

Infinio Accelerator

Installation and Upgrade Guide

Infinio Accelerator

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Infinio Accelerator 4.1.0

This document Infinio Accelerator explains how to install Infinio™ Accelerator® or upgrade it in VMware® environments.

Accelerator is a software solution that significantly improves storage performance, cost effectively and non-disruptively.

Accelerator creates a shared, deduplicated cache from user-configurable amounts of RAM (physical memory) in ESXi hosts. You can use SSD storage to extend the cache, which also maintains cache efficiency across ESXi reboots. All cache sizing operations are real-time and online for ease of access.

Accelerator is easy to manage and does not affect vSphere operations or storage configurations.

Note: This release of Infinio Accelerator has a different architecture and system requirements compared to Infinio Accelerator V2.1.5 and preceding 2.x releases. You must uninstall previous 2.x releases of Accelerator before you can install 4.1.0.

Note: Earlier Infinio Accelerator releases (3.x) were distributed with Ubuntu 14.04 LTS. As the public support of this version of Linux has ended, you will not be able to upgrade a 3.x management console to 4.0 or to any later releases. If you currently have a running 3.x management console, you must install a new 4.1.0 management console alongside the running 3.x management console. A 4.1.0 management console will be able to talk with previously installed 3.x I/O filters. The same license you used for 3.x will still work with 4.1.0. You can then upgrade the Infinio I/O filters on all clusters with the newly installed 4.1.0 management console. After all clusters are upgraded successfully, you may shutdown and archive the 3.x management console as a backup.

Accelerator Documentation

Accelerator includes the following user information:

- See the *Release Notes* for important late-breaking information about installing and using the Infinio Management Console VM and the Infinio I/O Filter.
- See the *Operations Guide* for information that describes Accelerator product features and explains how to use Infinio Accelerator.

Technical Support

To contact Infinio support:

- Open a ticket via the support portal: <https://support.infinio.com>
- Telephone the support line at
 - U.S. (toll free number): 1-888-576-9392
 - From outside the U.S: +1-972-556-5067
 - support@infinio.com.

Accelerator Installation

You can install Accelerator in approximately 15 minutes without rebooting your ESXi hosts.

The Accelerator installation wizard prompts you for information about your vCenter and your Accelerator configuration preferences, including the ESXi host that runs the Accelerator Management Console VM.

After installation completes, you can log in to the Management Console Web UI, install the I/O filter on selected clusters, manage storage policies and enable VM acceleration.

Important: See: “Appendix A — Accelerator Requirements and Restrictions” on Page 27 for a list of Accelerator requirements and restrictions. You should review these requirements before you install. See the *Infinio Accelerator Operations Guide* for additional requirements and specifications.

Installation Wizard Requirements

To run the Accelerator installation wizard, you need a client computer that meets these requirements:

- Is running any of the following operating systems:
 - Windows 7 x86 and x64
 - Windows 8
 - Windows 10
 - Windows Server 2008 R2
 - Windows Server 2012 R2
- Has network connection to the vCenter. The client computer should have an address on the same local area network (LAN) as the target vCenter.
- Has at least 4 GB of available disk space.

Avoid installing Accelerator remotely, using a wide area network (WAN) because installation might take a long time or time out and fail. For remote installations, copy the installation software to a computer that is local to the vCenter, and use remote desktop to run the installation.

Management Console Web UI Access Requirements

To access the Management Console VM through the Web interface after installation, you need a client computer that meets these requirements:

- A Network connection to the Management Console VM.

- One of following supported Internet browsers, updated with the latest patches:
 - Google Chrome (latest)
 - Mozilla Firefox (latest)
 - Microsoft Internet Explorer 11
 - Microsoft Edge

Information Required for Accelerator Installation

The Accelerator installation wizard prompts you for information about vCenter and the Accelerator configuration. Before you begin the installation, obtain the information described in the Table 1 and Table 2.

For requirements and restrictions of VMware and vCenter, see “VMware and vCenter Requirements” on Page 27 and “vCenter Restrictions” on Page 28.

Table 1: vCenter Information - Installation Information Worksheet

vCenter Data	Description	Notes
vCenter server name	Either an IP address or the full-qualified domain name.	If using DNS, make sure you can resolve the domain name.
vCenter server port	An optional alternate port number for the vCenter connection	The default port is 443
vCenter Credentials	Account name for the privileged vCenter account.	The vCenter account must have full administrative privileges.
	Password for the privileged vCenter account.	

Table 2: Accelerator Management Console - Installation Information Worksheet

Management Console VM Data	Description	Notes
ESXi Host	Name of an ESXi host to run the Management Console VM.	Requires 8GB RAM and one vCPU on the host.
Datastore	Datastore that will contain the Management Console VM.	Requires 80GB of free space on the datastore. You can select a thin volume, which consumes 20GB initially. Note: As a best practice avoid installing the management console on a local datastore.
Network	The access network name or ID.	IPv4 Only. Choose a secure network, such as a vCenter management network. This network provides access to the vCenter, and also enables access to the Management Console via a Web browser. If you use a dynamic address, you do not need the information for the Static IP address.
Dynamic IP Address	You can initially use enable a dynamically-assigned IPv4 address if your network uses DHCP. Infinio recommends that the Management Console VM has a permanent address in production mode.	
Static IP Address (If DHCP is not used)	IP Address	An alternate to a dynamically-assigned DHCP address.
	Netmask	
	Default Gateway	Infinio recommends that the Management Console VM has a permanent address in production mode.
	DNS Server 1	
	DNS Server 2 (optional)	
DNS Server 3 (optional)		
Domain Name (optional)	An fully-qualified domain name for the Management Console. This is preferred, to keep the Management Console accessible at all times.	If used, you must be able to use DNS to resolve the domain name.
Accelerator Management Console Credentials	Account name for the Management Console administration account.	Provides log-in access to the Infinio Accelerator UI, via a Web browser. (Choose a neutral account name such as infinio-admin rather than a person's name.)
	Password for the Management Console administration account.	Note: Be aware that it is difficult to recover lost or forgotten Management Console VM credentials.

For "preferred" and "recommended" choices above, see: "Using a Permanent Address for the Management Console VM" on Page 14.

Important: Keep the Management Console VM online at all times to perform required operations, such as installing or uninstalling the Infinio I/O Filter or upgrading the Infinio software. As a best practice, consider installing the Management Console VM into the same cluster where you host your management applications.

Management Console VM Installation Steps

Follow these steps to install the Management Console VM on an ESXi Host in one of your VMware clusters.

Before you Begin Installation

- Obtain the installation executable file named `infinio-full-install.exe` from Infinio. If purchasing the software (instead of using it in trial mode) you should also obtain your software license key.
- Make sure that the client Windows computer that you use for the installation:
 - Meets the requirements stated in: “Installation Wizard Requirements” on Page 7.
 - Is connected to the same local network as the vCenter Server. Do not attempt the installation over a wide-area network (WAN) because it might time out and fail.
- During connection to the vCenter, you might see a warning message similar to the following:

Invalid SSL Certificate Detected

You will not see this message if the certificate is signed and valid and has a valid chain. You can choose to proceed with the vCenter connection, or cancel the installation and resolve the SSL certificate problem. See the VMware documentation for your vSphere release for information about SSL certificates.

- During installation, you have the option to configure **Automatic Support** to collect diagnostic information and send it to Infinio each day. The process has a negligible effect on vSphere performance and includes no password information. You can change this setting at any time after installation as described in the *Infinio Accelerator Operations Guide*. Transmitted data consists of:
 - Infinio I/O Filter, Management Console and ESXi logs.
 - Infinio I/O Filter performance statistics.
 - vCenter inventory information such as ESXi host, cluster and VMs
 - Infinio Management Console use statistics.

After installation, you can upload and install your own SSL certificate.

Installation Procedure for Infinio Accelerator

1. Download the `infinio-full-install.exe` file to the client computer on which you will run the Accelerator installation wizard.
2. Double-click the executable file to begin installation.
3. Specify a temporary location for the installation files, or accept the default Desktop location and press **OK**.
4. Wait for the installation files to extract, and for the **Welcome** screen to open.
5. Read and accept the terms of the license agreement and then click **Begin**.
6. In the wizard screen prompts, enter the information described in: “Information Required for the Accelerator Installation” on Page 8.

Step 1 - Connect to the vCenter

Specify your vCenter information:

1. vCenter IP Address.
2. (Optional) If required, change the default port from 443 to another valid port configured for your vCenter.
3. Name of a user that has administrative privileges on the vCenter.
4. Password for the vCenter administrative user.
5. Click **Connect**.
6. Click **Connect to vCenter** if an *Invalid SSL Certificate* dialog opens. (Alternatively, you can resolve the certificate problem and restart the installation.)

Note: Port 443 might be blocked by the firewall on your local client. If necessary, open the port for both UDP and TCP. If you select an alternate port, you might also need to open that alternate port on the local client's firewall.

Step 2 - Set up the Management Console VM

Specify the ESXi host, a datastore, and the network used to communicate with vCenter.

1. Select an eligible ESXi host from the list provided. Eligible hosts have at least 8GB of memory and one vCPU available.
2. Select a datastore that has at least 80GB of available space, unless you select a thin volume. In the latter case, the Management Console consumes 20GB of space on the thin volume. Avoid using a local datastore.
3. Select a network that enables the Management Console VM to communicate with the vCenter.
4. Click **Next**.

Note: If installation fails for network access reasons, or if it succeeds but the Management Console does not acquire an IPv4 address, it is likely that you selected an incorrect network in this step.

Step 3 - Configure Network Settings

Specify the network settings for the Management Console VM.

1. Enter a host name for the Management Console VM. Optionally, you can specify a fully-qualified domain name (FQDN). (You must register that name with your DNS server so that you can access the Management Console Web UI by specifying its domain name instead of its IPv4 address.)
2. Specify either DHCP or a static IP address.

Note: See: "Using a Permanent Address for the Management Console VM" on Page 14.

3. Specify the network information for the static IP address, if used.
 - (a) IPv4 Address
 - (b) Netmask
 - (c) Default Gateway
 - (d) At least one, and up to 3 DNS servers.
4. Click **Next**.

Step 4 - Create a Management Console Web UI User Account

Specify the name and password to create a user account. You will use this account only to log in to the Management Console Web UI for the purpose of doing tasks such as enabling acceleration on VMs or managing the cache.

Note: If you lose or forget these credentials, call Infinio Support to reset the account name. See: "Technical Support" on Page 6.

1. Enter a user name.
2. Enter a strong password (Minimum 8 characters including one number and one symbol).
3. Confirm the password by re-entering it.
4. Click **Next**.

Step 5 - Configure Automatic Support

Infinio recommends that you configure Automatic Support at this time to send anonymous diagnostic information to Infinio. You can also defer this step and enable Automatic Support in the Management Console Web UI at a later time.

1. Enter a company name. If you deploy multiple instances of Infinio Accelerator in your enterprise, use a unique name for each instance, such as *Infinio-Marketing*.
2. Click **Next**.

Step 6 - Preview Deployment

Preview the Management Console VM's settings before you deploy.

1. Click **Previous** if you want to go back and make changes.
2. Click **Deploy Management Console** to begin the installation.

Step 7 - Deploy Infinio

Monitor progress of the Management Console VM during the following three phases:

1. Import Management Console VM - The Management Console OVA file is imported by the selected ESXi host. This might take up to 30 minutes depending on network bandwidth.
2. Configure IP settings - The Management Console VM settings are configured, such as vSwitch and IP address assignment.
3. Synchronize with vCenter - The Management Console VM powers on and acquires information about clusters and VMs from vCenter.
4. When the *Installation Complete* dialog opens, it contains the newly-assigned IPv4 address for the Management Console VM and reminds you to create a DNS entry for the console name.
5. Click **Open Management Console** to launch the Management Console Web UI.

If you used an DHCP-assigned IP address for the Management Console, either bookmark the page or record the assigned IP address.

What to do After Installing Infinio Accelerator

If this is the first time you are installing Infinio Accelerator in this vCenter, begin with the following tasks:

- Activate the Software License, unless you are using a trial version within the trial period. See: “Activating the Accelerator License” on Page 13. (This is required regardless of the number of times that you install the console on the vCenter.)
- Assign a permanent, resolvable address to the Management Console VM. See: “Using a Permanent Address for the Management Console VM” on Page 14.
- Initial configuration. See “Using the Management Console Web UI” on Page 16.

Activating the Accelerator License

You can obtain an Accelerator license from your Infinio sales representative. Without a license, you can use accelerator for a 30 day trial period. You must activate the license to use Accelerator beyond the trial period. If you attempt to use the software after the expiry date you will see the following error:

Expired evaluation license.

Contact Infinio at sales@infinio.com or telephone: +1 512-523-5192.

To review and activate the Infinio Accelerator license:

1. Log in to the Management Console Web UI.
2. Click **Settings** and then the **Licensing** tab.

3. Check the **License Status**, which tells you whether you are licensed or in trial mode:
 - (a) Licensed permanent: *<company>* is currently licensed for *<number>* sockets"
 - (b) Licensed term: You are currently using a term license for *<number>* sockets that expires in *<number>* days on *<date>*.
 - (c) Evaluation: You are currently using an evaluation license that expires in *<number>* days.
4. In the **Licensing** screen, enter the license key in the **Activate License Key** field and then click **Activate License Key**.

A success message indicates that the license is valid.

License Errors

Contact Infinio support if you see any of the following error when applying license keys:

- Invalid license signature or content.
- License file expected but not found.

Using a Permanent Address for the Management Console VM

During installation, you have the option to assign a static IPv4 address, or to use DHCP to automatically assign an address. While DHCP is acceptable for evaluating and testing Accelerator in your environment, Infinio recommends that you create permanent network address when using Accelerator in production environments. This section provides information about recommended address methods.

I/O Filter Offline Bundle Limitation in VAIO

There is a limitation in the current implementation of VMware VAIO in which the vCenter does not serve the filter's *offline bundle*. vSphere operations use a static URL to access an offline bundle. The following example shows a typical bundle URL, in which the IP address is the name of the server:

```
http://infinio-console.company.com/bundles/iniaccel-offline-bundle.zip
```

To resolve this limitation, Infinio Accelerator serves the filter's offline bundle from its Management Console VM, locally accessible to vSphere. The Management Console VM's address forms part of the URL.

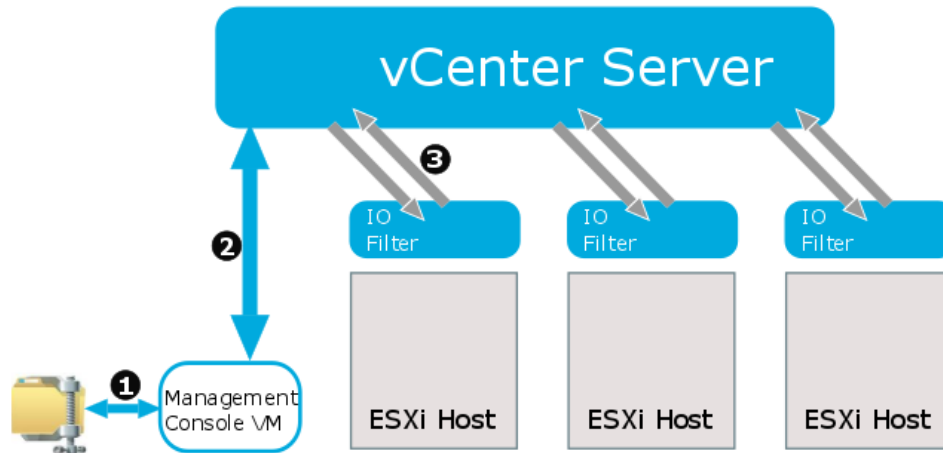
However, this URL might become invalid if both the following events occur in sequence:

- The Management Console VM's network name changes, for example because a DHCP lease expires and the Console receives a new IPv4 address.
- The vCenter restarts.

Note: A persistent URL is a VMware requirement for filter installation, uninstallation and upgrade.

If the URL no longer points to the offline bundle (either because the Management Console is unavailable, or its address changed after the initial filter installation), operations such as uninstalling and upgrading the filter will fail. Should these events occur during normal Infinio Accelerator operation, you will see a warning message that indicates an invalid state, and you should follow the on-screen instructions to revert the Management Console VM to its original name (as specified in the URL). This operation requires a vCenter restart.

Figure 1: Infinio I/O Filter - VIB Offline Bundle



Callout	Description
1	The Management Console VM hosts the offline bundle that contains the Infinio I/O Filter. The vCenter accesses this bundle via a URL that includes the Management Console VM's name (address).
2	When a filter change is requested for an ESXi host, the vCenter retrieves the offline bundle from the Management Console VM. To upgrade, both the existing and replacement bundles must remain accessible.
3	When requested, the vCenter installs or uninstalls the I/O filter from an ESXi host in the cluster.

Note: The Management Console UI's Support page provides a link to the latest I/O Filter offline bundle. See the *Infinio Accelerator Operations Guide* for more information.

Configuring a Permanent Network Address for the Management Console VM

Configuring a permanent network address for the Management Console VM resolves the VIB bundle limitation and also ensures consistent availability. It is also important that the Management Console VM remains on line at all times to perform other required operations, such as installing or uninstalling the Infinio I/O filter or upgrading the Infinio software.

When assigning a network name for the Management Console VM, consider the following options:

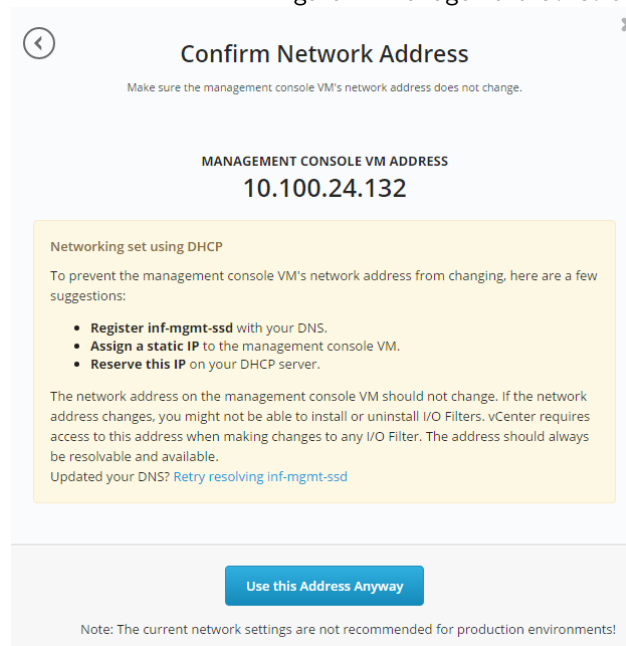
- DHCP-assigned IP Address - Use this option only for evaluation or test environments (although a static address or FQDN is recommended). Do not use it for production environments.
- DHCP Reserved IP Address - Reserve the address on your DHCP server. This is the minimum recommended method for address permanence.

- Static IPv4 Address - Assign a static IPv4 address. While better than DHCP, a fully-qualified domain name is preferred.
- DNS registration - Register the Management Console VM name with your DNS server, enabling the bundle URL to use the DNS name, making it more likely to be continuously available.

Verifying the Network Name and Address of the Management Console VM

To notify you of the potential risks of a Management Console VM name or IP address change, Accelerator evaluates the address before it installs the Infinio I/O filter on a cluster. For example, if you used DHCP to assign the network address at installation time, and did not specify a fully qualified domain name for the Management Console VM, you will see a screen similar to the following.

Figure 2: Management Console VM - Network Name Verification



If you see the preceding warning, you can do either of the following:

- Click Use this address anyway, to continue using the current name.
- Exit this task and register a permanent, DNS-resolvable name for the Management Console VM. Then resume the task.

After you register the DNS name, click **Retry DNS Resolution...** to verify the change.

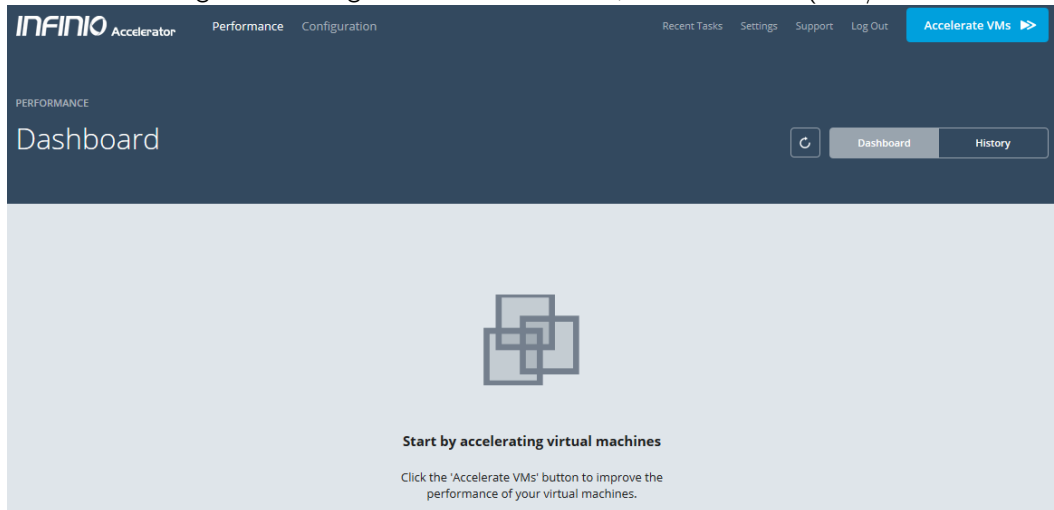
Using the Management Console Web UI

At the end of the installation procedure (see “Management Console VM Installation Steps” on Page 10, you are prompted to open the Management Console VM’s Web UI. Because this is the first time that you have used Accelerator, you have options to:

- Install the Infinio I/O Filter
- Select or create storage policies that include the I/O filter
- Enable VM acceleration (which guides you through any required filter and policy tasks).

You also have these same options after you disable acceleration on all VMs and uninstall the Infinio I/O Filter from all ESXi hosts.

Figure 3: Management Console Web UI, First Time Use (No I/O Filters Installed)



Be aware that the Management Console VM will detect whether the vCenter has any active or previously installed Infinio I/O filters. Providing the Management Console VM is compatible, it will detect and manage the current configuration. In this case, if at least one VM is accelerated, you will instead see the Dashboard screen shown in “Logging in to the Management Console Web UI” on Page 17.

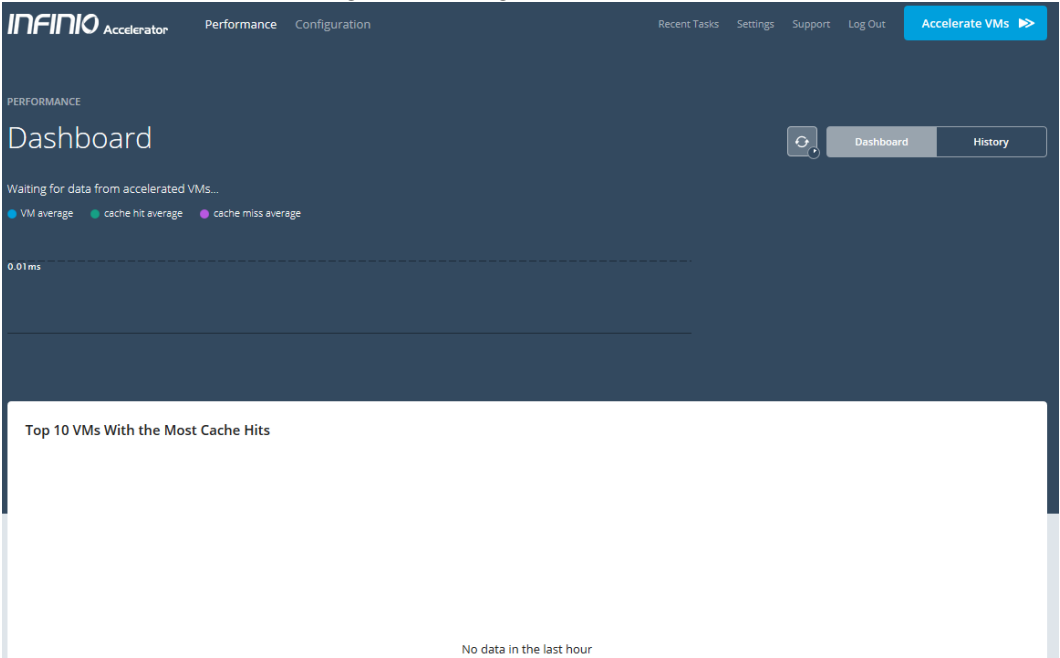
Logging in to the Management Console Web UI

To log in to the Management Console Web UI (assuming a configured environment):

1. Use a client computer that meets the requirements described in: “Management Console Web Access Requirements” on Page 7.
2. Open a supported Web browser and use the Management Console VM’s registered DNS host name or its IPv4 address as the target URL, such as: `http://infinio-console.mycompany.com`.
3. In the **Login** window, enter the account name and password of the Management Console VM’s user account that you created during installation and then click **Log In**.

The *Dashboard* screen opens, showing the current state of the environment, where no VMs are yet accelerated.

Figure 4: Management Console Web UI — Dashboard



For more information about the Dashboard, see the *Infinio Accelerator Operations Guide*.

Upgrading Accelerator

Important: Earlier Infinio Accelerator releases (3.x) were distributed with Ubuntu 14.04 LTS. As the public support of this version of Linux has ended, you will not be able to upgrade a 3.x management console to 4.0 or to any later releases. If you currently have a running 3.x management console, you must install a new 4.1.0 management console alongside the running 3.x management console. A 4.1.0 management console will be able to talk with previously installed 3.x I/O filters. The same license you used for 3.x will still work with 4.1.0. You can then upgrade the Infinio I/O filters on all clusters with the newly installed 4.1.0 management console. After all clusters are upgraded successfully, you may shutdown and archive the 3.x management console as a backup.

For this reason, we will not provide the upgrade package for the release 4.0.0. After you have installed a new 4.0.0 management console, you should skip the Step 1 below, and continue with “Upgrade Paths for I/O Filters” on Page 20 for Step 2 using the newly installed 4.0.0 management console.

Accelerator supports non-disruptive, in-place upgrade of all components. Upgrade is a two-step procedure:

- Step 1 — Upgrade the Management Console VM.
- Step 2 — Upgrade the Infinio I/O Filter.

VMware prevents downgrading an I/O filter to a previous version of the filter, except by a complete uninstallation followed by a full installation of the older release.

If there is a current health problem with the Infinio I/O filter and the filter is not responding, you can still upgrade. However, depending on the cause of the filter problem, an ESXi host reboot might be required to resume caching after the upgrade completes. In this case, you can upgrade more quickly by shutting down all VMs and placing the ESXi hosts into maintenance mode before you begin the upgrade.

Planning an Accelerator Upgrade

Infinio I/O Filter upgrades use VMware DRS to migrate running VMs (and the Accelerator Management Console VM) to alternate ESXi hosts while one host is upgraded at a time. Consequently, an upgrade might affect system performance for the duration of the VM migrations. In addition, the upgrade interrupts caching, which will have an additional affect on performance and it might take several minutes for caching to return to peak efficiency after the upgrade completes.

Infinio recommends that you defer all upgrades to a scheduled maintenance window.

When a new release of Accelerator becomes available, Infinio will notify you. An upgrade bundle is a windows compressed (.zip) file and has the following file name format:

upgrade-N.N.N-NNNNN.zip

For example: upgrade-3.5.3-15157.zip.

You require only this single bundle to upgrade all Accelerator components. The size of the bundle might vary depending on the components updated, but it should not exceed 100MB. The time required to complete an upgrade might also vary depending on the components updated, and the number of VMs and ESXi hosts.

Upgrading when DRS is not Enabled.

If DRS is not available, you must manually vMotion (or shut down) all VMs except the Management Console. Use vSphere Web client to monitor the upgrade. After the first ESXi Host is upgraded, manually vMotion the Management Console to that host to make sure that it remains available throughout the upgrade procedure. Do this only if the Management Console is hosted on a cluster that you are upgrading. For an explanation of why this is necessary in this release of VAIO, see: “Using a Permanent Address for the Management Console VM” on Page 14.

Upgrading when using VDI with Horizon Instant Clones

Important: The architecture of instant clone in vSphere 6.7 was significantly changed from earlier vSphere versions. As a result, in the current vSphere 6.7 releases, instant clones are not compatible with I/O filters. Infinio accelerated VMs cannot be used as source VMs for instant clone, and destination VMs of instant clone cannot be accelerated. VMware is currently working on a solution, but no definitive time table has been given.

To upgrade or uninstall the Infinio I/O filter, ESXi hosts must enter maintenance mode. However Instant clone creation requires parent VMs on all hosts in the cluster. Parent VMs are specific to a host and you cannot use vSphere client to migrate or power-off parent VMs.

When upgrading or installing the filter in VDI environments that use Horizon instant clones, you must either delete all instant clone pools, or use the procedure described in “Upgrading Environments that Use Horizon Instant Clones” on Page 24.

Upgrading Accelerator when using vShield

vShield prevents VM migration, preventing ESXi hosts from entering maintenance mode. This will interrupt Accelerator I/O Filter upgrades.

When using vShield, use the upgrade procedure described in: “Upgrading Accelerator when using vShield” on Page 25.

Upgrade Paths for I/O Filters

You can install a new version of Infinio software either by upgrading the filter, or by uninstalling the existing filter and then reinstalling a new filter. Each method has advantages and disadvantages.

The upgrade procedure is automatic and the method requires the following:

- Migrate all VMs to other hosts.
- Place the ESXi host into maintenance mode for filter upgrade.
- Upgrade the filter and then bring the ESXi host out of maintenance mode.
- Upgrade the remaining ESXi hosts one-by-one until it has upgraded all cluster hosts.

The filter uninstall method avoids the need for VM migration and ESXi host maintenance mode. However because of VMware restrictions on I/O filters and snapshots, the uninstall method requires:

- Delete all accelerated VM snapshots.
- Disable VM acceleration.
- Uninstall the existing filter.
- Install the updated filter.
- Accelerate VMs.

Depending on the existing filter version, the following alternate upgrade paths apply for this and for subsequent releases. (Management Console upgrade is unaffected.)

Upgrading From Accelerator V3.0.x I/O Filters

Accelerator V3.0.x I/O filters require that the ESXi host to enter maintenance mode for filter uninstallation and you simply follow the procedures described in this document.

To avoid maintenance mode when upgrading V3.0.x I/O Filters:

1. Use the manual uninstallation procedure for I/O Filters, described in the *Infinio Accelerator Operations Guide*.
2. Upgrade the Management Console.
3. Use the Management Console to install a later version of the I/O Filters.

While avoiding maintenance mode, this procedure interrupts VM acceleration for a short time and might affect performance.

Upgrading From Accelerator V3.1.x I/O Filters

Accelerator V3.1.x I/O filters support the following upgrade options:

Using ESXi Host Maintenance Mode

Use the automatic filter upgrade feature in the Management console, which systematically places ESXi hosts into maintenance mode, migrating VMs as necessary,

Advantages of this method are:

- VM acceleration is not disabled.

- Cache settings are maintained.
- You do not need to delete snapshots or instant clones of Accelerated VMs.

Avoiding ESXi Host Maintenance Mode

Use the uninstall filter method to avoid maintenance mode, migrating VMs as necessary,

1. Record the following settings:
 - (a) Allocated RAM cache amount for each ESXi Host.
 - (b) Allocated SSD cache amount.
 - (c) List of accelerated VMs.
2. Use the Management Console to uninstall the older, existing I/O Filters that is described in the *Infinio Accelerator Operations Guide*.
3. Use the Management Console to install a more recent version of the I/O Filters. that is described in the *Infinio Accelerator Operations Guide*.
4. Recreate the RAM and SSD caches and accelerate VMs as described in the *Infinio Accelerator Operations Guide*.

Management Console VM Upgrade Procedure

Important: If you are upgrading from Infinio Accelerator 3.x.x to Infinio Accelerator 4.x.x, you should skip this section. Follow the method in the beginning of “Upgrading Accelerator” on Page 19 and then continue to “Infinio I/O Filter Upgrade Procedure” on Page 23.

First, upgrade the Management Console VM. Avoid closing or refreshing your Web browser during the upgrade operation.

Important: Do not use the following procedure if you are using Horizon Instant Clones or vShield. See: “Upgrading Environments that Use Horizon Instant Clones” on Page 24 and “Upgrading Environments that use vShield” on Page 25.

1. Contact Infinio to obtain the software upgrade bundle (a .zip file) and copy this to the installation client. See: “Technical Support” on Page 6. Save the upgrade bundle to a folder on your Windows installation client.
2. Log in to the Management Console Web UI and display the *Dashboard* screen.
3. Click the *Settings* menu, and then click **Upgrade**.
4. Verify the current version, and if the version of the upgrade .zip file is newer, click **Upgrade Accelerator**.
5. Drag the upgrade bundle to the drop area on the *Upgrade Accelerator* dialog, or browse to the file location.
6. Wait for the *Uploading to Management Console* to complete by displaying the *Upload Successful* message.

7. Click **Start Upgrade** and wait for the *Restarting Accelerator* dialog to open.
8. Wait for:
 - (a) The Management Console Web UI to disconnect from vCenter and then reconnect automatically.
 - (b) The *Update Complete* dialog to open.
9. Click **Close** to return to the Upgrade screen and verify that the **Running Version** matches the version number of the upgrade bundle.
10. If a vCenter scan starts automatically, wait for the scan to complete before proceeding.

You can now proceed to upgrade Infinio I/O Filters on each accelerated cluster.

Infinio I/O Filter Upgrade Procedure

Before upgrading Infinio I/O Filters, you must upgrade the Management Console VM. Because much of the upgrade task occurs in vCenter, it is useful to open an instance of vSphere Web Client to monitor upgrade progress.

Important: If DRS is unavailable you must manually vMotion (or shut down) all guest VMs except the Management Console VM. The Management Console VM must remain accessible throughout the upgrade procedure to serve the offline bundle.

If not already at the *Upgrade* screen:

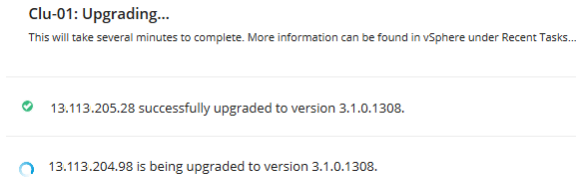
1. Log in to the Management Console Web UI and display the *Dashboard* screen.
2. Click the *Settings* menu, and then click **Upgrade**.
3. (Optional) Accelerator executes a task on vCenter, and that task might take some time to complete. Open a vSphere Web client session to monitor the upgrade, so that you can see events such as:
 - Hosts evacuating VMs.
 - Hosts entering and exiting maintenance mode.
 - Filter upgrade events.

If you are already at the *Upgrade* screen, do the following:

1. Click **Upgrade I/O Filters** and wait for the **Upgrade I/O Filter** dialog to open.
2. Click **Start Upgrade** after you have reviewed the upgrade information. In the Cluster panel, you will see the upgrade begin on the ESXi hosts.
3. Use vSphere client to monitor the upgrade as follows:
 - (a) In Recent Tasks, the *Upgrade IO Filter* task starts.
 - (b) Click a VM and select the **Monitor** tab. Click **Events** to observe VMs migrating.

- (c) If DRS is available, in **Hosts and Clusters** view, you will see the ESXi hosts enter Maintenance Mode when VM migration is complete.
- (d) If DRS is not available, and the Management Console is on the cluster that you are upgrading, you must wait until the first ESXi host is upgraded and has exited maintenance mode. Then use vSphere Web client to manually vMotion the Management Console VM to the upgraded host.
- (e) (Optional If you shut down VMs) When all ESXi hosts have exited Maintenance Mode, and the *Upgrade I/O Filter* task completes, you can restart all VMs and then return to the Management Console Web UI.

4. As the upgrade proceeds, the status of each ESXi host changes as follows:



5. Verify that the *Upgrade* screen shows that the cluster and all its ESXi hosts contain the latest I/O Filter.

If an ESXi host upgrade fails, it might occur only because of transient conditions. You can retry a failed upgrade unless you see messages warning you not to do so.

Because caching was interrupted during the upgrade, it might take several minutes to hours (depending on the cache size) before Accelerator returns to peak cache efficiency.

See: "Troubleshooting Upgrades" on Page 26 if you have problems with the upgrade. Contact Infinio support if you encounter consistent upgrade failure problems. See: "Technical Support" on Page 6.

Upgrading Environments that use Horizon Instant Clones

Important: The architecture of instant clone in vSphere 6.7 was significantly changed from earlier vSphere versions. As a result, in the current vSphere 6.7 releases, instant clones are not compatible with I/O filters. Infinio accelerated VMs cannot be used as source VMs for instant clone, and destination VMs of instant clone cannot be accelerated. VMware is currently working on a solution, but no definitive time table has been given.

Use the following procedure to put clusters with instant clones into maintenance mode and perform an I/O Filter upgrade. This procedure resolves a VMware constraint that prevents ESXi hosts that have parent VMs from entering maintenance mode.

A VMware knowledge base article (KBA) describes a workaround for this constraint: *Entering and exiting maintenance mode for an ESXi host that has Horizon instant clones* (2144808). The VMware KBA also includes instructions for using the Connection Server as an alternate procedure to the one described in this section, which uses the *vSphere Client for Windows*.

Upgrade Procedure for VDI Using Horizon Clones

1. Using vSphere Client for Windows, look up **Annotations** in every ESXi host's Summary tab and set **InstantClone.Maintenance** to **1**.

2. Wait up to three minutes for vSphere to delete the parent VMs on all ESXi host.
3. Upgrade the Management Console. See: “Management Console VM Upgrade Procedure” on Page 22.
4. Using the Infinio Management Console, start the I/O Filter upgrade, as described in: “Infinio I/O Filter Upgrade Procedure” on Page 23.
5. **(Important!)** Wait for the upgrade to complete. Depending on the environment, it might take some time to complete and you should not interrupt the task. (In the progress screen, you can monitor the status of ESXi hosts. You can also monitor tasks in vSphere Client.)
6. Using vSphere Client for Windows, look up **Annotations** in the ESXi host's Summary tab and verify that the **InstantClone.Maintenance** annotation does not have a value of **1** or **2**. If it does, clear this value (make null).

As new provisioning occurs, parent VMs and then instant clones are created on the ESXi host.

See: “Troubleshooting Upgrades” on Page 26 if you have problems with the upgrade. Contact Infinio Support if you encounter consistent upgrade failure problems. See: “Technical Support” on Page 6.

Upgrading Environments that use vShield

When using vShield, use the following upgrade procedure, which assumes that you have DRS enabled and you have performed the Management Console upgrade:

1. Open vShield's **Disable vShield** console and then click **Settings and Report** then click **vShield App**.
2. Unless you already configured **Fail Safe** mode to *allow traffic*, click **Change** to modify the default fail safe configuration to **Allow**, as shown below:



3. Power off both vShield VMs (*firewall VM* and *data security VM*).
4. Start the Accelerator I/O Filter upgrade and wait for all VMs that are unrelated to vShield to migrate off the ESXi host.
5. When all ESXi hosts are upgraded with the latest I/O Filter, verify that both vShield VMs have automatically powered on. If they did not, manually power on both vShield VMs.
6. If you modified the value of **Fail Safe** in *Step 2*, change it back to your preferred setting.

VMs will vMotion back to the appropriate hosts to balance the cluster.

Troubleshooting Upgrades

In rare circumstances, an ESXi host might fail to go into maintenance mode, and you might see an error message similar to the following:

```
16-Sep-2016;19:05:25.458 - "Failed to upgrade filter with id
INI_bootbank_iniaccel_3.0.1.1168-10EM.600.2.34.3657938 for cluster
cluster using offlineBundleUrl http://10.100.230.153:8080/assets/
bundles/iniaaccel-offline-bundle-3.0.2.1188.3657938.zip: Cannot complete
the operation. See the event log for details.
```

To correct this problem:

1. Identify the ESXi host that failed to uninstall and use vSphere client to put it into maintenance mode.
2. Repeat the filter uninstall operation. If you are using VDI, set the annotations as described in “Upgrading Environments that Use Horizon Instant Clones” on Page 24, making certain that the filter removal is successful.
3. Take the ESXi host out of maintenance mode. If you are using VDI verify that the annotations are correct as described in “Upgrading Environments that Use Horizon Instant Clones” on Page 24.
4. Perform a console rescan:
 - (a) Click **Settings** in the Dashboard.
 - (b) Click **Rescan the vCenter**. This will cause the management console to disconnect and reconnect to the vCenter, synchronizing the Management Console database.

Contact Infinio support if this procedure fails or if you encounter other problems. See: “Technical Support” on Page 6.

Appendix A – Accelerator Requirements and Restrictions

The following sections describe the requirements and restrictions for using Accelerator:

- “VMware and vCenter Requirements” on Page 27
- “Management Console VM Sizing Guide” on Page 28
- “vCenter Restrictions” on Page 28
- “Network Requirements” on Page 29
- “Diskless and Stateless ESXi Host Considerations” on Page 29
- “Accelerator Limits” on Page 30

VMware and vCenter Requirements

Before installing Accelerator, make sure your VMware environment meets these requirements.

Resource	Requirement
VMware vSphere vCenter version	6.0 Update 2. See the <i>Release Notes</i> for any patch requirements.
VMware vSphere ESXi version	<i>Release Notes</i> for any patch requirements.
VMware Licenses	Any of the following VMware vSphere licenses: <ul style="list-style-type: none">▪ Standard▪ Enterprise Plus
Internet Protocol Version	IPv4 network (Accelerator does not support IPv6)
Management Console VM - ESXi Host Requirements	The Accelerator Management Console VM requires the following minimum ESXi resources. <ul style="list-style-type: none">▪ One vCPU▪ Minimum 8GB of physical memory (RAM)▪ 80GB free space in the datastore that contains the Management Console VM
Storage Requirements	80GB for Management Console data, including chart history data.

When choosing storage space for the Management Console, you can optionally select a thin volume. In this case, the Management Console consumes 20GB of storage space during set up. This might change as additional resources are needed for data and logs.

For large configurations, see also: “Management Console VM Sizing Guide” on Page 28

Management Console VM Sizing Guide

The Management Console VM requires the following resources:

VMs	Resource	Required
0-1500	Memory (GB)	8
	vCPU	1
1500-5000	Memory (GB)	12
	vCPU	1
5000+	Memory (GB)	16
	vCPU	2

Contact Infinio support if you are running configurations with larger numbers of VMs and you require recommendations for increasing the Management Console resources.

vCenter Restrictions

The following table describes VMware vCenter restrictions.

Accelerator automatically manages these restrictions, ensuring that there is no risk of data loss from an unsupported configuration.

VMware Feature	Restriction
NFS V4.1	You cannot accelerate NFS 4.1 datastores in vSphere 6.x environments.
Multi-writer Virtual Machine Disk (VMDKs)	Multi-writer VMDKs allow multiple VMs to simultaneously write to a single VMDK. Accelerator automatically will not cache multi-writer VMDKs.
Standalone ESXi Host	I/O filters cannot be installed on a standalone ESXi host that does not belong to a cluster. As a result, VMs on such standalone ESXi hosts cannot be accelerated.
Fault Tolerance (FT)	Accelerator does not support Fault Tolerance, which is a VMware feature that mirrors the VM operating state between two hosts, allowing a failed VM to instantly resume operation without interruption. FT-enabled VMs require multi-writer VMDK support, which Accelerator does not support.
Raw device mappings (RDMs)	Accelerator automatically will not cache physical mode RDMs. An RDM is a mapping file in a VMFS volume that acts as a proxy for a raw storage device and allows VMs to directly access and use the storage device. Using a RDM with accelerated VMs might result in cache inconsistencies or undefined behavior.

Network Requirements

The following table describes the network requirements for using Accelerator:

Networking Feature	Requirement
vSphere Distributed Switch (VDS) Port Groups	If you configure the Accelerator Management Console VM to use a VDS Port Group, all hosts in the vSphere cluster must be members of the VDS. See: <i>Adding a vCloud Network Resource under Cloud Resources fails with the error: Cannot create network error</i> http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=2004892 (2004892)

Diskless and Stateless ESXi Host Considerations

An ESXi host might be configured for boot as follows:

- A *diskless* ESXi host boots from an SD card or other type of solid-state device. Such devices might, or might not be writable.
- A *stateless* ESXi host deliberately does not actively persist its state across reboots, regardless of whether it is diskless. (This means that it cannot preserve a revised configuration, it can only load a fixed configuration from persistent storage each time it reboots.)

If your ESXi hosts are configured as diskless and possibly also stateless, the following considerations might apply.

ESXi Boot Device

ESXi supports a boot disk that is a minimum size of 1GB. However, booting ESXi from a local disk or SAN/iSCSI LUN requires a 5.2GB disk to create a VMFS volume and a 4GB `/scratch` partition. If you use a smaller boot disk, the installer tries to locate `/scratch` any other local disk. If a local disk is unavailable, the installer uses an ESXi host ramdisk (linked to `/tmp/scratch`).

Under certain circumstances, this might place `/scratch` on a solid-state device (such as an SSD) that is in use as part of the Accelerator cache. To avoid this, either use a boot device of appropriate size to contain `/scratch`, or specify a location for `/scratch` that is neither in ramdisk nor on a virtual flash resource that you use for Accelerator.

The Cache Size Might Revert to the Default Minimum following an ESXi Host Reboot

Providing the ESXi Host can store its configuration state, information about the Infinio Accelerator Cache can also persist. However, if the ESXi host cannot persist its current configuration and the Infinio Management Console VM is unavailable during a reboot then the ESXi host cannot preserve the cache settings. In this scenario, the cache size reverts to the 0.5 GB default cache size for that host.

To correct this, resize the cache for the rebooted ESXi host. See: “*Managing the Accelerator Cache*” in the *Infinio Accelerator Operations Guide*.

Accelerator Limits

The following table lists the maximum Infinio Accelerator limits for a VMware environment.

(See the *Infinio Accelerator Release Notes* for any limits that are specific to this release.)

Resource	Minimum Limit	Maximum Limit
ESXi hosts running the Infinio I/O filter	-	100
ESXi host memory (RAM) allocated to the cache (per host)	0.5 GB	1 TB
ESXi hosts in each Accelerator Cluster	-	64
Accelerated VMs maximum VMDK Size	-	2TB ^(a)
Accelerated VMs on each ESXi host	-	300
Accelerated VMDKs on each ESXi host	-	1000
Accelerated VMDKs for each VM	-	32 ^(a)
SSD cache	12 GB	8 TB

^(a) The VM might have VMDKs that exceed these limits, but the excess is not cached.

Initial RAM Cache Size

When you configure the RAM cache for the first time (such as during initial cluster set-up), Accelerator sets a minimum cache size of 0.5GB per eligible host. You should subsequently adjust the RAM cache to a larger size, increasing Accelerator's performance benefit.

If you configure an SSD cache, that cache requires the allocation of an additional 3GB of RAM per TB of SSD space. Accelerator allocates this additional RAM in 0.5GB increments. After configuring SSDs, the minimum amount of memory that you can allocate per host is 0.5GB + $N \cdot NGB$ required to support the SSDs.

See also:

- "Resizing the Cache" in the *Infinio Accelerator Operations Guide*.
- "Configuring an SSD Cache" in the *Infinio Accelerator Operations Guide*.