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1. Upgrade to vSphere Pre-requisites

This checklist will detail the pre-requisites identified either as Required, Optional, or Recommended that should be reviewed and completed first, before starting to work on the upgrade from VMware Infrastructure to VMware vSphere.

Required	<input type="checkbox"/> If any of the following VMware products are being used with the target environment, please check* the <i>Compatibility Guide</i> on the VMware vSphere documentation Web site <ul style="list-style-type: none">o VMware Lab Managero VMware Stage Managero VMware Lifecycle Managero VMware Site Recovery Managero VMware View / VDM <p>* This step should be completed prior to <i>any</i> migration activities in order to determine eligibility for upgrade/migration to vSphere</p>
Required	<input type="checkbox"/> Ensure that the systems, I/O devices, and storage arrays are on the VMware certified compatibility list for VMware vSphere. See the <i>Hardware Compatibility Guide</i> on the VMware vSphere documentation web site
Required	<input type="checkbox"/> Ensure that your virtual machine operating systems are supported on VMware vSphere. See the <i>Guest Operating System Installation Guide</i> for a complete list

1.1 VirtualCenter / vCenter Server

Required	<input type="checkbox"/> Ensure that the VirtualCenter Server is version 2.0 or above (VirtualCenter 1.x cannot be upgraded and will require a clean installation of vCenter Server 4.0)
Required	<input type="checkbox"/> Ensure that the hardware and/or virtual machine meets the minimum system requirements for VMware vCenter 4.0 See the vCenter Server Hardware Requirements in <i>ESX and vCenter Server Installation Guide</i> on the VMware vSphere documentation web site

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Optional	<input type="checkbox"/> It may be necessary to increase the memory and CPU of the hardware and/or virtual machine depending on the size of the virtual infrastructure being managed by vCenter Server For example, <ul style="list-style-type: none"> • the minimum memory for vCenter Server is now 3 GB • 2 CPU/4 GB memory for managing upto 50 hosts • 4 CPU/4 GB memory for managing up to 200 hosts • 4 CPU/8 GB memory for managing 200 to 300 hosts • 64 bit OS in order to support larger memory
Required	<input type="checkbox"/> On a 64 bit vCenter Server system, use a 32 bit DSN using the 32 bit ODBS administrator
Required	<input type="checkbox"/> Ensure that the VirtualCenter Server database is supported (Oracle 9i and Microsoft SQL Server 2000 are no longer supported. The database can be upgraded to the supported versions first) Existing unsupported databases must be upgraded to a supported version before upgrading the VirtualCenter Server See the vCenter Server Database Requirements in <i>ESX and vCenter Server Installation Guide</i> on the VMware vSphere documentation web site
Required	<input type="checkbox"/> Ensure that the necessary patches required for database schema upgrade support are applied See table 3-3 of <i>vSphere Upgrade Guide</i> on the VMware vSphere documentation web site
Required	<input type="checkbox"/> Reconfirm that you have the login credentials, the database instance name, the database server name (or ODBC system data store name – DSN) that will be used by the vCenter Server database
Required	<input type="checkbox"/> If the database is 64-bit Oracle, make sure that the default installation path of C:\Program Files(x86) is changed to remove the parentheses (). Do not include any special characters in the installation path
Required	<input type="checkbox"/> Ensure that for Microsoft SQL database, the system DSN is using SQL Native Client driver
Required	<input type="checkbox"/> Ensure that the Oracle and Microsoft SQL databases have the appropriate permissions See the Database Prerequisites section in Chapter 3 of the <i>vSphere Upgrade Guide</i> on the VMware vSphere documentation web site
Required	<input type="checkbox"/> Ensure that the installation path of the existing VirtualCenter does NOT have commas (,) or periods (.)

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Required	<input type="checkbox"/> Confirm that you have READ permission for the Network service account on the root of the system disk of the vCenter Server installation; this is typically your C:\ drive (NOTE: The installer will prompt you if this is not set)
Required	<input type="checkbox"/> Confirm that the VirtualCenter Server system name is no more than 15 characters
Required	<input type="checkbox"/> Ensure that the following ports are not used by any existing application on the vCenter Server system and that there are no firewalls preventing these ports from/to the vCenter Server system <ul style="list-style-type: none">o HTTP – port 80o HTTPS – port 443o LDAP – port 389 (needed even if not using linked mode)o SSL – port 636
Recommended	<input type="checkbox"/> Ensure that you have taken a complete backup of VirtualCenter, VirtualCenter database, templates in VirtualCenter repository, license files, certificate files before the install or upgrade
Required	<input type="checkbox"/> Ensure you have the VMware vCenter Server 4.0 installation media or ISO image

1.2 VMware Infrastructure Client / vSphere Client

Required	<input type="checkbox"/> Ensure that the operating system and hardware supports vSphere Client See the <i>Compatibility Guides</i> on the VMware vSphere documentation web site
Required	<input type="checkbox"/> Ensure that the Internet Explorer (IE) security settings are set to enable <i>Allow scripting of Internet Explorer web browser control</i> (if the IE security settings are set to High)

1.3 VMware Update Manager

Recommended	<input type="checkbox"/> Ensure that you have taken a complete backup of VMware Update Manager and Update Manager database before the install or upgrade
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Required	<input type="checkbox"/> Ensure that the following ports are not used by any existing application on the VMware Update Manager system and that there are no firewalls preventing these ports from/to the VMware Update Manager system <ul style="list-style-type: none">○ SOAP – port 8084○ Web – port 9084○ SSL – port 9087
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1.4 VMware ESX/ESXi

Optional	<input type="checkbox"/> Ensure that ESX/ESXi version in order to determine the upgrade path (in-place upgrade vs. migration upgrade vs. clean install) (ESX 2.5.5 will require a migration upgrade to ESX 4.0. In-place upgrade from 2.5 to 4.0 is not supported. The only exception is if you have more than 100 MB free in the /boot partition, you can do a 2.5 to 3.x to 4.0 upgrade. It is recommended to do a clean install, or a migration upgrade if a clean install is not an option).
Required	<input type="checkbox"/> Ensure that the hardware meets the minimum system requirements for VMware ESX/ESXi 4 See the <i>Hardware Compatibility Guides</i> at http://www.vmware.com/resources/compatibility and the hardware requirements in <i>ESX and vCenter Server Installation Guide</i> from the VMware documentation web site
Required	<input type="checkbox"/> Ensure that there is either a local VMFS volume with at least 10 GB free space, or a shared VMFS volume with at least 10 GB free space masked or zoned to the ESX host - to store the ESX 4 COS vmdk
Recommended	<input type="checkbox"/> Ensure that there is adequate capacity in the cluster to evacuate all the workloads from the ESX/ESXi host being installed or upgraded
Recommended	<input type="checkbox"/> Ensure that you have backed up your ESX host (service console files, .vmx files, custom scripts, host configuration files, local VMFS file system)
Recommended	<input type="checkbox"/> Ensure that you have backed up your ESXi host (using VI CLI and vicfg-cfgbackup command)
Recommended	<input type="checkbox"/> If applicable, check with vendor for updated and supported 3 rd party agents/software

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1.5 Virtual Machines

Required	<input type="checkbox"/> Ensure that there are no suspend files for a virtual machine in order to do the VM hardware upgrade
Required	<input type="checkbox"/> Ensure that the virtual machine has a CDROM device configured in order for the VMware Tools to mount the ISO and install/upgrade VMware Tools
Optional	<input type="checkbox"/> Ensure that it is ok to upgrade the virtual machine hardware from v4 to v7. Once upgraded, you cannot revert back to an earlier virtual machine format unless you have created a snapshot of the virtual machine prior to the changes.
Recommended	<input type="checkbox"/> Ensure that the virtual machines used for the upgrade are backed up (example: you can use a backup agent / VMware Consolidated Backup or cloning to another datastore)

1.6 Licensing

Required	<input type="checkbox"/> Ensure that you have the necessary licenses for the required features of VMware vSphere. The evaluation license is valid for 60 days after you power on the ESX/ESXi host
Recommended	<input type="checkbox"/> Ensure that you have the necessary VMware store account information in order to access and manage the licenses
Recommended	<input type="checkbox"/> Ensure that you have a backup copy of the existing VMware License Server license files and SSL certificates before you do the upgrade

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2. New VMware vSphere Features Pre-requisites

This checklist will detail pre-requisites identified either as Required or Optional that should be reviewed and completed after you have completed your migration from VMware Infrastructure to VMware vSphere and you are now ready to evaluate and implement some of the new features and functionality that are now part of VMware vSphere.

2.1 Linked Mode

Required	<input type="checkbox"/> Ensure that each vCenter Server instance in a Linked Mode group is part of a domain and not a workgroup. Each instance can be in a different domain if the domains have a two-way trust relationship between themselves
Required	<input type="checkbox"/> DNS must be operational in order for Linked Mode replication to work
Required	<input type="checkbox"/> DNS name of the vCenter Server system must match the actual machine name
Required	<input type="checkbox"/> Ensure that vCenter Server system is not a domain controller
Required	<input type="checkbox"/> Ensure that vCenter Server system is not a terminal server
Required	<input type="checkbox"/> Ensure that the installer is run by a domain user who is an administrator of the vCenter Server machine and the target machine of the Linked Mode group
Required	<input type="checkbox"/> Ensure that the domain user account has the following permissions: <ul style="list-style-type: none">o Member of the Administrators groupo Act as part of the operating systemo Log on as a service
Required	<input type="checkbox"/> Ensure that the vCenter Server instances are running network time synchronization and their time is not more than 5 minutes apart
Required	<input type="checkbox"/> Ensure that the NETWORK SERVICE account has permissions to write to the vCenter Server installation folder

2.2 Storage VMotion

Required	<input type="checkbox"/> Ensure that virtual machines do not have snapshots (VMs with snapshots cannot be migrated using Storage VMotion)
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Required	<input type="checkbox"/> Ensure that virtual machine disks are either in persistent mode or are raw device maps (RDM). Non persistent disks cannot be migrated using Storage VMotion
Required	<input type="checkbox"/> Ensure that the host on which the virtual machine is running has sufficient resources to support two instances of the virtual machine running concurrently for a brief time
Required	<input type="checkbox"/> Ensure that the host on which the virtual machine is running has a VMware VMotion license and is correctly configured for VMotion
Required	<input type="checkbox"/> Ensure that the host on which the virtual machine is running has access to both the source and target datastores
Required	<input type="checkbox"/> Validate that there is no requirement to run more than four simultaneous migrations using VMware VMotion or VMware Storage VMotion accessing a single datastore. If no other migrations are occurring, up to four concurrent migrations with VMware Storage VMotion involving the datastore can occur simultaneously

2.3 Thin Provisioning

Required	<input type="checkbox"/> Ensure that virtual machines with thin provisioned disks do not need to be protected with VMware FT (since VMware FT requires virtual machines to have thick-eagerzeroed disks)
Required	<input type="checkbox"/> If using thin provisioning for an array LUN, consult with the array vendor on compatibility with VMware vSphere, performance, reporting, and alerting capabilities
Optional	<input type="checkbox"/> Ensure that you understand the time involved for procuring, adding, and configuring additional storage, so that the appropriate alarms can be set in order to send alerts well in advance of running out of physical storage

2.4 VMware HA Improvements

Required	<input type="checkbox"/> Ensure that all virtual machines and configuration files reside on shared storage
Required	<input type="checkbox"/> Ensure that all hosts in a HA cluster are configured to have access to the same virtual machine network and network label names are valid and consistent

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Required	<input type="checkbox"/> Ensure that DNS is configured (forward, reverse, short name, and long name / FQDN)
Required	<input type="checkbox"/> If VM Monitoring is to be used to restart VMs when the VM heartbeat is lost, ensure that the virtual machines have the latest version of VMware Tools installed in order to communicate heartbeats
Required	<input type="checkbox"/> If physical switches support PortFast (or equivalent), enable it on the physical network switches that connect to the hosts
Required	<input type="checkbox"/> Ensure that the network isolation addresses respond to ICMP ping requests
Optional	<input type="checkbox"/> Ensure that all hosts in a HA cluster are configured with static IP address (VMware recommendation)
Optional	<input type="checkbox"/> Ensure that there is a redundant Service Console and VMkernel networking (VMware recommendation)
Optional	<input type="checkbox"/> Use a team of two NICs connected to separate physical switches to improve reliability of VMkernel network (VMware recommendation)
Optional	<input type="checkbox"/> Add a second network isolation address (in addition to the default gateway) for each network (VMware recommendation to set das.isolationaddress2 to second isolation address and das.failedetectiontime to value more than 20000 – default is 15000)

2.5 Fault Tolerance

Required	<input type="checkbox"/> ESX/ESXi Hardware: Ensure that the processors are supported: AMD Barcelona+, Intel Penryn+ (run the CPU compatibility tool to determine compatibility)
Required	<input type="checkbox"/> ESX/ESXi Hardware: Ensure that HV (Hardware Virtualization) is enabled in the BIOS
Optional	<input type="checkbox"/> ESX/ESXi Hardware: Ensure that power management (also known as power-capping) is turned OFF in the BIOS (performance implications)
Optional	<input type="checkbox"/> ESX/ESXi Hardware: Ensure that hyper-threading is turned OFF in the BIOS (performance implications)
Required	<input type="checkbox"/> Storage: Ensure that FT protected virtual machines are on shared storage (FC, iSCSI or NFS). Try to avoid using NFS, and if you must use NFS, increase timeouts and have a dedicated NIC for NFS traffic
Required	<input type="checkbox"/> Storage: Ensure that the datastore is not using physical RDM (Raw Disk Mapping). Virtual RDM is supported

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Required	<input type="checkbox"/> Storage: Ensure that there is no requirement to use Storage VMotion for VMware FT VMs since Storage VMotion is not supported for VMware FT VMs
Required	<input type="checkbox"/> Storage: Ensure that NPIV (N-Port ID Virtualization) is not used since NPIV is not supported with VMware FT
Optional	<input type="checkbox"/> Storage: Ensure that virtual disks on VMFS3 are thick-eagerzeroed (thin or sparsely allocated will be converted to thick-eagerzeroed when VMware FT is enabled requiring additional storage space)
Optional	<input type="checkbox"/> Storage: Ensure that ISOs used by the VMware FT protected VMs are on shared storage accessible to both primary and secondary VMs (else errors reported on secondary as if there is no media, which might be acceptable)
Optional	<input type="checkbox"/> Storage: Try to avoid using NFS, and if you must use NFS, increase timeouts and have a dedicated NIC for NFS traffic
Optional	<input type="checkbox"/> Network: Ensure that at least two NICs are used (NIC teaming) for ESX management/VMotion and VMware FT logging. VMware recommends four VMkernel NICs: two dedicated for VMware VMotion and two dedicated for VMware FT.
Required	<input type="checkbox"/> Network: Ensure that at least gigabit NICs are used (10 Gbit NICs can be used as well as jumbo frames enabled for better performance)
Optional	<input type="checkbox"/> Redundancy: Ensure that the environment does not have a single point of failure (i.e. use NIC teaming, multiple network switches, and storage multipathing)
Required	<input type="checkbox"/> vCenter Server: Ensure that the primary and secondary ESX hosts and virtual machines are in an HA-enabled cluster
Required	<input type="checkbox"/> vCenter Server: Ensure that there is no requirement to use DRS for VMware FT protected virtual machines; in this release VMware FT cannot be used with VMware DRS (although manual VMotion is allowed)
Required	<input type="checkbox"/> vCenter Server: Ensure that host certificate checking is enabled (enabled by default) before you add the ESX/ESXi host to vCenter Server
Required	<input type="checkbox"/> ESX/ESXi: Ensure that the primary and secondary ESX/ESXi hosts are running the same build of VMware ESX/ESXi
Required	<input type="checkbox"/> Virtual Machines: Ensure that the virtual machines are NOT using more than 1 vCPU (SMP is not supported)
Required	<input type="checkbox"/> Virtual Machines: Ensure that there is no user requirement to use NPT/EPT (Nested Page Tables/Extended Page Tables) since VMware FT disables NPT/EPT on the ESX host

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Required	<input type="checkbox"/> Virtual Machines: Ensure that there is no user requirement to hot add or remove devices since hot plugging devices cannot be done with VMware FT
Required	<input type="checkbox"/> Virtual Machines: Ensure that there is no user requirement to use USB (USB must be disabled) and sound devices (must not be configured) since these are not supported for Record/Replay (and VMware FT)
Required	<input type="checkbox"/> Virtual Machines: Ensure that there is no user requirement to have virtual machine snapshots since these are not supported for VMware FT. Delete snapshots from existing virtual machines before protecting with VMware FT
Required	<input type="checkbox"/> Virtual Machines: Ensure that virtual machine hardware is upgraded to v7
Optional	<input type="checkbox"/> Virtual Machines: Ensure that there will be no more than four (to eight) VMware FT enabled virtual machine primaries or secondaries on any single ESX/ESXi host (suggested general guideline based on ESX/ESXi host and VM size and workloads which can vary)
Required	<input type="checkbox"/> Guest OS: Ensure that the virtual machines do not use a paravirtualized guest OS
Required	<input type="checkbox"/> 3 rd Party: Ensure MSCS clustered virtual machines will have MSCS clustering removed prior to protecting with VMware FT (and make sure that the virtual machines are not SMP)

2.6 Host Profiles

Required	<input type="checkbox"/> For Activate vSphere projects only, host profile implementation will be limited to simple configurations (example DNS and NTP settings), and will NOT include a vNetwork Distributed Switch
Required	<input type="checkbox"/> Identify one host that will be used to create a baseline host profile
Required	<input type="checkbox"/> Ensure that there is at least one additional host of similar hardware, make, model, and configuration that can be used to apply a host profile
Required	<input type="checkbox"/> Ensure that there is adequate capacity to evacuate the workloads running on the additional host when put in maintenance mode to apply the host profile

2.7 vNetwork Distributed Switch

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Required	<input type="checkbox"/> If vDS is being implemented in order to support PVLANS, ensure that the physical switch is PVLAN aware and is configured appropriately
Required	<input type="checkbox"/> Ensure that no more than 16 vNetwork Distributed Switches are required per vCenter Server (max is 16 per vCenter Server)
Required	<input type="checkbox"/> Ensure that there is no requirement (for this Activate engagement only) to support IPv6 and VMDirectPath I/O
Optional	<input type="checkbox"/> Ensure existing standard vswitches have multiple physical NICs (NIC teaming) in order to have zero downtime to migrate ESX/ESXi hosts from standard vswitches to vDS

2.8 Distributed Power Management

Required	<input type="checkbox"/> Ensure that there are at least two ESX/ESXi hosts are in a vCenter Server cluster
Required	<input type="checkbox"/> Ensure that VMotion is set up and working correctly. The VMotion network should be a single IP subnet, not multiple subnets separated by routers
Required	<input type="checkbox"/> If using WOL (Wake on LAN), ensure that the VMotion NIC on each ESX/ESXi host supports WOL
Required	<input type="checkbox"/> If using WOL, ensure that the switch port that each WOL supporting VMotion NIC is set to auto-negotiate and NOT set to a fixed speed (because many NICs support WOL only if they can switch to 100Mbps or less when the host is powered off)
Required	<input type="checkbox"/> If using BMC (Baseboard Management Controller) or IPMI (Intelligent Platform Management Interface), ensure that BMC or IPMI settings are configured for each host. The steps will vary according to manufacturer and model
Required	<input type="checkbox"/> If using BMC, ensure that BMC LAN channel is configured to be "always available" and to allow "operator" privileged commands
Required	<input type="checkbox"/> If using BMC, ensure you have the user name and password for the BMC account, IP address and MAC address of the NIC associated with the BMC. The BMC may have a dedicated NIC or it may work in-line with one of the system's onboard adapters
Required	<input type="checkbox"/> If required, ensure that the IP address of the NIC associated with the BMC has a static IP address (or a DHCP address with an infinite lease)

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Required	<input type="checkbox"/> Ensure you test each ESX/ESXi host that is using a BMC or WOL before configuring VMware DPM for the cluster (hosts that fail a BMC or WOL test should be disabled from using power management)
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2.9 vCLI and vMA

Required	<input type="checkbox"/> If using vSphere CLI (Command Line Interface) 4.0, ensure that the target environment is ESX/ESXi 3.5U2 and later with vCenter 2.5U2 and later
Required	<input type="checkbox"/> If using vMA (vSphere Management Assistant) 4.0, ensure that the target environment is ESX/ESXi 3.5U2 and later with vCenter 4.0 and later

