

« VCAP-DCA Objective 4.4 : Deploy and Maintain vCenter Server
Heartbeat

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HA Solutions »

VCAP-DCA Objective 4.1: Implement and Maintain Complex VMware HA Solutions

Another VCAP-DCA objective here. For a complete list of study objectives for the VCAP-DCA (V DCA-410) browse to <http://www.vfail.net/vcap-dca/>.

This is the first pass through the objective for configuring MSCS Clustering. Your biggest resource for this section will be the [Setup for Failover Clustering and Microsoft Cluster Service document](#) from VMware. If you haven't already bought an iPad or another reading, device maybe now is the time to justify it. There is a lot of reference material to go through for this test.

If you haven't already done so, download the zip file full of additional study resources from Kendrick Coleman's blog. These can be found at his [VCAP exam landing page](#). He has compiled a lot of resources and broken them down by objective, and these make great additional reading if you are not greatly familiar with any of the following.

Knowledge

Identify MSCS clustering solution requirements

Component	Requirement
Virtual NIC adapters	LSI Logic Parallel for Windows 2008 Server LSI Logic Parallel for Windows Server 2003 LSI Logic LSI for Windows Server 2008
Operating system	Windows Server 2003 SP2, Windows Server 2008 SP1, or Windows Server 2008
Virtual NIC	Use the default type for all guest operating systems
ISO format	Set to all records or none. Modify-WBT_LSI, WBT, WBTONE (to select Current/Control/Get) Use vncsd (Share Transfer/Local) The entries might meet this ISO format value if you create a cluster. You must meet the value in that case.
Disk layout	Select Support clustering features such as Fault Tolerance to create disks in expert mode/Full disk image.
Disk and networking setup	Add networking before disks. Refer to the VMware knowledge base article at http://kb.vmware.com/kb/10117 if you encounter any errors.
Number of nodes	Use two-node clustering.
NTFS permissions	Use the same permissions and cluster mode with a common NTFS permissions, and double fault-based file structuring when using clustering in the guest.

Storage Type	Clusters on One Physical Machine (Cluster in a Box)	Clusters Across Physical Machines at Same Access (Boxes)	Clusters of Physical and Virtual Machines (Standby Host Clustering)
Virtual disks	Yes (recommended)	No	No
Peer-to-peer RDM (physical compatibility mode)	No	Yes (recommended)	Yes
Non-peer-to-peer RDM (virtual compatibility mode)	Yes	Yes	No

Note: Clusters across physical machines with non-peer-to-peer RDM is supported only the clustering with Windows 2008 Server or Windows Server 2003. It is not supported the clustering with Windows Server 2008.

Identify the three supported MSCS configurations

- Clustering virtual machines on a single host
- Storage can be local or on a san.
- Clustering virtual machines across physical hosts
- Clustering physical machines with virtual machines

Skills and Abilities

Configure Virtual Machine hardware to support cluster type and guest OS

- See requirements above.

Configure a MSCS cluster on a single ESX/ESXi Host

- Refer to the [Setup for Failover Clustering and Microsoft Cluster Service document](#) for complete guidance on the process. Note that with a cluster on a single box you could use local storage or shared storage.
- A cluster on a single ESX(i) host requires A separate physical network adapter for clustered virtual machines to connect with external hosts.

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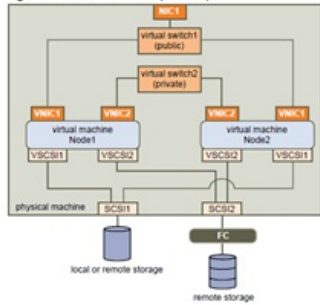
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Figure 2-2. Cluster in a Box Complete Setup



Configure a MSCS cluster across ESX/ESXi Hosts

- A cluster across ESX(i) hosts requires

Two physical network adapters dedicated to the MSCS cluster and to the public and private networks.

One physical network adapter dedicated to the service console (ESX hosts) or the VMkernel (ESXi hosts).

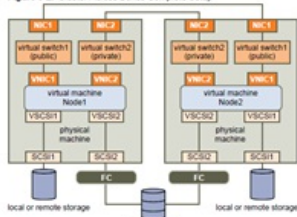
Fibre Channel (FC) SAN. Shared storage must be on an FC SAN.

RDM in physical compatibility (pass-through) or virtual compatibility (non-pass-through) mode. VMware recommends physical compatibility mode. The cluster cannot use virtual disks for shared storage.

Note-Failover clustering with Windows Server 2008 is not supported with virtual compatibility mode (nonpass-through) RDMs.

- Refer to the [Setup for Failover Clustering and Microsoft Cluster Service document](#) for complete guidance on the process.

Figure 3-2. Cluster Across Boxes Complete Setup



Configure standby host clustering (Cluster physical and virtual machines)

- Standby host clustering requires:

Two physical network adapters dedicated to the MSCS cluster and to the public and private networks.

One physical network adapter dedicated to the service console (ESX hosts) or the VMkernel (ESXi hosts).

Use RDMs in physical compatibility mode (pass-through RDM). You cannot use virtual disks or RDMs in virtual compatibility mode (non-pass-through RDM) for shared storage.

Use the STORport Miniport driver for the Fibre Channel (FC) HBA (QLogic or Emulex) in the physical/Windows machine.

Do not run multipathing software in the physical or virtual machines.

Use only a single physical path from the host to the storage arrays in standby host configurations.

- Refer to the [Setup for Failover Clustering and Microsoft Cluster Service document](#) for complete guidance on the process.

The following limitations also exist to using MSCS clustering(not supported)

- Clustering on iSCSI, FCoE, and NFS disks.
- Mixed environments, such as configurations where one cluster node is running a different version of ESX/ESXi than another cluster node.
- Clustered virtual machines as part of VMware clusters (DRS or HA).

Virtualization

Quote of the Day



Configuration
Maximums for
VMware

vSphere is my favorite VMware document. It answers many of the "How many", "How much" type questions about VI capabilities. This is one of the documents that will most often be updated as new releases of VMware VI are released so it's a good one to keep tabs on.

<http://www.vmware.com/pdf/vsphere4/r41>

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- Use of MSCS in conjunction with VMware Fault Tolerance.
- Migration with VMotion of clustered virtual machines.
- N-Port ID Virtualization (NPIV)
- With native multipathing (NMP), clustering is not supported when the path policy is set to round robin.
- You must use hardware version 7 with ESX/ESXi 4.0.

Tools

Setup for Failover Clustering and Microsoft Cluster Service

Product Documentation

vSphere Client

Other Relevant Reading related to this Section

http://www.infortrend.com/doc/appNote/APP_Note_MSCS%20in%20vSphere4.pdf

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1004617

<http://www.yellow-bricks.com/2009/06/03/mscs-vms-in-a-hadrs-cluster/>

<http://www.boche.net/blog/index.php/2009/04/01/setup-for-microsoft-cluster-service/>

<http://blog.vnote.net/?p=248>

- [Objective 9.3 – Configure vCenter Server Linked Mode](#)
- [Objective 9.2 – Plan and Execute Scripted Installations](#)
- [Objective 8.2 – Administer vCenter Orchestrator](#)
- [VCAP-DCA Brownbag Session #1](#)
- [VCAP-DCA Objective 7.1 : Secure ESX\(i\) Hosts](#)
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- [VCAP-DCA Objective 3.4 – Perform Capacity Planning in a vSphere Environment](#)
- [VCAP-DCA Objective 3.3 – Implement and Maintain Complex DRS Solutions](#)
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