



# Configuring and Installing HP Blade Servers

You can deploy VMware ESX Server 2.1 on a variety of hardware, including blade servers (blades). Because of the unique hardware of blade servers, we have prepared this paper to help you maximize your ESX Server experience on HP blade servers.

This note contains the following topics:

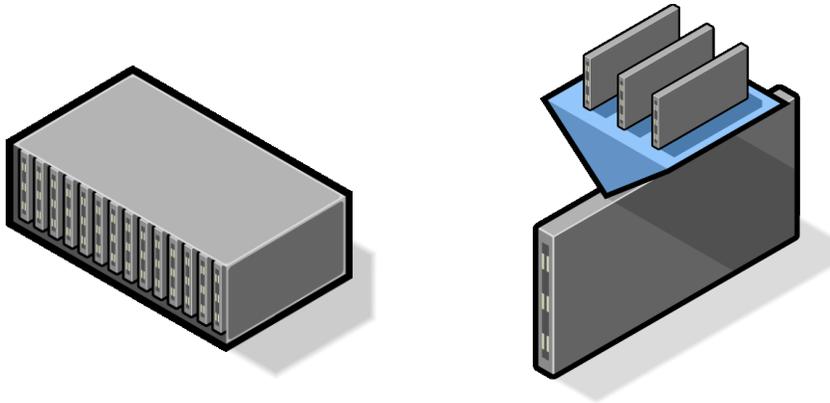
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## Using Blade Servers with ESX Server

The advantages of blade servers include greater versatility, ease of deployment and serviceability, and cost savings. When combined with VMware ESX Server, and optionally with VMware VirtualCenter, blade servers offer you even more benefits.

In particular, using VMware products with blade servers provides:

- Improved utilization by increasing server and application density. You can consolidate applications and infrastructure services onto fewer blade servers.
- Increased operational flexibility.
- Increased resource management and use of each virtual machine.



VMware products improve on the existing benefits of blade servers. By using ESX Server, you can install multiple virtual servers on a single blade, thereby containing costs and maximizing the potential of your hardware.

For more information on the benefits of VMware ESX Server, see [www.vmware.com/products/server/esx\\_features.html](http://www.vmware.com/products/server/esx_features.html).

## Using Blades with ESX Server and VirtualCenter

VMware VirtualCenter is a separately purchasable product that provides virtual infrastructure management software. You have a central point of control through a single management console window for your data center's virtual computing resources. VirtualCenter manages your virtual machines as a single, logical pool of processing, networking, memory, and storage resources, thereby enabling you to manage workload and optimize resource utilization.

VirtualCenter also enables the VMotion add-on module that enables zero-downtime maintenance and ensures 100% service availability. You can migrate a running virtual machine to a different physical server, connected to the same storage area network (SAN), without service interruption. By moving virtual machines on the fly, you can perform maintenance on the underlying hardware and storage, without scheduling downtime and without impacting users.

For more information on the benefits of VMware VirtualCenter, see [www.vmware.com/products/vmanage/vc\\_features.html](http://www.vmware.com/products/vmanage/vc_features.html).



## Blade Server Hardware Requirements

Blade server hardware requirements are as follows:

- Blade server enclosure
- BL20p, BL20p G2, or BL40p blade servers
- GbE or GbE2 Interconnect Switch (GbE2 is required for Fibre Channel connectivity with BL20p G2 blade servers)
- Dual Port Fibre Channel Mezzanine Card (for FC connectivity with BL20p G2 server blades).  
**Note:** This is a requirement if you are planning to use Fibre Channel SAN storage media or VMotion.
- Sufficient physical memory to prevent virtual machine swapping from being a significant performance issue. Refer to the *ESX Server 2.1 Administration Guide* for more information on system requirements at [www.vmware.com/support/esx21/doc/esx21admin\\_res.html](http://www.vmware.com/support/esx21/doc/esx21admin_res.html).

## Configuring ESX Server on HP ProLiant BL p-class Blade Servers

There are two main choices for blade server storage:

- Local storage
- SAN devices with Fibre Channel adapters

### Local Storage

On blade servers, you need local storage for installing the VMkernel and VMware Service Console.

ESX Server does not support “diskless” operation, where the ESX Server base installation is on a Fibre Channel SAN logical unit number (LUN), Internet SCSI (iSCSI), network-attached storage (NAS), or other external storage.

### Local SCSI

On HP blades, the local SCSI drives are placed into a RAID1 (mirrored) configuration for redundancy.

### SAN Storage

Fibre Channel SANs are the preferred storage media for ESX Server and VirtualCenter in a blade environment, due to the following advantages:

- SAN storage may be shared among multiple blades (and other systems), thus allowing storage consolidation. Often, this is a much more efficient use of storage resources than dedicated, per-system, RAID-protected storage.
- Blade systems support redundant host bus adapters (HBAs) to meet High Availability needs.
- The storage is more reliable (RAID5 with hot spares compared to RAID1).



- Storage is unlimited compared to the storage that fits on a single local SCSI disk.
- A shared SAN is required for using VMotion with VirtualCenter.
- Images, templates, and so on, may be shared between multiple ESX Server systems.

### **Fibre Channel Connectivity**

As listed in [Blade Server Hardware Requirements on page 3](#), HP blades require a specific Fibre Channel interconnect in the blades enclosure, to support external Fibre Channel connectivity to a FC SAN. The latest list of supported SAN configurations and devices is available at [www.vmware.com/products/server/esx\\_specs.html](http://www.vmware.com/products/server/esx_specs.html).

### **VMotion**

For you to use VMotion, all blades in a VirtualCenter farm need access to the same logical unit number (LUN) on a SAN. Consequently, VMFS volumes, containing the virtual machine virtual disk (.disk) files, must be on a shared SAN.

**Note:** VMotion is not supported for virtual machines hosted on local storage. The virtual machines must reside on a shared SAN accessible by ESX Server.

### **Core Dump Partition**

ESX Server core dump partitions must be on a controller visible to the virtual machines (VMkernel). We recommend that you create ESX Server core dump partitions on a local SCSI drive.

### **Swap File**

ESX Server swap partitions must be on a controller visible to the virtual machines (VMkernel). We recommend that you create ESX Server swap partitions on a local SCSI drive.

Purchase enough physical memory to prevent virtual machine swapping from being a significant performance issue.

Depending on the number of blades and your swap usage, you may choose to allocate a dedicated LUN for swap files. Multiple swap files from multiple ESX servers can reside on this dedicated LUN. Do not store any other kind of file (virtual machine .disk files, checkpoint files, and so on) on this LUN.

Use a unique name for each blade server swap file, such as, <server\_name>.vswp. Although you can have a total of eight swap files for each ESX Server machine, you can select only one swap file through the VMware Management Interface.



## Installing VMware ESX Server on HP Blade Servers

For a list of blade servers supported with ESX Server, see the *ESX Server Systems Compatibility Guide* at [www.vmware.com/products/server/esx\\_specs.html](http://www.vmware.com/products/server/esx_specs.html).

You can install ESX Server on HP Blade Servers in one of two ways:

- If your HP Blade Server has a version of Integrated Lights Out firmware (iLO) prior to 1.4, use a remote network installation or Rapid Deployment Pack (RDP).
- If your HP Blade Server has the 1.4 or later version of Integrated Lights Out (iLO) firmware, you may use a remote network installation, a remote CD installation, or RDP.

For complete information on installing ESX Server on HP blades, see *Installing VMware ESX Server 2.1 on HP ProLiant BL p-class Blade Servers*. This document provides two detailed installation procedures: deploying ESX Server with iLO Virtual Media and deploying ESX Server using RDP.

### Post-Installation ESX Server Configuration

Perform ESX Server configuration in the VMware Management Interface by following the steps in the *VMware ESX Server 2.1 Installation Guide* at [www.vmware.com/support/esx21/doc/esx21install\\_config\\_install.html](http://www.vmware.com/support/esx21/doc/esx21install_config_install.html).

**Note:** We recommend you dedicate all Fibre Channel devices to the virtual machines.

## Best Practices on HP Blade Servers

This section includes some general best practices for using ESX Server on HP blades.

### Updating the BIOS if ESX Server is Unable to See HBAs

If you notice that ESX Server is unable to see both host bus adapters (HBAs), then you may need to update your blade server BIOS to version 4.06 I04-01/26/2004 for BL20p G2 blades, and to version 4.04 I02-01/12/2004 for BL40p blades. Refer to your HP documentation for more information on updating the BIOS.

### Mounting a USB CD-ROM Device

HP blades use a USB-based CD-ROM drive. VMware ESX Server automatically detects this drive and installs the needed drivers. It is important to note that this drive uses a special device node, `/dev/scd0`.

To mount the USB CD-ROM manually, type one of the following sets of commands:

```
mkdir -p /mnt/cdrom
mount /dev/cdrom /mnt/cdrom
```

Or:

```
mkdir -p /mnt/cdrom
mount /dev/scd0 /mnt/cdrom
```

### Determining the Floppy Drive on a Blade Server

Generally, the floppy disk drive is `/dev/sda` on HP blades.



## Mounting a Floppy Drive from the Command Line

Type the following:

```
mkdir -p /mnt/floppy
mount /dev/sda /mnt/floppy
```

## Mounting a Floppy Drive from the VMware Remote Console

Follow these steps to mount a floppy drive from the remote console:

1. Choose **Settings > Configuration Editor**.
2. If it is not already selected, click the **Hardware** tab.
3. Click **Floppy Drive** and select **Use floppy image** (even though you are actually using a physical floppy drive).
4. Enter the appropriate `/dev/sda` device name.