



Cisco Expressway on Virtual Machine

Installation Guide

Expressway X8.1

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Introduction

Cisco Expressway (Expressway) software supports flexible deployment options and is available as a virtualized application for VMware or similar virtual environments. This enables enterprises to run Expressway on the 'company standard' Virtual Machine (VM) hardware platform for ease of management and deployment within an existing data center.

This deployment guide specifies:

- the VM platform requirements for Expressway
- how to load the Expressway .ova installation file
- how to install a VM
- how to troubleshoot the system, when there are issues

Using the VM .ova file for initial VM installation only

The VM Expressway is licensed using information that is generated at the time of the .ova file installation. If the .ova was installed a second time, new licensing information would be created, and to use the new VM, new release and licence keys would need to be purchased. To upgrade a VM Expressway, follow the procedure under [Upgrading a VM Expressway \[p.17\]](#), using the .tar.gz version of the Expressway software.

After installation we recommend that you take a snapshot of the VM Expressway (see [Taking and restoring snapshots \[p.14\]](#)) so that it can be restored if the running VM gets damaged in any way. The VM snapshot retains the licensing information that was generated when the .ova file was installed, including any release and license keys that were applied.

Obtaining release keys and license keys

Licenses can be obtained after the VM Expressway is installed, using the serial number of the VM Expressway. The serial number is available from the **Option key** page and from the footer of the Expressway web interface. See [Ordering and entering release and option keys \[p.13\]](#) for more information.

Note that when the VM Expressway is first installed, the banner area on the web interface will display Cisco TelePresence Video Communication Server. After the **Expressway Series** option key has been installed the banner area will change to show Cisco Expressway-C (or Cisco Expressway-E if the **Traversal Server** option key has also been installed).

Installing a VM

The sections below list the recommended platform and specifications-based system requirements, and describe the VM installation process. The requirements outlined below refer to the minimum requirements for Expressway version X8.1. The minimum requirements for future Expressway software releases may differ and you should refer to the release notes or administrator guide to ensure that pre-requisites are met.

Recommended platform

Ensure that:

- VT is enabled in the BIOS before installing VMware ESXi
- the VM host “Virtual Machine Startup/Shutdown” is configured to “Allow Virtual machines to start and stop automatically with the system”, and that the VM Expressway has been moved to the Automatic startup section
- your UCS system is configured with RAID 5

If using a UCS Tested Reference Configuration or specifications-based system, the minimum requirements are:

Deployment type	vCPU	Reserved CPU resource	Reserved RAM	Disk space	NIC
Small (for BE 6000 platform)	2 core	3600 MHz (2 x 1.8 GHz)	4 GB	132 GB	1 Gb
Medium (typical installation)	2 core	4800 MHz (2 x 2.4 GHz)	6 GB	132 GB	1 Gb
Large (extra performance and scalability capabilities)	8 core	25600 MHz (8 x 3.2 GHz)	8 GB	132 GB	10 Gb

See http://docwiki.cisco.com/wiki/Unified_Communications_in_a_Virtualized_Environment for the current list of supported UCS Tested Reference Configurations and specs-based supported platforms.

Co-residency support

The Expressway can co-reside with applications (any other VMs occupying same host) subject to the following conditions:

- no oversubscription of CPU: 1:1 allocation of vCPU to physical cores must be used
- no oversubscription of RAM: 1:1 allocation of vRAM to physical memory
- sharing disk storage subsystem is supported subject to correct performance (latency, bandwidth) characteristics

Installation process

This process guides you through installing the Expressway VM using vCenter or vSphere client.

Configuring the VM host

Ensure that the VM host is configured with a valid NTP server – the same NTP server that will be specified in Expressway.

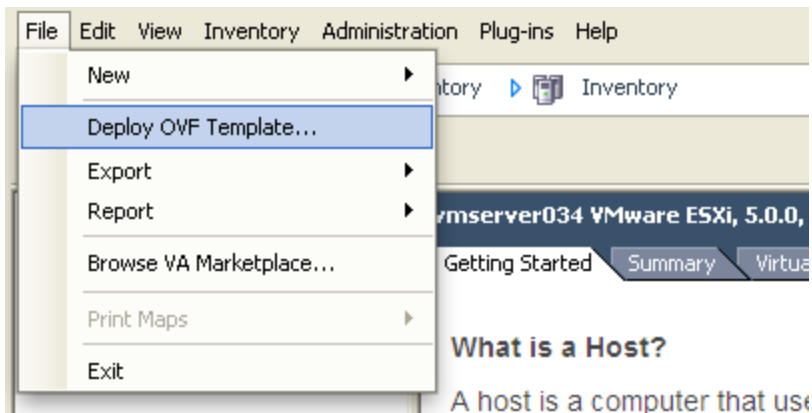
1. Select the host.
2. Go to the **Configuration** tab.
3. Select **Time configuration**.
4. Select **Properties**.
If the date and time were red on the previous page, set the date and time manually to the current time.
5. Click **Options**.
6. Select **NTP Settings**.
7. Click **Add**.
8. Enter the IP address of the NTP server.
9. Click **OK**.
10. Select the **Restart NTP service to apply changes** check box.
11. Click **OK**.
12. Click **OK**.

The following section describes how to deploy the ova to host using vCenter. If you are using vSphere, skip this section and go to [Deploying ova to host using vSphere client \[p.9\]](#).

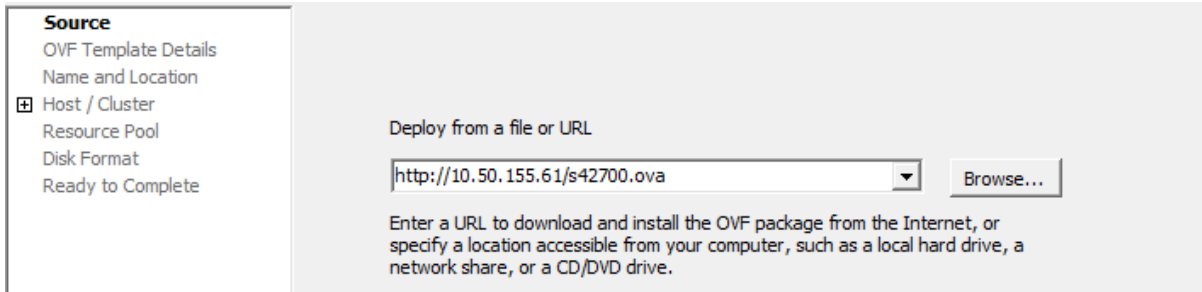
Deploying ova to host using vCenter

These instructions represent a typical installation. The Deploy OVF Template wizard dynamically changes to reflect host configuration.

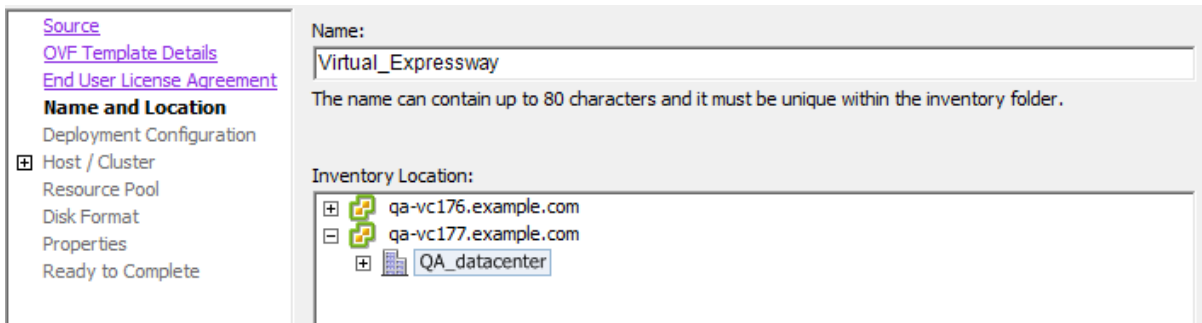
1. If the .ova file is already preloaded onto the ESXi Host datastore (for example, in Cisco Business Edition 6000 deployments):
 - a. Using a web browser, go to <https://<VMwareHost>/folder> supplying any required credentials (typically the same username and password as used to log into vCenter).
 - b. Navigate through the index of datacenters to find the .ova file you want to deploy from the datastore.
 - c. Right click on the .ova file and select **Copy Link Location**.
(If the .ova file is not preloaded on the datastore, you can select and upload it in the following steps.)
2. Log in to vCenter to access the ESXi Host.
3. Select **File > Deploy OVF Template**.



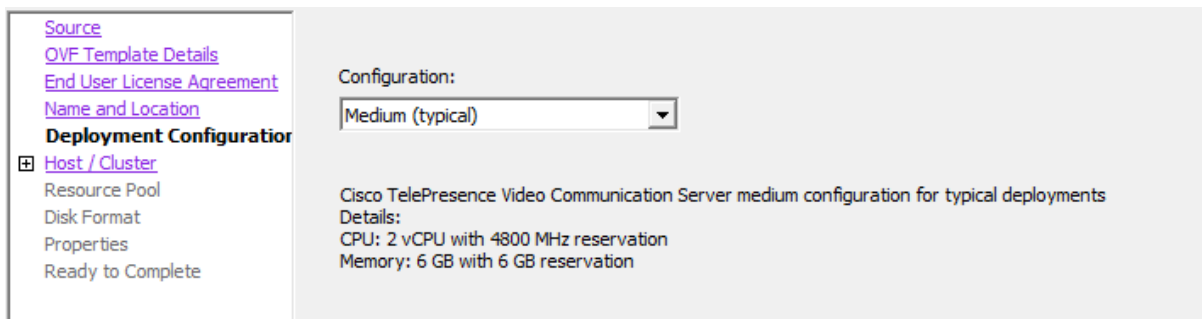
4. On the **Source** page, identify where the .ova file is located, and then click **Next**.
 - If the .ova file is already preloaded onto the ESXi Host datastore, paste the URL you copied from step 1 above. You may have to re-enter username and password credentials so that vCenter can access the web server.
 - If the .ova file is not preloaded on the datastore, **Browse** to the location of the .ova file.



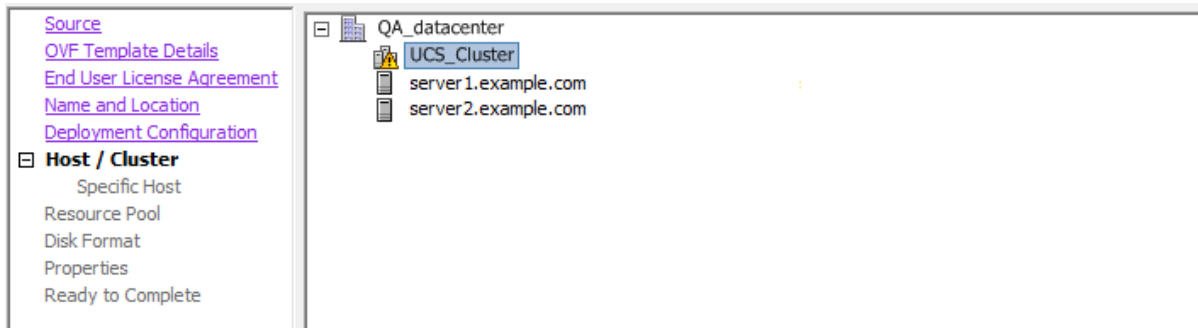
5. On the **OVF Template Details** page, check that the Publisher certificate is valid and click **Next**.
6. On the **End User License Agreement** page:
 - a. Read the EULA
 - b. If you accept the EULA, click **Accept** then **Next**.
7. On the **Name and Location** page enter a **Name** for this Expressway VM guest, for example "Virtual_Expressway" and click **Next**.



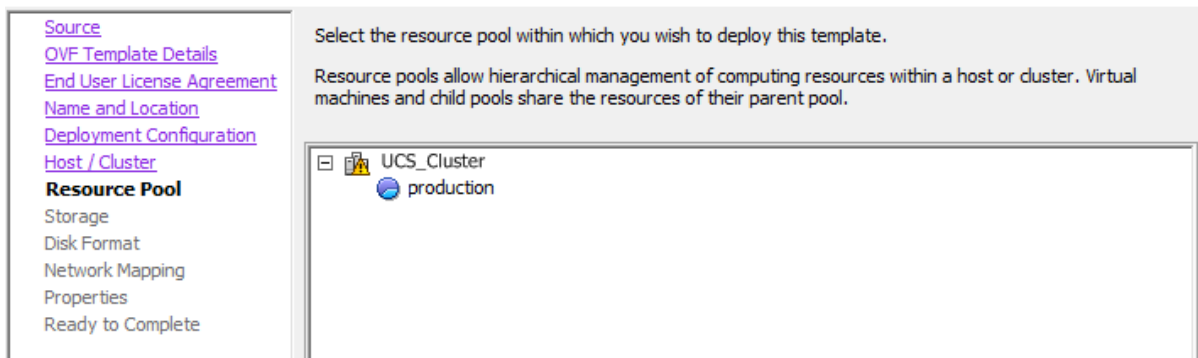
8. On the **Deployment Configuration** page, select the appropriately sized deployment:
 - a. Select *Small*, *Medium* or *Large* depending on the capabilities of the VMware host. The default is *Medium*. See [Recommended platform \[p.4\]](#) for details about resource requirements. If the VMware host has insufficient resources, the virtual Expressway will fail to power on / boot.
 - b. Click **Next**.



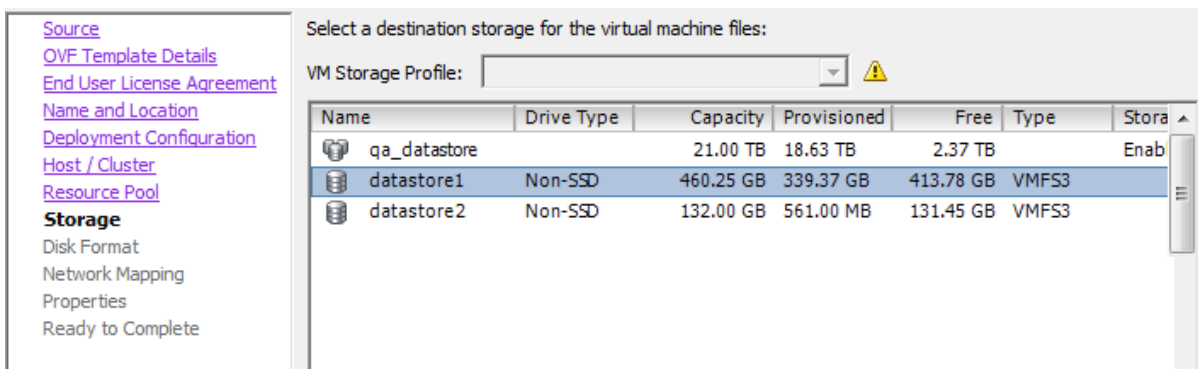
9. On the **Host / Cluster** page, select where you want to run the virtual Expressway and click **Next**.



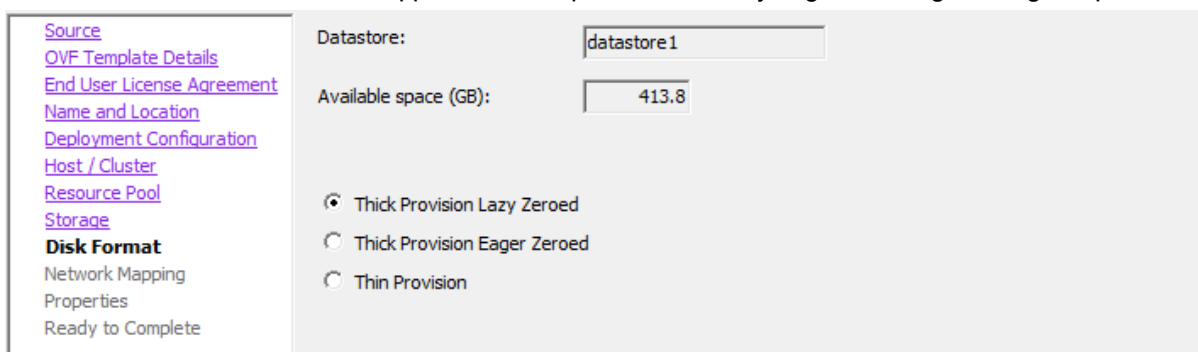
10. On the **Resource Pool** page, select where you want to run the virtual Expressway and click **Next**.



11. On the **Storage** page, select the location onto which the virtual Expressway will be deployed and click **Next**.



12. On the **Disk Format** page, ensure that the default disk format of **Thick Provision Lazy Zeroed** is selected and then click **Next**.
Note that **Thin Provision** is not supported as VM performance may degrade during resizing of a partition.



13. On the **Network Mapping** page, select the network mapping that applies to your infrastructure (the default is **VM Network**) and then click **Next**.

Source Networks	Destination Networks
VM Network	VM Network

14. On the **Properties** page, configure the network properties of the virtual Expressway and click **Next**. This includes the Expressway's **IPv4 Address**, **IPv4 Netmask**, and **IPv4 Gateway**. You can optionally enable IPv6 support and specify the equivalent IPv6 addresses.

Network properties

IPv4 Enable

IPv4 Address
192 . 168 . 0 . 100

IPv4 Netmask
255 . 255 . 255 . 0

IPv4 Gateway
192 . 168 . 0 . 1

IPv6 Enable

IPv6 Address

IPv6 Gateway

15. On the **Ready to Complete** page:
- Confirm the deployment settings.
 - Select the **Power on after deployment** check box.
 - Click **Finish**.
- The installation process will begin and a progress bar will be displayed.

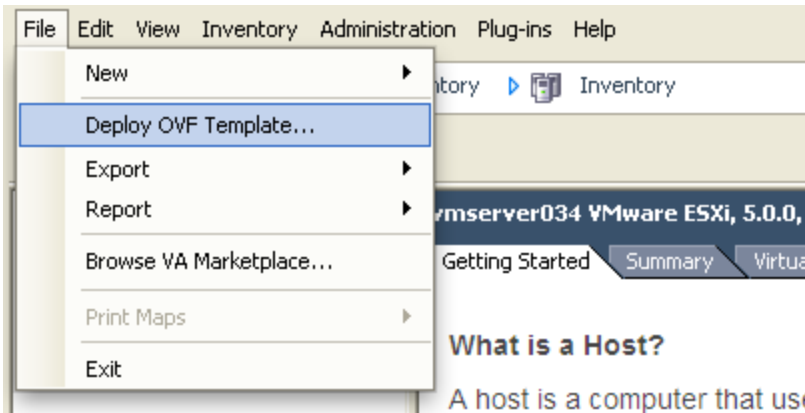
The Expressway ova is now deployed as a Guest on the VM Host and you should be able to access the Expressway via a web browser.

You can now order your release key; see [Ordering and entering release and option keys \[p. 13\]](#).

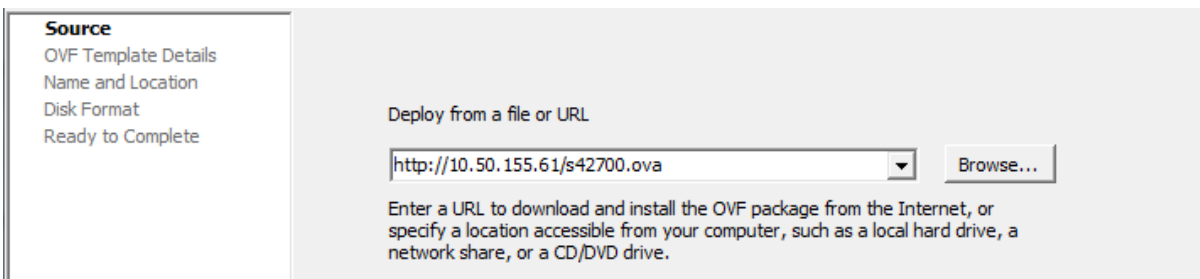
Deploying ova to host using vSphere client

These instructions represent a typical installation. The Deploy OVF Template wizard dynamically changes to reflect host configuration.

1. If the .ova file is already preloaded onto the ESXi Host datastore (for example, in Cisco Business Edition 6000 deployments):
 - a. Using a web browser, go to `https://<VMwareHost>/folder` supplying any required credentials (typically the same username and password as used to log into the vSphere client).
 - b. Navigate through the index of datacenters to find the .ova file you want to deploy from the datastore.
 - c. Right click on the .ova file and select **Copy Link Location**.
 (If the .ova file is not preloaded on the datastore, you can select and upload it in the following steps.)
2. Log in to the vSphere client to access the ESXi Host.
3. Select **File > Deploy OVF Template**.

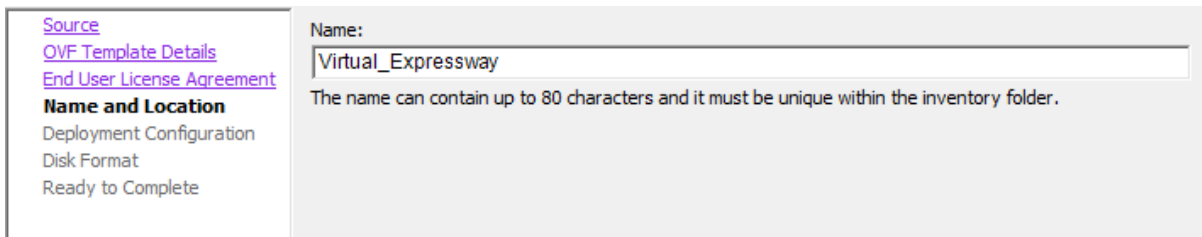


4. On the **Source** page, identify where the .ova file is located, and then click **Next**.
 - If the .ova file is already preloaded onto the ESXi Host datastore, paste the URL you copied from step 1 above. You may have to re-enter username and password credentials so that the vSphere client can access the web server.
 - If the .ova file is not preloaded on the datastore, **Browse** to the location of the .ova file.

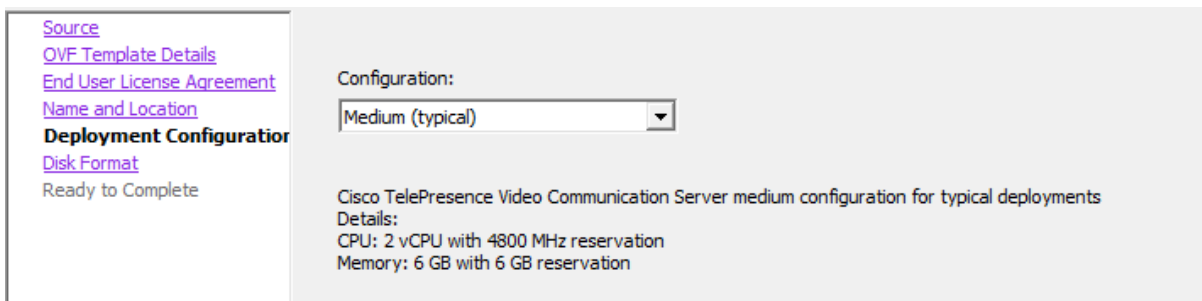


5. On the **OVF Template Details** page, check that the Publisher certificate is valid and click **Next**.
6. On the **End User License Agreement** page:
 - a. Read the EULA
 - b. If you accept the EULA, click **Accept** then **Next**.

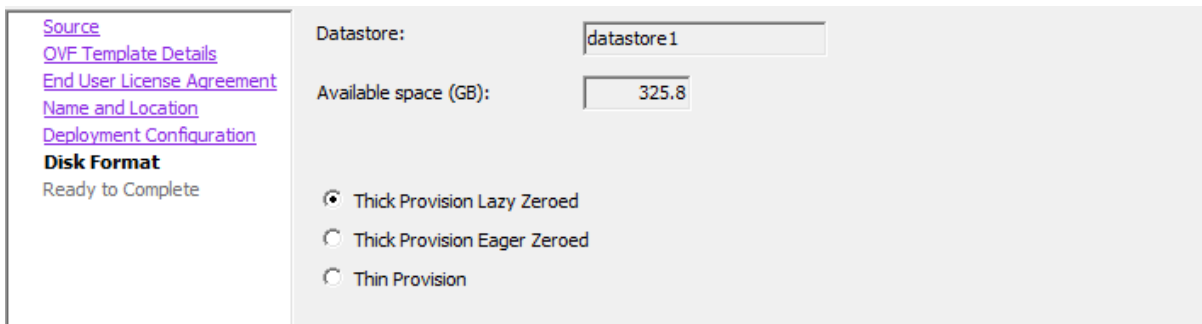
7. On the **Name and Location** page enter a **Name** for this Expressway VM guest, for example "Virtual_Expressway" and click **Next**.



8. On the **Deployment Configuration** page, select the appropriately sized deployment:
- Select *Small*, *Medium* or *Large* depending on the capabilities of the VMware host. The default is *Medium*. See [Recommended platform \[p.4\]](#) for details about resource requirements. If the VMware host has insufficient resources, the virtual Expressway will fail to power on / boot.
 - Click **Next**.



9. On the **Disk Format** page, ensure that the default disk format of **Thick Provision Lazy Zeroed** is selected and then click **Next**. Note that **Thin Provision** is not supported as VM performance may degrade during resizing of a partition.



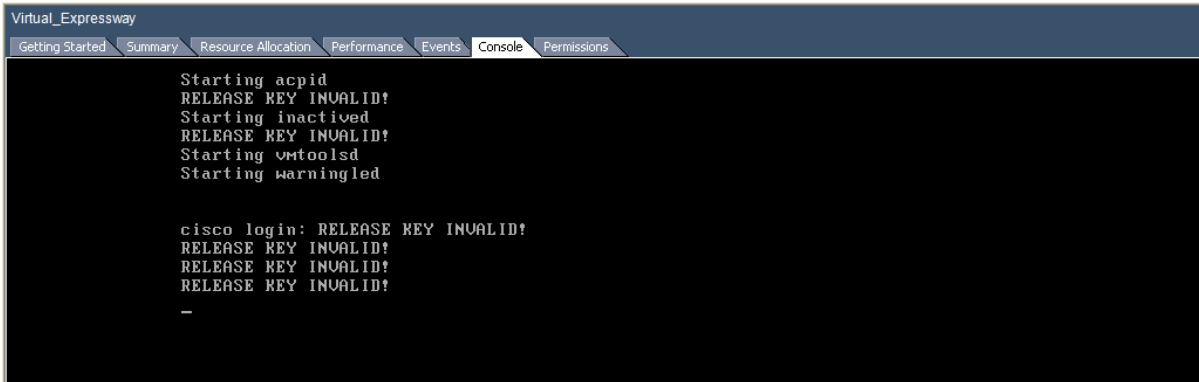
10. On the **Ready to Complete** page:
- Confirm the deployment settings.
 - Select the **Power on after deployment** check box.
 - Click **Finish**.
- The installation process will begin and a progress bar will be displayed.

The Expressway ova is now deployed as a guest on the VM Host.

You now have to enter the network IP information for the Expressway; see [Configuring the VM guest \(vSphere clients\) \[p.11\]](#).

Configuring the VM guest (vSphere clients)

1. Select the VM guest and then select the **Console** tab.
The VM guest will take some time to boot, create its second hard disk partition and then reboot to a login prompt.
You can ignore any RELEASE KEY INVALID messages that may appear.
2. At the login prompt enter 'admin' for the username and 'TANDBERG' for the password.



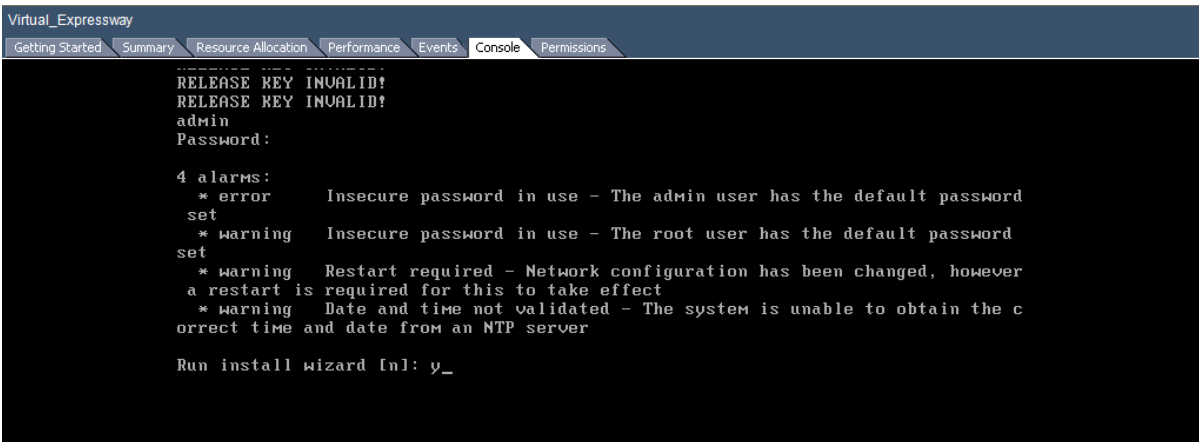
```

Virtual_Expressway
Getting Started Summary Resource Allocation Performance Events Console Permissions
Starting acpid
RELEASE KEY INVALID!
Starting inactived
RELEASE KEY INVALID!
Starting vmttoolsd
Starting warningled

cisco login: RELEASE KEY INVALID!
RELEASE KEY INVALID!
RELEASE KEY INVALID!
RELEASE KEY INVALID!
_

```

3. At the Install Wizard prompt type **y** and then press **Enter**.



```

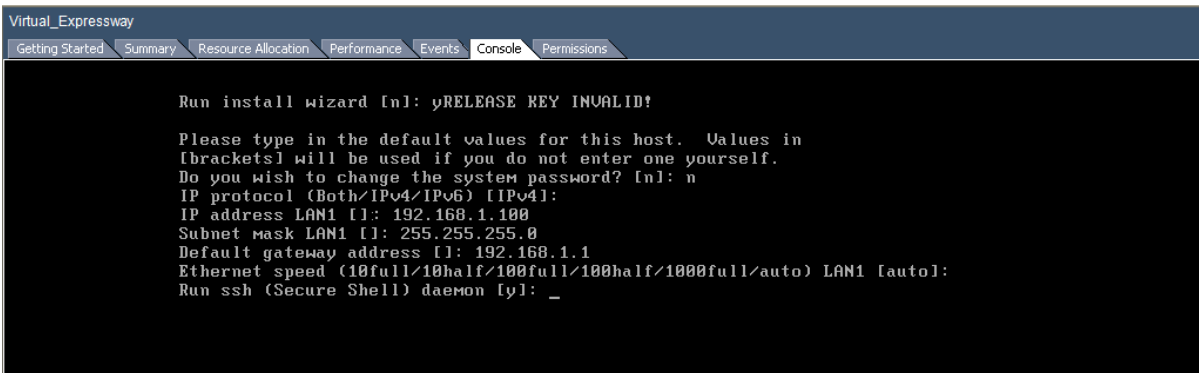
Virtual_Expressway
Getting Started Summary Resource Allocation Performance Events Console Permissions
-----
RELEASE KEY INVALID!
RELEASE KEY INVALID!
admin
Password:

4 alarms:
* error      Insecure password in use - The admin user has the default password
set
* warning    Insecure password in use - The root user has the default password
set
* warning    Restart required - Network configuration has been changed, however
a restart is required for this to take effect
* warning    Date and time not validated - The system is unable to obtain the c
orrect time and date from an NTP server

Run install wizard [n]: y_

```

4. Follow the Install Wizard to enter the network IP information for the Expressway. (Defaults can be entered by pressing **Enter** at the prompt.)



```

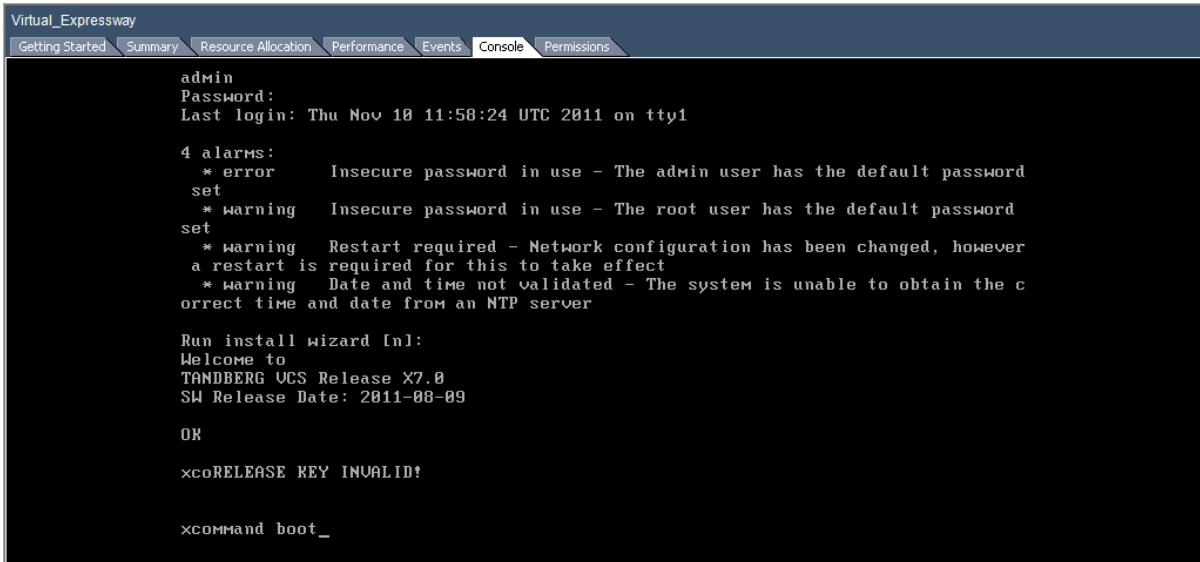
Virtual_Expressway
Getting Started Summary Resource Allocation Performance Events Console Permissions
Run install wizard [n]: yRELEASE KEY INVALID!

Please type in the default values for this host. Values in
[brackets] will be used if you do not enter one yourself.
Do you wish to change the system password? [n]: n
IP protocol (Both/IPv4/IPv6) [IPv4]:
IP address LAN1 []: 192.168.1.100
Subnet mask LAN1 []: 255.255.255.0
Default gateway address []: 192.168.1.1
Ethernet speed (10full/10half/100full/100half/1000full/auto) LAN1 [auto]:
Run ssh (Secure Shell) daemon [y]: _

```

5. When the wizard completes, the configuration is applied and the Expressway logs you out.

6. Log back into the Expressway as admin and then type `xcommand boot` to reboot the VM guest.



```
Virtual_Expressway
Getting Started Summary Resource Allocation Performance Events Console Permissions
admin
Password:
Last login: Thu Nov 10 11:58:24 UTC 2011 on tty1

4 alarms:
* error      Insecure password in use - The admin user has the default password
set
* warning    Insecure password in use - The root user has the default password
set
* warning    Restart required - Network configuration has been changed, however
a restart is required for this to take effect
* warning    Date and time not validated - The system is unable to obtain the c
orrect time and date from an NTP server

Run install wizard [n]:
Welcome to
TANDBERG UCS Release X7.0
SW Release Date: 2011-08-09

OK

xcoRELEASE KEY INVALID!

xcommand boot_
```

7. You should now be able to access the Expressway via a web browser.

You can now order your release key; see [Ordering and entering release and option keys \[p.13\]](#).

Ordering and entering release and option keys

After the Expressway ova has been deployed as a Guest on the VM Host you should be able to access the Expressway via a web browser and order your release key.

1. Log in to the Expressway via a web browser as admin with the default password of TANDBERG.
2. Get release and option keys:
 - a. Go to the **Option keys** page (**Maintenance > Option keys**).
 - b. Copy the **Hardware serial number**.
 - c. Use this serial number to order release and option keys for this VM Expressway.
For full details on obtaining your release and option keys, see [Appendix 2: VM Expressway activation process \[p.23\]](#).

When the release and option keys are available:

1. Log in to the Expressway via a web browser as admin.
2. Enter the release and option keys:
 - a. Go to the **Option keys** page (**Maintenance > Option keys**).
 - b. Enter the release key provided in the **Release key** field.
 - c. Click **Set release key**.
 - d. For each option key provided:
 - i. Enter the option key value in the **Add option key** field.
 - ii. Click **Add option**.Note that when the VM Expressway is first installed, the banner area on the web interface will display Cisco TelePresence Video Communication Server. After the **Expressway Series** option key has been installed the banner area will change to show Cisco Expressway-C (or Cisco Expressway-E if the **Traversal Server** option key has also been installed).
3. Reboot the Expressway to activate the licenses:
 - a. Go to the **Restart options** page (**Maintenance > Restart options**).
 - b. Click **Reboot**.
4. After the reboot, log in to the web interface and configure the Expressway, including changing any default passwords, configuring DNS, NTP, zones, search rules and so on as required.
Follow the [Expressway Basic Configuration Deployment Guide](#) to guide you through configuring this VM Expressway ready for operation.
5. After the Expressway has been configured it is good practice to backup the Expressway configuration using the Expressway backup facility, and also to take a VM snapshot (see [Taking and restoring snapshots \[p.14\]](#)).
The snapshot is important as it can be used to restore a VM should it become damaged – the snapshot retains the existing license keys. If the VM is re-installed instead of being restored, new license keys would be required.

Taking and restoring snapshots

The VMware snapshot feature is especially useful in test labs where it is required to return to a known starting point. This is not a replacement for the Expressway backup – the Expressway backup should always be performed prior to the VMware snapshot being taken.

A VMware snapshot can be used to restore a VM should it become damaged (because the VMware snapshot retains the existing license keys).

- Ensure that the host has spare disk space on which to create and store the snapshot – each snapshot can take up to 132GB + 6GB.
- Only perform the snapshot when the VM Expressway has little activity going on – performing the snapshot will degrade the performance of the VM.

Note that if the VM is re-installed instead of being restored, the serial number will change and new license keys would be required. If you need to move Expressway to a new host you must perform a host migration via vMotion.

Creating a VMware snapshot

We strongly recommended to perform a VMware snapshot when there are no calls in progress to ensure reliability.

1. Select the relevant Expressway VM Guest.
2. Right-click the Expressway VM Guest and select **Snapshot > Take Snapshot**.
3. Enter name and description.
4. Ensure **Snapshot the virtual machine's memory** is selected.
5. Click **OK**.
6. Wait for the "Create virtual machine snapshot" task to complete.

Restoring a VMware snapshot

1. Select the relevant Expressway VM Guest.
2. Right-click the Expressway VM Guest and select **Snapshot > Snapshot Manager**.
3. Select the required snapshot image.
4. Click **Goto**.
5. Click **Yes**.
6. Click **Close**.

Incremental VMware backups

If incremental backups are to be enabled, ensure that you follow the VMware Guides on 1st & 3rd Party Guest Backup Solutions.

Hardware references

Serial interface

A VM Expressway has no physical serial interface; the serial interface is accessible through the console tab of the VM guest.

Note that you can use CTRL+ALT to exit from the Console window (this is identified in the bottom right corner of the vSphere Client window).

Ethernet interfaces (NICs)

In VM Expressway the LAN interfaces are Virtual NICs. Appropriate drivers are set up as VM Expressway is installed; configuration of IP addresses is carried out through the standard Expressway interface.

VM Expressway allocates 3 virtual NICs:

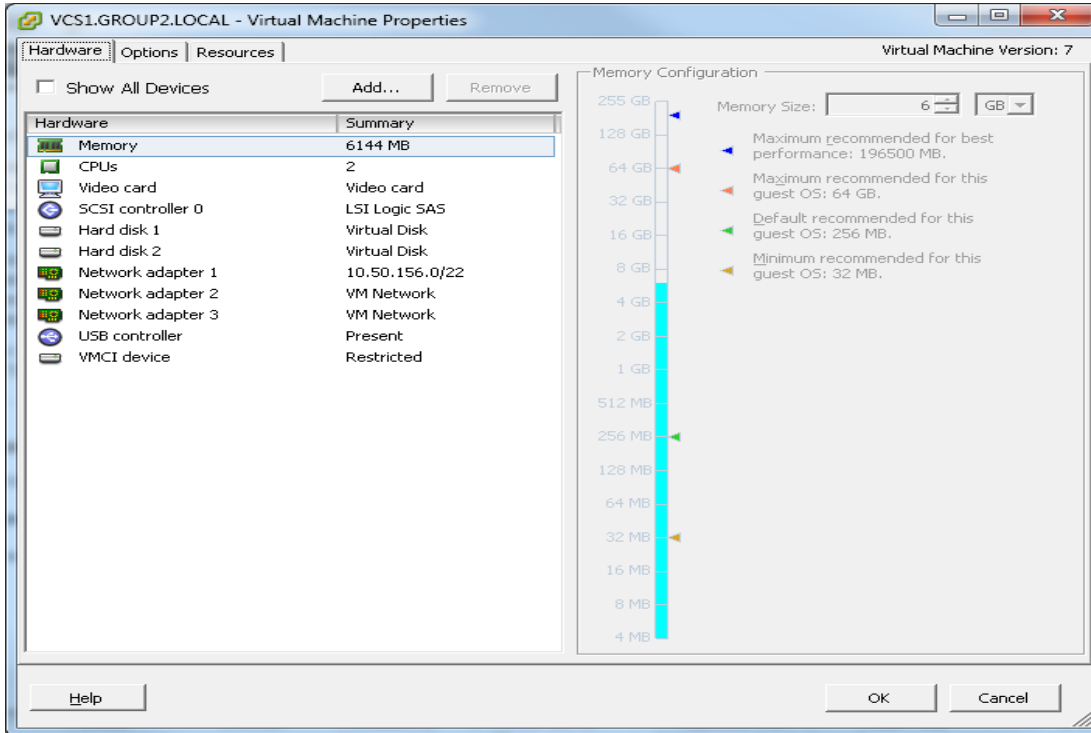
- the first is used for the standard LAN 1 interface
- the second is used if Dual Network interfaces is enabled (LAN 2)
- the third is reserved for future use

Allocating a virtual NIC to a physical NIC interface

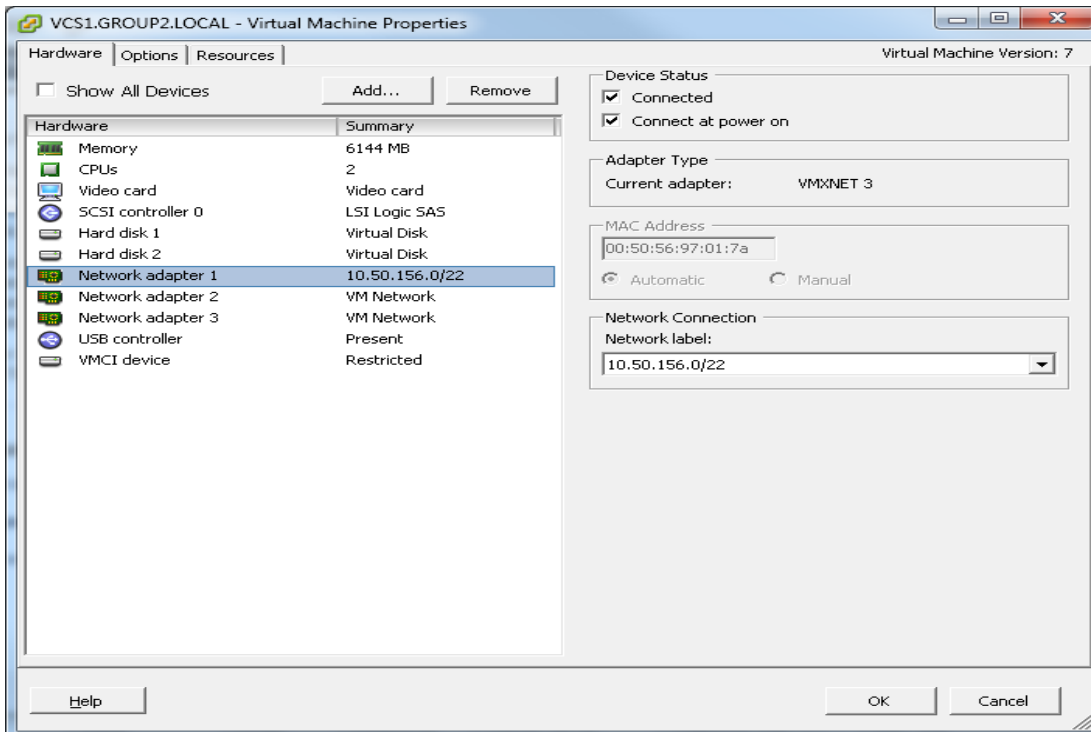
Virtual NICs can be assigned to physical interfaces as follows:

1. Ensure that the physical NIC on the VM host is connected and operational.
2. Set up or check that there are Virtual Switches (vNetwork Distributed Switches) for each physical NIC. (Select the host on which the VM Expressway will run, select the **Configuration** tab and select **Networking**.)
3. Ensure that there is at least one Virtual Machine Port Group (with associated VLAN IDs) set up for each physical NIC.
To add a new Virtual Machine Port Group:
 - a. Click **Properties** on the appropriate Virtual Switch or vNetwork Distributed Switch.
 - b. Follow the network wizard.
4. Note the name of a Virtual Machine Port Group connecting to the required NIC.

5. Select the VM guest; right click it and select **Edit settings...**



6. Select the required network adaptor (Network adaptor 1 = LAN 1, Network adaptor 2 = LAN 2).



7. Select the appropriate Network label (Virtual Machine Port Group) to associate the Expressway LAN interface with the required physical NIC.
8. After a few seconds the Expressway will be able to communicate over the physical interface.

Additional information

Upgrading a VM Expressway

When upgrading a VM Expressway you must use a .tar.gz file (available from the software download site), not an .ova file:

1. If the Expressway is part of a cluster, follow the relevant *Expressway Cluster Deployment Guide*.
2. If the Expressway is not part of a cluster:
 - a. Log in to the Expressway VM web interface as an administrator.
 - b. Backup the Expressway from the **Backup** page (**Maintenance > Backup and restore**).
 - c. Upgrade the Expressway from the **Upgrade** page (**Maintenance > Upgrade**).

Clustering for resilience and capacity

When clustering VM Expressways it is strongly recommended to use at least two physical hardware hosts – clustered Expressways are designed to support resilience and capacity.

To support hardware resilience, Expressway peers must run on at least two different hardware platforms.

Each and every Expressway peer in a cluster must be within a 15ms hop (30ms round trip delay) of each and every other Expressway in or to be added to the cluster.

For more information on clustering Expressways, see [Expressway Cluster Creation and Maintenance Deployment Guide](#).

Supported features

vMotion

vMotion has been tested and Expressway will move (migrate) successfully. If you need to move Expressway to a new host you must perform a host migration via vMotion.

There may be glitches (packet loss/jitter) in media for calls that are interworked by Expressway as the VM is moved. We recommend that a vMotion move is carried out when there is low call activity on the VM Expressway.

SAN with Fibre interconnect

Use of a SAN with Fibre interconnect, rather than a NAS, is recommended in order to maximize the transfer speed.

Unsupported features

VMware fault tolerant mode

VMware fault tolerant mode is not supported (because the Expressway uses multiple cores).

Licensing

If you copy the VM, the Expressway serial number will change and the existing license keys will be invalidated. If you need to move Expressway to a new host you must perform a host migration via vMotion.

Appendix 1: Troubleshooting

This section contains information to help in troubleshooting system issues.

Checking VMware compatibility

If you are using third party hardware for hosting the VM Expressway application, check the hardware compatibility. This can be done using the VMware compatibility guide tool available from <http://www.vmware.com/resources/compatibility/search.php>.

VMware checklist

1. Check the accessibility to the VM host server (by ping, physical console access, ssh remote access, KVM-over-IP console, and so on).
2. Check the network connectivity of the VMkernel (by executing the `vmkping` command using Tech Support Mode to verify network connectivity from the VMkernel NIC level).
3. If you are having problems connecting to the vSphere Client management console, execute the command `/sbin/services.sh` from an SSH session to restart the ESXi management agent.
4. Check the utilization of the VM host server (CPU utilization, memory utilization, disk access speed, storage access speed, network access status, power utilization, and so on).
If any specific application causes high utilization, stop or restart this application to isolate the overall VM host performance level. Alternatively execute the command `esxtop` from Tech Support Mode to list all system processes running on the ESXi host application.
5. Check the ESXi server file log (hostd.logs) under the folder `/var/log/vmware`.
This log contains common error logs such as iSCSI naming error, authentication error, host convertibility error, and so on.
6. Verify that there is adequate disk space available on the physical volume that stores the database files, and free up disk space if necessary.
7. Validate the authentication to the vCenter Server database. The vCenter Server service may not be able to authenticate with the database if:
 - a. There are permission issues with the database when importing from one instance to another.
 - b. The password on the account you are using to authenticate to the database has changed but the password in the registry has not changed as well.
 - c. The vCenter Server database user is not granted correct permissions.

Isolating a possible root cause

Potential issue area	What to look for
Storage	<p>Look for the VM store application image stored either on the local drive, SAN or NFS. VMs often freeze or hang up if the application failed to access the storage. Possible error messages are:</p> <ul style="list-style-type: none"> ■ vCenter Server does not start ■ vCenter Server is slow to respond ■ vCenter Server fails after an indefinite amount of time

Potential issue area	What to look for
Network	Any network failure or locking causes a connection failure between the VM and the virtual network. Also, if using NFS or iSCSI, storage may cause application failures because the application cannot access the file system.
DNS	DNS server failures or communication failures between DNS and the VM server may cause the VMware application or the VM Expressway application to fail.
vCenter Server	If vCenter is not operating properly, even though the VM Expressway application is still up and running, you may lose connection to the VM Expressway application from the network.
Host application	Check any critical alarms on the VM application for events on the host or application level (check the event information from vSphere Client).

Possible issues

VM image fails to boot

If the VM image fails to boot, check the VT (Virtualization Technology) setting in BIOS. This needs to be enabled for hosting VMs. If it is not set, set it and re-install ESXi then load the .ova file.

Expressway application fails to start

Look at the /tmp/hwfail file – its content will indicate any violations in the installation.

For example, Expressway reserves 3 virtual NICs – these are required in the Expressway, do not try deleting one or more of them otherwise hwfail will be created and the VM Expressway will not run.

Configured NTP does not work

For NTP to work on Expressway, the same NTP must also be configured on the VM host.

Guest console in vSphere 5 fails to run on some Microsoft platforms

When attempting to open a console screen from vSphere for the VM:

- Error message: “The VMRC console has disconnected...attempting to reconnect.”
- Screen remains black

The following operating systems are at risk:

- Windows 7 64 bit – reported on VMware forum (<http://communities.vmware.com/thread/333026>)
- Windows Server 2008 R2 (64-bit) – found by use

Raid controller synchronization

If the VMware system is synchronizing its RAID disks, disk performance is seriously degraded. It is strongly recommended that Expressway is not installed or run on VM platforms where RAID disks are in a degraded or synchronizing state.

Analyzing the cause of VMware issues

If VMware is causing problems on the Expressway host, you are initially recommended to collect logs from the host for analysis:

1. Using the vSphere client (or the vCenter Server managing this ESXi host) connect to the ESXi host on which the Expressway is running.
2. Go to **File > Export > Export System logs**, choose the appropriate ESXi host and go with the default settings.

After you have downloaded the logs analyze them, or have them analyzed to determine the issue.

More information on exporting logs can be found at

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=653.

Active options only indicates '150 traversal calls' for Large deployments

To utilize the Large scale capabilities (500 traversal calls) of the Expressway, the VM platform must have an active 10Gb network connection.

Restoring default configuration (factory reset)

Very rarely, it may become necessary to run the “factory-reset” script on your system. This reinstalls the software image and resets the configuration to the functional minimum.

Prerequisite files

The **factory-reset** procedure described below rebuilds the system based on the most recent successfully-installed software image. The files that are used for this reinstallation are stored in the **/mnt/harddisk/factory-reset/** folder on the system. These files are:

- A text file containing just the 16-character Release Key, named **rk**
- A file containing the software image in tar.gz format, named **tandberg-image.tar.gz**

In some cases (most commonly a fresh VM installation that has not been upgraded), these files will not be present on the system. If so, these files must first be put in place using SCP as root.

Performing a reset to default configuration

The following procedure must be performed from the serial console. This is because the network settings will be rewritten, so any SSH session used to initiate the reset would be dropped and the output of the procedure would not be seen.

The process takes approximately 20 minutes.

1. Log in to the system as **root**.
2. Type **factory-reset**
3. Answer the questions as required:

The recommended responses will reset the system completely to a factory default state.

Prompt	Recommended response
Keep option keys [YES/NO]?	YES
Keep IP configuration [YES/NO]?	YES
Keep ssh keys [YES/NO]?	YES
Keep ssl certificates and keys [YES/NO]?	YES
Keep root and admin passwords [YES/NO]?	YES
Save log files [YES/NO]?	YES

4. Finally, confirm that you want to proceed.

Appendix 2: VM Expressway activation process

Follow this procedure to activate your Cisco Expressway software.

1. Ensure you have downloaded and installed the virtual Expressway software before attempting to register your Product Authorization Keys (PAKs) that you will have received via email. The Expressway software can be downloaded from the link contained in your email or from <http://software.cisco.com/download/navigator.html>.

Note that you need to select and install **Cisco TelePresence Video Communication Server (VCS)** software. After you have completed this procedure, including the installation of the **Expressway Series** key, the web interface will change to indicate **Cisco Expressway**.

2. After the VM software is installed, retrieve the 8 character serial number from the **Option keys** page (**Maintenance > Option keys**) or from the bottom right hand corner of the web interface.

The screenshot displays the 'Option keys' configuration page. At the top, there's a breadcrumb 'You are here: Maintenance > Option keys'. Below is a table with columns 'Key' and 'Description'. Underneath the table are three main sections: 'System information', 'Software option', and a footer. In the 'System information' section, the 'Hardware serial number' is 'XXXXXXXX', which is highlighted with a red box. The 'Software option' section contains an 'Add option key' input field. The footer shows system details: 'User: admin Access: Read-write System host name: int-sc-taa22 System time: 12:06 GMT Language: en_US SN: XXXXXXXX Version: X8.1', with the 'SN: XXXXXXXX' part highlighted by a red box.

3. Register your software and feature PAKs at the customer licensing portal to retrieve your **Release** key and any relevant **Option** keys:
 - a. Go to www.cisco.com/go/license and sign in.
 - b. If necessary, click **Continue to Product License Registration**.
 - c. Follow the onscreen instructions to register your software PAK (with a part number prefix of LIC-SW-EXP), utilizing the product serial number obtained from the previous step.
 - d. Continue to register any applicable feature PAK.

You will shortly receive 2 emails containing your Release and Option keys.
4. Enter your **Release key** and any **Option keys** on the **Option keys** page (**Maintenance > Option keys**) on the Expressway web interface.
5. Restart the Expressway (**Maintenance > Restart options**).
Note that only one restart is required after the release key and option keys have been entered.

Appendix 3: Deploying multiple datastores

This process should be carried out during the initial build of the VM host, if the VM host has two or more RAID arrays of disk storage. This configuration enables vSphere / vCenter to know about all the datastores.

1. From vSphere or vCenter Inventory list select the relevant Host.
2. Select the **Configuration** tab.
3. Select **Storage**.

The screenshot shows the vSphere Client interface for a VM host named 'vm-vodafone1'. The 'Configuration' tab is active, and the 'Storage' sub-tab is selected. The 'Datastores' section displays a table with the following data:

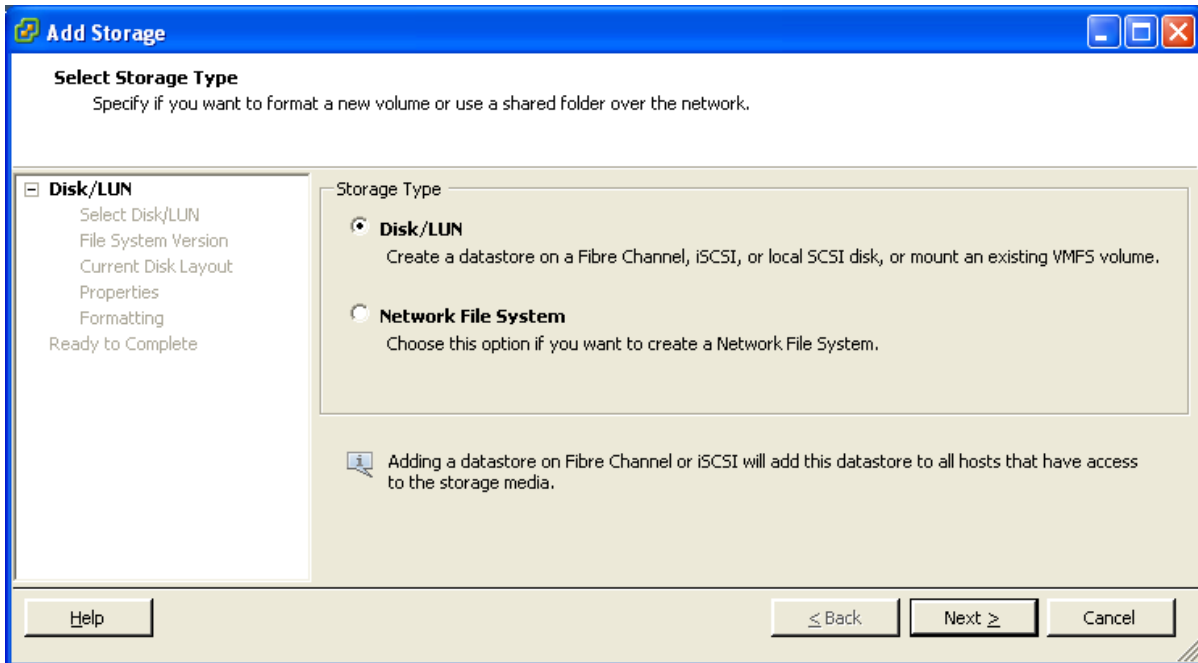
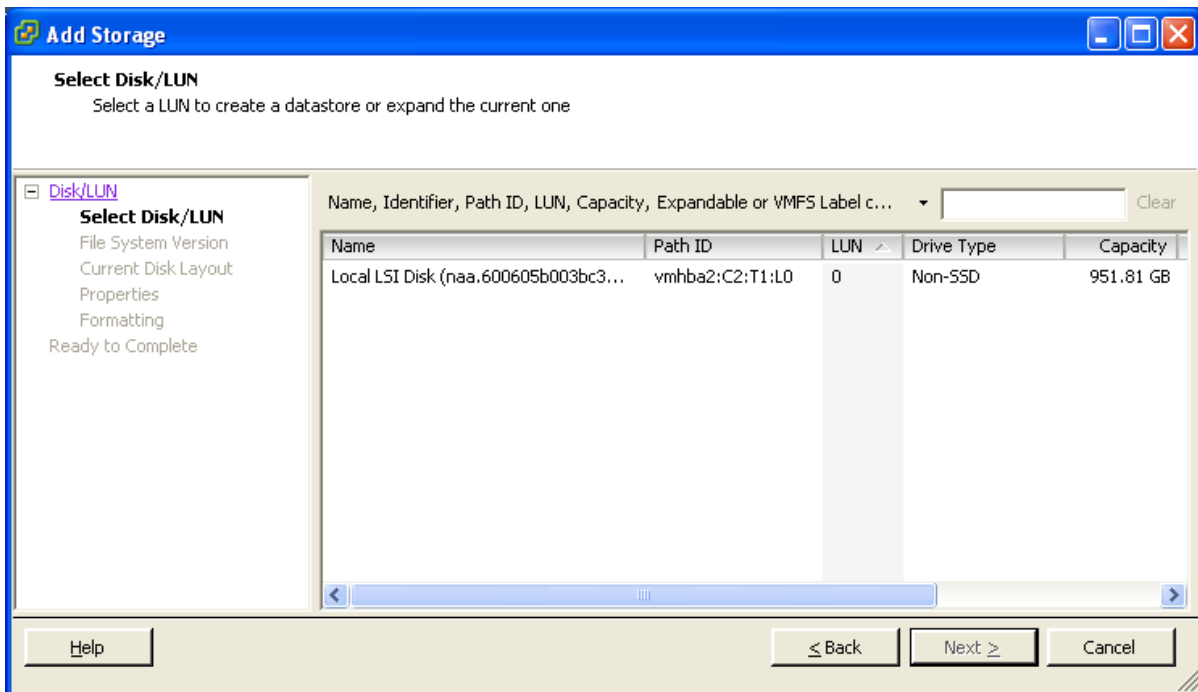
Identification	Device	Drive Type	Capacity	Free	Type	Last Update	Hardware Acceleration
datastore1	Local LSI Disk (n...)	Non-SSD	131.00 GB	130.05 GB	VMFS5	11/17/2011 8:16:37 AM	Not supported

Below the table, there is a 'Datastore Details' section with a 'Properties...' link. At the top right of the Datastores section, there are buttons for 'Refresh', 'Delete', 'Add Storage...', and 'Rescan All...'. The 'Add Storage...' button is highlighted in the screenshot.

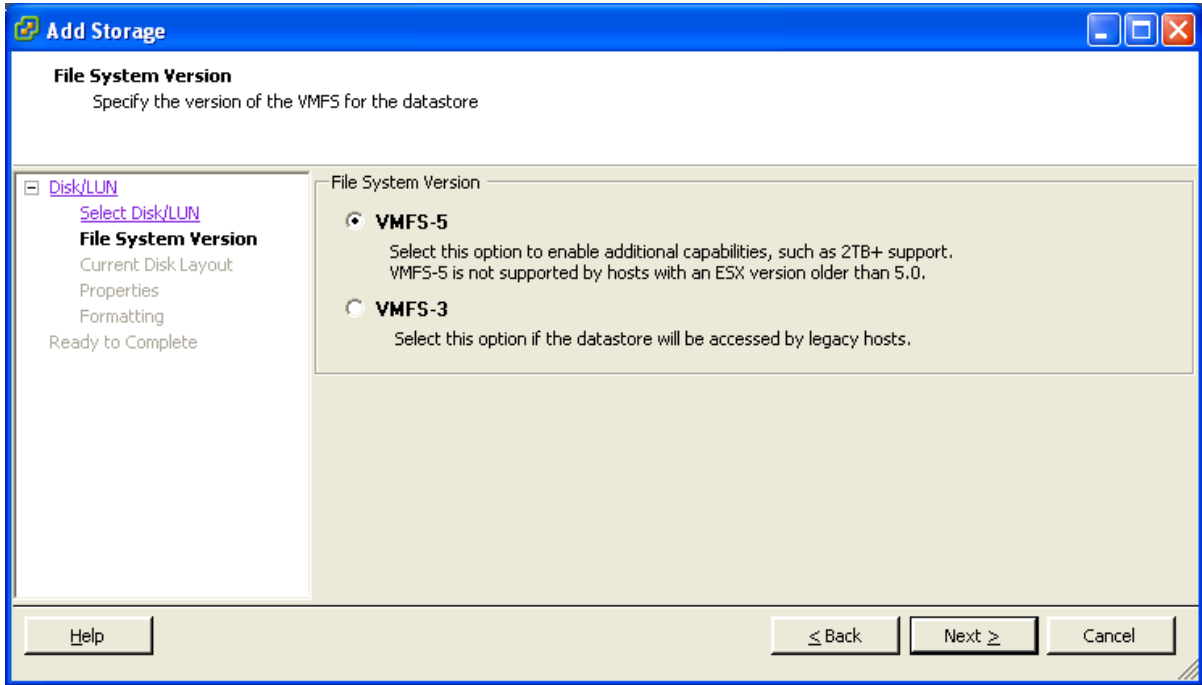
At the bottom of the interface, the 'Recent Tasks' section shows a table of completed tasks:

Name	Target	Status	Details	Initiated by	Requested Start Time	Start Time	Completed Time
Rescan VMFS	10.50.159.84	Completed		root	11/17/2011 8:16:37 ...	11/17/2011 8:16:37 ...	11/17/2011 8:16:37 ...
Rescan all HBAs	10.50.159.84	Completed		root	11/17/2011 8:16:36 ...	11/17/2011 8:16:36 ...	11/17/2011 8:16:37 ...

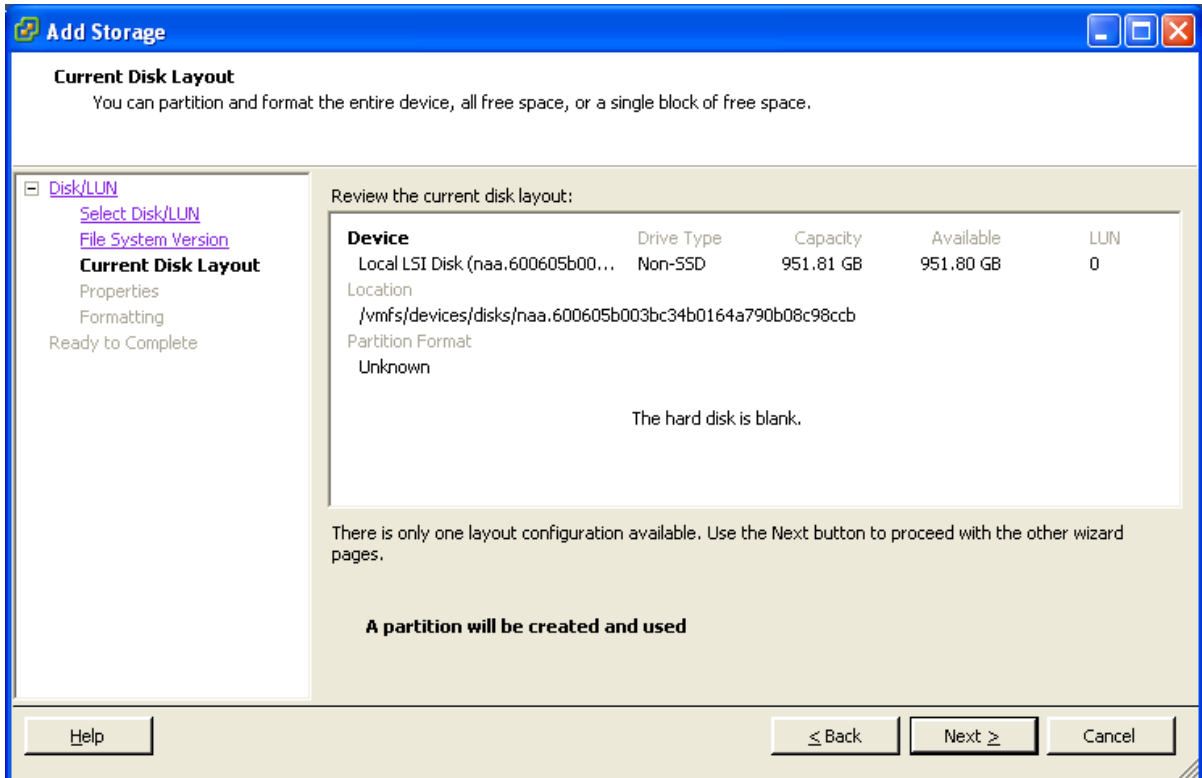
4. Select **Add Storage ...** (on the right hand side window).

5. Select **Disk/Lun** and click **Next**.6. Under **Disk/LUN** select the required Disc/LUN from the list presented and click **Next**.

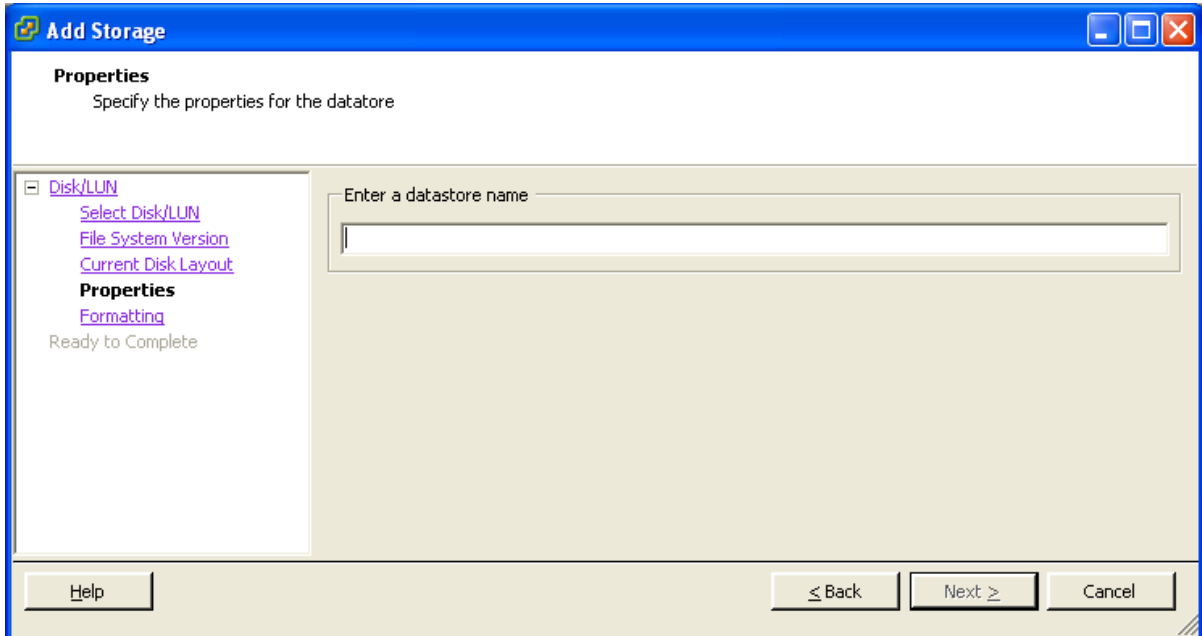
7. On the **File System Version** page select **VMFS-5** and then click **Next**.



8. On the **Current Disk Layout** page verify the details and then click **Next**.

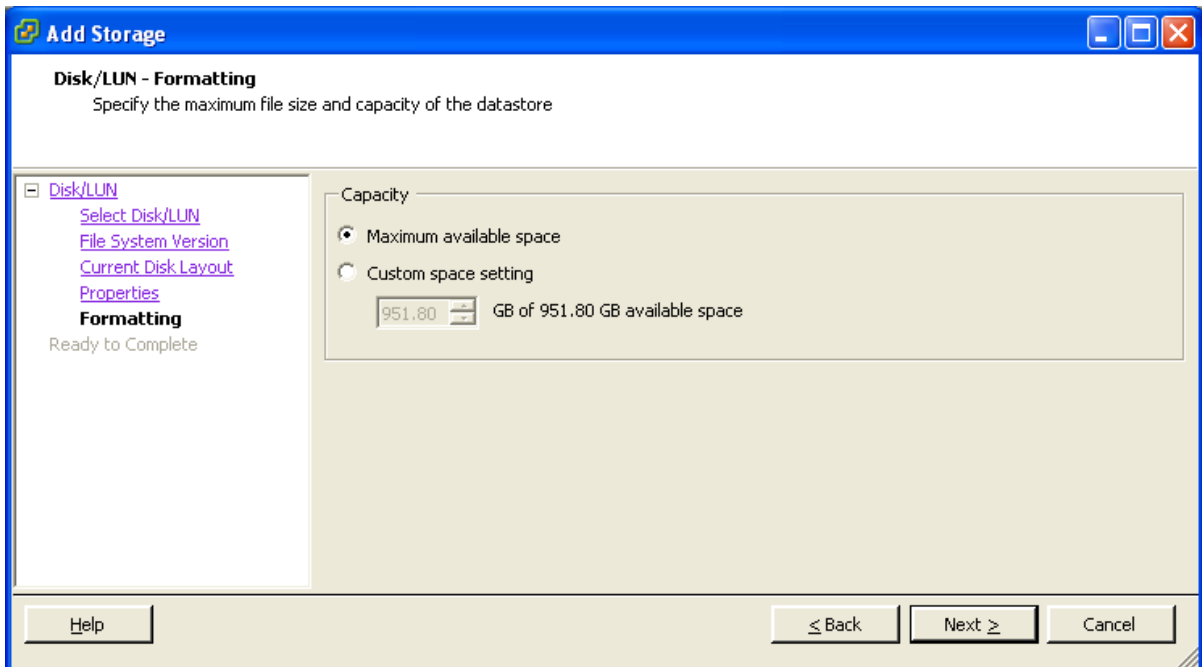


9. On the **Properties** page enter a name for the new datastore and then click **Next**.



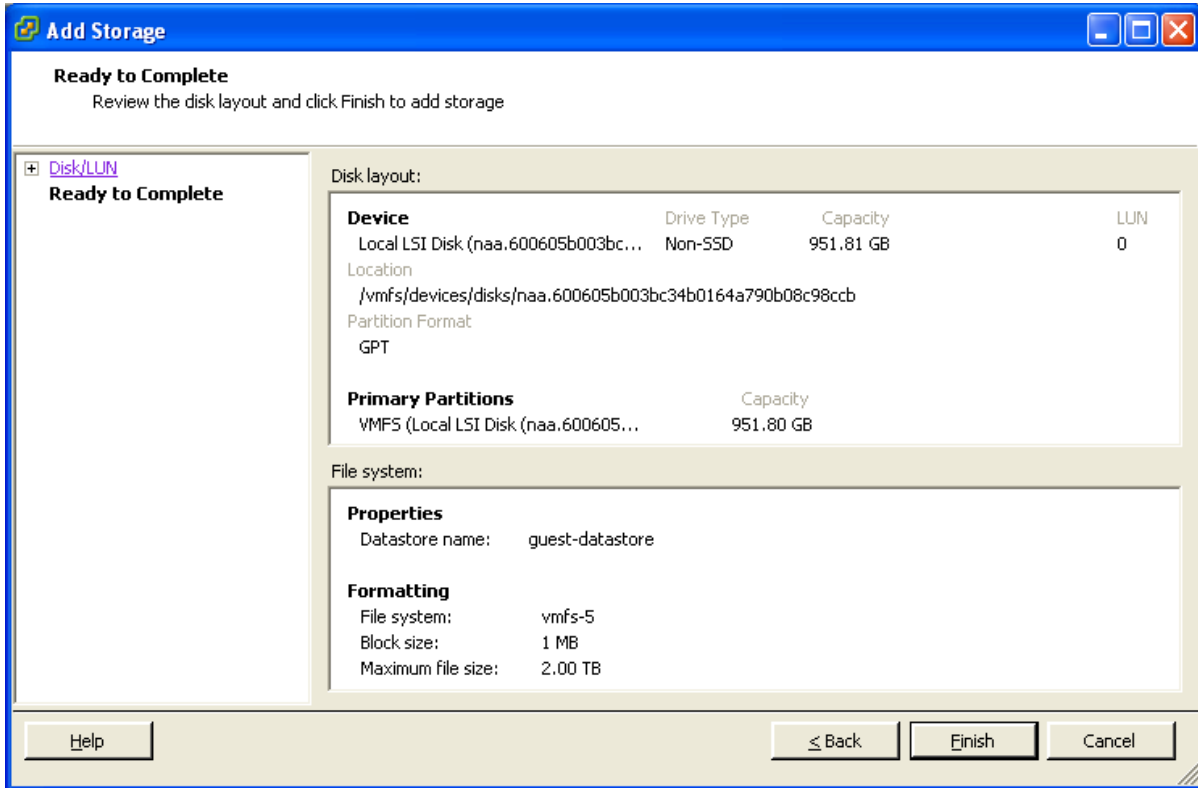
The screenshot shows the 'Add Storage' wizard window. The title bar reads 'Add Storage'. The main heading is 'Properties' with the instruction 'Specify the properties for the datastore'. On the left, a tree view shows 'Disk/LUN' expanded, with sub-items: 'Select Disk/LUN', 'File System Version', 'Current Disk Layout', 'Properties', and 'Formatting'. The 'Properties' sub-item is selected, and below it, it says 'Ready to Complete'. The main area contains a text input field labeled 'Enter a datastore name'. At the bottom, there are three buttons: 'Help', '< Back', 'Next >', and 'Cancel'.

10. On the **Formatting** page select **Maximum available space** and then click **Next**.

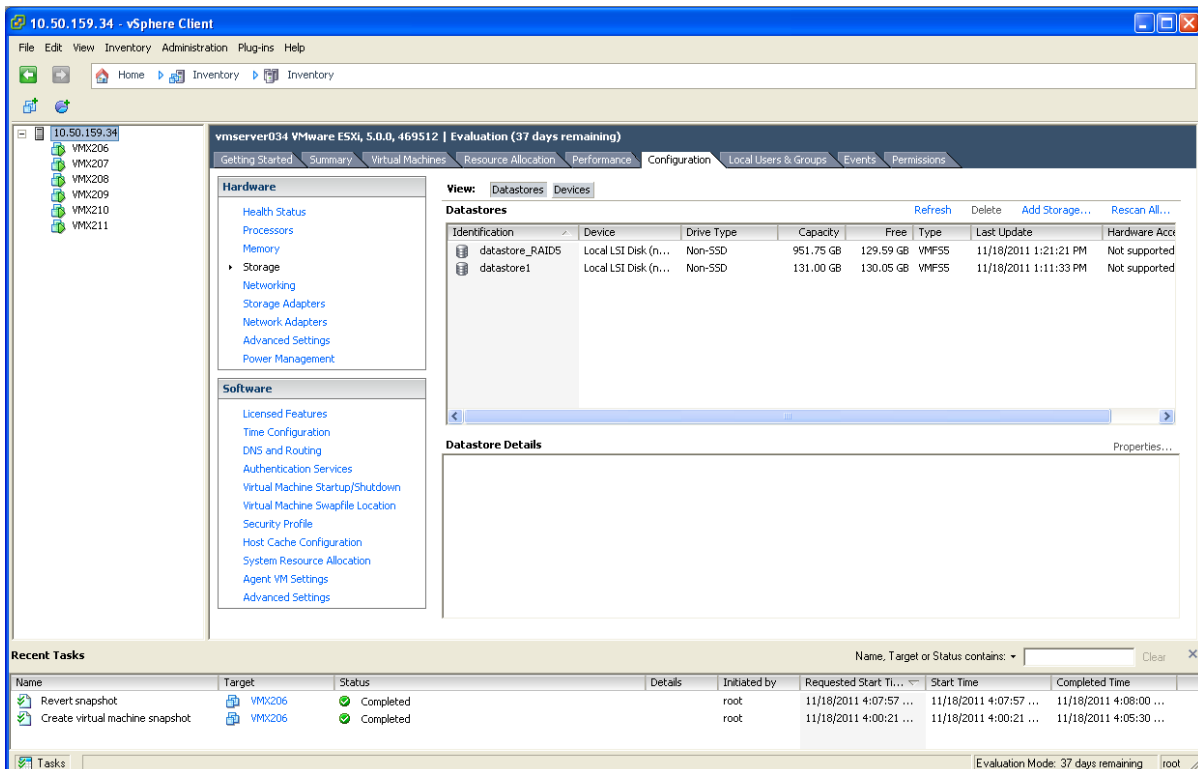


The screenshot shows the 'Add Storage' wizard window at the 'Disk/LUN - Formatting' step. The title bar reads 'Add Storage'. The main heading is 'Disk/LUN - Formatting' with the instruction 'Specify the maximum file size and capacity of the datastore'. On the left, the tree view shows 'Disk/LUN' expanded, with sub-items: 'Select Disk/LUN', 'File System Version', 'Current Disk Layout', 'Properties', and 'Formatting'. The 'Formatting' sub-item is selected, and below it, it says 'Ready to Complete'. The main area contains a 'Capacity' section with two radio buttons: 'Maximum available space' (which is selected) and 'Custom space setting'. Below the radio buttons, there is a text input field containing '951.80' and a unit label 'GB of 951.80 GB available space'. At the bottom, there are three buttons: 'Help', '< Back', 'Next >', and 'Cancel'.

- On the **Ready to Complete** page verify the details and then click **Finish**.



- Wait for the Create VMFS Datastore task to complete.
- On completion, the new datastore will be listed under the **Storage** section.



Document revision history

The following table summarizes the changes that have been applied to this document.

Revision	Date	Description
1	December 2013	Initial release.

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