Converting Physical Exchange Server into virtual environment (P2V) – Best Practices & Tips from the field

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By: Netanel Ben-Shushan, Microsoft MVP

About the Author

Netanel Ben-Shushan (CSA/JNCIA-SSL/MCSE/MCTS/MCITP and Microsoft MVP) is an IT Consultant & Trainer from Israel, who works mainly with Microsoft, networking and information security systems. He's the creator of www.ben-shushan.net, a personal website in Hebrew with technical guides and articles. Beside he's website, Netanel is also writing a Hebrew weblog at Microsoft Israel's blogging community.

Today Netanel is working as a Microsoft Infrastructure Practice Manager at Ankor Computer Infrastructure; Leading Integration Company in Israel.

You can contact Netanel by sending e-mails to netanel@ben-shushan.net.

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Abstract

This document designed to provide details on Exchange P2V migrations and deployment as a virtual machine, most of the topics covered in this document tested and performed under VMWare vSphere 4.1 & Microsoft Windows Server 2008 R2 Hyper-V.

This guide was written after performing P2V migration for Exchange Server 2003 SP2 & Exchange Server 2007 SP3 systems.

Performing P2V to a physical Exchange Server

In order to convert a physical Exchange server into a virtual machine, or VM for short, using the P2V process it's important to design this step carefully since we're converting one of the most important servers in the organization – the mail server.

It's recommended to have a full and up-to-date backup of the Exchange server machine (from any perspective – System & Databases & Logs).

Note: If you're preparing to P2V a Small Business Server (SBS) machine – prepare additional backups as needed – System state for Active Directory Domain Services, WSS database, SQL Server, etc.

After verifying the Exchange server backup is up-to-date and valid, prepare yourself and your organization for downtime (if there's no clustered environment) at the P2V process. Keep in mind that connectors to Exchange system such as Fax, ERP and Notification systems will not be available till P2V is complete.

Also, it's important to know how the server works; there are few questions that you may need to answer for better designing the P2V migration process:

1. Is that server is a standalone server or member node of a cluster?
2. What's the storage subsystem that stores the databases & logs?

After answering those questions we can proceed in the preparation for the P2V migration.

Step 1: Configure your virtual environment for Exchange

To get best performance make sure that you're dedicating part of the virtual environment for Exchange, make sure you have enough RAM in the physical hosts for allocating memory for the VM you'll create during the P2V migration, take care of enough free space on the disks for hosting the virtual hard drives and configure virtual networks (if needed, for clusters for example).

If you're migrating Exchange Server 2003 it's recommended to allocate 4GB of RAM & 2 Logical cores for Exchange VM.

In case of working with Exchange Server 2007 it's recommended to allocate the same amount of RAM & logical processors. Note that if your Exchange Server 2007 machine

works with 2 Logical cores under Windows Server 2008 – it's recommended to allocate additional cores for better performance as a VM (4 at least).

Step 2: Prepare your Storage Subsystem for Exchange

If your virtualization solution using shared storage, such as Storage Area Network, or SAN for short, make sure you're reserving a dedicate LUN for Exchange virtual machine. In real world scenarios, System disk will be placed under this specific reserved LUN and Exchange databases & logs will re-assigned / re-connected to the virtual machine using appropriate storage initiator.

Note: if your Exchange system doesn't worked with external storage (such as SAN), and the databases & logs stored on local disks make sure you're converting those disks too on the P2V process and reserving them a dedicate LUNs on the storage subsystem that stores virtual machines.

Step 3: Document your Exchange before and after the P2V migration

Document every service, driver and application that runs on the Exchange machine. It will help the system administrator that convert the machine at the P2V process to get familiar with the services & products that running on Exchange.

After converting Exchange successfully, document the new environment as well, they may be few changes on the virtual machine after the P2V completed (for example, device driver that has been removed).

Step 4: Minimize System Activity

It's recommended to take P2V from offline machine, which boots from removable media/PXE network the P2V Migration Agent.

Note: In case that you're converting physical Small Business Server (SBS) into a virtual machine, you must to perform offline P2V, since the machine is acting as a domain controller as well.

In case you couldn't perform offline P2V migration make sure that before the P2V process you're minimizing system activity as possible:

- ✓ **Disable the antivirus program** – during the P2V process make sure that the antivirus program that running on Exchange is disabled.

- ✓ **Stop running tasks** – stop all scheduled tasks that performed on the server, you can view scheduled tasks using ***Task Scheduler*** and using the ***AT*** command. Also, if there are other tasks such as backing up Exchange databases & logs; Stop them before starting the P2V process.
- ✓ **Dismount Exchange Databases** – Make sure you're dismounting manually Exchange Databases (Mailbox store(s) & Public Folder(s)) and verifying databases consistency as **'clean shutdown'** state using ESEUTIL /mh.
  You can refer to Exchange Server 2003: How to Dismount Mailbox and Public Folder Stores and/or Exchange Server 2007: How to Dismount a Database in order to get information on dismounting Exchange databases.
  More information about ESEUTIL you can find in Article ID 182903.
- ✓ **Stop Exchange-related services** – stop Microsoft Exchange related services before the P2V migration, make sure you're stopping ***Exchange Server 2003-related services***: Microsoft Exchange Information Store (MSExchangeIS), Microsoft Exchange Management (MSExchangeMGMT), Microsoft Exchange MTA Stacks (MSExchangeMTA), Microsoft Exchange Routing Engine (RESvc), Microsoft Exchange System Attendant (MSExchangeSA) or ***Exchange Server 2007-related services***: Microsoft Exchange Active Directory Topology (MSExchangeADTopology), Microsoft Exchange File Distribution Service (MSExchangeFDS), Microsoft Exchange Anti-spam Update (MSExchangeAntispamUpdate), Microsoft Exchange Information Store (MSExchangeIS), Microsoft Exchange Mail Submission Service (MSExchangeMailSubmission), Microsoft Exchange Mailbox Assistants (MSExchangeMailboxAssistants), Microsoft Exchange Service Host (MSExchangeServiceHost), Microsoft Exchange System Attendant (MSExchangeSA), Microsoft Exchange Transport (MSExchangeTransport) and storage initiator-related services (if any), 3rd party Anti-Spam/Mail filtering service, etc.

Step 5: Perform the P2V process

Perform the P2V process using P2V utility such as VMWare vConverter or System Center Virtual Machine Manager P2V Utility. In case of offline P2V (recommended) – prepare P2V Cold boot removable media or PXE boot image. Make sure you're setting the VM to work with fixed-size disks and not dynamically expand disks.

Step 6: Restart the Virtual Machine

After the P2V process has been completed successfully perform a manual restart to the VM, after the restart make sure those Exchange-related services are up and running.

Verify time & date on the virtual machine is correct (sometimes, the time & date are adjusted for time & date from the starting point of the P2V migration, so make sure it's correct).

Step 7: Reconnect Disks

Reconnect Exchange DB & Logs disks, if you're virtualization solution supports Pass-through or Raw Device Mapping (RDM for short), RDM allows a VM to directly access a volume on physical storage subsystem, this feature available only with iSCSI and Fiber Channel. Storage vendors such as NetApp providing the ability to reconnect manually disks to virtual machines using client-side initiator such as NetApp SnapDrive.

Step 8: Mount Exchange Databases

After Database & Logs disks are connected to the system, perform the opposite action of dismounting that you've performed on Step 4 and mount the stores.

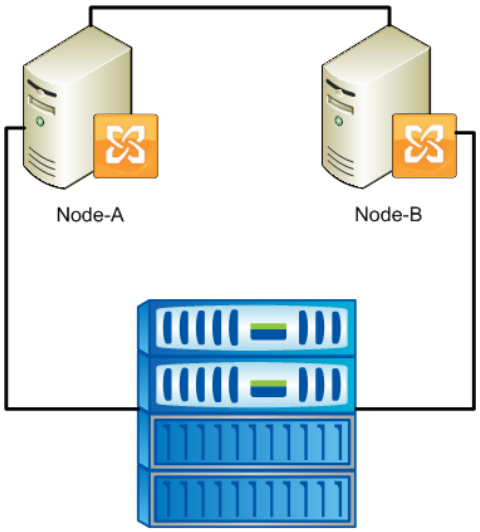
More information about mounting Exchange Databases you can find in Exchange Server 2003: How to Mount an Exchange Store, and/or Exchange Server 2007: How to Mount a Database.

Step 9: Validate Configuration

After Exchange system is back on a VM and shared disks are connected, test full connectivity using Outlook client (MAPI), Web Access (HTTP/S) & ActiveSync.

Tips for clustered environment

If you're working in a clustered Exchange network, it's recommended to perform the P2V process mentioned earlier in the document at one node at a time, in order to provide messaging services to the organization. Perform the P2V process for example on Node-B, and then on Node-A or Node-*n* (where *n* is node number).



After performing the P2V for Node-B (and reconnecting the storage subsystem disks, and running Microsoft Exchange & Cluster services) make Node-B as an active node at the cluster and P2V Node-A.

The most well-known issue with clustered environment is shared disks after P2V migration are inaccessible; Verify that you're able to access shared disks after P2V completed.

The second common issue is network connectivity issues – make sure you're connecting each VM Network Interface Card (NIC) to the right virtual network/switch – Public network for users' access, Private for Heartbeat, and Storage subsystem network for accessing shared disks.

It is also recommended to prevent self VM live migration between physical hosts by disabling self-computing workloads between resources (such as VMWare DRS). And verify that cluster's nodes running or separate physical hosts for redundancy.