provides consistent authentication of users across multiple access methods and provides rich authorization and entitlement controls. It also provides a central point for security and compliance administration, policy enforcement, and logging for all accesses and changes made to the virtual infrastructure. HTCC administrators can define access control policies based on user roles within an organization, on the individual virtual objects (including virtual machines, networks, and storage), and server hosts that users need to access in the course of doing their daily work.

One of the benefits of virtualization is the compression of multiple physical layers of systems into a much more manageable, single, logical system. Rather than having physically separated servers and network switches, for example, all of that hardware gets flattened down into a logical representation, making it easier to perform tasks like backup, disaster recovery, etc. This comes with a risk, as previously physical components are now logical applications or services running on a host, making it easier to disrupt operations, inadvertently or on purpose. For example, a simple right-click of the mouse on the virtual switch brings up a dialog box to power down the device—presenting a significant risk to organizations that rely on these virtual machines to run core infrastructure including switches, firewalls, mail servers, directory servers, etc.

HTCC eliminates these risks by providing strict access control over which individual or role is allowed to access the virtual infrastructure, and whether they can make changes. HTCC granularly determines on a command-by-command basis what tasks each individual is entitled to perform, eliminating the possibility that an individual can shut down pieces of the infrastructure without explicit permissions.

Additionally, HTCC automatically configures VMware ESX hosts to match customer-defined templates and continually monitors the protected virtual infrastructure to ensure that the ESX host configurations continue to match the defined templates—eliminating guesswork and saving time for the users charged with maintaining the virtual infrastructure.

The combination of centralized access control and policies, configuration management, and logging all help to make HTCC a great security and compliance solution for customers.

System Requirements

The ESX host and HyTrust CloudControl (HTCC) virtual machine requirements depend on the specific load of a protected virtual environment. The system requirements are as follows:

Table 1-1 HTCC System Requirements

Resource	Default Capacity
Memory	16 GB
Virtual CPUs	4
Disk Space†	30 GB
Network	1 physical network interface

†HyTrust recommends configuring the underlying disk volumes to use RAID 10 in order to optimize performance and reliability. However, this is not a requirement and the system will function correctly with other configurations.

In addition to the above requirements, the following are also needed:

- Firefox v18+, Internet Explorer v7+, or Chrome web browser for display and operation of the HTCC Management Console.
- HTCC is a 64-bit virtual appliance, so the server hardware running the VMware ESX on which HTCC is installed must be capable of running 64-bit virtual machines; a 64-bit CPU is required. For Intel CPUs, virtualization acceleration (VT) must be enabled in the BIOS.

HTCC is delivered in the Open Virtualization Format (OVF) via a single `.ovf` file that has the appliance description and two virtual machine disk (VMDK) files that contain the appliance software.

Note: HTCC is currently compatible with the Enterprise Editions of VMware vSphere 4.0 and above. This includes both ESX and ESXi hosts, vCenter Server, and vSphere Web Client Server. HTCC also supports and protects Cisco Nexus 1000V VSM, Cisco UCS Manager, and Cisco Nexus 5000 and 7000 series switches.

Appliance Installation Overview

The following is an overview of the installation and configuration process to set up HTCC:

1. Review the ESX host and other system and environment prerequisites for installing and using HTCC—see System Requirements on page 11.
2. Configure your network infrastructure to support any required VLANs and a physical network topology, or request an additional block of IP addresses for Mapped Mode. (Decide on the network configuration you plan to use and configure accordingly—see Chapter 2, Selecting the Deployment Architecture.)

3. For production environments, set up a Microsoft Active Directory (AD) to perform authentication of Administrators and their group information for HTCC rules. (Refer to the *HyTrust CloudControl Administration Guide* for AD configuration information.)
4. Deploy HTCC as a VMware vSphere virtual machine—see Deploying the OVF Template on page 17. Confirm that the network adapter(s) are properly configured and connected.
5. After editing the necessary settings, power on the HTCC virtual machine—see Powering Up the Appliance on page 19.
6. Log into the HTCC command line interface (CLI) as '`ascadminuser`' and type '`setup`' to start the setup process and assign an IP address to the HTCC virtual machine—see Configuring the HTCC Management Network Interface on page 19.
7. Start the HTCC Management Console and run the Installation Wizard—see Starting the HTCC Management Console on page 20.
8. Optionally, set up the HTCC vCenter Server Plugin which allows you to perform HTCC operations directly from a vSphere Client by accessing a vCenter Server. (Refer to the *HyTrust CloudControl Administration Guide* for further details.) You can still use the HTCC Management Console.
9. Add the hosts (vCenter Servers, ESX hosts, WCS hosts, Cisco Nexus 1000V switches, a Cisco UCS Manager, and Cisco Nexus 5000 and 7000 series switches) to be managed and protected by HTCC—see Adding the First HTCC-Protected Host on page 37.

Refer to the appropriate chapters and sections for step-by-step instructions to perform the tasks described above.

IMPORTANT: Use the resource checklist worksheets provided in Appendix A, Resource Tables and Checklists to record network, IP address, AD, and other virtual infrastructure host information you will need to install and configure HTCC.

Obtaining the Software

Log in to the HyTrust website (http://www.hytrust.com) or follow the directions you received from HyTrust Support to obtain the download URL of the HTCC OVF file. Download the files to a local drive that is accessible by your virtual infrastructure.

If you wish to enable the HTCC Enterprise features, obtain and download the appropriate XML license file to a local drive that is accessible to the HTCC Management Console.

CHAPTER 2

Selecting the Deployment Architecture

This chapter contains the following sections:

Preparation: Network Architecture and Topology

HyTrust CloudControl (HTCC) operates by intercepting ESX management requests normally routed directly to ESX hosts or vCenter Servers; however, it does not intercept any VM guest traffic. HTCC first authenticates users and authorizes all the operations they want to perform before passing on the request to the target resource. In addition, HTCC allows administrators to create and apply granular access policies and perform ESX configuration management by applying and monitoring ESX compliance to custom-defined security templates and then remediating deficiencies and discrepancies.

HTCC relies on customers' network topology to gain visibility to the virtual infrastructure's management traffic to be able to intercept it. There are two network configuration options available for installing HTCC: Mapped Mode or Router Mode.

Mapped Mode

When configured for use in Mapped Mode, HTCC works as a proxy server and does not require any architectural changes to the virtual infrastructure (VI) network. It works well in both segmented networks and in environments with flat, unstructured network topologies. In Mapped Mode, only Network Connection 1 (eth0) of HTCC is utilized. Each HTCC protected host (e.g., vCenter Server, ESX/ESXi host) has a dedicated IP address (called the Published IP or PIP) which management clients use to access the host.

Destination Maps, an *out-of-band* solution, proxy the management traffic within your existing network. The requirements are as follows:

- HTCC should be able to communicate with the Service Console (or VMkernel Port for ESXi) of each protected host.
- For each protected host (including a vCenter Server), a new published IP address is used by end users to access the host.
- The PIP addresses need to be on a subnet local to the HTCC Connection 1 (eth0) interface. Do not specify a PIP that belongs to a remote, routed network

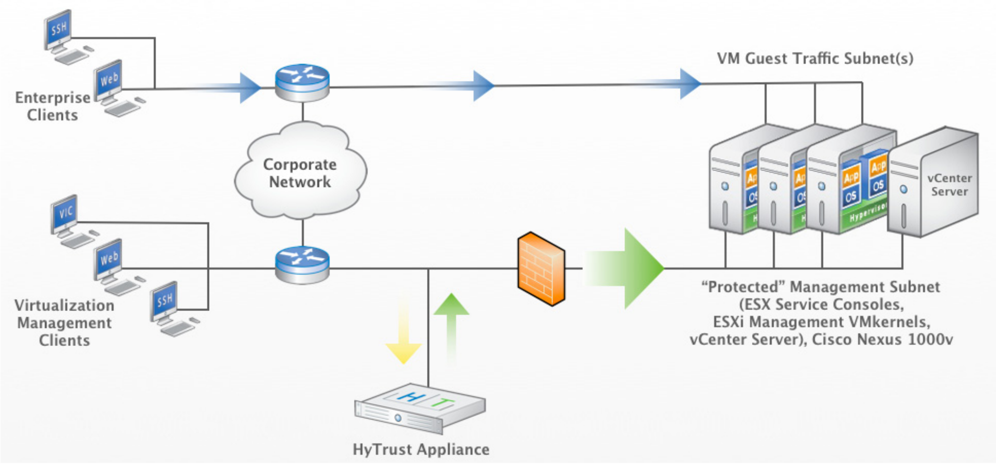

SSH
Web
Enterprise Clients
VM Guest Traffic Subnet(s)
Corporate Network
VIC
Web
SSH
Virtualization Management Clients
App
OS
Hypervisor
vCenter Server
"Protected" Management Subnet (ESX Service Consoles, ESXi Management VMkernels, vCenter Server), Cisco Nexus 1000v
HT
HyTrust Appliance

Figure 2-1 Network topology utilizing Mapped Mode

When a vCenter Server or host is added in the Mapped Mode, enter the PIP in the **Add Host Wizard**, or on the ***Edit Host*** page in the '**Published IP'** tab. HTCC presents a published IP address for each protected target. The user accesses the protected host by using their PIP through SSH, vSphere Client, web console, etc. as if addressing the host directly. Several thousand IP addresses of protected target hosts may be deployed on the same HTCC.

Connections to unprotected services are forwarded by HTCC to the protected target. Connections destined to protected services are handled by HTCC.

Due to being out-of-band, Destination Maps do not provide any connection security. Unless there are external routing rules or a firewall, the original IP addresses of vCenter Server, ESX and ESXi hosts are still available for connections that go around the security HTCC provides. For example, when using the original IP address to access an ESXi host, an administrator can view the web-based Datastore Browser using root credentials of the ESXi host. When available, ESX hosts should be configured to *Lock-out Unauthorized Access* through HTCC Management Console so that the ESX host denies any traffic that goes around HTCC.

Router Mode

The most common deployment method of an *in-line* configuration is Router Mode. In this configuration, HTCC joins two IPv4 networks, passing information from one network to the other. An example of how Router Mode can be implemented is as follows:

- The NIC for Connection 1 (eth0) is connected to the network from which clients access the virtual infrastructure (typically the internal or corporate LAN segment).
- The NIC for Connection 2 (eth1) is connected to the network segment that is to be protected by HTCC (where vCenter Server and the ESX hosts are located)

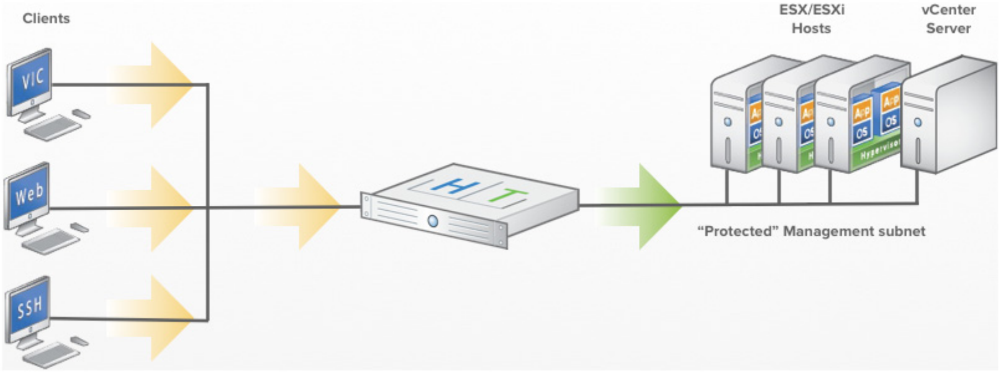


Figure 2-2 Network topology utilizing Router Mode

Note: An Enterprise or appropriate evaluation license is required to implement Router Mode. If you are currently using the Community License and want to test Router Mode, contact HyTrust Sales for an evaluation license.

The following table will help you determine the method for installing HTCC.

Table 2-1 HTCC network deployment options

Network Option	Advantages	Disadvantages
Mapped Mode	Does not require changes to existing routing infrastructure.	■ Requires management of an additional IP address for each protected host. ■ End users need to change the IP to which they connect their clients. ■ Weaker protection against HTCC bypass.
Router Mode	In-line solution guarantees network enforcement.	■ As a participant in corporate routing fabric, requires more thorough and advanced planning. ■ ESX configuration (gateway) needs to be changed out of band.

Network Configuration Considerations

For Mapped Mode, only Connection 1 (eth0) is used. For Router Mode, the most common configuration utilizes Connection 1 (eth0) and Connection 2 (eth1).

Connection 1 (eth0) defaults to the HTCC Management Console interface and should be connected to your management network. In the case of Router Mode, there is an ingress and egress point that is established (the ingress/egress is eth0/eth1 respectively).

For Router Mode, the default gateway for each host and vCenter Server must be the protected IP address of HTCC (IP assigned to eth1). An additional route should also be defined for unprotected networks to route unprotected traffic to HTCC.

Note: Before you login to HTCC, confirm that all the necessary HTCC network adapters in the vSphere Client are connected to the proper network segment and are set to automatically connect at power on. By default, only eth0 is automatically connected. Manual connection of eth1 is required for Router Mode.

Use the worksheets provided in Appendix A, Resource Tables and Checklists to record network, IP address, and other virtual infrastructure host information needed when configuring HTCC and adding protected hosts.

High Availability (HA)

If deploying in a High Availability configuration, HyTrust recommends using an isolated HA network to establish the Connection 3 (eth2) connection between the primary and secondary HTCCs. For example, you can use the vSphere Client to create and configure a virtual network connection for the two HTCC instances to use. Since the primary and secondary HTCCs are on separate hosts, creating a new VLAN for HTCC HA and trunking the physical switches that support the virtual infrastructure to handle the new VLAN is required. The eth0 and eth2 IP addresses must not be on the same subnet.

The following table provides example settings for Connection 3.

Table 2-2 Connection 3 example settings

Resource	Value
Connection 3 of Primary HTCC	
■ IP	192.168.20.1
■ Subnet Mask	255.255.255.248
■ VLAN ID	VLAN 20
Connection 3 of Secondary HTCC	
■ IP	192.168.20.2
■ Subnet Mask	255.255.255.248
■ VLAN ID	VLAN 20

Make sure to complete the HyTrust High Availability checklist on page 66 for either Mapped Mode or Router Mode network configuration.

CHAPTER 3

Installing the Appliance

This chapter contains the following sections:

Deploying the OVF Template

Prerequisites

Before installing HTCC, the following should already be in place:

- Virtual infrastructure consisting of installed vCenter Servers and, optionally, ESX hosts.
- Network connectivity and access to the HTCC host machine and the infrastructure to secure. The HTCC installation requires an ESX host with at least one dedicated network interface (using VLANs).
- For Directory Service mode authentication, setup of Microsoft Active Directory with an AD Service Account and the recommended HyTrust security groups, as described in the *HyTrust CloudControl Administration Guide*.
- Services used by virtual infrastructure clients should be routable from the appropriate interface. For example, Active Directory, DNS, and RSA services need to be accessible from HTCC.

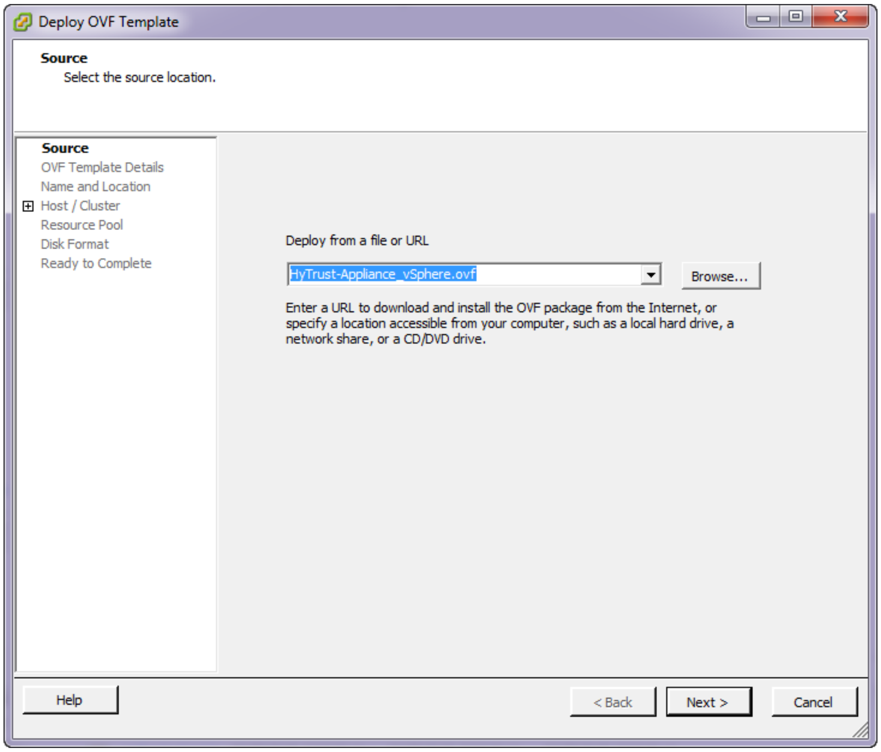
To install and run HTCC as a virtual appliance, use the vSphere Client application or vSphere Web Client to access either vCenter Server or the ESX host on which you want to deploy and configure the HTCC virtual machine.

Detailed Steps

Perform the following steps to deploy the HTCC OVF template:

1. In the vSphere Client, select vCenter Server (if managed) or ESX host (if standalone) where you want to deploy the HTCC OVF file.
2. Choose **File > Deploy OVF Template**.

   The **Deploy OVF Template Wizard** appears.



Deploy from a file or URL

HyTrust-Appliance_vSphere.ovf

Enter a URL to download and install the OVF package from the Internet, or specify a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.

Figure 3-1 Deploying the OVF template

3. Click '**Browse**' and navigate to the virtual appliance OVF file stored on media or a network directory location.
4. Proceed through the remaining steps of the wizard making sure that you set Connection 1 to the network used to access the HTCC Management Console. When you reach the end of the wizard, click '**Finish**'.

   The vSphere Client now initiates the deployment process on the selected ESX host or vCenter Server resource. As the process continues, its progress is displayed in the vSphere Client Status panel. When finished, the vSphere Client displays the "*Create Virtual Machine completed*" message in the **Recent Tasks** display.

5. You can now view the HTCC virtual machine default settings and configuration and make any changes through the vSphere Client, such as increasing the memory and virtual CPUs assigned to HTCC, and changing the size of the log disk in the virtual appliance. Confirm that the network adapter(s) are properly configured and connected.
6. Configure the appliance to automatically start on ESX startup. To do that, from the vSphere Client:
   a. Select the 'ESX host' in the object tree.
   b. Select the **Configuration** tab.

c. Click the **Virtual Machine Start / Shutdown** option in the list on the left, and then click **Properties** in the top right corner of the window.

d. Select your HTCC virtual machine in the list and prioritize its order. Services that support HTCC, such as Active Directory, should have a higher priority. Automatic startup and the proper start order will enable HTCC host ESX protection in the event of a host reboot.

Note: If you choose to deploy the appliance in a Distributed Resource Scheduler (DRS) cluster, make sure that DRS is disabled for the HTCC virtual machine by selecting **Edit Settings > VMware DRS > Virtual Machine Options**. This is required to make sure that HTCC runs only on the ESX where virtual networking is properly configured.

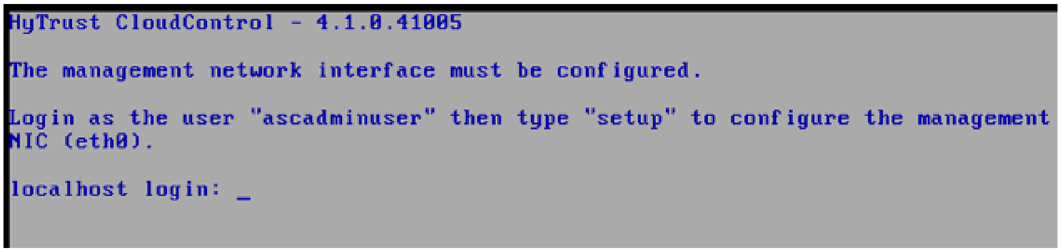
Once the deployment is complete, HTCC appears in the vSphere Client inventory hierarchy for the selected vCenter Server or ESX host.

Powering Up the Appliance

To power up the HTCC virtual machine:

1. From the vSphere **Client Summary** tab, view select the HTCC virtual machine and click the '**Power On**' button, or right-click the HTCC virtual machine and select '**Power On**'.
2. Open the vSphere Client Console to view the status of the HTCC virtual machine as it starts up. (You can also click the '**Launch Virtual Machine Console Window'** button to open a popup window to display virtual machine console startup messages.)

   After HTCC has completed the boot process, you will see the login screen:



```
HyTrust CloudControl - 4.1.0.41005

The management network interface must be configured.

Login as the user "ascadminuser" then type "setup" to configure the management
NIC (eth0).

localhost login: _
```

Figure 3-2 Login Screen after reboot

Once the appliance has powered up and completed booting, you must configure the HTCC Management network interface.

Configuring the HTCC Management Network Interface

The HTCC Management network interface (eth0) must be manually configured before you can access the HTCC Management Console.

Perform the following to configure the HTCC Management network interface:

1. At the vSphere Client console window, log in as the user *ascadminuser* with the password `Pa$$w0rd123!`.
2. You are prompted to assign a new password to the local HTCC administrator account (*ascadminuser*). Be sure to keep your new password in a safe and secure place.
3. Start the setup procedure. At the prompt, type:

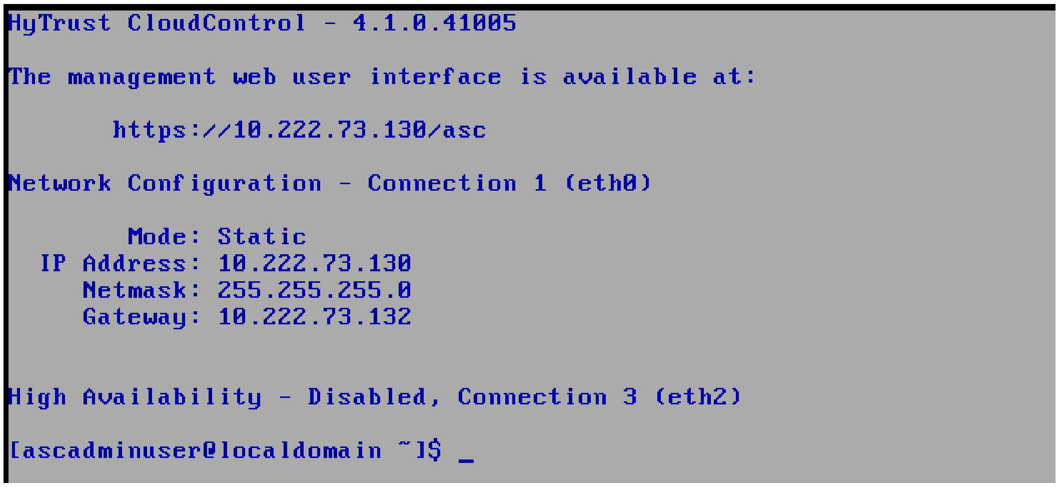
```
setup
```

4. Manually assign a static IP address to the management network interface (eth0) and set the subnet mask, gateway, and DNS server addresses.
5. Save by typing:

   ```
   y
   ```

6. Log out after the network settings have been updated.

You now have a static IP address assigned to the HTCC Management interface. Note down the URL address displayed in the console window as shown in the figure below. You will use this URL to access the web-based HTCC Management Console.



```
HyTrust CloudControl - 4.1.0.41005

The management web user interface is available at:

       https://10.222.73.130/asc

Network Configuration - Connection 1 (eth0)

        Mode: Static
  IP Address: 10.222.73.130
     Netmask: 255.255.255.0
     Gateway: 10.222.73.132


High Availability - Disabled, Connection 3 (eth2)

[ascadminuser@localdomain ~]$ _
```

Figure 3-3 Static IP Address configuration

Starting the HTCC Management Console

Use the web-based HTCC Management Console to customize the HTCC configuration settings and set up operations for safeguarding your managed virtual infrastructure environment. For example, the HTCC Management Console provides menus to set authentication options for users, add vCenter Servers and hosts to the protected infrastructure, define templates and policy checks/tests to enforce security of protected virtual infrastructure, and view and configure logs.

If you have not already done so, confirm that the Network adapter(s) are properly configured and connected to HTCC. Refer to Chapter 2, Selecting the Deployment Architecture to help you determine your preferred deployment method and how to configure the HTCC network adapter(s) before you login to the HTCC Management Console.

To start the HTCC Management Console:

1. Open a web browser and enter the IP address of the HTCC Management network interface. For example:

   ```
   https://hta.example.com/asc
   ```

Note: When accessing HTCC for the first time, you must use the IP address in the URL. Using the fully qualified domain name (FQDN) is not supported until after you have completed the **Installation Wizard** in the HTCC Management Console.

2. The first time you start the HTCC Management Console, you will receive a security exception. Manually allow the security exception as the HTCC initially ships with a self-signed certificate.

Note: If using Internet Explorer (IE), a security warning window may appear when accessing the HTCC Management Console. You must edit the Internet Security properties within IE to remove this warning.
In IE 8+, go to **Tools > Internet Options > Security Tab > Internet > Custom level > Miscellaneous** and enable the *Display mixed content* setting. Restart Internet Explorer for the change to take effect.

In some customer environments, additional modifications to the IE security settings or firewall settings within your corporate network may be required.

Note: SSL certificates issued by a trusted authority can be imported at a later time through the HTCC Management Console.

3. The login screen appears.

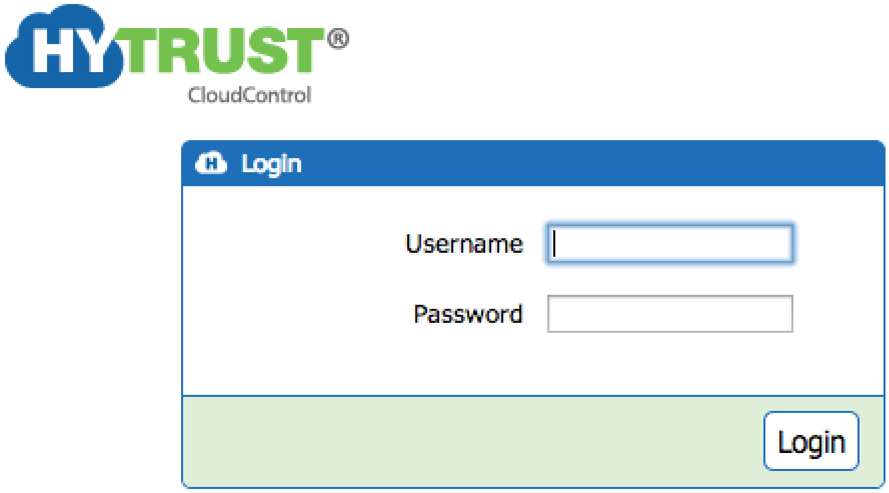


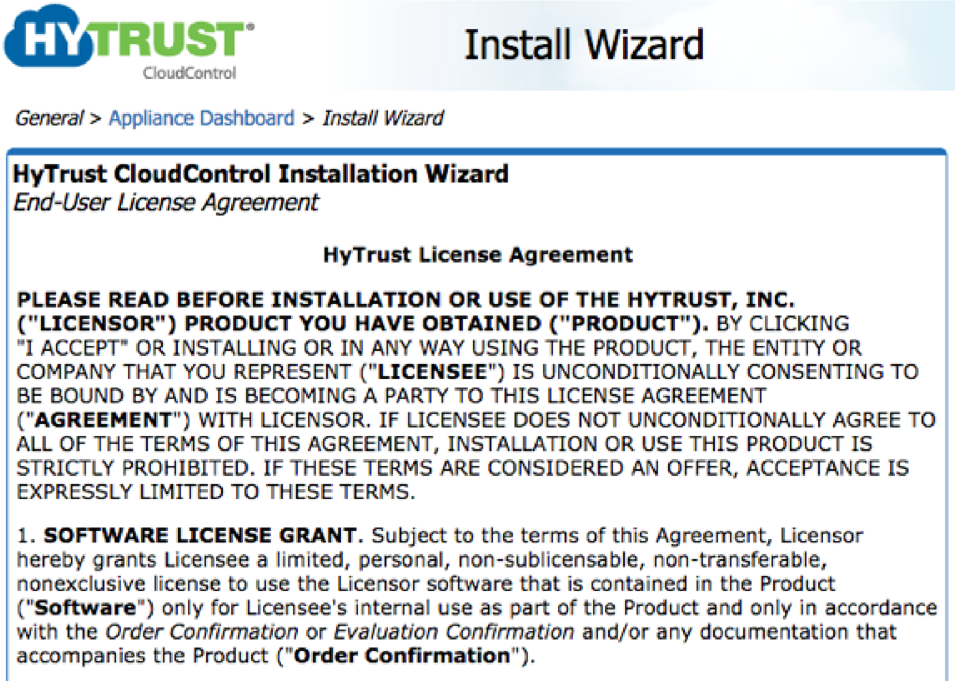
Figure 3-4 HTCC Management Console login screen

4. Enter the default login username (*superadminuser*) and password (`Pa$$w0rd123!`) to log into the system.

Initial Setup and Configuration

The following steps describe the Initial setup and configuration of HTCC consists of the following operations:

1. Accept the end-user license agreement.
   a. Read the terms of the end-user license agreement (EULA).
   b. Select the *'**I Accept**'* checkbox at the bottom.
   c. Click '**Next**'.



HyTrust CloudControl Installation Wizard
End-User License Agreement

HyTrust License Agreement

PLEASE READ BEFORE INSTALLATION OR USE OF THE HYTRUST, INC. ("LICENSOR") PRODUCT YOU HAVE OBTAINED ("PRODUCT"). BY CLICKING "I ACCEPT" OR INSTALLING OR IN ANY WAY USING THE PRODUCT, THE ENTITY OR COMPANY THAT YOU REPRESENT ("**LICENSEE**") IS UNCONDITIONALLY CONSENTING TO BE BOUND BY AND IS BECOMING A PARTY TO THIS LICENSE AGREEMENT ("**AGREEMENT**") WITH LICENSOR. IF LICENSEE DOES NOT UNCONDITIONALLY AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, INSTALLATION OR USE THIS PRODUCT IS STRICTLY PROHIBITED. IF THESE TERMS ARE CONSIDERED AN OFFER, ACCEPTANCE IS EXPRESSLY LIMITED TO THESE TERMS.

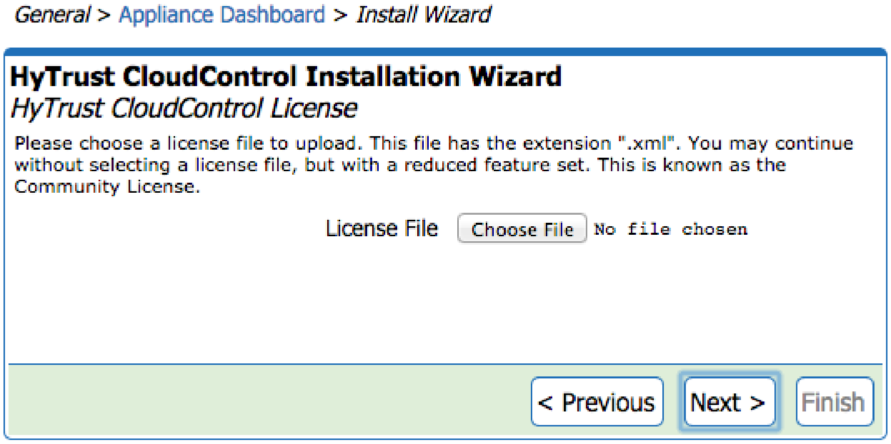
1. **SOFTWARE LICENSE GRANT.** Subject to the terms of this Agreement, Licensor hereby grants Licensee a limited, personal, non-sublicensable, non-transferable, nonexclusive license to use the Licensor software that is contained in the Product ("**Software**") only for Licensee's internal use as part of the Product and only in accordance with the *Order Confirmation* or *Evaluation Confirmation* and/or any documentation that accompanies the Product ("**Order Confirmation**").

Figure 3-5 HTCC End-User License Agreement

2. If applicable, install a license.
   a. If you have a license file, enter the location of the license file, or click '**Browse**' to navigate to it.

      If you do not have a license, the Community License is activated and HTCC will operate with a reduced feature set.

   b. Click '**Next'**.



HyTrust CloudControl Installation Wizard
HyTrust CloudControl License

Please choose a license file to upload. This file has the extension ".xml". You may continue without selecting a license file, but with a reduced feature set. This is known as the Community License.

License File [Choose File] No file chosen

Figure 3-6 HTCC license installation

3. Complete the **HTCC Installation Wizard** based on your selected networking mode.
   - To configure HTCC for Mapped Mode networking, see Chapter 4, Mapped Mode.
   - To configure HTCC for Router Mode networking, see Chapter 5, Router Mode.

4. Perform post-installation setup and configuration tasks, see Chapter 6, Post-Installation Tasks.

After finishing the installation, users can select from the **General**, **Compliance**, **Policy**, **Configuration**, **Maintenance,** and **Help** page options that appear across the top banner of the HTCC Management Console to view and configure other HTCC settings. Refer to the *HyTrust CloudControl Administration Guide* for more information.

Migrating from HTA 3.6 to HTCC 4.x

Migrating the appliance from the HTA 3.6 release to the HTCC 4.x release involves the following steps:

1. Deploying the HTCC 4.x release OVF template
2. Taking backup of the HTA 3.6 appliance
3. Restoring the HTA 3.6 appliance to HTCC 4.x

Deploying the 4.x Release OVF Template

Please follow the instructions in the section Deploying the OVF Template on page 17.

Taking backup of the HTA 3.6 appliance

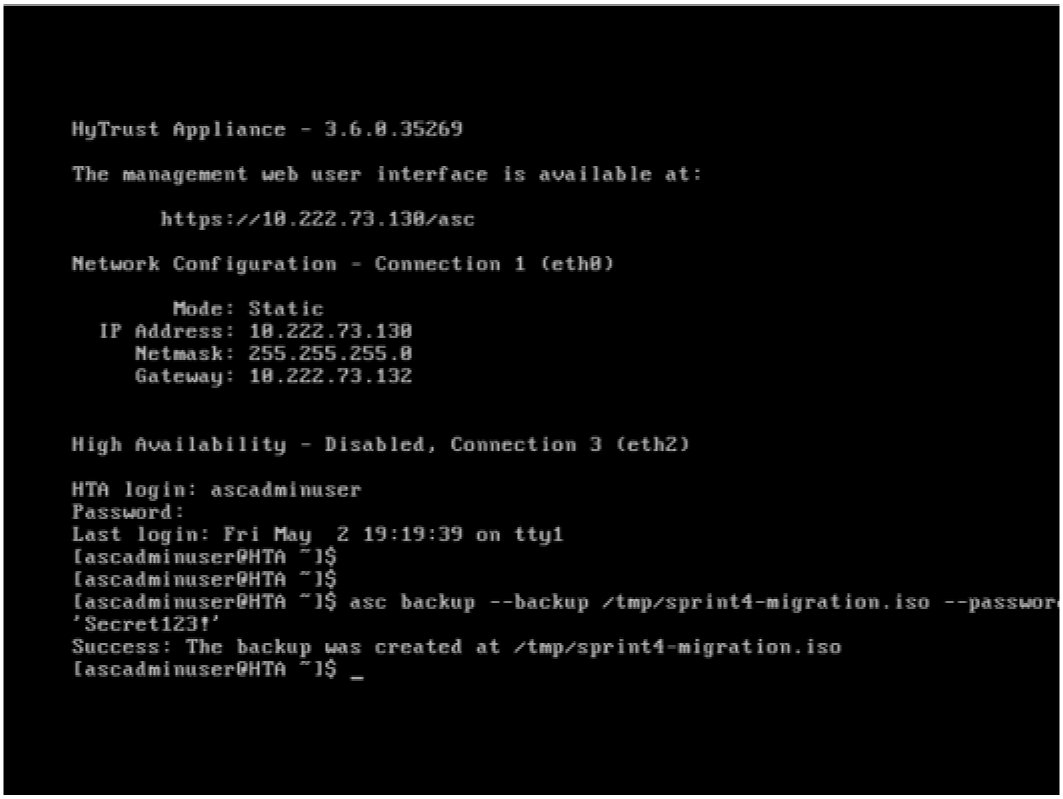
Use the following procedure to backup the HTA 3.6 release:

1. When migrating from HTA 3.6 to HTCC 4.x, attach the backup preparation ISO image as the CD drive (or SCP the ISO to the 3.6 appliance).
2. If the HTA is part of an HA pair, disband the HA pair and then perform the upgrade on the primary by running the following command:

   ```
   asc upgrade -i (<backup-prep.iso>)
   ```
3. Ensure the HTA 3.6 appliance is running properly and that no users are performing any operations in the HTA GUI.
4. Login to the HTA console as `ascadminuser`.
5. Stop and disable the tomcat service using the command:

   ```
   asc service -n tomcat6 -d
   ```
6. Backup the appliance using asc backup command:

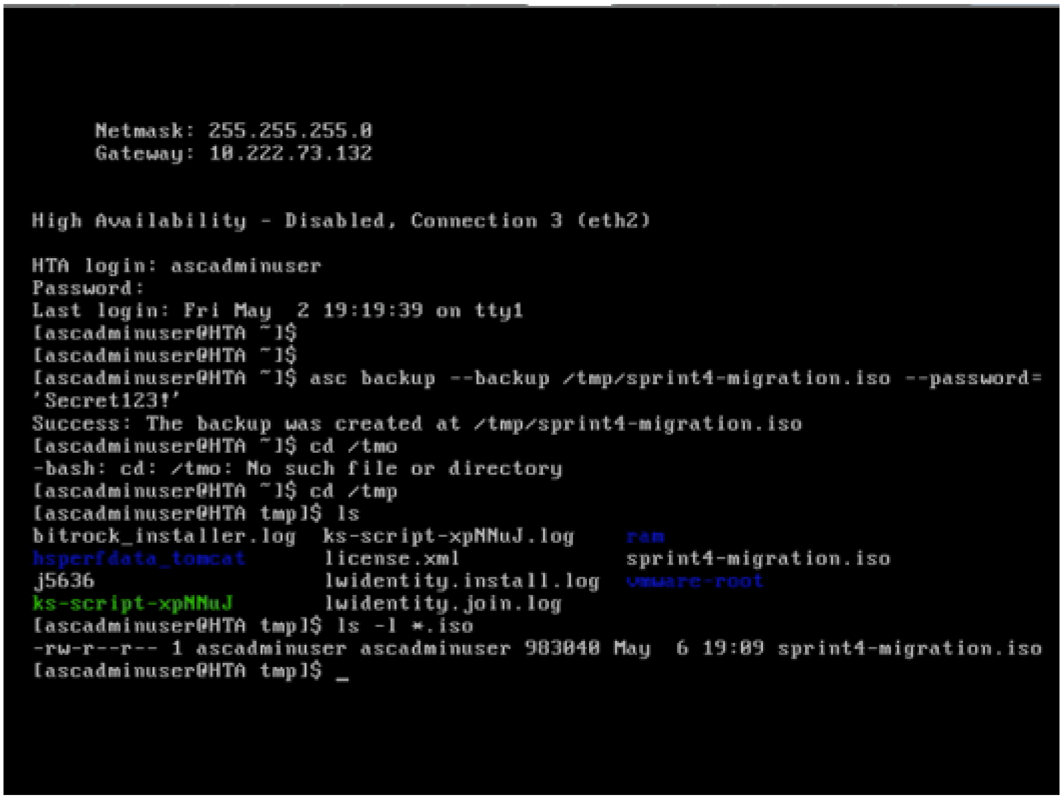
   ```
   asc backup --backup /tmp/<filename.iso> --password <'password'>
   ```



```
HyTrust Appliance - 3.6.0.35269

The management web user interface is available at:

       https://10.222.73.130/asc

Network Configuration - Connection 1 (eth0)

        Mode: Static
  IP Address: 10.222.73.130
     Netmask: 255.255.255.0
     Gateway: 10.222.73.132


High Availability - Disabled, Connection 3 (eth2)

HTA login: ascadminuser
Password:
Last login: Fri May  2 19:19:39 on tty1
[ascadminuser@HTA ~]$
[ascadminuser@HTA ~]$
[ascadminuser@HTA ~]$ asc backup --backup /tmp/sprint4-migration.iso --passwor
'Secret123!'
Success: The backup was created at /tmp/sprint4-migration.iso
[ascadminuser@HTA ~]$ _
```

Figure 3-7 Taking the backup of HTA 3.6 appliance

The following image shows the backup taken as an ISO image.



```
    Netmask: 255.255.255.0
    Gateway: 10.222.73.132


High Availability - Disabled, Connection 3 (eth2)

HTA login: ascadminuser
Password:
Last login: Fri May  2 19:19:39 on tty1
[ascadminuser@HTA ~]$
[ascadminuser@HTA ~]$
[ascadminuser@HTA ~]$ asc backup --backup /tmp/sprint4-migration.iso --password=
'Secret123!'
Success: The backup was created at /tmp/sprint4-migration.iso
[ascadminuser@HTA ~]$ cd /tmo
-bash: cd: /tmo: No such file or directory
[ascadminuser@HTA ~]$ cd /tmp
[ascadminuser@HTA tmp]$ ls
bitrock_installer.log  ks-script-xpNNuJ.log    ram
hsperfdata_tomcat      license.xml             sprint4-migration.iso
j5636                  lwidentity.install.log  vmware-root
ks-script-xpNNuJ       lwidentity.join.log
[ascadminuser@HTA tmp]$ ls -l *.iso
-rw-r--r-- 1 ascadminuser ascadminuser 983040 May  6 19:09 sprint4-migration.iso
[ascadminuser@HTA tmp]$ _
```

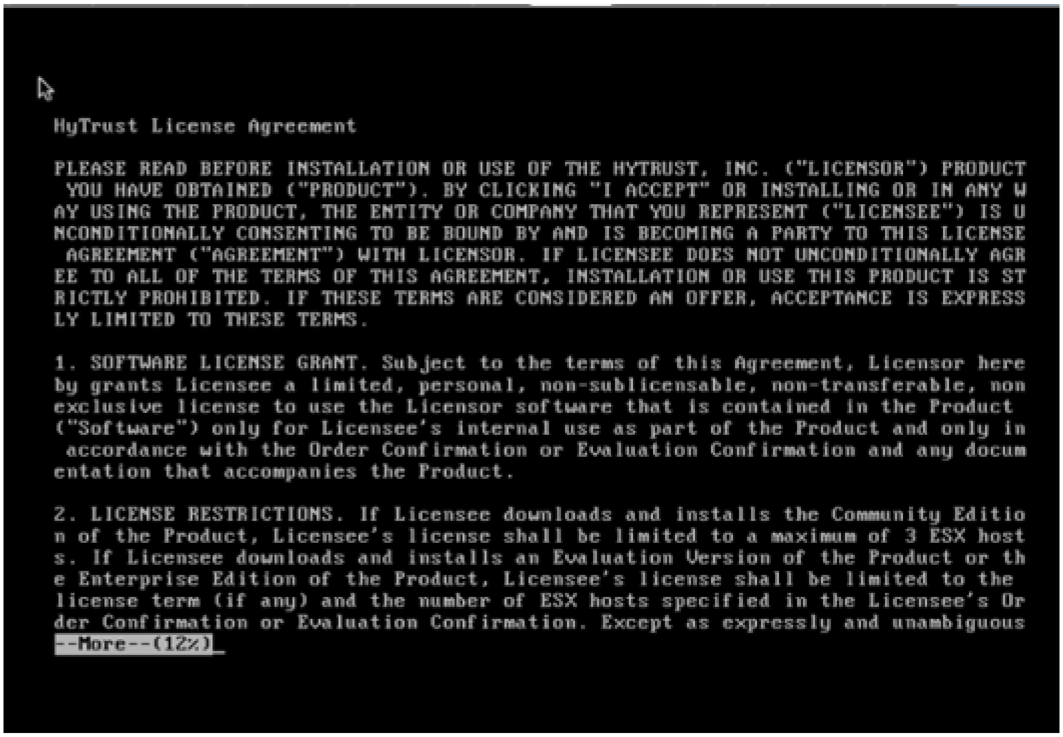
Figure 3-8 asc backup generates the ISO image

7. Copy the ISO image to the remote machine
8. Shut down the HTA 3.6 appliance.

Restore the HTA 3.6 to HTCC 4.x

The following procedure describes the process of restoring from the HTA 3.6 to HTCC 4.x appliance.

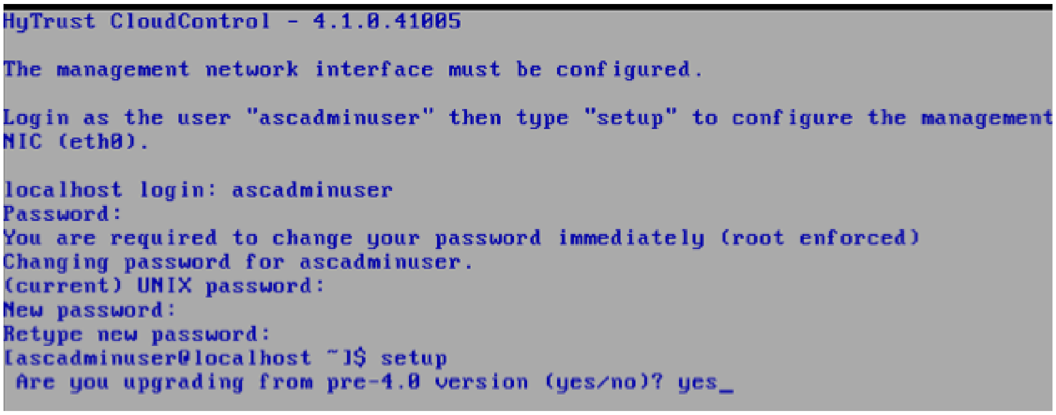
1. Power on the 4.x machine deployed in the first step. See Powering Up the Appliance on page 19.
2. Carefully read the EULA displayed on the screen.



```
HyTrust License Agreement

PLEASE READ BEFORE INSTALLATION OR USE OF THE HYTRUST, INC. ("LICENSOR") PRODUCT
 YOU HAVE OBTAINED ("PRODUCT"). BY CLICKING "I ACCEPT" OR INSTALLING OR IN ANY W
AY USING THE PRODUCT, THE ENTITY OR COMPANY THAT YOU REPRESENT ("LICENSEE") IS U
NCONDITIONALLY CONSENTING TO BE BOUND BY AND IS BECOMING A PARTY TO THIS LICENSE
 AGREEMENT ("AGREEMENT") WITH LICENSOR. IF LICENSEE DOES NOT UNCONDITIONALLY AGR
EE TO ALL OF THE TERMS OF THIS AGREEMENT, INSTALLATION OR USE THIS PRODUCT IS ST
RICTLY PROHIBITED. IF THESE TERMS ARE CONSIDERED AN OFFER, ACCEPTANCE IS EXPRESS
LY LIMITED TO THESE TERMS.

1. SOFTWARE LICENSE GRANT. Subject to the terms of this Agreement, Licensor here
by grants Licensee a limited, personal, non-sublicensable, non-transferable, non
exclusive license to use the Licensor software that is contained in the Product
("Software") only for Licensee's internal use as part of the Product and only in
 accordance with the Order Confirmation or Evaluation Confirmation and any docum
entation that accompanies the Product.

2. LICENSE RESTRICTIONS. If Licensee downloads and installs the Community Editio
n of the Product, Licensee's license shall be limited to a maximum of 3 ESX host
s. If Licensee downloads and installs an Evaluation Version of the Product or th
e Enterprise Edition of the Product, Licensee's license shall be limited to the
license term (if any) and the number of ESX hosts specified in the Licensee's Or
der Confirmation or Evaluation Confirmation. Except as expressly and unambiguous
--More--(12%)_
```

Figure 3-9 EULA part of the agreement

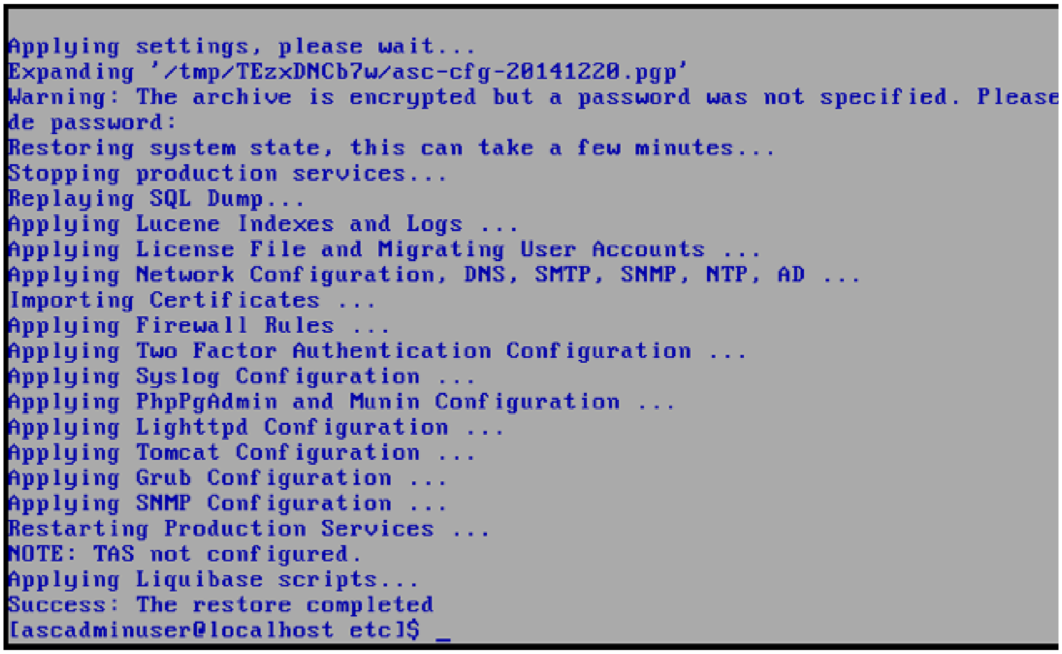
3. Press 'Enter'/'return' to scroll down.
4. Read the rest of the EULA and accept it.
5. Login as ascadminuser, and change the password at the first login.
6. Mount the ISO image to HTCC appliance.
7. Run the *Setup* command.



```
HyTrust CloudControl - 4.1.0.41005

The management network interface must be configured.

Login as the user "ascadminuser" then type "setup" to configure the management
NIC (eth0).

localhost login: ascadminuser
Password:
You are required to change your password immediately (root enforced)
Changing password for ascadminuser.
(current) UNIX password:
New password:
Retype new password:
[ascadminuser@localhost ~]$ setup
 Are you upgrading from pre-4.0 version (yes/no)? yes_
```

Figure 3-10 Running the Setup command on HTCC 4.0

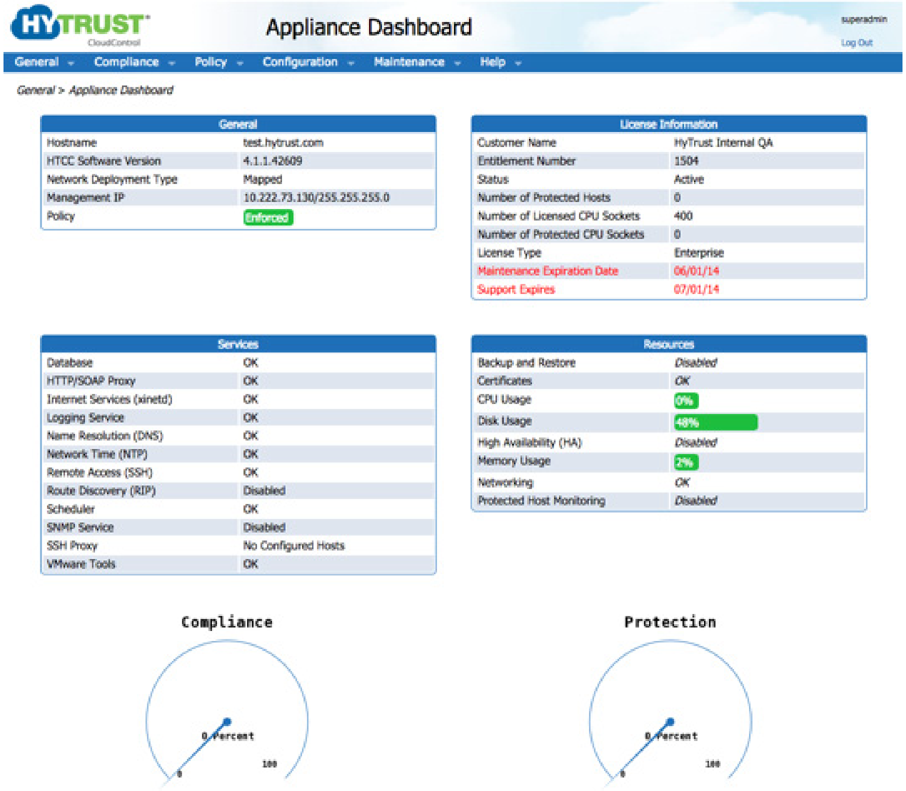
8. Enter 'yes' and setup will begin the process of restoring the 3.6 HTA configuration on the new 4.x HTCC.
9. This may take a few minutes.



```
Applying settings, please wait...
Expanding '/tmp/TEzxDNCb7w/asc-cfg-20141220.pgp'
Warning: The archive is encrypted but a password was not specified. Please
de password:
Restoring system state, this can take a few minutes...
Stopping production services...
Replaying SQL Dump...
Applying Lucene Indexes and Logs ...
Applying License File and Migrating User Accounts ...
Applying Network Configuration, DNS, SMTP, SNMP, NTP, AD ...
Importing Certificates ...
Applying Firewall Rules ...
Applying Two Factor Authentication Configuration ...
Applying Syslog Configuration ...
Applying PhpPgAdmin and Munin Configuration ...
Applying Lighttpd Configuration ...
Applying Tomcat Configuration ...
Applying Grub Configuration ...
Applying SNMP Configuration ...
Restarting Production Services ...
NOTE: TAS not configured.
Applying Liquibase scripts...
Success: The restore completed
[ascadminuser@localhost etc]$ _
```

Figure 3-11 Restore Complete

10. Verify the restore process is completed successfully by checking the /var/log/asc/restore.log for more information.
11. Access the HTCC 4.x web console using the same URL and credentials used when connecting to the HTA 3.6.



General	
Hostname	test.hytrust.com
HTCC Software Version	4.1.1.42609
Network Deployment Type	Mapped
Management IP	10.222.73.130/255.255.255.0
Policy	Enforced

License Information	
Customer Name	HyTrust Internal QA
Entitlement Number	1504
Status	Active
Number of Protected Hosts	0
Number of Licensed CPU Sockets	400
Number of Protected CPU Sockets	0
License Type	Enterprise
Maintenance Expiration Date	06/01/14
Support Expires	07/01/14

Services	
Database	OK
HTTP/SOAP Proxy	OK
Internet Services (xinetd)	OK
Logging Service	OK
Name Resolution (DNS)	OK
Network Time (NTP)	OK
Remote Access (SSH)	OK
Route Discovery (RIP)	Disabled
Scheduler	OK
SNMP Service	Disabled
SSH Proxy	No Configured Hosts
VMware Tools	OK

Resources	
Backup and Restore	*Disabled*
Certificates	*OK*
CPU Usage	0%
Disk Usage	48%
High Availability (HA)	*Disabled*
Memory Usage	2%
Networking	*OK*
Protected Host Monitoring	*Disabled*

Figure 3-12 Appliance Dashboard after restore

CHAPTER 4

Mapped Mode

This chapter contains the following sections:

- Planning
- Running the HTCC Installation Wizard

Planning

The following information for Connection1 is needed while completing the **HTCC Installation Wizard** (this information is also contained in Table A-1).

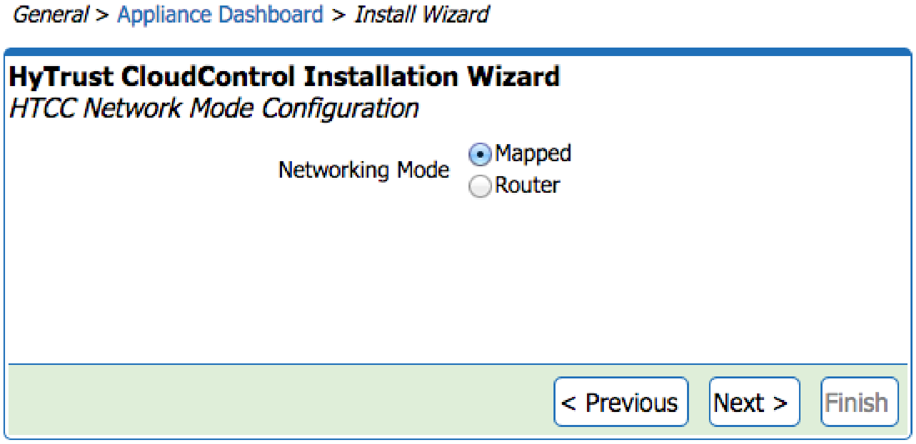
Table 4-1 Mapped Mode connection settings

Resource	Value
Connection 1	
■ IP	
■ Subnet Mask	
■ Gateway	
■ DNS Server	
■ VLAN ID	

Running the HTCC Installation Wizard

The **HTCC Installation Wizard** steps you through the following pages to configure HTCC for Mapped Mode.

1. On the ***HTCC Network Mode Configuration*** page, select 'Mapped' as the Networking Mode, and click '**Next**'.



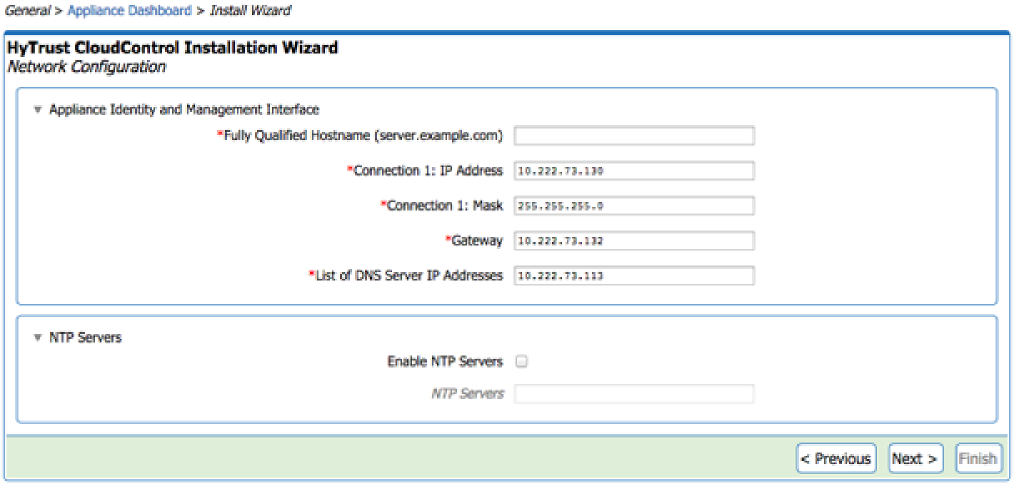
General > Appliance Dashboard > *Install Wizard*

HyTrust CloudControl Installation Wizard
HTCC Network Mode Configuration

Networking Mode ● Mapped ○ Router

Figure 4-1 HTCC Installation Wizard - HTCC Network Mode Configuration

2. The ***Network Configuration*** page appears.



General > Appliance Dashboard > *Install Wizard*

HyTrust CloudControl Installation Wizard
Network Configuration

▾ Appliance Identity and Management Interface

*Fully Qualified Hostname (server.example.com)	
*Connection 1: IP Address	10.222.73.130
*Connection 1: Mask	255.255.255.0
*Gateway	10.222.73.132
*List of DNS Server IP Addresses	10.222.73.113

▾ NTP Servers

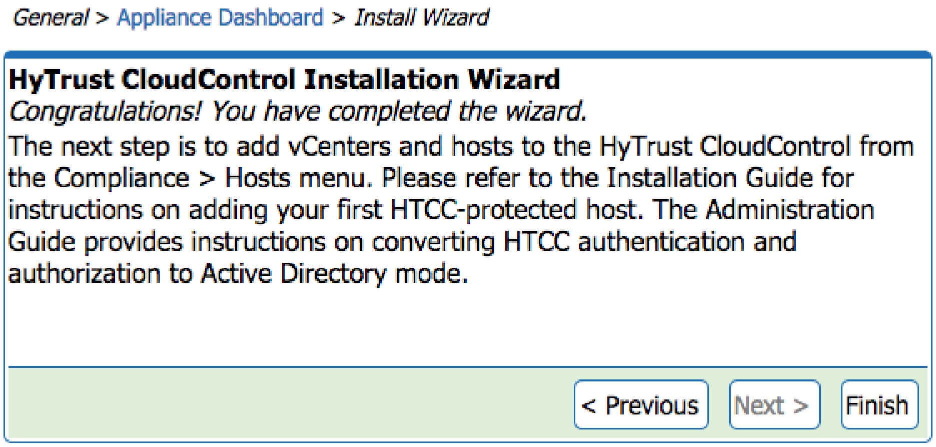
Enable NTP Servers	□
NTP Servers	

Figure 4-2 HTCC Installation Wizard - Network Configuration

3. Specify the network and IP address connection information for the HTCC host:
   a. Assign a fully qualified hostname.
   b. Double-check the IP address for Connection1. This is the management interface (eth0).
   c. Specify the subnet mask (Connection 1: Mask), gateway, and a comma-separated list of DNS servers.
   d. Optionally, select the '**Enable NTP Servers'** checkbox and specify the IP address of one or more, comma-separated, NTP servers HTCC should use for time synchronization.

Note: Ensure you use IP addresses for the DNS and NTP servers.

4. Click '**Next'**.



General > Appliance Dashboard > *Install Wizard*

HyTrust CloudControl Installation Wizard

Congratulations! You have completed the wizard.

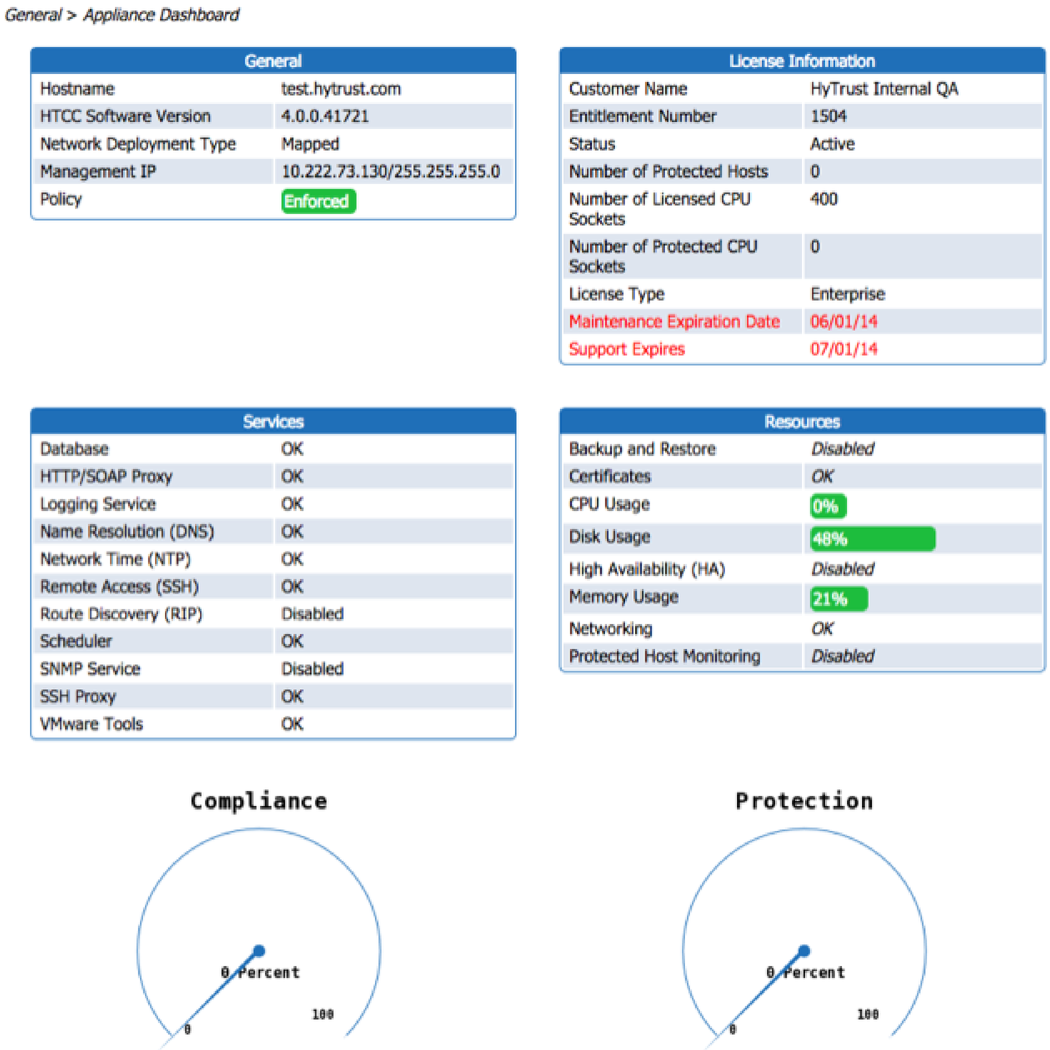
The next step is to add vCenters and hosts to the HyTrust CloudControl from the Compliance > Hosts menu. Please refer to the Installation Guide for instructions on adding your first HTCC-protected host. The Administration Guide provides instructions on converting HTCC authentication and authorization to Active Directory mode.

Figure 4-3 HTCC Installation Wizard - Finish

5. Click '**Finish'** to complete the **Installation Wizard**.

Note: The '**Finish**' button is not available until after the **Install Wizard** completes.

Upon successfully completing the **HTCC Installation Wizard**, the **HTCC Management Console Appliance Dashboard** appears.



General > Appliance Dashboard

General	
Hostname	test.hytrust.com
HTCC Software Version	4.0.0.41721
Network Deployment Type	Mapped
Management IP	10.222.73.130/255.255.255.0
Policy	Enforced

License Information	
Customer Name	HyTrust Internal QA
Entitlement Number	1504
Status	Active
Number of Protected Hosts	0
Number of Licensed CPU Sockets	400
Number of Protected CPU Sockets	0
License Type	Enterprise
Maintenance Expiration Date	06/01/14
Support Expires	07/01/14

Services	
Database	OK
HTTP/SOAP Proxy	OK
Logging Service	OK
Name Resolution (DNS)	OK
Network Time (NTP)	OK
Remote Access (SSH)	OK
Route Discovery (RIP)	Disabled
Scheduler	OK
SNMP Service	Disabled
SSH Proxy	OK
VMware Tools	OK

Resources	
Backup and Restore	*Disabled*
Certificates	*OK*
CPU Usage	0%
Disk Usage	48%
High Availability (HA)	*Disabled*
Memory Usage	21%
Networking	*OK*
Protected Host Monitoring	*Disabled*

Figure 4-4 HTCC Management Console Appliance Dashboard

CHAPTER 5

Router Mode

This chapter contains the following sections:

- Planning
- Running the HTCC Installation Wizard

Planning

The following information for Connection 1 and Connection 2 is needed while completing the **HTCC Installation Wizard** (this information is also shown in the Table A-1).

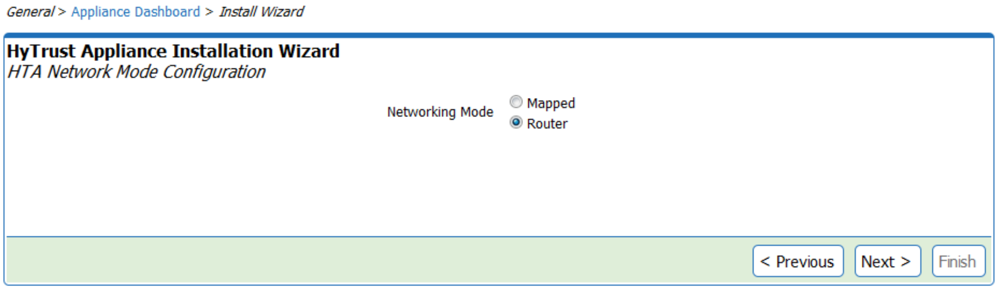
Table 5-1 Router Mode connection settings

Resource	Value
Connection 1	
■ IP	
■ Subnet Mask	
■ Gateway	
■ DNS Server	
■ VLAN ID	
Connection 2	
■ IP	
■ Subnet Mask	
■ VLAN ID	

Running the HTCC Installation Wizard

The **HTCC Installation Wizard** steps you through the following pages to configure HTCC for Router Mode.

1. On the ***HTCC Host Configuration*** page, select 'Router' as the **Networking Mode** and click '**Next'.**



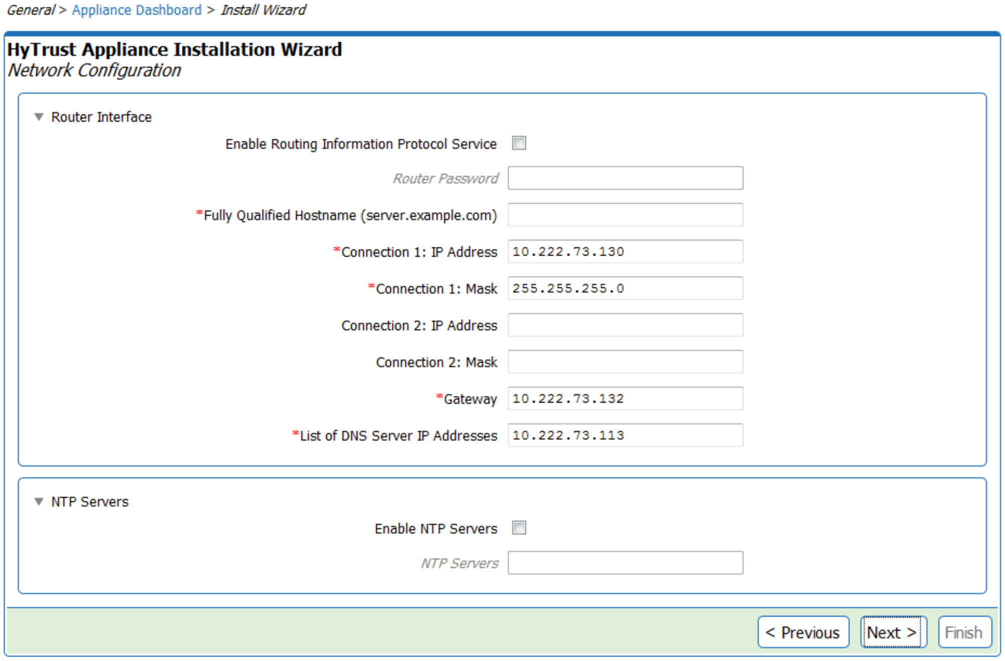
General > Appliance Dashboard > Install Wizard

HyTrust Appliance Installation Wizard
HTA Network Mode Configuration

Networking Mode ○ Mapped ● Router

Figure 5-1 HTCC Installation Wizard - HTCC Host Configuration

2. The ***Network Configuration*** page appears.



General > Appliance Dashboard > Install Wizard

HyTrust Appliance Installation Wizard
Network Configuration

▼ Router Interface

Enable Routing Information Protocol Service □
Router Password
*Fully Qualified Hostname (server.example.com)
*Connection 1: IP Address 10.222.73.130
*Connection 1: Mask 255.255.255.0
Connection 2: IP Address
Connection 2: Mask
*Gateway 10.222.73.132
*List of DNS Server IP Addresses 10.222.73.113

▼ NTP Servers

Enable NTP Servers □
NTP Servers

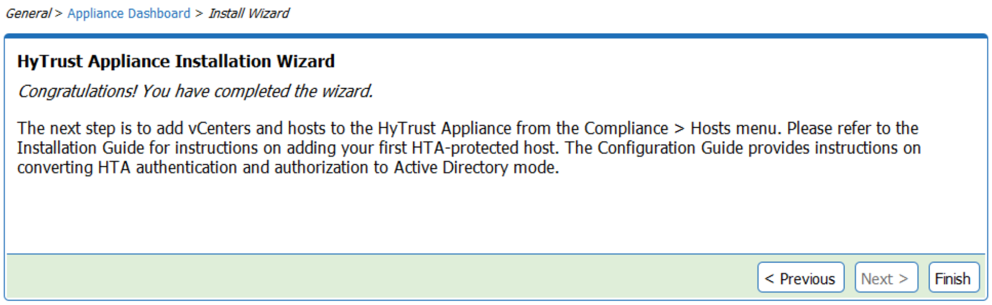
Figure 5-2 HTCC Installation Wizard - Network Configuration

3. Specify the network and IP address connection information for the HTCC host:
   a. Routing Information Protocol (RIP) is a widely deployed interior gateway protocol. If you are deploying in a network where RIP is currently enabled, select the '**Enable Routing Information Protocol Service'** checkbox and assign a Router Password. All services running under RIP require the Router Password for remote configuration. (RIPv1 and RIPv2 are supported.)
   b. Assign a fully qualified hostname.
   c. Double-check the IP address for Connection 1. This is the management interface (eth0), which connects to the unprotected network.
   d. Specify the subnet mask (Connection 1: Mask), gateway, and a comma-separated list of DNS servers.
   e. All Router Mode configurations will also utilize Connection 2 (eth1), which connects to the HTCC-protected network—see 2.

f. Optionally, select the ‘**Enable NTP Servers’** checkbox and specify the IP address (or FQDN) of one or more, comma-separated, NTP servers the HTCC should use for time synchronization.

Note: Ensure you use IP addresses for the DNS and NTP servers.

4. Click ‘**Next.**



HyTrust Appliance Installation Wizard

Congratulations! You have completed the wizard.

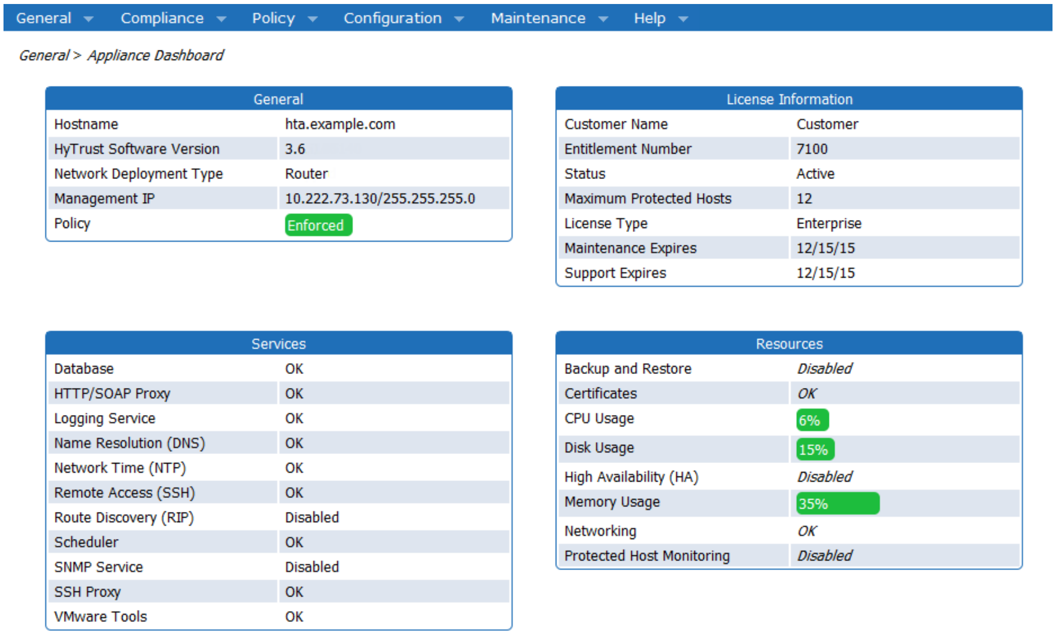
The next step is to add vCenters and hosts to the HyTrust Appliance from the Compliance > Hosts menu. Please refer to the Installation Guide for instructions on adding your first HTA-protected host. The Configuration Guide provides instructions on converting HTA authentication and authorization to Active Directory mode.

Figure 5-3 HTCC Installation Wizard - Finish

5. Click ‘**Finish**’ to complete the installation wizard.

Note: The ‘**Finish’** button is not available until after the Install Wizard completes.

Upon successfully completing the **HTCC Installation Wizard**, the **HTCC Management Console Appliance Dashboard** appears.



General	
Hostname	hta.example.com
HyTrust Software Version	3.6
Network Deployment Type	Router
Management IP	10.222.73.130/255.255.255.0
Policy	Enforced

License Information	
Customer Name	Customer
Entitlement Number	7100
Status	Active
Maximum Protected Hosts	12
License Type	Enterprise
Maintenance Expires	12/15/15
Support Expires	12/15/15

Services	
Database	OK
HTTP/SOAP Proxy	OK
Logging Service	OK
Name Resolution (DNS)	OK
Network Time (NTP)	OK
Remote Access (SSH)	OK
Route Discovery (RIP)	Disabled
Scheduler	OK
SNMP Service	Disabled
SSH Proxy	OK
VMware Tools	OK

Resources	
Backup and Restore	*Disabled*
Certificates	*OK*
CPU Usage	6%
Disk Usage	15%
High Availability (HA)	*Disabled*
Memory Usage	35%
Networking	*OK*
Protected Host Monitoring	*Disabled*

Figure 5-4 HTCC Management Console Appliance Dashboard

CHAPTER 6

Post Installation Tasks

This chapter contains the following sections:

After completing the initial setup and configuration, HyTrust CloudControl (HTCC) allows access only to the default, built-in users. This mode of user authentication is called *Demo* mode. HTCC also allows user authentication via a directory service (e.g., Microsoft Active Directory). This mode of user authentication is called *Directory Service* mode. HTCC remains in Demo mode until configured to use a directory service.

You may continue to use Demo mode authentication at this time, however, Demo mode is only intended for product evaluation and testing—it is not suitable for production environments.

While in Demo mode, continue to use the *superadminuser* account to complete the initial configuration of HTCC. Once HTCC is configured to Directory Service mode, the *superadminuser* account is no longer available and only directory users with the necessary group membership can access the **HTCC Management Console** and the virtual infrastructure.

If you are deploying HTCC in a production environment, it is recommended that you first configure HTCC to Directory Service mode. Refer to the *HyTrust CloudControl Administration Guide* to complete the conversion prior to adding a vCenter Server.

Verifying Network Configuration

The first thing you need to do after installing HTCC is verify your network is properly configured by performing the following:

1. Access the HTCC web-based management interface using a web browser from a client system.
    a. Enter the URL of the HTCC Management Console. For example:
    ```
    https://hta.example.com/asc
    ```
2. Ping the Service Console IP of a target ESX/ESXi host from the HTCC terminal window.
3. Ping the Service Console IP of a target ESX/ESXi host from the client system.
4. Ping the vCenter Server IP from the client system.

5. Login with root credentials to the ESX/ESXi host using the vSphere Client from the client system.
6. For ESX hosts only:
   a. Login with root credentials to the web management interface of the ESX host using a web browser from the client system.
   b. Login via SSH to the ESX host using root credentials.
7. Login with Administrator credentials to vCenter Server using the vSphere Client from the client system.
8. Login with Administrator credentials to the vCenter Server web management interface using a web browser from the client system.

If all of the above work properly, then your network is properly configured and you are ready to access the HTCC environment and add your first host to HTCC-protected host.

Adding the First HTCC-Protected Host

HTCC can protect the following types of hosts:

- vCenter Server host (including its managed ESX hosts) and a vSphere Web Client Server host—see Adding vCenter Server Managed Hosts.

Note: If you are protecting vCenter Server 5.1/5.5, refer to Appendix D, VMware vSphere 5.1/ 5.5 Support for information on supported deployments, requirements, and limitations.

- vSphere Web Client Server host—see Adding a WCS Host.
- ESX hosts not managed by vCenter Server—see Adding Unmanaged Hosts.
- KVM hosts- see Adding KVM Hosts.
- Cisco Nexus switches—see Adding Cisco Nexus Switches.
  - Nexus 1000V Virtual Supervisor Module (VSM) switch
  - Nexus 5000 and 7000 series switches
- Cisco UCS Manager—see Adding Cisco UCS Manager Hosts.

Note: A data center with HTCC managed hosts will not be fully protected until all the hosts in the data center are protected.

All vCenter Server managed hosts that were automatically added to the HTCC hosts list will initially show a blocked (⛔) icon, indicating that additional configuration is required before HTCC can assess or protect these hosts.

HTCC-protected hosts are marked with a yellow shield (🛡) icon, or silver shield (🛡) icon for ESXi hosts with no PIP assigned, indicating that HTCC is controlling all future management communications based on the configured access and segmentation policies. Non-approved hosts are indicated with a 🛡 or 🛡 icon—refer to the *Approved Hosts* section in the *HyTrust Administration Guide* for more information.

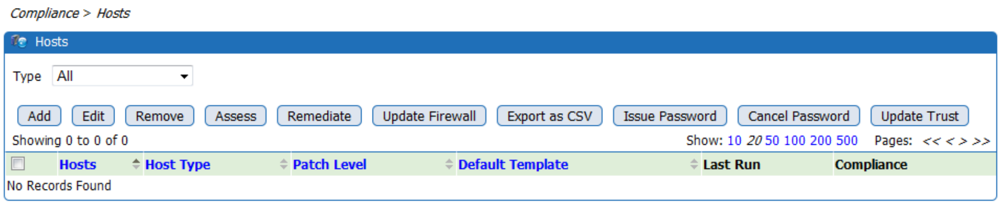
Adding vCenter Server Managed Hosts

Before you can add host(s) managed by vCenter Server, you must add vCenter Server as a host to your HTCC-protected environment. Once a vCenter Server is added to HTCC, HTCC will automatically import all the vCenter Server virtualized resources and managed ESX/ESXi hosts.

The following sections describe how to add a vCenter Server and its managed ESX/ESXi hosts (see 6), and how to configure vCenter Server managed hosts (see 6).

Adding vCenter Server

1. From the HTCC Management Console, select **Compliance > Hosts** to open the ***Hosts*** page



Type: All

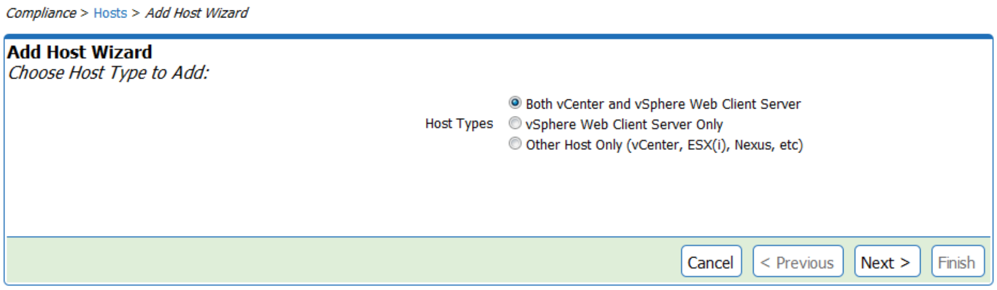
Showing 0 to 0 of 0

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
No Records Found						

Figure 6-1 Compliance > Hosts page

2. Click '**Add**'.

   The **Add Host Wizard** appears.

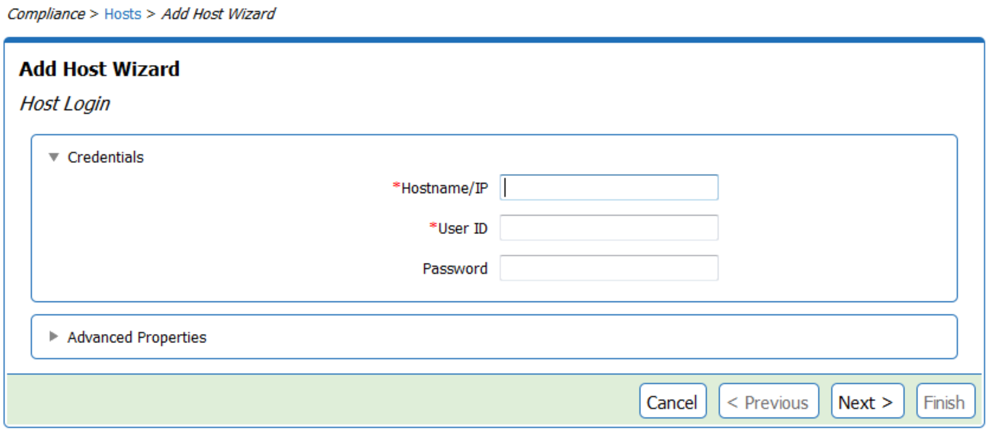


Add Host Wizard
Choose Host Type to Add:

Host Types
● Both vCenter and vSphere Web Client Server
○ vSphere Web Client Server Only
○ Other Host Only (vCenter, ESX(i), Nexus, etc)

Figure 6-2 Add Host Wizard - Host Type page

3. Select the type of host you are adding, and click '**Next**'.
   - **Both vCenter and vSphere Web Client Server**—Select this to add both a vCenter Server host and a vSphere Web Client Server host.
   - **vSphere Web Client Server Only**—Select this to add only a Web Client Server host.
   - **Other Host Only**—Select this to add a host of any other type (e.g., vCenter Server, unmanaged ESX/ESXi, UCS, or Cisco Nexus).
4. The ***Host Login*** page appears



Compliance > Hosts > Add Host Wizard

Add Host Wizard

Host Login

▼ Credentials

*Hostname/IP

*User ID

Password

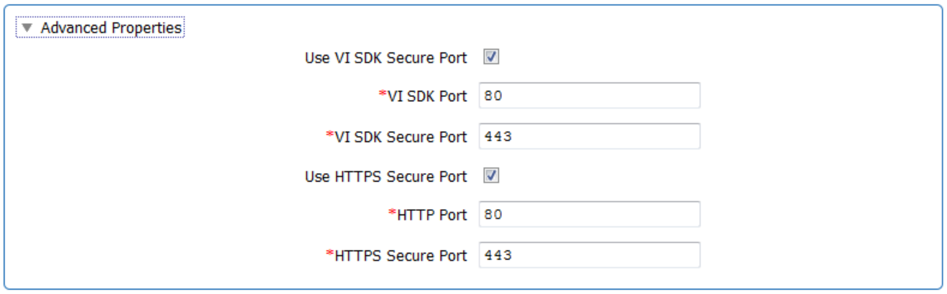
▶ Advanced Properties

Figure 6-3 Add Host Wizard - Host Login page

5. Enter the following:
    a. The fully qualified hostname or IP address of vCenter Server (or Host).
    b. The administrator User ID and Password for vCenter Server (or root credentials for a host).

Note: You will not be able to add a host with a password that contains both, the left angle bracket (<) and the right angle bracket (>) characters. However, passwords with either character are supported.

    c. Optionally, open the **Advanced** tab to see the VI SDK, HTTP, and HTTPS port settings. It is recommended to maintain the default settings



▼ Advanced Properties

Use VI SDK Secure Port ☑

*VI SDK Port 80

*VI SDK Secure Port 443

Use HTTPS Secure Port ☑

*HTTP Port 80

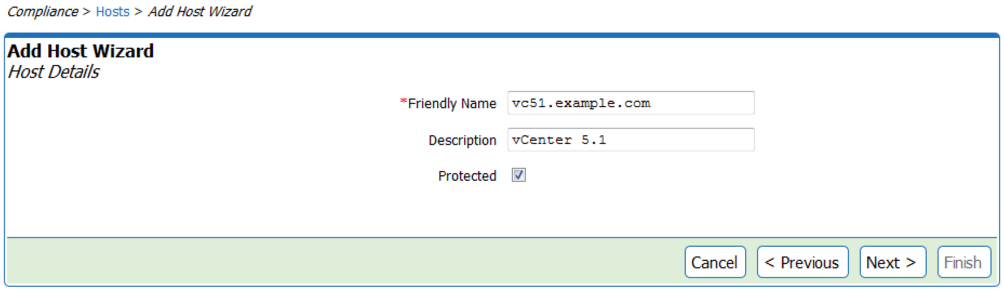
*HTTPS Secure Port 443

Figure 6-4 Host Login page - Advanced Properties section

    d. When finished entering vCenter Server or ESX host information, click '**Next'**.

    HTCC attempts to automatically detect the host type. Supported host types are vCenter Server, ESX, ESXi, WCS, Cisco Nexus 1000V VSM, Cisco UCS Manager, and Cisco Nexus 5000 and 7000 series switches.

6. The ***Host Details*** page appears.



Compliance > Hosts > Add Host Wizard

Add Host Wizard
Host Details

*Friendly Name: vc51.example.com

Description: vCenter 5.1

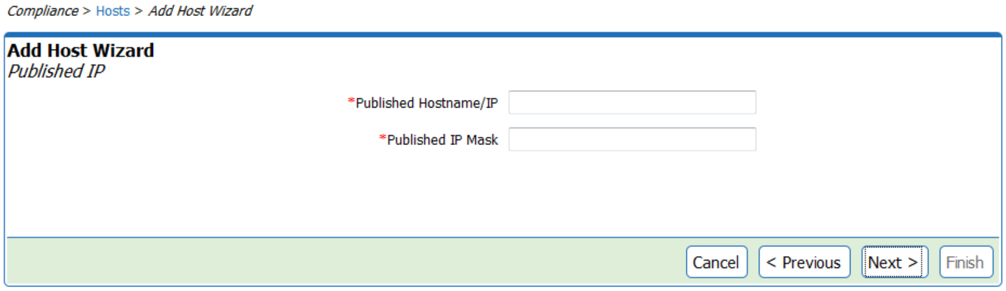
Protected: ☑

Figure 6-5 Add Host Wizard - Host Details page

7. The following options are available on the ***Host Details*** page:
   - Friendly Name—A unique name to identify the vCenter Server, or the specified ESX host, in the list of HTCC hosts. This does not have to be the same name as used in DNS.

Note: Spaces and special characters are allowed, but the name should not exceed 64 characters.

   - Description—A description for the host.
   - Protected—Select this checkbox to have HTCC protect both the vCenter Server, and the ESX hosts it manages. '**Default**' is selected.
8. Click '**Next'**.
9. If using Mapped Mode, the Published IP (PIP) page appears.



Compliance > Hosts > Add Host Wizard

Add Host Wizard
Published IP

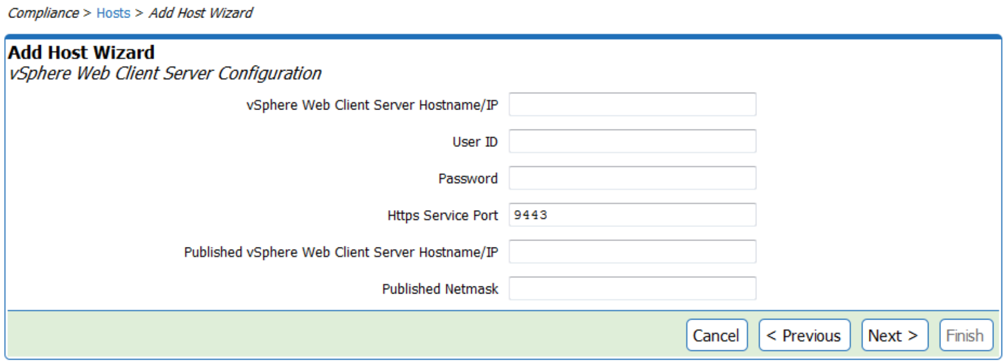
*Published Hostname/IP:

*Published IP Mask:

Figure 6-6 Add Host Wizard - Published IP page

10. The following fields are available:
    - Published Hostname/IP—The hostname/IP address to use to route all traffic to this host.
    - Published IP Mask—The subnet mask to use to route all traffic to this host.

    Click '**Next'** to continue.
11. If applicable, the ***vSphere Web Client Server Configuration*** page appears.



Add Host Wizard
vSphere Web Client Server Configuration

vSphere Web Client Server Hostname/IP
User ID
Password
Https Service Port 9443
Published vSphere Web Client Server Hostname/IP
Published Netmask

Figure 6-7 Add Host Wizard - vSphere Web Client Server Configuration page

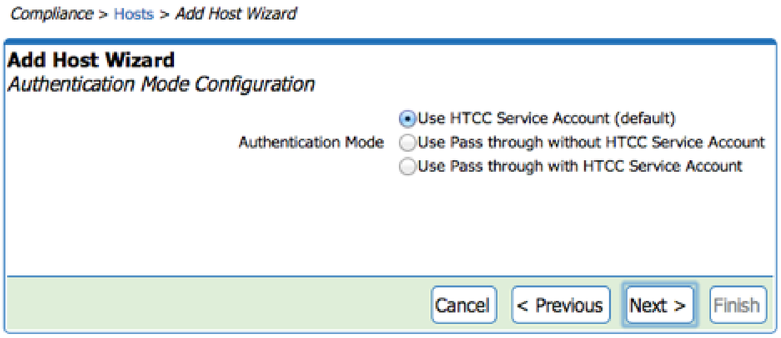
The following fields are available:

- **vSphere Web Client Server Hostname/IP**—The hostname/IP address of the Web Client Server.
- **User ID**—The HTCC service account user name. The same account must be used across all vCenter Servers connected to the Web Client Server.
- **Password**—The HTCC Service Account password.
- **Https Service Port**—The Web Client Server HTTPS port number.
- **Published vSphere Web Client Server Hostname/IP**—The published hostname/IP address for the Web Client Server.

Note: HyTrust recommends the Web Client Server and vCenter Server to have separate published IPs if they reside on the same physical machine.

- **Published Netmask**—The published subnet mask for the Web Client Server.

12. Click '**Next**'.
13. The ***Authentication Mode Configuration*** page appears



Add Host Wizard
Authentication Mode Configuration

Authentication Mode
● Use HTCC Service Account (default)
○ Use Pass through without HTCC Service Account
○ Use Pass through with HTCC Service Account

Figure 6-8 Add Host Wizard - Authentication Mode Configuration page

The following authentication modes are available:

- **Use HTCC Service Account (default)**—Select this to use the HTCC Service Account for authentication when establishing sessions from HTCC to vCenter Server. This is the default mode.

In this mode, only one administrative account is required on vCenter Server. This configuration, however, does not limit the visibility of objects displayed in the vSphere Client.

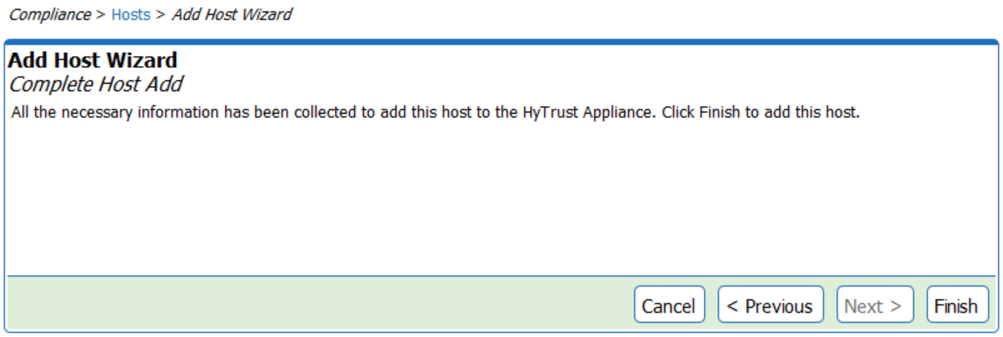
- **Use Pass through without HTCC Service Account**—Select this to use the user's account for authentication when establishing sessions from HTCC to vCenter Server.

  In this mode, a vCenter Server account must be configured for each user. Limits on viewing objects in the vSphere Client are supported and maintained using vCenter Server roles and permissions.

- **Use Pass through with HTCC Service Account**—Select this to use the user's account for initial authentication but use the HTCC Service Account for all other operations.

  Select this mode if using Smart Card for authentication. Refer to the *Smart Card Authentication* section in the *HyTrust CloudControl Administration Guide* for more information on Smart Card support.

14. Click '**Next**'.
15. The **HTCC Add Host Wizard** now indicates it has all the information needed to add the host(s).


Compliance > Hosts > *Add Host Wizard*

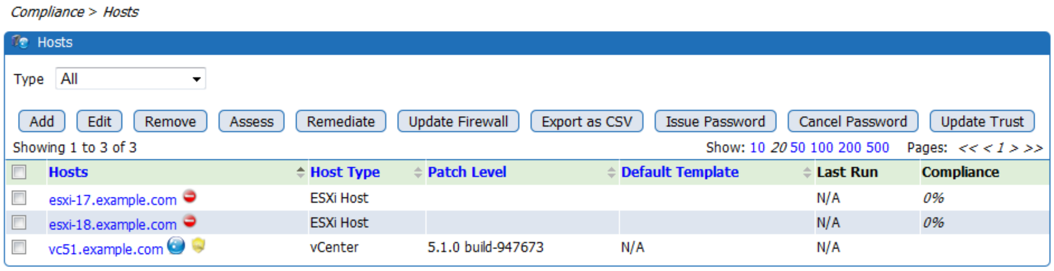
Add Host Wizard
Complete Host Add

All the necessary information has been collected to add this host to the HyTrust Appliance. Click Finish to add this host.

Figure 6-9 Add Host Wizard - Complete Host Add page

16. Click '**Finish**'.

Once you have successfully added a vCenter Server, it will appear on the ***Hosts*** page along with its managed hosts.


Compliance > Hosts

Hosts

Type: All

Showing 1 to 3 of 3 Show: 10 *20* 50 100 200 500 Pages: << < *1* > >>

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
□	esxi-17.example.com	ESXi Host			N/A	*0%*
□	esxi-18.example.com	ESXi Host			N/A	*0%*
□	vc51.example.com	vCenter	5.1.0 build-947673	N/A	N/A	

Figure 6-10 Compliance > Hosts page with added hosts

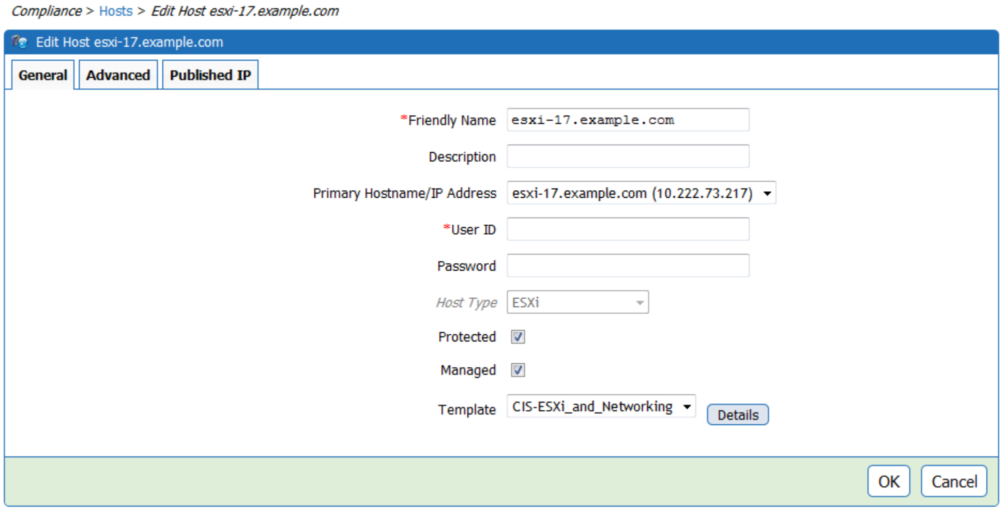
Note: In larger environments, the add host process can take several minutes, so it may take some time before the hosts appear in the list.

As shown in Figure 6-10, vCenter Server is now protected, as indicated by the gold shield (🛡) icon.

However, each imported vCenter Server managed-host requires additional configuration before HTCC can protect it, as indicated by the blocked (⛔) icon.

Configuring Managed Hosts

1. On the ***Compliance* > *Hosts*** page, click on a blocked hostname.
2. On the '**General'** tab, specify the root administrator credentials (User ID and Password) for the selected host.



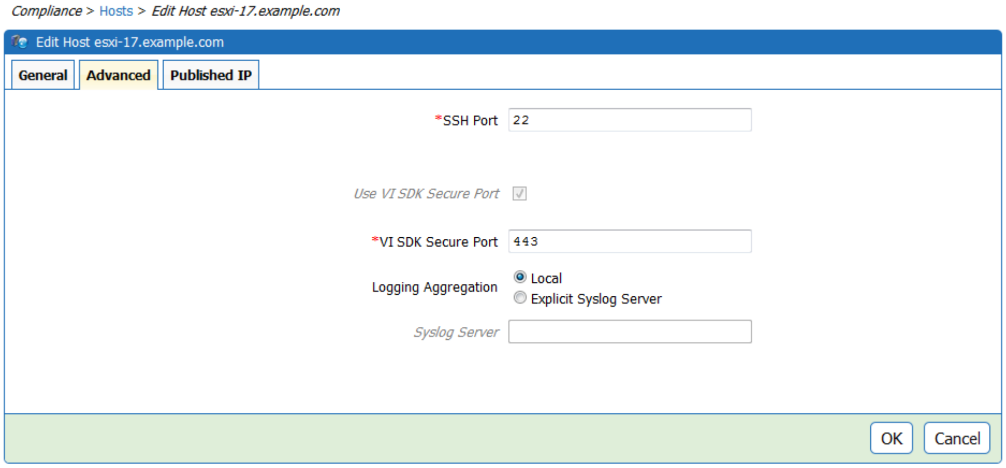
Compliance > Hosts > Edit Host esxi-17.example.com

Edit Host esxi-17.example.com

*Friendly Name: esxi-17.example.com
Description:
Primary Hostname/IP Address: esxi-17.example.com (10.222.73.217)
*User ID:
Password:
Host Type: ESXi
Protected: ☑
Managed: ☑
Template: CIS-ESXi_and_Networking

Figure 6-11 Compliance > Hosts > Edit Host page - General tab

3. If needed, change the assigned security template (default template chosen by host type).
4. Open the **Advanced** tab, review the settings, and, if needed, update the advanced HTCC configuration settings for the selected host



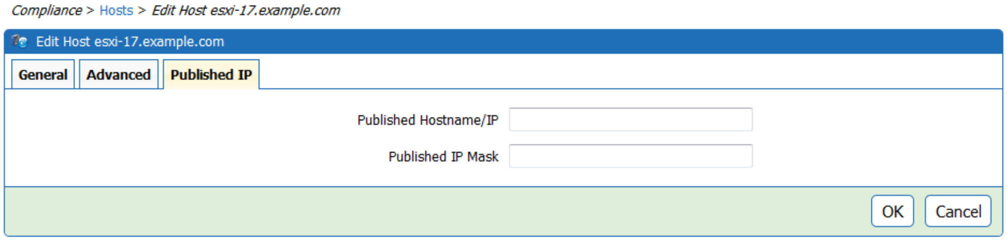
Compliance > Hosts > Edit Host esxi-17.example.com

Edit Host esxi-17.example.com

*SSH Port: 22
Use VI SDK Secure Port: ☑
*VI SDK Secure Port: 443
Logging Aggregation: ● Local ○ Explicit Syslog Server
Syslog Server:

Figure 6-12 Compliance > Hosts > Edit Host page - Advanced tab

5. If using Mapped Mode, select the **Published IP** tab and specify the Published IP address and Mask that clients will use to route management traffic to HTCC


Compliance > Hosts > Edit Host esxi-17.example.com
Edit Host esxi-17.example.com
General
Advanced
Published IP
OK
Cancel

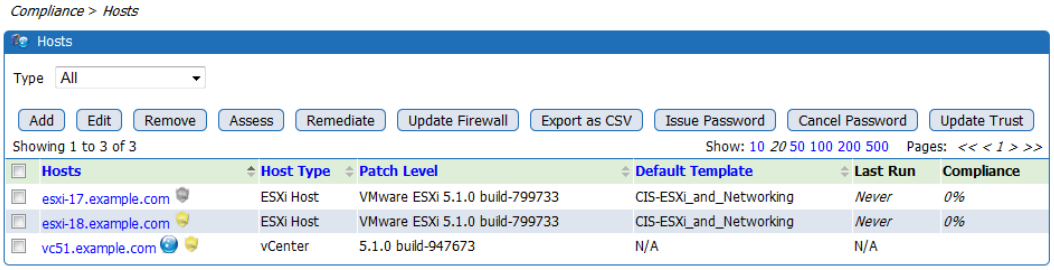
Published Hostname/IP

Published IP Mask

Figure 6-13 Compliance > Hosts > Edit Host page - Published IP tab

6. Once you are finished editing the host configuration, click '**OK**' to save your changes.
7. Repeat for each blocked host.

After completing this process for each host, all hosts on the Hosts page should now be protected (as indicated by a 🛡 or 🛡 icon).



Showing 1 to 3 of 3

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
□	esxi-17.example.com	ESXi Host	VMware ESXi 5.1.0 build-799733	CIS-ESXi_and_Networking	*Never*	*0%*
□	esxi-18.example.com	ESXi Host	VMware ESXi 5.1.0 build-799733	CIS-ESXi_and_Networking	*Never*	*0%*
□	vc51.example.com	vCenter	5.1.0 build-947673	N/A	N/A	

Figure 6-14 Compliance > Hosts page with protected hosts

You can sort the list by **Hosts**, **Host Type**, **Patch Level**, or **Default Template**. Click on the appropriate column headers to sort the contents.

Now that all hosts are protected, all future communication to them goes through HTCC.

If you are utilizing the 'Destination Map' feature, you can login to your ESX host (using its Published Hostname/IP address) from any client to confirm proper network connectivity.

In Router Mode, you can login directly to the host using the real IP address to confirm proper network connectivity.

Note: If you are still in Demo mode, you will need to use the Demo mode username (*superadminuser*) and password (`Pa$$w0rd123!`).

You are now ready to create and deploy access policies. Refer to the *HyTrust CloudControl Administration Guide* for details.

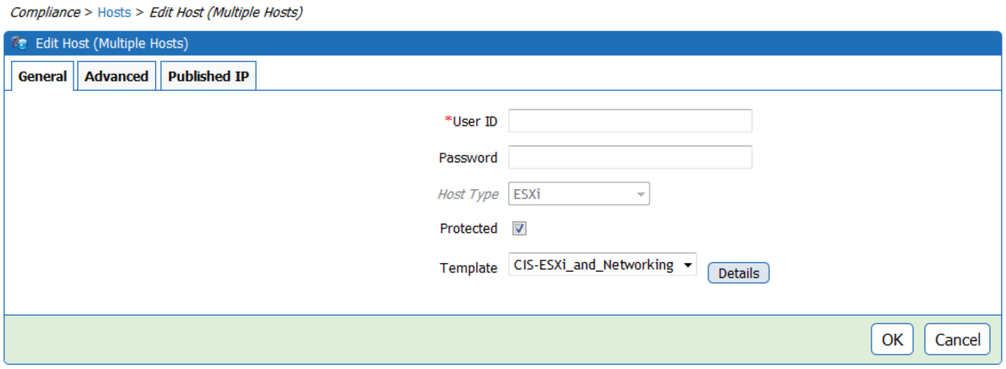
Configuring multiple ESX or ESXi hosts

To configure multiple ESX or ESXi hosts at the same time, also called batch edit:

1. Place a checkbox next to each host you want to configure.

Note: Multiple host edit is only supported for hosts of the same type (e.g., ESXi only) that share the same root credentials.

2. Click the **'Add'** button. The ***Edit (Multiple Host)*** page appears.



Compliance > Hosts > *Edit Host (Multiple Hosts)*

Edit Host (Multiple Hosts)

*User ID

Password

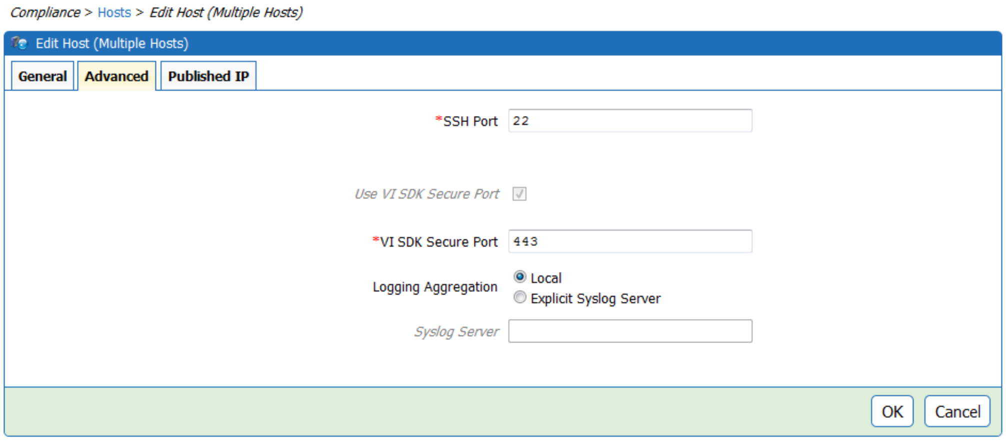
Host Type ESXi

Protected ☑

Template CIS-ESXi_and_Networking

Figure 6-15 Edit Host (Multiple Hosts) page - General tab

3. Open the **Advanced** tab and make necessary changes.



Compliance > Hosts > *Edit Host (Multiple Hosts)*

Edit Host (Multiple Hosts)

*SSH Port 22

Use VI SDK Secure Port ☑

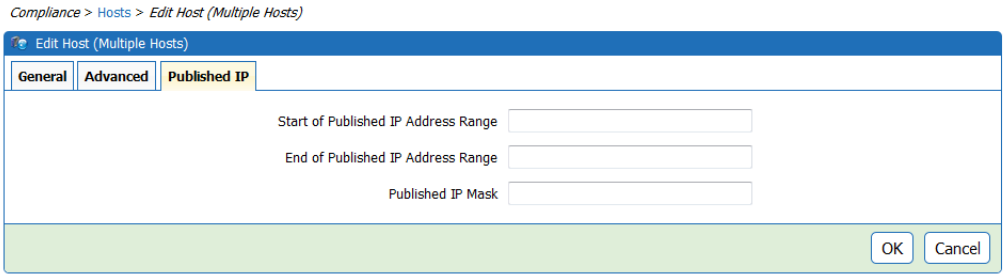
*VI SDK Secure Port 443

Logging Aggregation ● Local ○ Explicit Syslog Server

Syslog Server

Figure 6-16 Edit Host (Multiple Hosts) page - Advanced tab

If using Mapped Mode, you can open the **Published IP** tab and enter an IP range and subnet mask for automatic PIP assignment (PIPs are not required for hosts).



Compliance > Hosts > *Edit Host (Multiple Hosts)*

Edit Host (Multiple Hosts)

Start of Published IP Address Range

End of Published IP Address Range

Published IP Mask

Figure 6-17 Edit Host (Multiple Hosts) page - Published IP tab

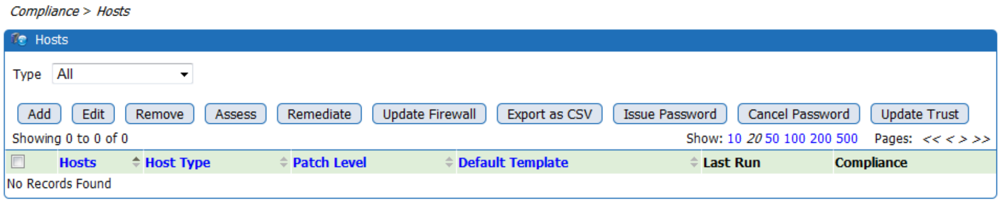
4. Once you are finished configuring the hosts, click '**OK'** to save your changes.

You are now ready to create and deploy access policies. Refer to the *HyTrust CloudControl Administration Guide* for details.

Adding a WCS Host

To add a vSphere Web Client Server (WCS) host:

1. From the HTCC Management Console, select **Compliance > Hosts** to open the ***Hosts*** page



Showing 0 to 0 of 0

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
No Records Found						

Figure 6-18 Compliance > Hosts page

2. Click '**Add'**.

   The **HTCC Add Host Wizard** appears (see Figure 6-2). This wizard sequences through a series of steps where you specify the WCS host to add.

3. Select the "vSphere Web Client Server Only" option and click '**Next**'.

   The VMware ***vSphere Web Client Server Configuration*** page appears (see Figure 6-7).

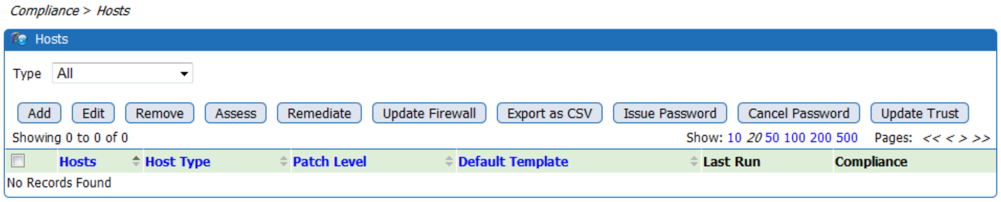
4. Complete the WCS configuration and click '**Next**'.
5. Complete the **Add Host Wizard**.

You are now ready to create and deploy access policies. Refer to the *HyTrust CloudControl Administration Guide* for details.

Adding Unmanaged Hosts

To add unmanaged ESX hosts (i.e., ESX hosts that are not managed by a vCenter Server):

1. From the HTCC Management Console, select ***Compliance > Hosts*** to open the ***Hosts*** page.



Showing 0 to 0 of 0

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
No Records Found						

Figure 6-19 Compliance > Hosts page

2. Click '**Add**'.

   The **HTCC Add Host Wizard** appears (see Figure 6-2). This wizard sequences through a series of steps where you specify an individual unmanaged ESX host to add.

3. Select the 'Other Hosts' option and click '**Next**'.

The ***Host Login*** page appears (see Figure 6-3).

4. Complete the **Add Host Wizard**.

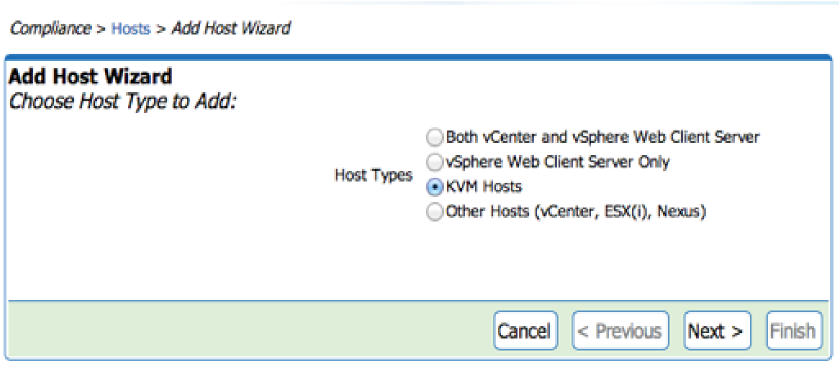
You are now ready to create and deploy access policies. Refer to the *HyTrust CloudControl Administration Guide* for details.

Adding KVM Hosts

KVM hosts are "unmanaged" hosts. There is no equivalent of vCenter currently being used to manage KVM hosts in HTCC. The following steps describe the process of adding KVM hosts.

1. From the HTCC Management Console, select ***Compliance*** > ***Hosts*** to open the ***Hosts*** page.
2. Click '**Add**'.

   The **Add Host Wizard** appears.



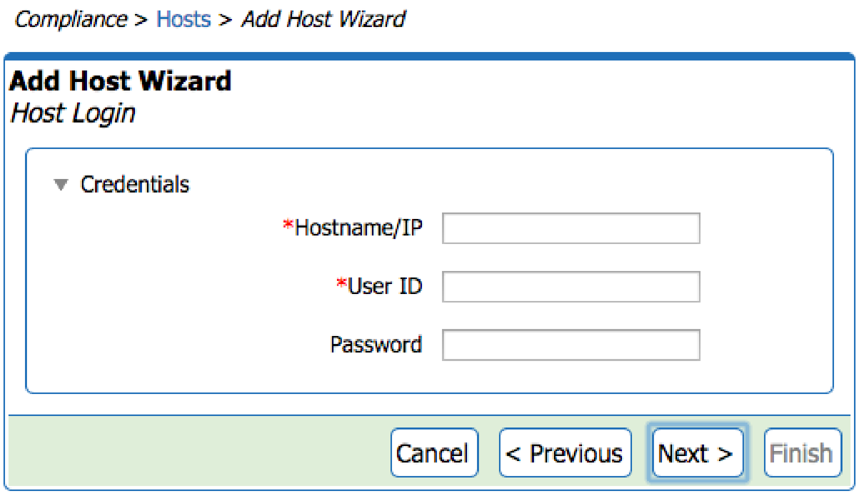
Compliance > Hosts > *Add Host Wizard*

Add Host Wizard
Choose Host Type to Add:

Host Types
○ Both vCenter and vSphere Web Client Server
○ vSphere Web Client Server Only
● KVM Hosts
○ Other Hosts (vCenter, ESX(i), Nexus)

Figure 6-20 Add Host Wizard: Host Login: Choose Host Type to Add

3. Select 'KVM Hosts' and click **'Next'**.



Compliance > Hosts > *Add Host Wizard*

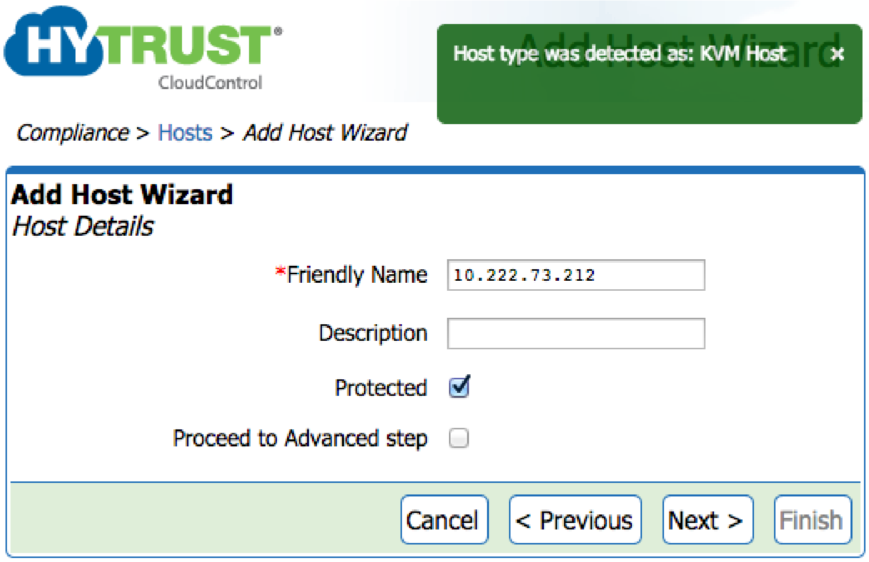
Add Host Wizard
Host Login

Credentials
*Hostname/IP
*User ID
Password

Figure 6-21 Add Host Wizard: Host Login

4. Enter **Hostname/IP**, **User ID** and **Password** and click '**Next**'.

   HTCC displays a message, "Host type was detected as: KVM Host".



Host type was detected as: KVM Host ×

Compliance > Hosts > Add Host Wizard

Add Host Wizard
Host Details

*Friendly Name 10.222.73.212

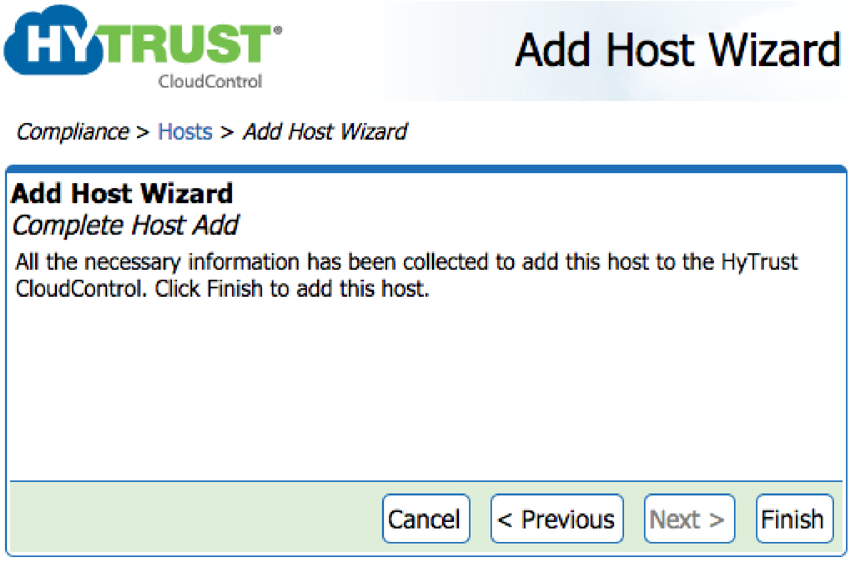
Description

Protected ☑

Proceed to Advanced step □

Figure 6-22 Add Host Wizard: Host Type detected message

5. Click '**Finish**' on the '**Complete Host Add**' screen.



Add Host Wizard

Compliance > Hosts > Add Host Wizard

Add Host Wizard
Complete Host Add

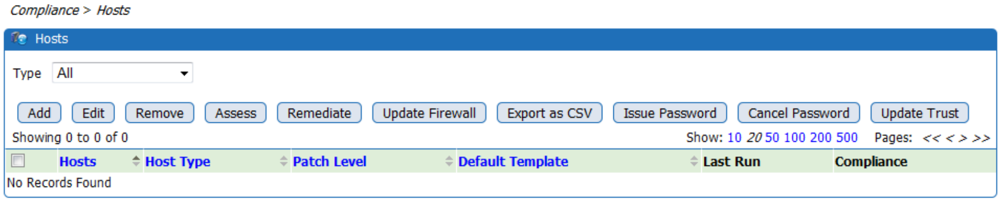
All the necessary information has been collected to add this host to the HyTrust CloudControl. Click Finish to add this host.

Figure 6-23 Add Host Wizard: Complete Host Add

The newly added host will appear on the ***Compliance*** > ***Hosts*** page.

Adding Cisco Nexus Switches

1. From the HTCC Management Console, select ***Compliance*** > ***Hosts*** to open the ***Hosts*** page.



Type: All

Showing 0 to 0 of 0

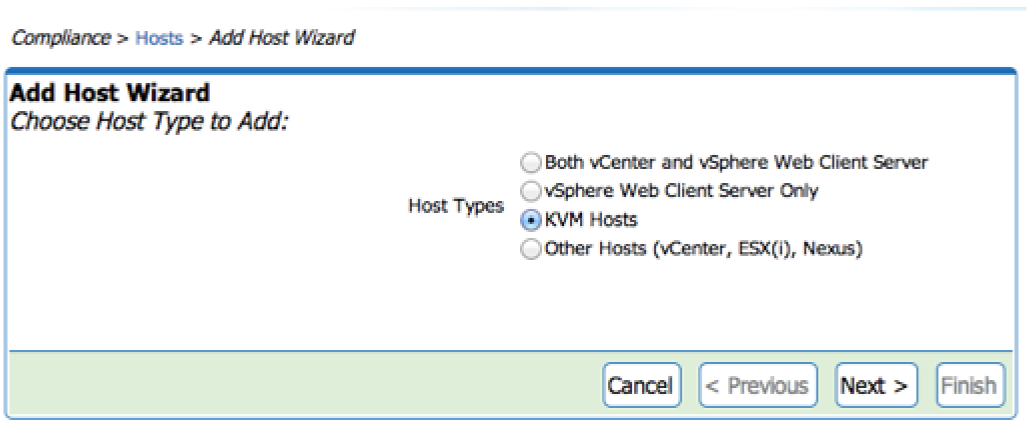
□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance

No Records Found

Figure 6-24 Compliance > Hosts page

2. Click ‘**Add**’.

   The **Add Host Wizard** appears.

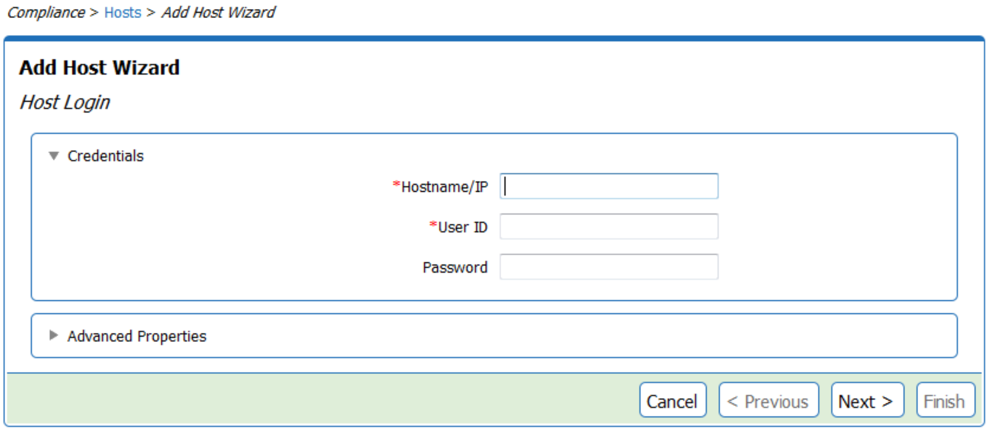


Host Types
○ Both vCenter and vSphere Web Client Server
○ vSphere Web Client Server Only
● KVM Hosts
○ Other Hosts (vCenter, ESX(i), Nexus)

Figure 6-25 Add Host Wizard - Host Type page

3. Select ‘Other Hosts’ option and click ‘**Next**’.

   The ***Host Login*** page appears.



*Hostname/IP
*User ID
Password

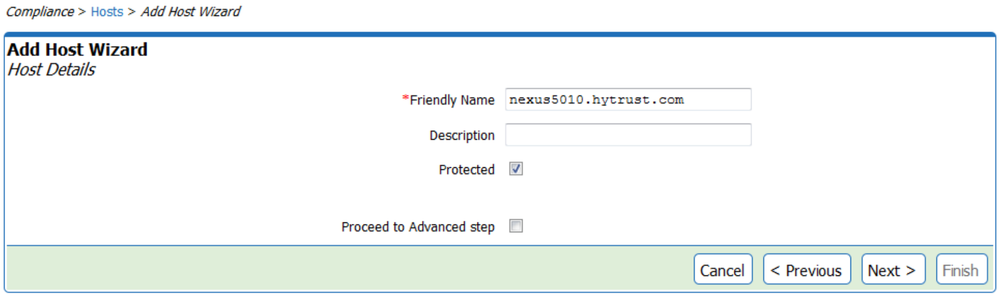
Figure 6-26 Add Host Wizard - Host Login page

4. Enter the following:
   a. The fully qualified hostname or IP address of the Nexus host.
   b. The administrator User ID and Password for the Nexus host.

Note: You will not be able to add a host with a password that contains both the left angle bracket (<) and the right angle bracket (>) characters. However, passwords with either character are supported.

c. Click '**Next'**.

5. The ***Host Details*** page appears.



Compliance > Hosts > Add Host Wizard

Add Host Wizard
Host Details

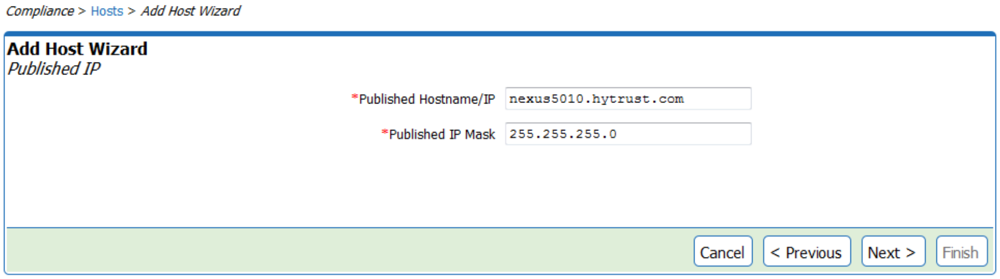
*Friendly Name: nexus5010.hytrust.com
Description:
Protected ☑
Proceed to Advanced step ☐

Figure 6-27 Add Host Wizard - Host Details page (Nexus)

6. On the ***Host Details*** page, enter the following:
   - Friendly Name—A unique name to identify the Nexus host in the list of HTCC hosts. This does not have to be the same name as used in DNS.

Note: Spaces and special characters are allowed, but the name should not exceed 64 characters.

   - Description—A description for the host.
   - Protected—Select this checkbox to have the HTCC protect the Nexus host. Default is selected.
7. Click '**Next'**.
8. If using Mapped Mode, the Published IP (PIP) page appears.



Compliance > Hosts > Add Host Wizard

Add Host Wizard
Published IP

*Published Hostname/IP: nexus5010.hytrust.com
*Published IP Mask: 255.255.255.0

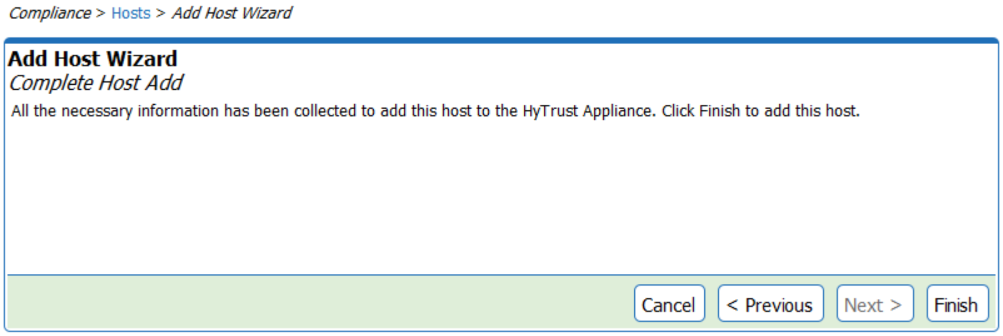
Figure 6-28 Add Host Wizard - Published IP page

The following fields are available:

- **Published Hostname/IP**—The hostname/IP address to use to route all traffic to this host.
- **Published IP Mask**—The subnet mask to use to route all traffic to this host.

Click '**Next**' to continue.

9. The **HTCC Add Host Wizard** now indicates it has all the information needed to add the host(s).



Compliance > Hosts > Add Host Wizard

Add Host Wizard

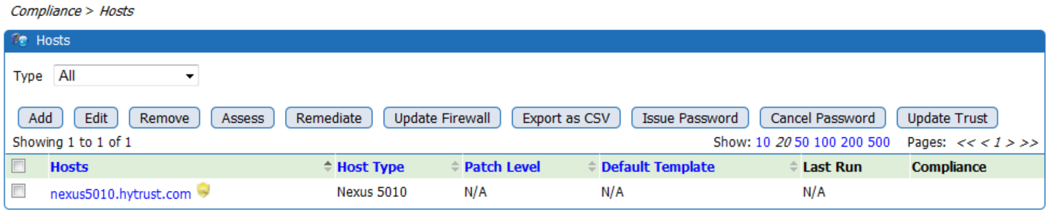
Complete Host Add

All the necessary information has been collected to add this host to the HyTrust Appliance. Click Finish to add this host.

Figure 6-29 Add Host Wizard - Complete Host Add page

10. Click '**Finish**'.

Once you have successfully added a Nexus host, it will appear on the ***Compliance > Hosts*** page.



Compliance > Hosts

Showing 1 to 1 of 1 Show: 10 20 50 100 200 500 Pages: << < 1 > >>

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
□	nexus5010.hytrust.com 🛡	Nexus 5010	N/A	N/A	N/A	

Figure 6-30 Compliance > Hosts page with added Nexus host

Note: In larger environments, the add host process can take several minutes, so it may take some time before the hosts appear in the list.

A yellow shield (🛡) icon next to the Nexus host indicates it is now protected.

Adding Cisco UCS Manager Hosts

Prerequisites

If using SSL, you must perform the following before you can add a Cisco UCS Manager host:

1. Import the SSL Certificate using the HTCC Management Console—refer to *Managing Certificates* in the *HyTrust CloudControl Administration Guide*.
2. By default, HTCC only accepts SSL version 3; however, SSL version 2 is required for compatibility with Cisco USC Manager hosts. Configure the HTCC to accept SSL version 2 by running the following command as *ascadminuser*:

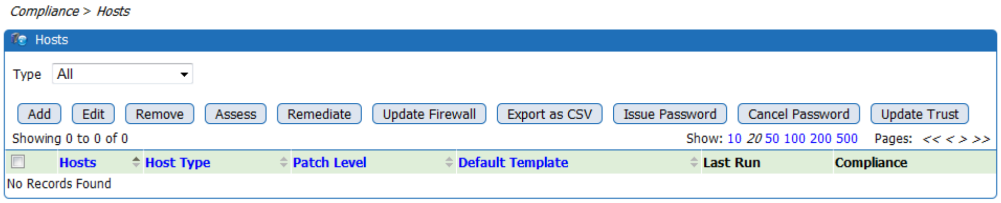
```
asc certs -ssl 2
```

3. Restart Tomcat by running the following command as *ascadminuser*:

```
asc service -n tomcat6
```

Steps

1. From the **HTCC Management Console**, select ***Compliance*** > ***Hosts*** to open the ***Hosts*** page



Type: All

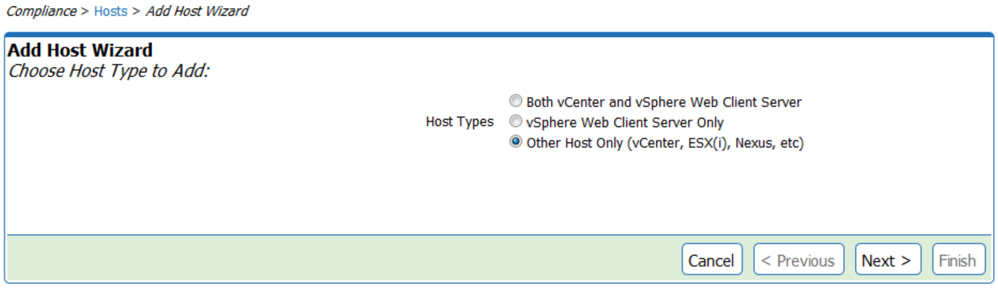
Showing 0 to 0 of 0

No Records Found

Figure 6-31 Compliance > Hosts page

2. Click '**Add**'.

   The **Add Host Wizard** appears.


Compliance > Hosts > Add Host Wizard
Add Host Wizard
Choose Host Type to Add:
Host Types
○ Both vCenter and vSphere Web Client Server
○ vSphere Web Client Server Only
Cancel
< Previous
Next >
Finish

Host Types: ● Other Host Only (vCenter, ESX(i), Nexus, etc)

Figure 6-32 Add Host Wizard - Host Type page

3. Select **Other Hosts** and click '**Next**'.

   The ***Host Login*** page appears.

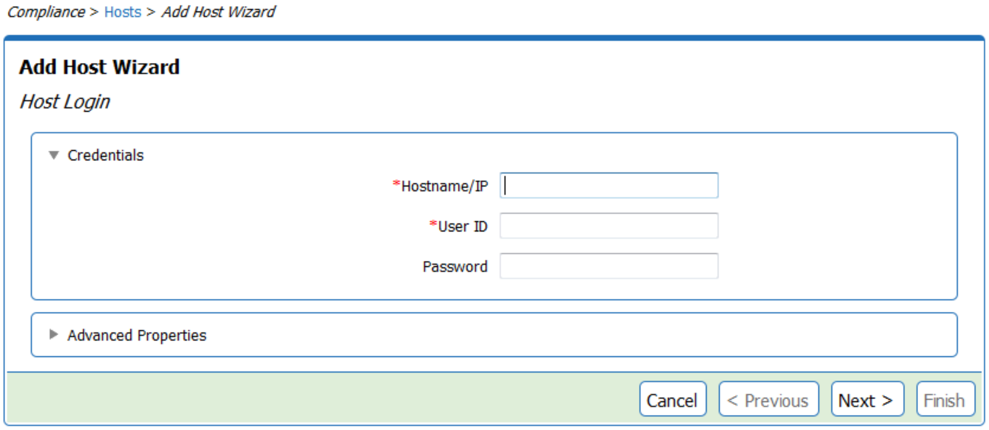
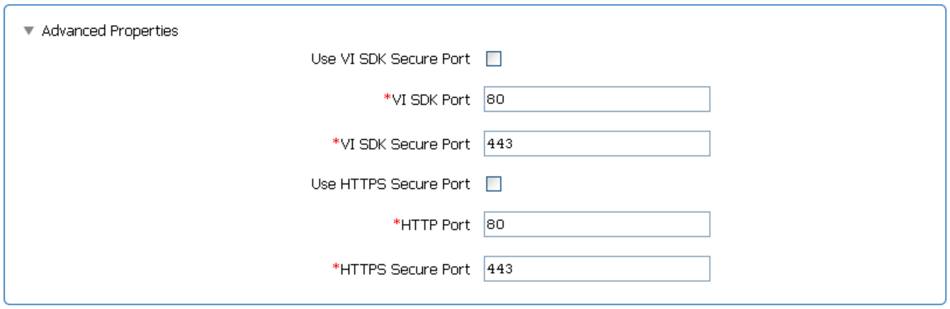


Figure 6-33 Add Host Wizard - Host Login page

4. Enter the following:
   a. The fully qualified hostname or IP address of the UCS Manager host.
   b. The administrator User ID and Password for the UCS Manager host.

Note: You will not be able to add a host with a password that contains both the left angle bracket (<) and the right angle bracket (>) characters. However, passwords with either character are supported.

c. If not using SSL, open the Advanced Properties section and deselect the Use VI SDK Secure Port and Use HTTPS Secure Port settings.



▼ Advanced Properties

Use VI SDK Secure Port □

*VI SDK Port: 80

*VI SDK Secure Port: 443

Use HTTPS Secure Port □

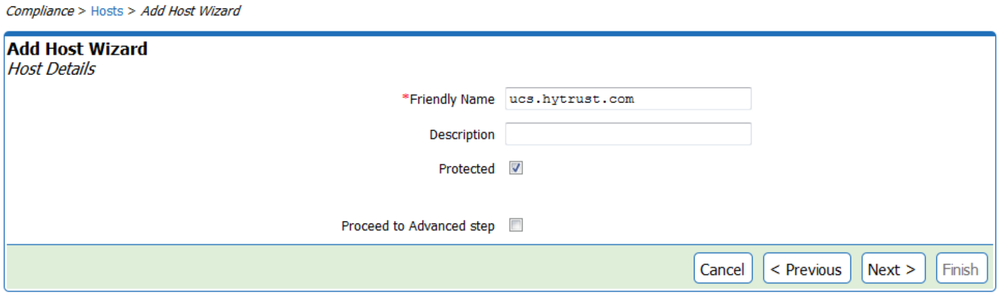
*HTTP Port: 80

*HTTPS Secure Port: 443

Figure 6-34 Advanced Properties section - Disable SSL

d. Click '**Next**'.

5. The ***Host Details*** page appears.



Compliance > Hosts > *Add Host Wizard*

Add Host Wizard
Host Details

*Friendly Name: ucs.hytrust.com

Description:

Protected ☑

Proceed to Advanced step □

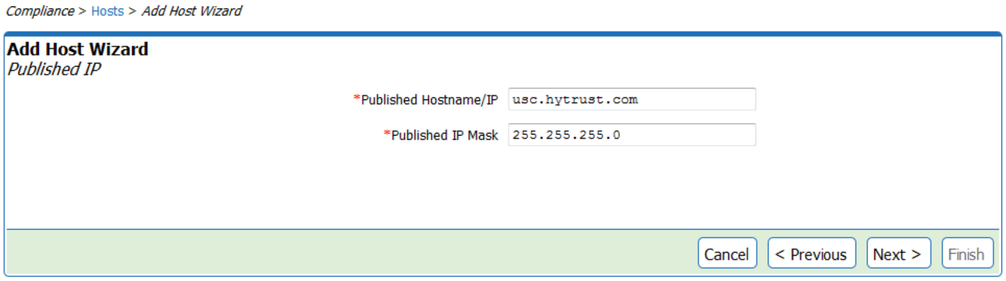
Figure 6-35 Add Host Wizard - Host Details page (UCS)

6. On the ***Host Details*** page, enter the following:
   - **Friendly Name**—A unique name to identify the UCS Manager host in the list of HTCC hosts. This does not have to be the same name as used in DNS.

Note: Spaces and special characters are allowed, but the name should not exceed 64 characters.

   - **Description**—A description for the host.
   - **Protected**—Select this checkbox to have the HTCC protect the UCS Manager host. Default is selected.

7. Click '**Next**'.
8. If using Mapped Mode, the **Published IP** page appears.


Compliance > Hosts > Add Host Wizard

Add Host Wizard
Published IP

*Published Hostname/IP: usc.hytrust.com

*Published IP Mask: 255.255.255.0

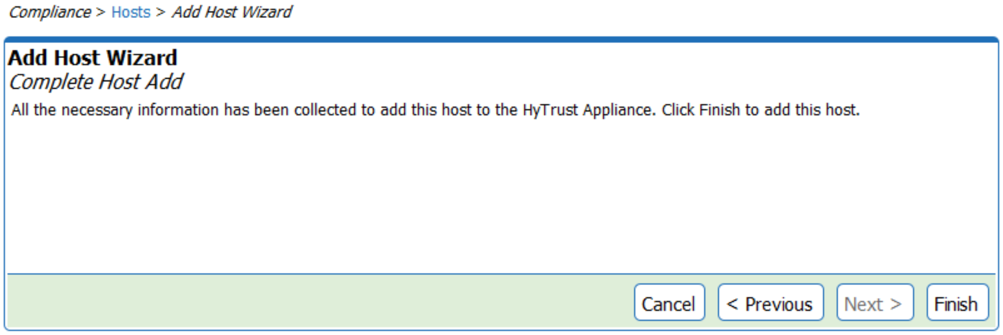
Figure 6-36 Add Host Wizard - Published IP page

The following fields are available:

- **Published Hostname/IP**—The hostname/IP address to use to route all traffic to this host.
- **Published IP Mask**—The subnet mask to use to route all traffic to this host.

Click '**Next**' to continue.

9. The **HTCC Add Host Wizard** now indicates it has all the information needed to add the host(s).


Compliance > Hosts > Add Host Wizard

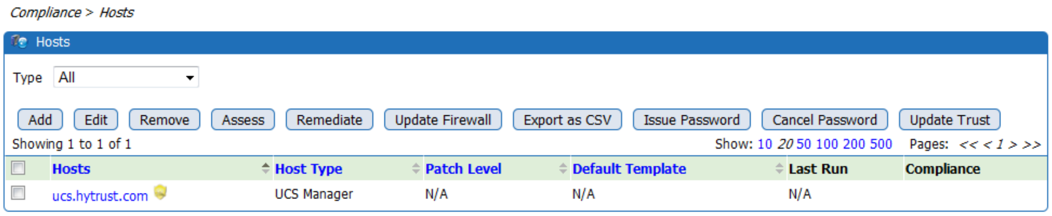
Add Host Wizard
Complete Host Add

All the necessary information has been collected to add this host to the HyTrust Appliance. Click Finish to add this host.

Figure 6-37 Add Host Wizard - Complete Host Add page

10. Click '**Finish**'.

Once you have successfully added a UCS Manager host it will appear on the ***Compliance > Hosts*** page.


Compliance > Hosts

Showing 1 to 1 of 1 | Show: 10 20 50 100 200 500 | Pages: << < 1 > >>

□	Hosts	Host Type	Patch Level	Default Template	Last Run	Compliance
□	ucs.hytrust.com 🛡	UCS Manager	N/A	N/A	N/A	

Figure 6-38 Compliance > Hosts page with added UCS Manager host

In larger environments, the add host process can take several minutes, so it may take some time before the hosts appear in the list.

A yellow shield (🛡) icon next to the UCS Manager host indicates it is now protected.

Accessing the HTCC-Protected Virtual Infrastructure

When a user attempts to establish a session with an ESX host or a vCenter Server, in an HTCC-protected environment, HTCC intercepts the request. The HTCC authenticates the user against a combination of the policy-data stored locally, and the central user directory or Active Directory (AD). In addition, the HTCC performs an authorization check to determine if the user is allowed to login to the target host.

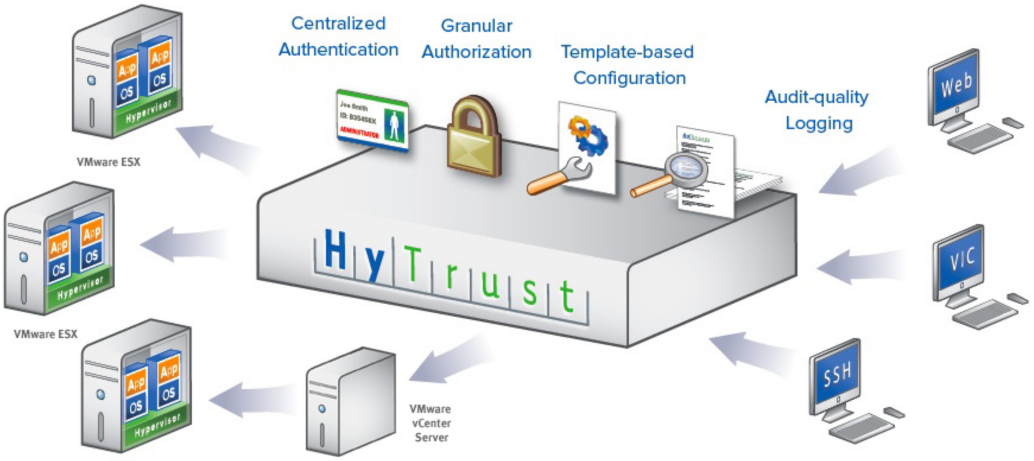


Figure 6-39 ***HTCC-protected virtual infrastructure***

HTCC forwards the request to the intended ESX host only if authentication and authorization at the HTCC-level is successful.

Authentication for the user (including session ID) lasts for the duration of the session. Once the session is established, authorization of the user to perform a particular operation, including AD group membership, can occur on multiple occasions per session.

After HTCC authenticates the user and authorizes the request, it sends the request to the target object. HTCC uses a special service account when forwarding requests to the target. Further explanation regarding the authentication and authorization process using the vSphere Client and SSH can be found in the *HyTrust CloudControl Administration Guide*.

Limiting Unauthorized Admin Access to the HTCC

The following configuration steps are required to mitigate the risk of unauthorized administrative access to HTCC:

1. Apply the *CoreAppliance* RuleSet to the HTCC virtual machine and restrict membership in the CoreAppliance security group.
2. Setup and configure SNMP to monitor HTCC reboots and implement change control.
3. Change the HTCC virtual machine boot order to boot from the disk first (not CD, etc.).

Refer to the appropriate sections in the *HyTrust CloudControl Administration Guide* for details on how to perform these tasks.

CHAPTER 7

High Availability

This chapter contains the following sections:

Overview

An Enterprise or appropriate evaluation license is required to configure HTCC for high availability (HA).

HTCC HA requires a second HTCC virtual machine (matching the specifications listed in Table 1-1) installed on a different host from the primary HTCC.

Using the HTCC HA option, two HTCC instances are installed on separate hosts. During HTCC HA setup, an administrator joins and establishes a relationship between the two HTCC instances, assigning one HTCC as primary and the other HTCC as secondary. Each HTCC instance uses a network connection (eth2) to monitor the health of the other HTCC and synchronizes all current database and configuration information at a default interval of 10 minutes.

Note: For maximum HA protection, it is recommended that each HTCC instance be in a separate cluster, have its own separate storage, and use a dedicated network link (eth2) connecting them to each other.

When configuring the secondary HTCC, two static IP addresses are assigned. Manually assign a static IP address to its management network interface (eth0). Once you assign the static IP address, subnet mask, gateway, and DNS server, you are prompted to specify the network settings for the HA services on the Connection 3 (eth2) interface.

Note: The HTCC Management Console is not available on the secondary HTCC.

Client traffic is only routed through the primary HTCC.

On failover, the primary HTCC management interface settings are transferred to the secondary HTCC, which becomes the primary HTCC. Client traffic is then routed to the new primary HTCC (which was originally configured as the secondary HTCC). This is referred to as HA promotion and demotion.

IMPORTANT: After the secondary HTCC becomes the primary, install a fresh secondary HTCC, configure it, and join it to the newly promoted primary HTCC. You can also restore the failed primary node and use it as a new secondary see— Recovering from a failover.

The following illustration shows the HTCC HA configurations for both Mapped Mode and Router Mode.

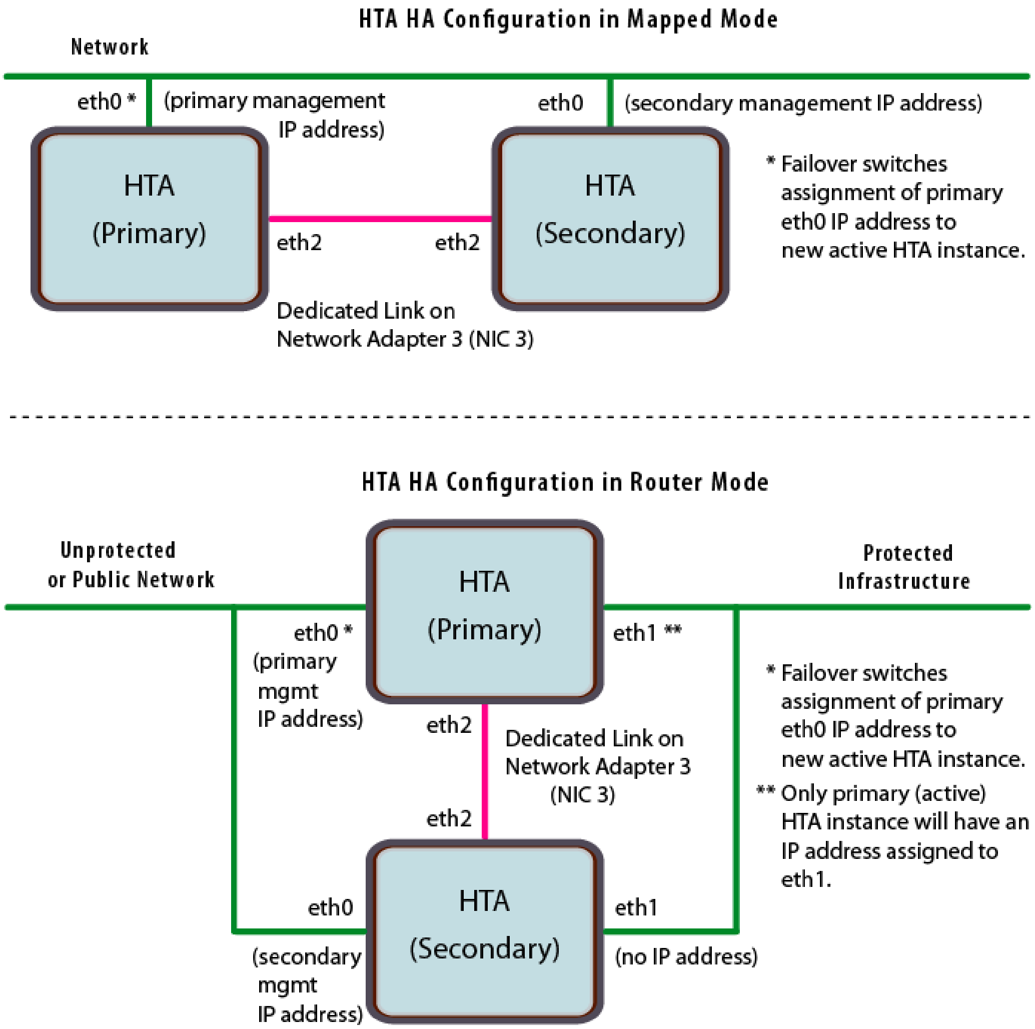

HTA HA Configuration in Mapped Mode
Network
eth0 *
(primary management IP address)
eth0
(secondary management IP address)
HTA (Primary)
eth2
eth2
HTA (Secondary)
* Failover switches assignment of primary eth0 IP address to new active HTA instance.
Dedicated Link on Network Adapter 3 (NIC 3)
HTA HA Configuration in Router Mode
Unprotected or Public Network
HTA (Primary)
Protected Infrastructure
eth0 *
(primary mgmt IP address)
eth1 **
eth2
Dedicated Link on Network Adapter 3 (NIC 3)
* Failover switches assignment of primary eth0 IP address to new active HTA instance.
** Only primary (active) HTA instance will have an IP address assigned to eth1.
eth2
eth0
HTA (Secondary)
eth1
(secondary mgmt IP address)
(no IP address)

Figure 7-1 HTCC high availability configuration

During normal operation, all client requests destined for the HTCC or the protected infrastructure are routed to the primary HTCC. When both HTCC instances are running, the secondary HTCC periodically monitors the health of the primary HTCC and synchronizes its data and configuration information with the primary HTCC.

Administrators can use the HTCC HA command line interface (CLI) command (`asc ha`) to configure and monitor the HA (e.g., checking status, setting the synchronization and timeout intervals, forcing immediate synchronization, or initiating the failover process)—see 7.

As long as the primary HTCC remains healthy, it continues to process client access requests. However, if a problem is detected on the primary HTCC, and automatic failover is active on both the primary and secondary HTCCs, the secondary HTCC will automatically promote itself to become the new primary. The duration of time from when the secondary detects a problem and when automatic failover occurs depends on the timeout interval.

An Administrator can manually promote or demote an HTCC using the `asc ha --mode` command—see 7.

Setup and Configuration

It is important to have the proper measures (i.e., notifications) in place to alert an HTCC administrator well in advance of a failover event so he can try to determine the root cause of the issue. Refer to the *Appliance Configuration* chapter (*Configuring Notifications* section) in the *HyTrust CloudControl Administration Guide* for more information on configuring HTCC notifications.

An HTCC administrator must install and join a new secondary HTCC to the newly promoted primary HTCC to restore the HA structure.

Once the HTCC administrator verifies that everything is working properly, he can remove the failed HTCC from the vCenter Server inventory since it can no longer be used.

Note: HTCC HA is only supported when the management interface (eth0) and the HA interface (eth2) are on different subnets. This requirement applies to both Mapped Mode and Router Mode deployments.

Note: The network segment used by eth2 should be correctly propagated between the clusters hosting the primary and secondary HTCCs.

Default Configuration

The default HTCC HA configuration is automatic failover with a default poll (health check) interval of 5 minutes, and a default timeout of 30 minutes, as shown in the table below.

Table 7-1 Default HA Configuration

Setting	Default Value	Minimum Value	Description
Failover Mode	Automatic		The secondary HTCC will automatically promote itself to the primary HTCC when the timeout clock expires.
Poll Interval (health check)	5 minutes	2 minutes	The health check polling interval time period between primary and secondary HTCCs.

Table 7-1 Default HA Configuration (Continued)

Setting	Default Value	Minimum Value	Description
Poll Interval (data sync)	10 minutes	5 minutes	The data synchronization period between nodes.
Timeout	30 minutes	2 minutes	The minimum time threshold before an automatic failover event occurs.

If the secondary HTCC determines during one of its health checks that the primary HTCC is not healthy, the timeout clock starts. If during the timeout period, a subsequent health check determines the primary HTCC is healthy, the timeout clock resets; otherwise, when the timeout clock expires the secondary HTCC will automatically promote itself and become the primary HTCC.

It is recommended that you configure both email (SMTP) and SNMP notifications when using HA. HA details are also logged in the `/var/log/asc/htcli.log` file. Refer to the *HyTrust CloudControl Administration Guide* for details on configuring SMTP and SNMP notifications.

HA Planning

Perform the following while planning your HA setup:

- Choose Router Mode or Mapped Mode network configuration—see 2.
- Complete the High Availability checklist (Table A-4) for you selected network configuration.

Primary HTCC Setup

Perform the following steps to setup the primary HTCC.

1. Complete the initial HTCC setup on an ESX or ESXi host for the primary HTCC:
   a. From the vSphere Client, deploy an HTCC on an ESX or ESXi host for the primary HTCC—see 3.
   b. Edit the HTCC virtual machine settings using the vSphere Client and select the Network Connection 3 (eth2) Device Status check boxes *Connected* and *Connect at power on*.
   c. Power on the primary HTCC—see 3.
   d. Assign an IP address to network Connection 1 (eth0)—see 3.
   e. Complete the HTCC Management Console Installation Wizard—see 3 and 3.
2. From the vSphere Client, open up the HTCC console window and login using the *ascadminuser* credentials.

Note: The *ascadminuser* password was modified during initial HTCC setup.

The *ascadminuser* account is a local administrator account on each HTCC, so the credentials for this account on the primary HTCC and secondary HTCC are independent.

3. Start the HA setup procedure. From the HTCC command line interface, type:

```
hasetup
```

4. At the "*Please specify network settings for the Connection 1 (eth0) interface"* prompts, confirm the settings assigned to HTCC. Press 'Enter' each time when prompted to maintain the current setting.
5. After confirming the settings for IP, subnet mask, gateway, and DNS server, type: "y" to proceed to the next step.
6. At the "*Deploy as primary (production) or secondary (standby)"* prompt, type:

   ```
   pri
   ```
7. At the "*Please specify network settings for High Availability services on Connection 3 (eth2) interface"* prompt, enter the primary HTCC Connection 3 (eth2) values you selected when filling out Table A-4.
8. To save your settings, type: "y"
9. Logout.

HA setup for primary HTCC is now complete. Next, you must install and configure a second HTCC instance and join the two HTCCs to create an HTCC-HA cluster.

Secondary HTCC Setup

Perform the following steps to setup the secondary HTCC.

1. Complete the initial HTCC setup on an ESX or ESXi host for the secondary HTCC:
   a. From the vSphere Client, deploy a second HTCC on a different ESX or ESXi host from the primary HTCC—see 3.
   b. Edit the HTCC virtual machine settings using the vSphere Client. Select Edit Settings for the HTCC within the vSphere Client and confirm that Network Connection 3 (eth2) is connected to the proper network segment and the Device Status checkboxes *Connected* and *Connect at power on* are selected.
   c. Power on the secondary HTCC—see 3.
2. From the vSphere Client, open up the HTCC console window and login using the *ascadminuser* credentials.

Note: The *ascadminuser* password was modified during initial HTCC setup.

The *ascadminuser* account is a local administrator account on each HTCC, so the credentials for this account on the primary HTCC and secondary HTCC are independent.

3. Start the HA setup procedure. From the HTCC command line interface, type:

   ```
   hasetup
   ```
4. At the *Please specify network settings for the Connection 1 (eth0) interface* prompt, manually assign a static IP address, subnet mask, gateway, and DNS server to the management network interface of the secondary HTCC.
5. Once you have assigned the static IP address, subnet mask, gateway, and DNS server, type:

   ```
   y
   ```

   to save the results and proceed to the next step.
6. At the *Deploy as primary (production) or secondary (standby)* prompt, type:

   ```
   sec
   ```
7. At the *Please specify network settings for High Availability services on Connection 3 (eth2) interface* prompt, enter the secondary HTCC Connection 3 (eth2) values you selected when filling out Table A-4.
8. To save your settings, type:

```
y
```

9. At the *Join a primary appliance by specifying its (eth2) IP address and ascadminuser password* prompt, specify the IP address and *ascadminuser* password of the primary HTCC.

Note: Make sure to use the new password (not the default) for the primary HTCC *ascadminuser* account which was changed during setup.

This process may take several minutes as the secondary HTCC establishes communication with the primary HTCC.

If successful, the secondary HTCC updates and displays the HyTrust High Availability (HA) System status as *Enabled* and the Mode as *Secondary*. The HA status is also updated on the primary HTCC and shows the Mode as *Primary* after you refresh the CLI command window.

Note: The *Last Sync* date displayed in the CLI command window is in UTC.

10. After the HA system status updates, you can logout.

Changing the Heartbeat IP address for eth2

Perform the following steps to change the heartbeat IP address for eth2:

1. Open a vSphere Client Console for the HTCC, and log in as the *ascadminuser*.
2. Disconnect the Secondary HTCC from the HA cluster (disband), by typing:

```
asc ha -disband
```

3. Change the primary IP, using the following command:

```
asc network -i eth2 -ip <new_IP> -nm <new_netmask>
```

4. Rerun the `hasetup` command to change the secondary IP and rejoin.

This process keeps the Primary HTCC passive until the Secondary HTCC re-initiates the join. It also avoids two sets of processes competing and interfering with each other.

Recovering from a failover

In the event of a failover, after the secondary HTCC is promoted, a new replacement secondary HTCC should be configured. The new secondary HTCC can either be a fresh deployment, or the failed HTCC can be restored to a clean state and configured as the new secondary HTCC.

To deploy a fresh secondary, follow the steps described in the section 7. To re-use a failed HTCC, first ensure the new primary HTCC is healthy, as the system restore operation permanently deletes the data and configuration files on the failed HTCC.

Configuring a failed HTCC as a new secondary.

1. If the HTCC is shutdown, as a precaution disable the network adapters prior to starting HTCC.
2. Login to the failed HTCC console using the vSphere client using the ascadminuser credentials.
3. Stop the HA services on the failed HTCC.

```
‘asc ha –disband’
```

4. Perform a 'system restore' operation on the failed HTCC to return it to an un-configured state.

   ```
   asc restore — —systemrestore
   ```

5. Enter 'y' to confirm.
6. Reboot the HTCC to complete the restore operation.
7. If the network adapters were disconnected, reconnect them through the vSphere Client.
8. Configure the Secondary HTCC — see 7 (continue from step 2).

HA Systems Boot Order

Anytime you have to shutdown or restart the primary HTCC, or after successfully completing the setup of both HTCC HA systems, perform the following steps to boot the HTCC HA systems (i.e., systems are synced):

1. Perform a clean shutdown of the secondary HTCC.
2. Perform a clean shutdown of the primary HTCC.
3. Start the primary HTCC.
4. Start the secondary HTCC after the primary has finished booting. (This is required to prevent automatic take-over.)

HA CLI Commands

All HTCC HA operations are performed using the HTCC CLI `asc ha` command. Using the vSphere Client, you can open the HTCC console window and execute HTCC CLI commands to perform HTCC HA operations. For example, you can run the `asc ha --status` command from either the primary or secondary HTCC to retrieve updated status for both HTCCs in the cluster.

You can obtain help on the syntax of all HTCC HA CLI commands and options using the following command:

```
asc ha --help
```

The following table provides a description of the most common HTCC HA command options. Refer to the *HyTrust CloudControl Administration Guide* for the full list of HA commands.

Table 7-2 Most common HTCC HA command options

Option	Description
`-d` or `--disband`	Disconnect the HTCC from the HA cluster. This can be run from the primary or secondary HTCC.
`-e` or `--peertest`	Test the health of the remote system and automatically failover if needed.
`-f` or `--failover {auto|manual}`	Set the failover mode to either manual or automatic. ▪ `auto`—Enable automatic failover. The secondary HTCC can assume primary functions if the primary HTCC has been offline for the timeout interval. ▪ `manual`—Disable automatic failover.
`--haclean`	Clean old HA sync data, keeping only the three most recent data sets.

Table 7-2 Most common HTCC HA command options (Continued)

Option	Description
`-i` or `--interval` *`<minutes>`*	Sets the data synchronization period, in minutes, between HTCCs. Valid range is 2–1440. The default is 10.
`-j, --join` *`<IP_address>`*	Join two HTCCs to create an HA cluster. This can only be run from the secondary HTCC.
`-o` or `--mode {primary|secondary}`	Set the HA mode. Valid values are: ■ `primary`—The main HTCC where all traffic is routed. ■ `secondary`—The backup or standby HTCC. **Note:** Changing the HA mode triggers a failover event.
`-p` or `--password` *`<password>`*	The password of the remote node. Required when joining a HA cluster. Optionally, the password can be supplied via the `HTHAPW` environment variable.
`-s` or `--sync`	Forces an immediate synchronization of data between HA HTCCs.
`--sshkeytest`	Tests the network connection between the two HA HTCCs and verifies the SSH keys.
`-t` or `--status`	View the current configuration and operational state of the HA cluster.
`-u` or `--timeout` *`<minutes>`*	Sets the primary HTCC monitoring minimum time threshold, in minutes, before an automatic failover event occurs. The minimum value is 10.
restore – –systemrestore	The 'system restore' operation returns the HTCC appliance to a clean state. It removes temporary and working files, and restores the system configuration files. The system restore operation can be used after an HA failover event, before joining a failed HTCC as a secondary, or during testing to restore HTCC to a clean state.

APPENDIX A

Resource Tables and Checklists

This appendix contains the following sections:

- HTCC Host and Appliance
- Protected Hosts
- Active Directory
- HyTrust High Availability

Use the tables and checklists in this appendix to document the information required when planning and installing HyTrust CloudControl (HTCC). You can reference this information as you set up and configure HTCC.

HTCC Host and Appliance

Table A-1 HTCC Host and Appliance checklist

Resource	Value
ESX Server for HTCC	
ESX/ESXi FQDN	
Service Console IP	
Service Console Subnet Mask	
Service Console Gateway (in Router Mode: gateway = Connection 2 IP of HTCC)	
Host Type and Version (e.g., ESXi 4.1)	
Root Password	
Network separation method (physical, VLAN, tagged VLAN)	
Verify 64-bit capability	
Public VLAN ID or NIC	
Protected VLAN ID or NIC	
HTCC Networking	

Table A-1 HTCC Host and Appliance checklist (Continued)

Resource	Value
Connection 1	
■ IP	
■ Subnet Mask	
■ Gateway	
■ DNS Server	
■ VLAN ID	
Connection 2 (used only in Router Mode)	
■ IP	
■ Subnet Mask	
■ VLAN ID	

Protected Hosts

Note: HTCC does not support hosts with passwords that contains *both* the "<" and the ">" characters. However, passwords that have either character are supported.

Table A-2 Protected Hosts checklist

Resource	Value
vCenter Server to Protect	
Server Name	
Server IP	
Server Subnet Mask	
Service Gateway (in Router Mode: gateway = Connection 2 IP of HTCC)	
Server VLAN ID	
Server Version (e.g., vCenter Server 4.1)	
Windows Server Edition	
Administrator account & password (Local or AD account)	
vCenter Server Services credentials (Log On As)	
■ VMware VirtualCenter Server (vpxd.exe)	
■ VMware VirtualCenter Management Webservices (vctomcat)	
ESX Server(s) to Protect	
ESX/ESXi FQDN	

Table A-2 Protected Hosts checklist (Continued)

Resource	Value
Service Console IP	
Service Console Subnet Mask	
Service Console Gateway (in Router Mode: gateway = Connection 2 IP of HTCC)	
Host Type and Version (e.g., ESXi 4.1)	
Root Password	
Service Console VLAN ID or NIC	

Active Directory

Refer to the *HyTrust CloudControl Administration Guide* for information on AD configuration.

£ Verify, AD service can be routed to Network Connection 1 of HTCC.
£ Create HTCC service account.
£ Create 17 unique HyTrust Security Groups.

Table A-3 Active Directory checklist

Resource	Value
Root Domain Name	
Preferred Global Catalog	
Domain Controller Name	
DNS Server IP	
HTCC Service Account Name and credentials	

HyTrust High Availability

Optional

£ Locate second host to install secondary HTCC.
£ Verify network connectivity of Host to Public and Protected network segments.
£ Create isolated VLAN for HyTrust HA and create necessary vSwitch for Network connection 3 (eth2).

Table A-4 HyTrust High Availability checklist

Resource	Mapped Mode Value	Router Mode Value
Connection 1 of Primary HTCC		
■ IP		
■ Subnet Mask		
■ Gateway		
■ DNS Server		
■ VLAN ID		

Table A-4 HyTrust High Availability checklist (Continued)

Resource	Mapped Mode Value	Router Mode Value
Connection 2 of Primary HTCC		
■ IP	▨	
■ Subnet Mask	▨	
Connection 3 of Primary HTCC		
■ IP		
■ Subnet Mask		
Connection 1 of Secondary HTCC		
■ IP		
■ Subnet Mask		
■ Gateway		
■ DNS Server		
■ VLAN ID		
Connection 2 of Secondary HTCC		
■ IP	▨	▨
■ Subnet Mask	▨	▨
Connection 3 of Secondary HTCC		
■ IP		
■ Subnet Mask		

APPENDIX B

Configuring the Windows Server 2008 Firewall

This appendix describes how to configure the Windows Server 2008 Firewall to work with HyTrust CloudControl (HTCC). For details on configuring other firewalls, refer to the appropriate documentation.

This appendix contains the following sections:

- View and Modify Inbound Rules

View and Modify Inbound Rules

Configuring the Windows Server 2008 Firewall to work with HTCC requires you to use the Windows Server 2008 Firewall advanced configuration utility to change its Inbound Rules.

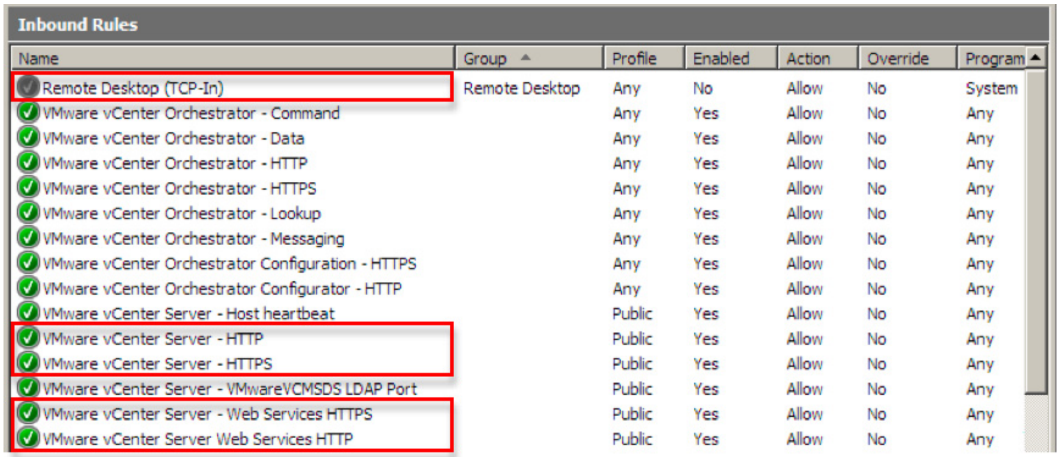
Perform the following steps:

1. Open the Start menu and select **Administrative Tools** > **Windows Firewall and Advanced Security**.
2. Click **Inbound Rules** in the left pane to view the current inbound firewall rules.
3. Locate the ‘Remote Desktop (TCP-In)’ rule and confirm, it is disabled.

   If it is enabled, select it and click the ‘**Disable Rule’** button in the **Action** pane on the right. (You could also right-click on it and choose **Disable Rule** from the context pop-up.)

4. Locate the ‘VMware vCenter Server - HTTP’ rule.
   a. Select it and click the Properties button in the **Action** pane (or right-click on it and choose **Properties** from the context pop-up) to open its properties dialog.
   b. Click the **Scope** tab.
   c. In the **Remote IP address** section, select These IP addresses, and click the ‘**Add’** button.
   d. Select ‘This IP address or subnet’, enter the IP address of HTCC in the field, and click ‘**OK**’.
   e. Click ‘**OK’** in the **Properties** dialog to apply the changes.
   f. Repeat for the following rules:
      □ VMware vCenter Server - HTTPS
      □ VMware vCenter Server - Web Services HTTPS
      □ VMware vCenter Server Web Services HTTP

You should now have all the necessary rules configured properly.



Inbound Rules

Name	Group	Profile	Enabled	Action	Override	Program
Remote Desktop (TCP-In)	Remote Desktop	Any	No	Allow	No	System
VMware vCenter Orchestrator - Command		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator - Data		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator - HTTP		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator - HTTPS		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator - Lookup		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator - Messaging		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator Configuration - HTTPS		Any	Yes	Allow	No	Any
VMware vCenter Orchestrator Configurator - HTTP		Any	Yes	Allow	No	Any
VMware vCenter Server - Host heartbeat		Public	Yes	Allow	No	Any
VMware vCenter Server - HTTP		Public	Yes	Allow	No	Any
VMware vCenter Server - HTTPS		Public	Yes	Allow	No	Any
VMware vCenter Server - VMwareVCMSDS LDAP Port		Public	Yes	Allow	No	Any
VMware vCenter Server - Web Services HTTPS		Public	Yes	Allow	No	Any
VMware vCenter Server Web Services HTTP		Public	Yes	Allow	No	Any

Figure B-1 Windows Server 2008 Firewall with Advanced Security Inbound Rules

Now, authentication and authorization to vCenter Server can only be accomplished via HTCC.

APPENDIX C

Network Access Requirements

This appendix describes the HyTrust CloudControl (HTCC) network protocol and port requirements.

The following tables list the required network protocol ports needed while implementing network access restrictions when deploying HTCC.

Table C-1 HTCC inbound traffic requirements

Service Name	Protocols	Ports	Interfaces	Comments
HTTP	TCP	80	All	Including custom HTTP ports referenced in the HTCC configuration.
HTTPS	TCP	443	All	Including custom HTTPS ports referenced in the HTCC configuration.
Ping	ICMP	Types 8, 11	All	
Route Discovery	TCP, UDP	179, 2602, 2604	All	Only required for HTCC Router Mode deployments. Route discovery services are disabled by default.
SNMP v2c	TCP, UDP	161	Network 1	SNMP is disabled by default.
SSH	TCP	22	All	Including custom SSH ports referenced in the HTCC configuration.
vCenter Server Forwards	TCP, UDP	1–65535	All	vCenter Server plug-ins and Windows Server can require additional forwards in this port range.
vSphere	TCP, UDP	902, 903	All	
Web Client Server	TCP	9443	All	By default open to HTCC

Table C-2 HTCC outbound traffic requirements

Service Name	Protocols	Ports	Interfaces	Comments
Active Directory	TCP	389, 3268	All	Active Directory communications for LDAP and GC access
Active Directory	TCP	636, 3269	All	With SSL

Table C-2 HTCC outbound traffic requirements (Continued)

Service Name	Protocols	Ports	Interfaces	Comments
DNS	TCP, UDP	53	All	
HTTP	TCP	80	All	Including custom HTTP ports referenced in the HTCC configuration.
HTTPS	TCP	443	All	Including custom HTTPS ports referenced in the HTCC configuration.
Ping	ICMP	Types 8, 11	All	
Route Broadcast	TCP, UDP	179, 2602, 2604	All	Only required for HTCC Router Mode deployments.
SMTP	TCP	25	All	Required for sending SNMP alerts.
SNMP v2c Trap	TCP, UDP	162	All	SNMP alerts are disabled by default.
SSH	TCP	22	All	Including custom SSH ports referenced in the HTCC configuration.
Syslog	TCP, UDP	514, 10514	All	Including custom Syslog ports referenced in the HTCC configuration.
vCenter Server Forwards	TCP, UDP	1–65535	All	vCenter Server plug-ins and Windows Server can require additional forwards in this port range.
vSphere	TCP, UDP	902, 903	All	
Web Client Server	TCP	9443	All	By default open to vCenter Server

APPENDIX D

VMware vSphere 5.1/5.5 Support

This appendix describes the HyTrust CloudControl (HTCC) requirements, supported deployments, and authentication process for VMware vSphere 5.1/5.5 support.

Overview

VMware vSphere 5.1 added three new components which affect the way the HTCC performs authentication and authorization. These new components are:

- vCenter Single Sign On (SSO) Server—provides single authentication for users accessing multiple resources in a vSphere environment.
- vCenter Inventory Service—offloads multiple client inventory requests by handling those requests directly and reducing the load on the vCenter Server.
- vSphere Web Client Server—enhances the functionality of the existing vSphere Client allowing management of the virtual infrastructure using a cross-platform web browser.

In supporting vSphere 5.1/5.5 environments HTCC proxies all communication from the Web Client to the Web Client Server to protect the virtual environment. The following figure shows how communication occurs between HTCC and the various vSphere 5.1/5.5 components.

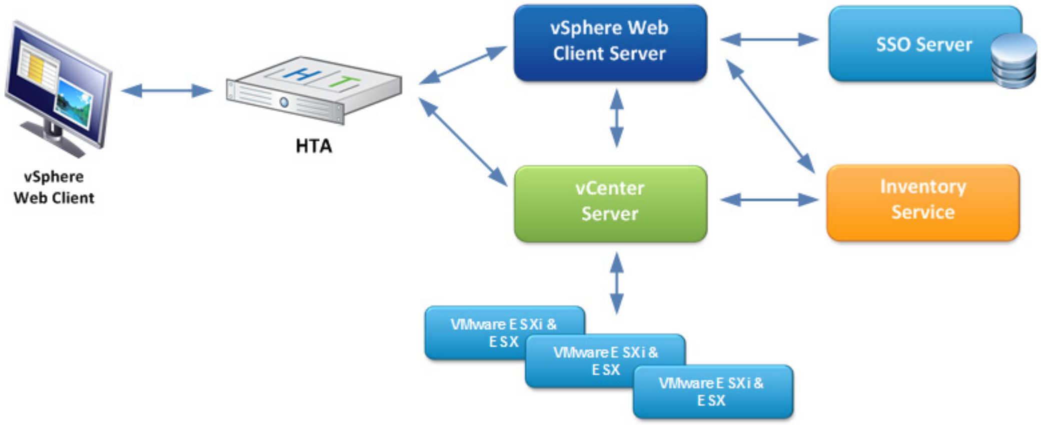


Figure D-1 Communication between the HTCC and vSphere 5.1/5.5 components

Supported Deployments

HTCC supports the following deployments with vSphere 5.1/5.5 vCenter Server and Web Client Server components.

- VMware vSphere Web Client Server and vCenter Server services running on separate underlying OS instances are treated as two protected assets from the HTCC's perspective with separate Real/Target IP identities for each entity.

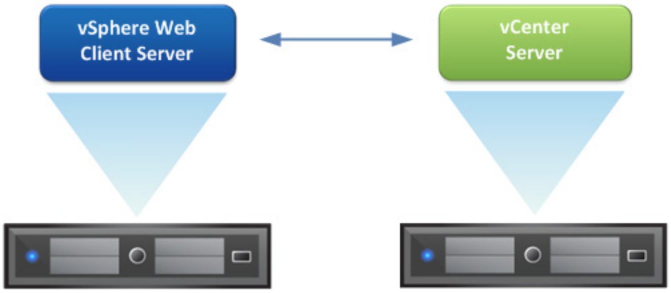


Figure D-2 Separate vCenter Server and Web Client Server hosts

- VMware vSphere Web Client Server and vCenter Server services running on the same underlying OS instance are treated as two separate protected assets from the HTCC's perspective, but with a single shared Real/Target IP identity.

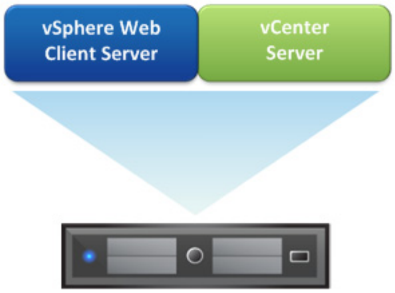


Figure D-3 vCenter Server and Web Client Server on same host

- VMware vSphere Web Client Server and vCenter Server services running on the same underlying OS instance and serving additional vCenter Server environments running on separate underlying OS instances.

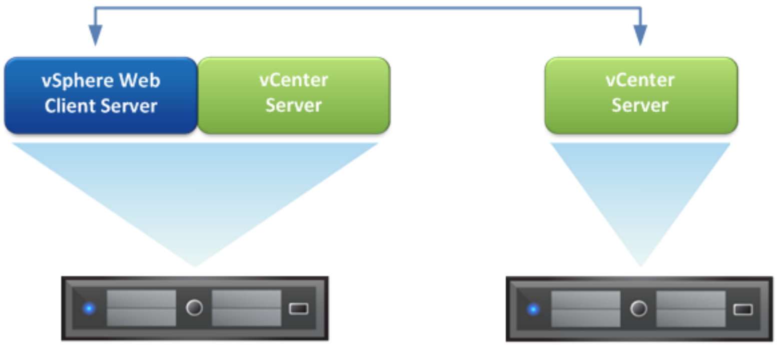


Figure D-4 vCenter Server and Web Client Server on same host 2

- VMware vSphere Web Client Server serving multiple vCenter Server environments, all running on separate underlying OS instances, are treated as multiple protected assets from HTCC's perspective with separate Real/Target IP identities for each entity.

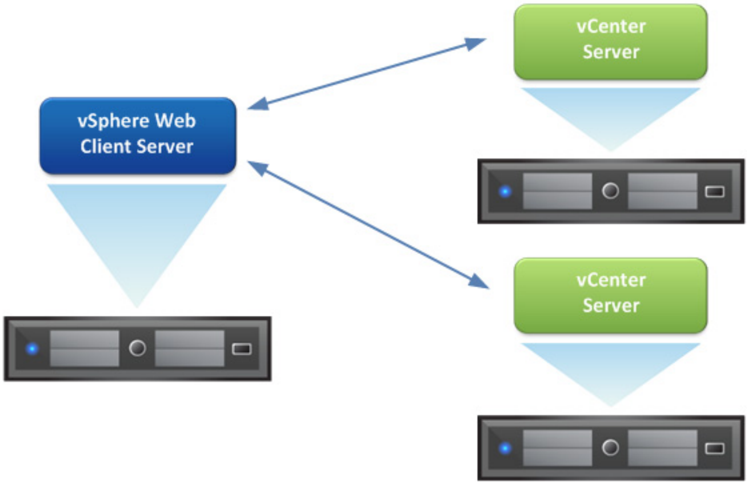


Figure D-5 Web Client Server serving multiple vCenter Server hosts

Authentication

HTCC performs the following authentication process when performing authentication in a vSphere 5.1/5.5 environment.

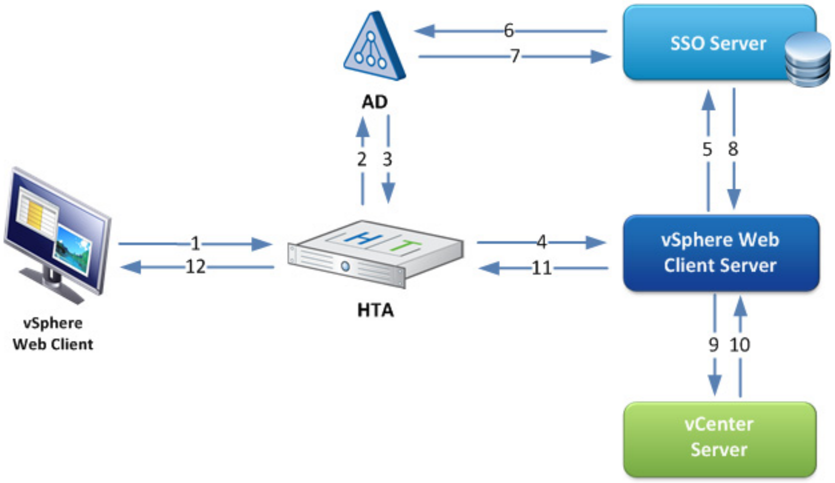


Figure D-6 vSphere and HTCC authentication process

The authentication process occurs as follows:

1. User attempts to login or perform an operation on a protected host.
2. HTCC queries the directory service to authenticate user.
3. If user is authenticated, HTCC obtains the user's group information for authorization of operations.
4. If user is authorized to perform the requested operation, HTCC sends the request to the Web Client Server.

5. The Web Client Server sends authentication credentials to the SSO Server.
6. The SSO Server authenticates with the directory service.
7. If authenticated, the directory service informs the SSO Server.
8. The SSO Server passes a login token back to the Web Client Server.
9. If user is authorized to login, the Web Client Server sends the associated login token to the vCenter Server.
10. The vCenter Server sends success or error message to the Web Client Server.
11. The Web Client Server passes the message to HTCC.
12. User receives success or error message.

Requirements

The following are required when using vSphere 5.1/5.5:

- HTCC should be configured to use the same AD server that has been configured in the VMware SSO Server.
- The service account credentials must be the same for vCenter Servers and vSphere Web Client Servers.
- Using pass through authentication requires HTCC and all its protected assets to use the same MS Active Directory domain configuration.
- Using non-pass through or pass through with service account authentication requires a single service account with administrative privileges across all vCenter Server protected assets that the vSphere Web Client Server serves.

Limitations

The following limitation exists when using vSphere 5.1/5.5:

- HTCC only supports authentication against a single directory server (multi domain, single forest root node).