

P2V Best Practices

Joe Christie

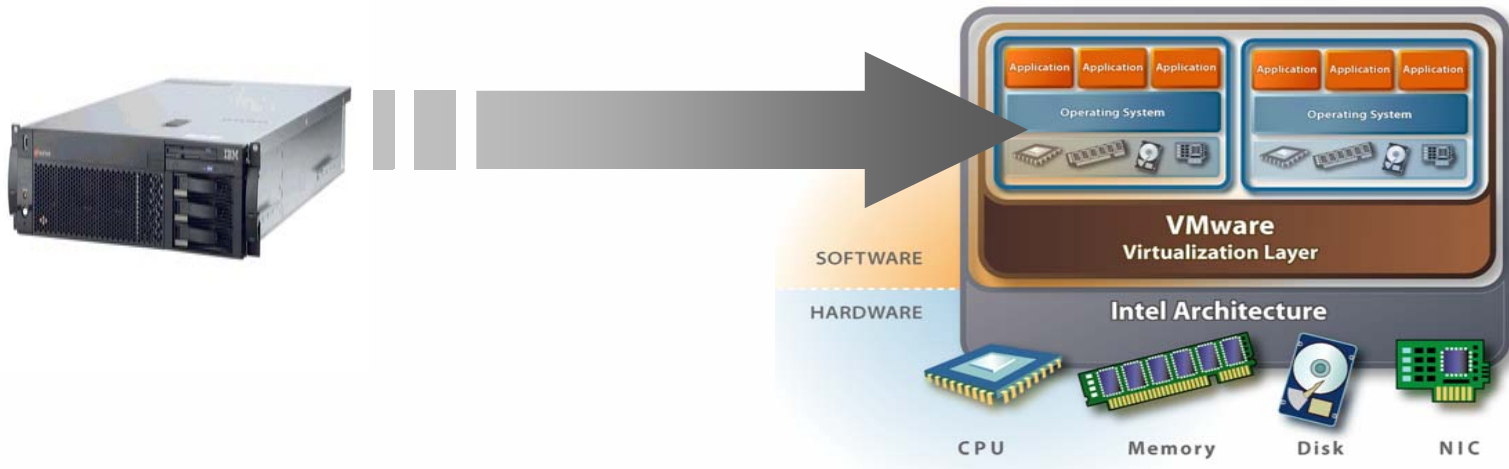
Technical Trainer



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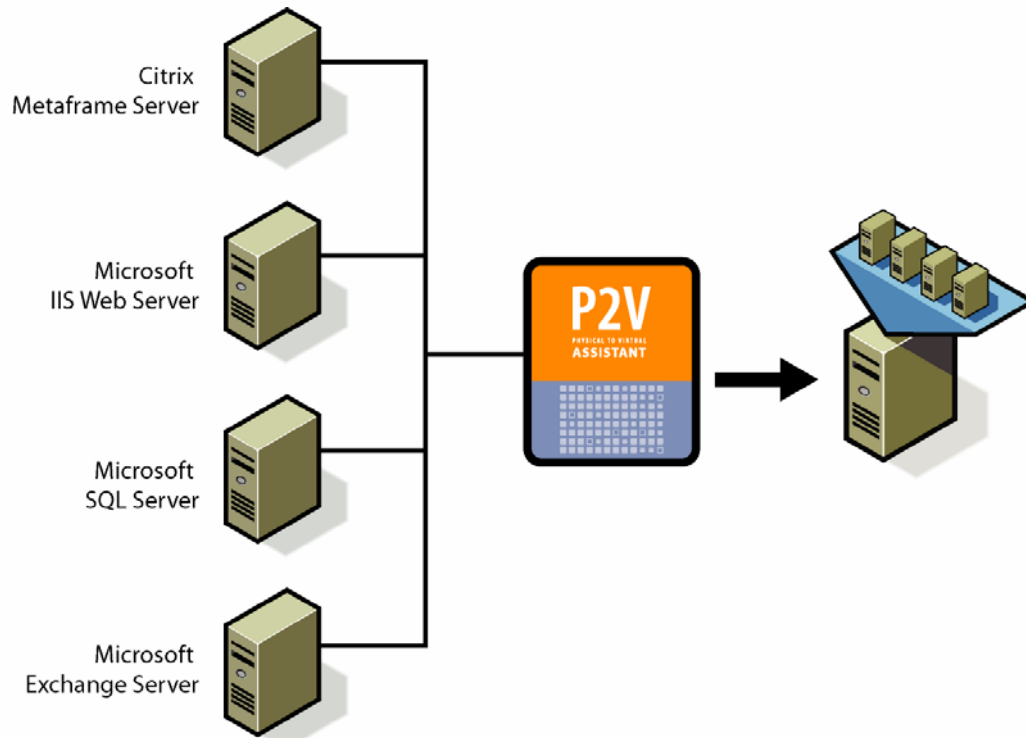
P2V Best Practices

- What is P2V?
 - A process used to create a virtual machine that duplicates an existing physical computer.



P2V Best Practices

- What is P2VA?
 - A set of utilities from VMware for reliably creating a virtual machine as an exact duplicate of a physical computer.

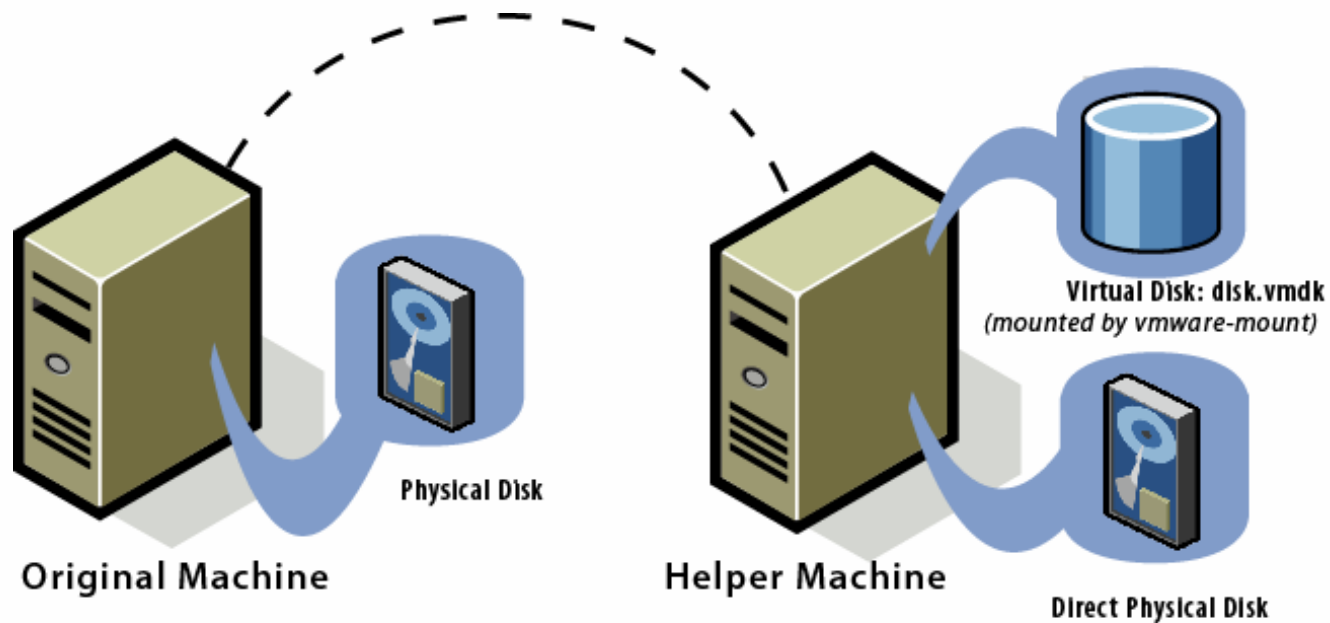


P2V Best Practices

- Generic P2V process
 - 1. Create an image of the physical computer's boot/OS drive for transfer into a virtual disk or image file
 - 2. Reconfigure the boot/OS disk to operate correctly in a virtual environment.
 - 3. Use reconfigured disk as the boot/OS disk for a new virtual machine
 - 4. Copy over data drives/partitions

P2V Best Practices

- Step 1 - Create an image of the physical drive for transfer to a virtual disk using any imaging/disk duplication tool



P2V Best Practices

- What's in the virtual disk?
 - A clone of the physical disk
 - Boot sector
 - Operating system
 - Applications
 - Device drivers for physical hardware
 - Configuration information
 - NETBIOS name
 - Computer SID
 - Network settings
 - Hardware-specific utilities

P2V Best Practices

- What's different?
 - The physical hardware is gone
 - wrong hba drive

```
*** STOP: 0x0000007B (0xF241B84C,0xC0000034,0x00000000,0x00000000)
INACCESSIBLE_BOOT_DEVICE
```

```
If this is the first time you've seen this Stop error screen,
restart your computer. If this screen appears again, follow
these steps:
```

```
Check for viruses on your computer. Remove any newly installed
hard drives or hard drive controllers. Check your hard drive
to make sure it is properly configured and terminated.
Run CHKDSK /F to check for hard drive corruption, and then
restart your computer.
```

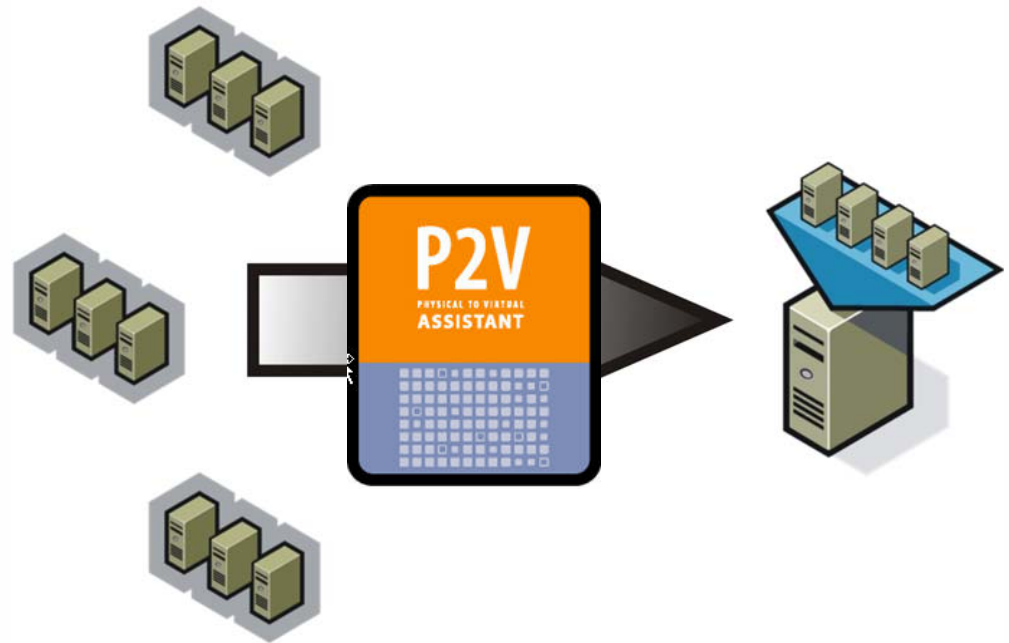
```
Refer to your Getting Started manual for more information on
troubleshooting Stop errors.
```

P2V Best Practices

- Step 2 – Reconfigure the device drivers so the operating system can boot successfully and function in a virtual environment
 - Replace physical boot disk's hba driver with the virtual hba driver
 - Remove any unnecessary drivers, services and utilities

P2V Best Practices

- What is VMware P2VA?
 - A suite of utilities to ease physical to virtual conversion
 - Boot CD For imaging
 - P2VA (running on helper machine)
 - To clone and mount the imaged drive
 - To reconfigure the new virtual machine (license required)



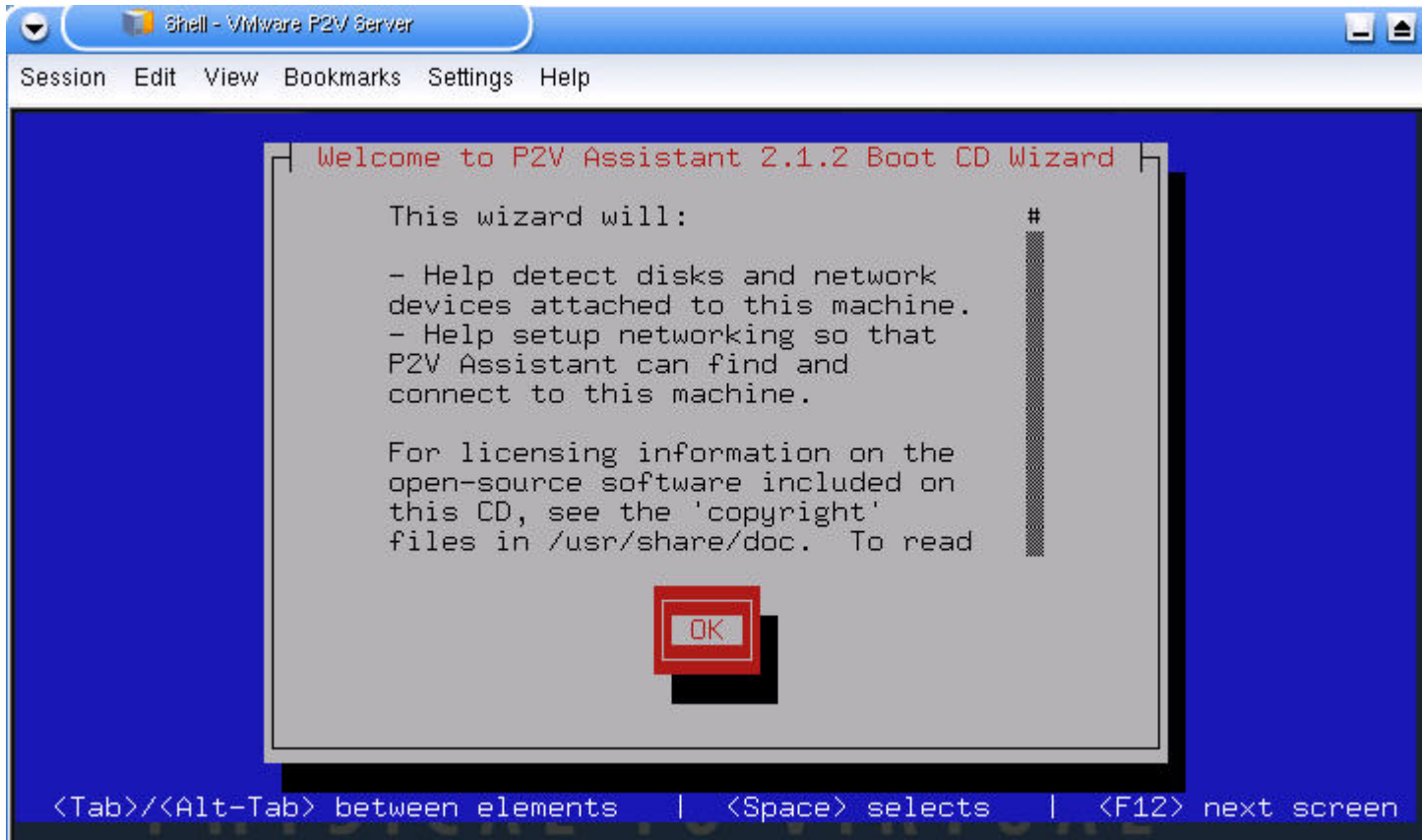
P2V Best Practices

- The process (using virtual disk and VM helper machine)
 - 1. Create a new virtual machine. (create with scsi drive)
 - 2. Boot the physical computer with P2VA Boot Disk
 - 3. Clone the physical computer into the virtual disk created in step 1
 - 4. Test the cloned drive (hurray – a blue screen)
 - 5. Use the helper machine and P2V Assistant to mount and reconfigure the new virtual disk
 - 6. Boot the new VM and clean up the virtual machine

Note – helper VM should be NT for NT physical to virtual migrations.
XP/2003 for 2000 or 2003 migrations.

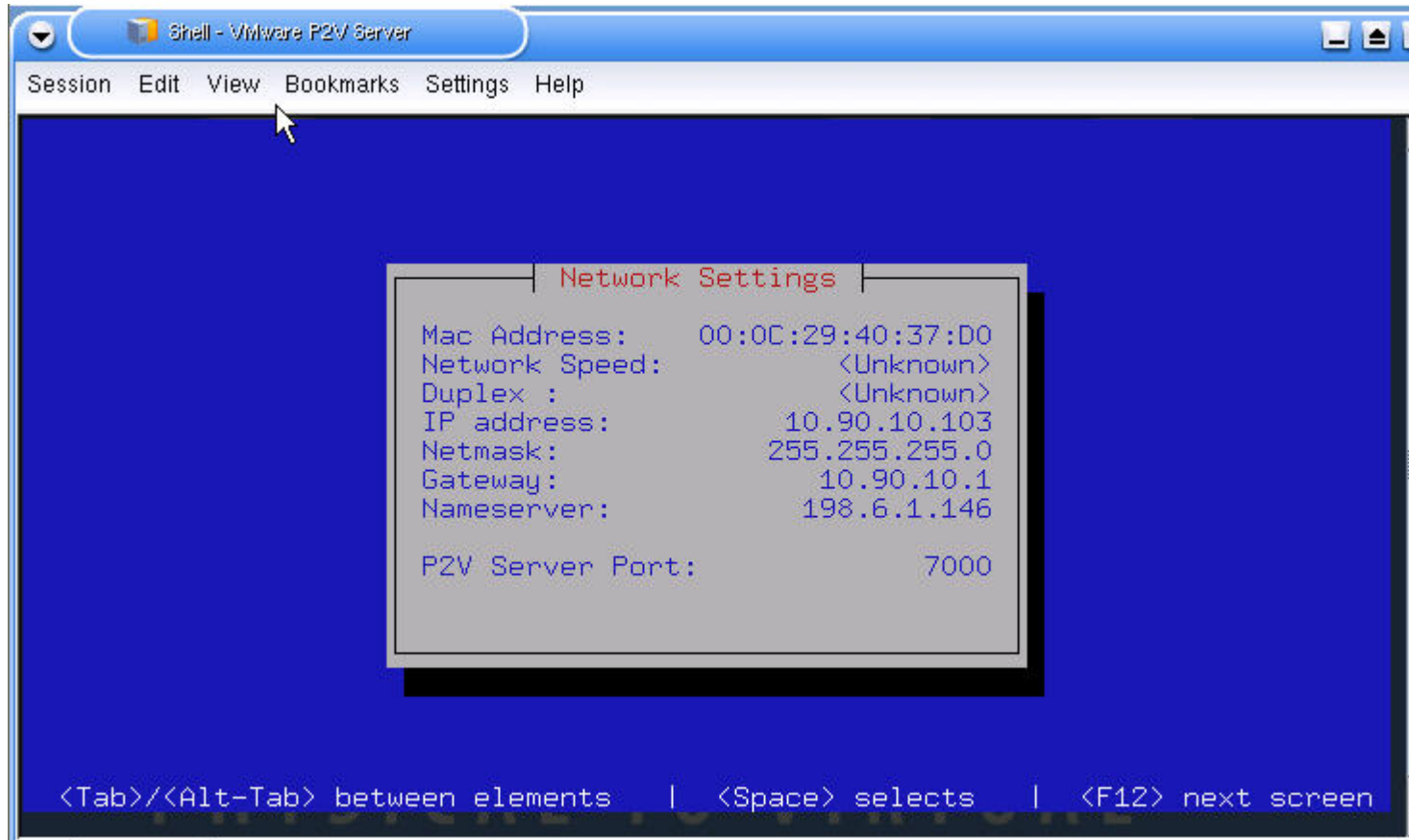
P2V Best Practices

■ 2. Boot the physical computer with P2VA Boot CD



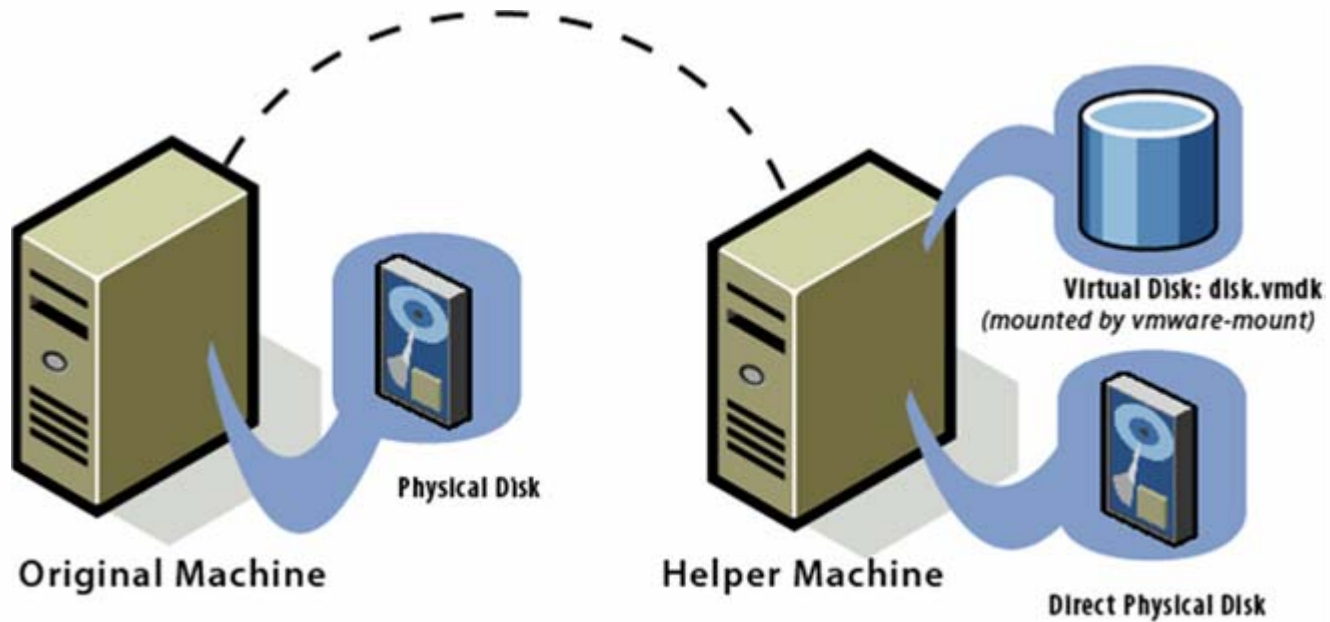
P2V Best Practices

- 2. Boot the physical computer with P2VA Boot CD (cont'd.)



P2V Best Practices

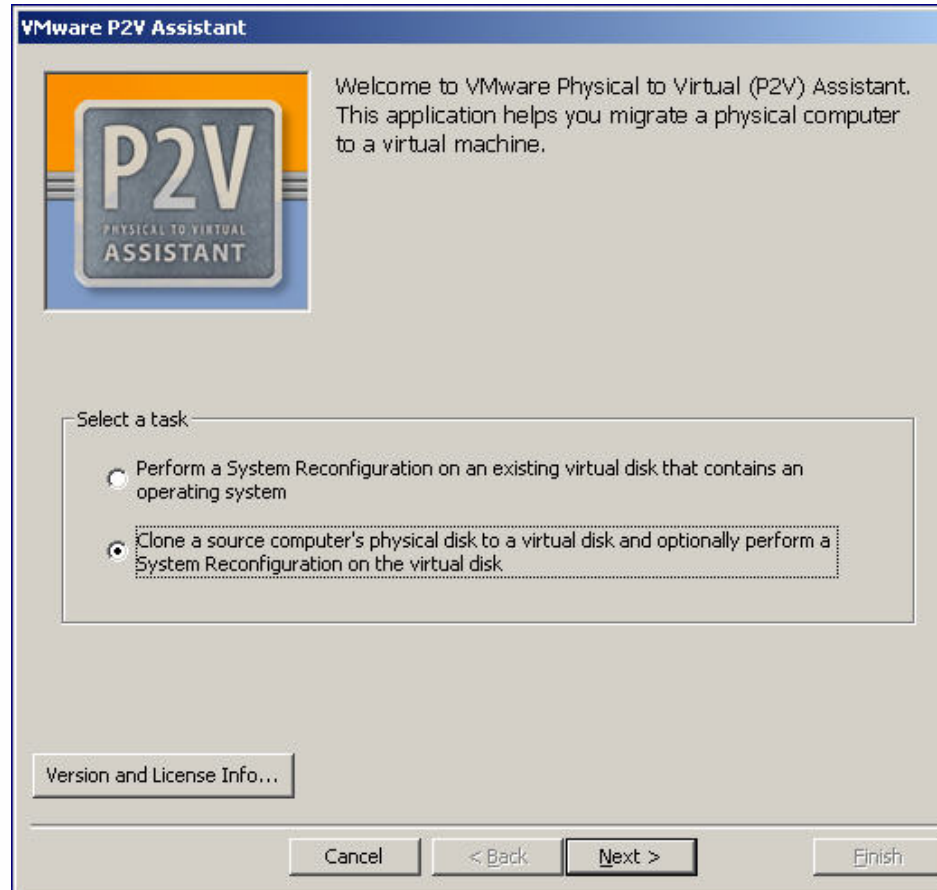
- 3. Clone the physical computer into the virtual disk
 - clone operation takes place over an IP network



P2V Best Practices

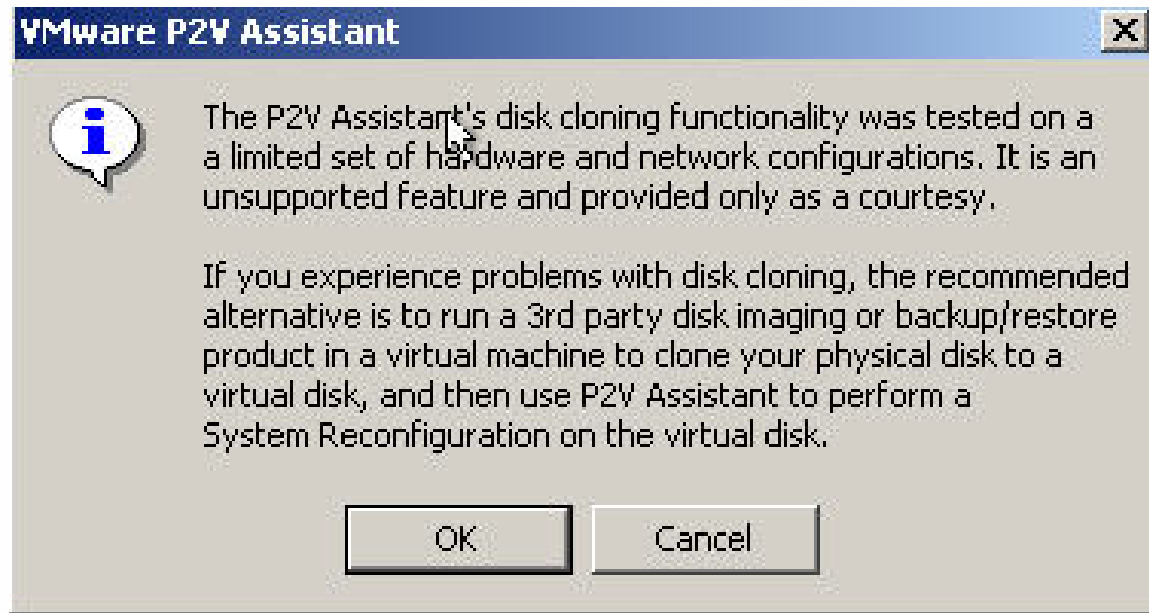
- 3. Clone the physical computer into the virtual disk

No Reconfigure



P2V Best Practices

- 3. Clone the physical computer into the virtual disk (cont'd.)



P2V Best Practices

- 3. Clone the physical computer into the virtual disk

Enter Source
Computer IP
Address

VMware P2V Assistant

Select the source computer to clone. If it is a remote computer, reboot it from the VMware P2V Boot CD, and then enter its network address below.

Select a source computer

IP Address 192.168.2.127

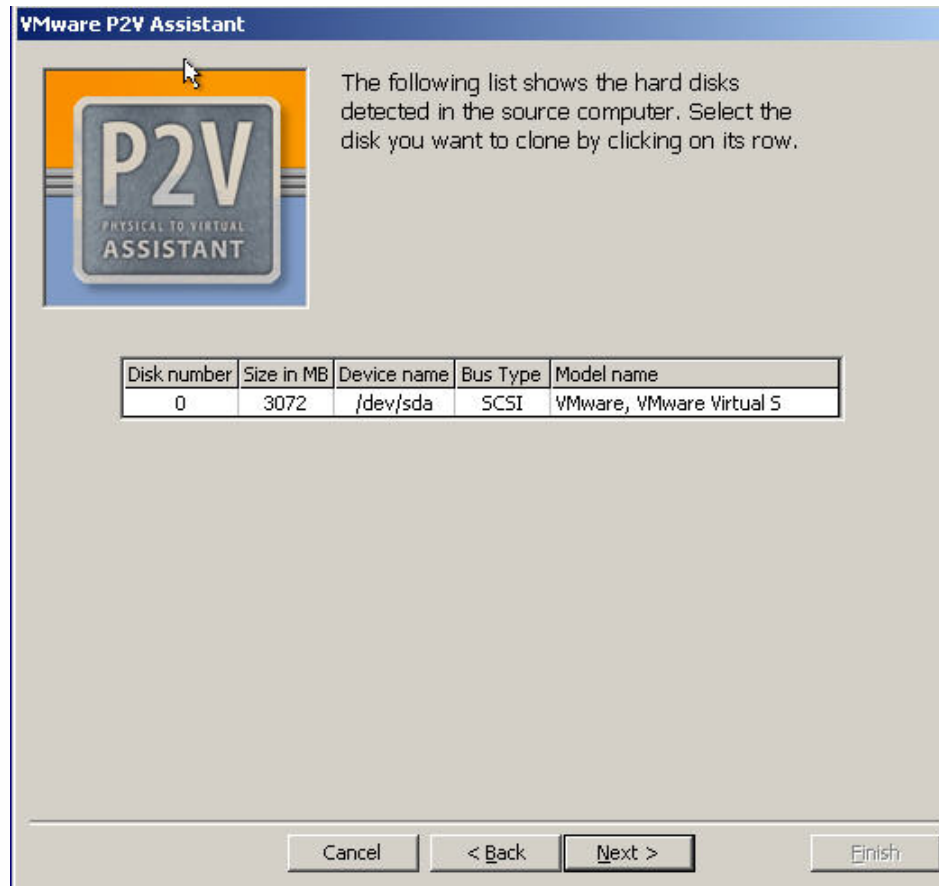
Port Number 7000

Cancel < Back Next > Finish

P2V Best Practices

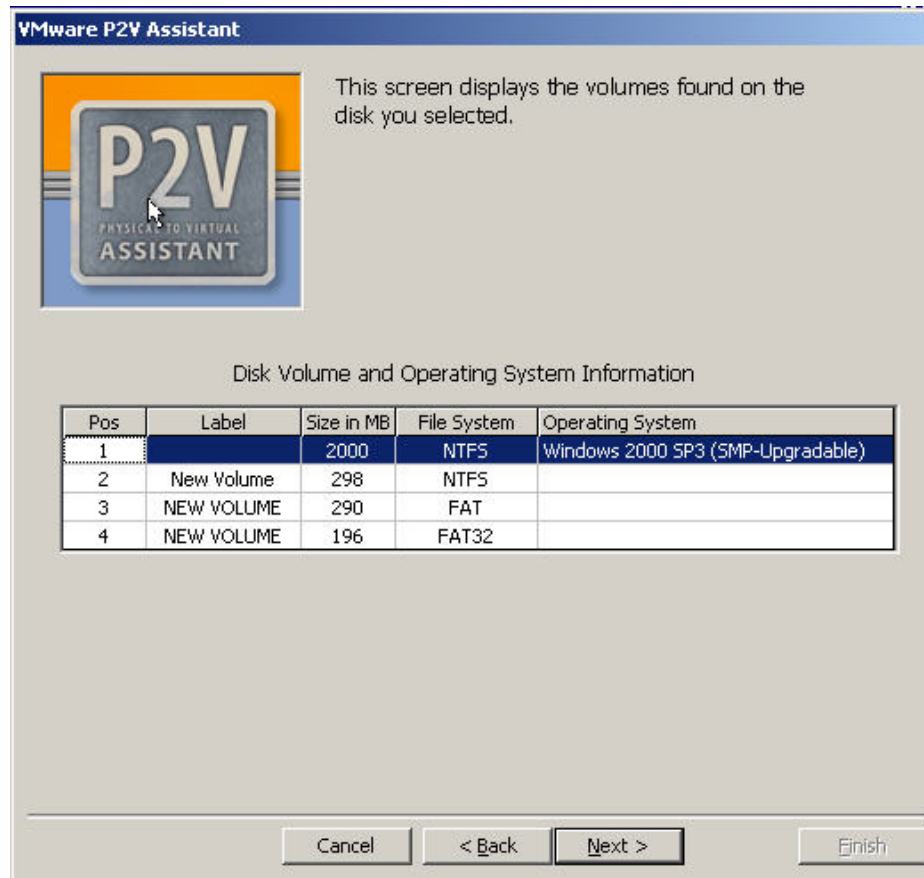
- 3. Clone the physical computer into the virtual disk

Select boot disk if more than one choice is offered



P2V Best Practices

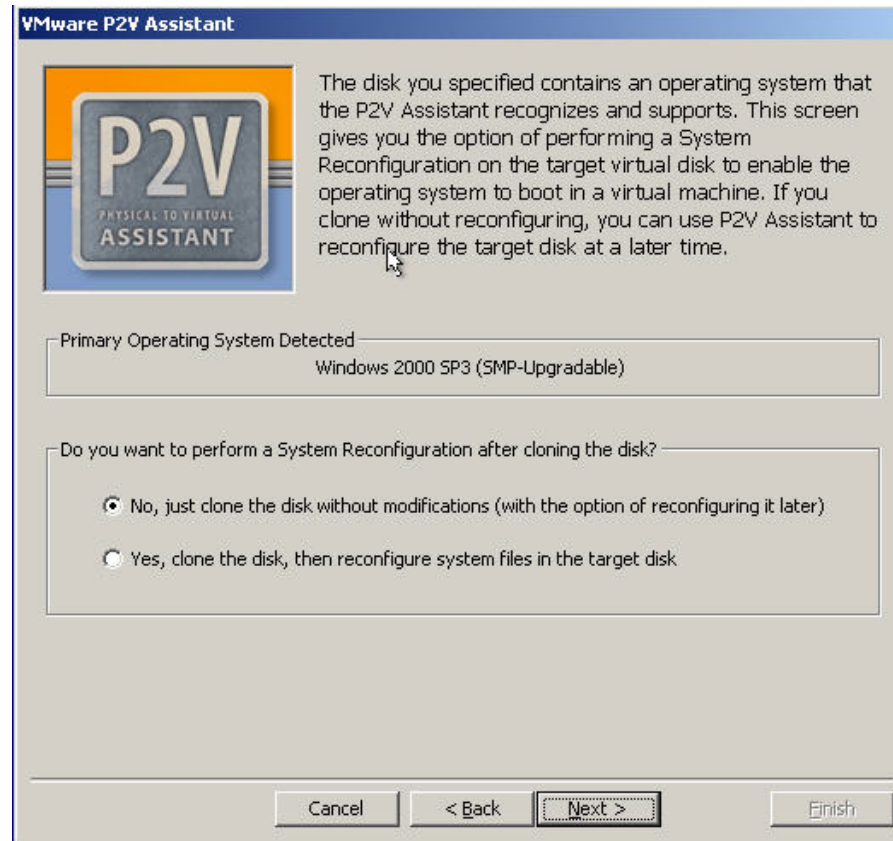
- 3. Clone the physical computer into the virtual disk



P2V Best Practices

- 3. Clone the physical computer into the virtual disk

No Reconfigure
at this time
(License)



P2V Best Practices

- 4. Power on the new virtual machine using the reconfigured virtual disk
 - Hurray – we got a blue screen

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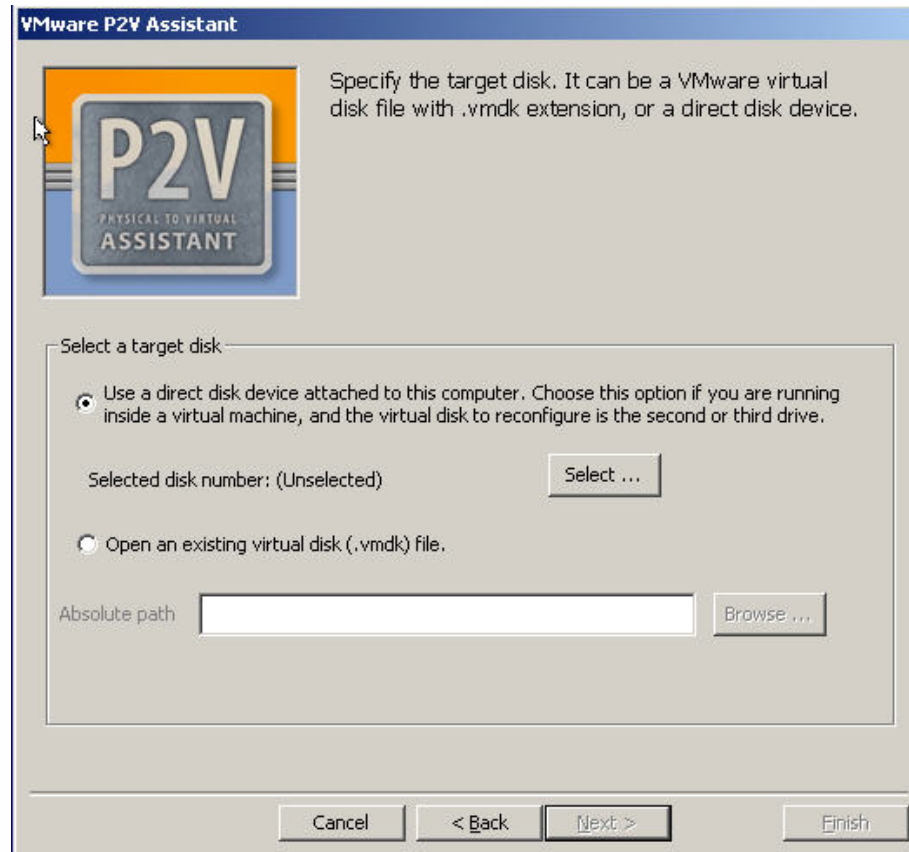
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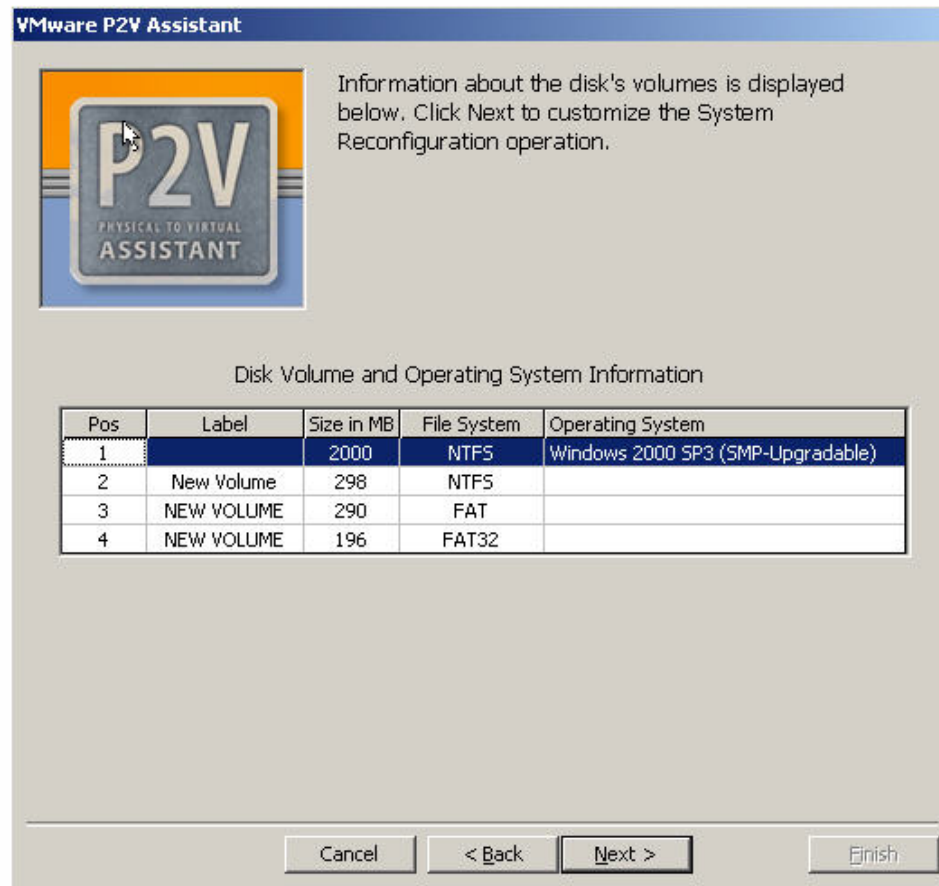
P2V Best Practices

- 5. Use the helper machine and P2V Assistant to mount and reconfigure the new virtual disk



P2V Best Practices

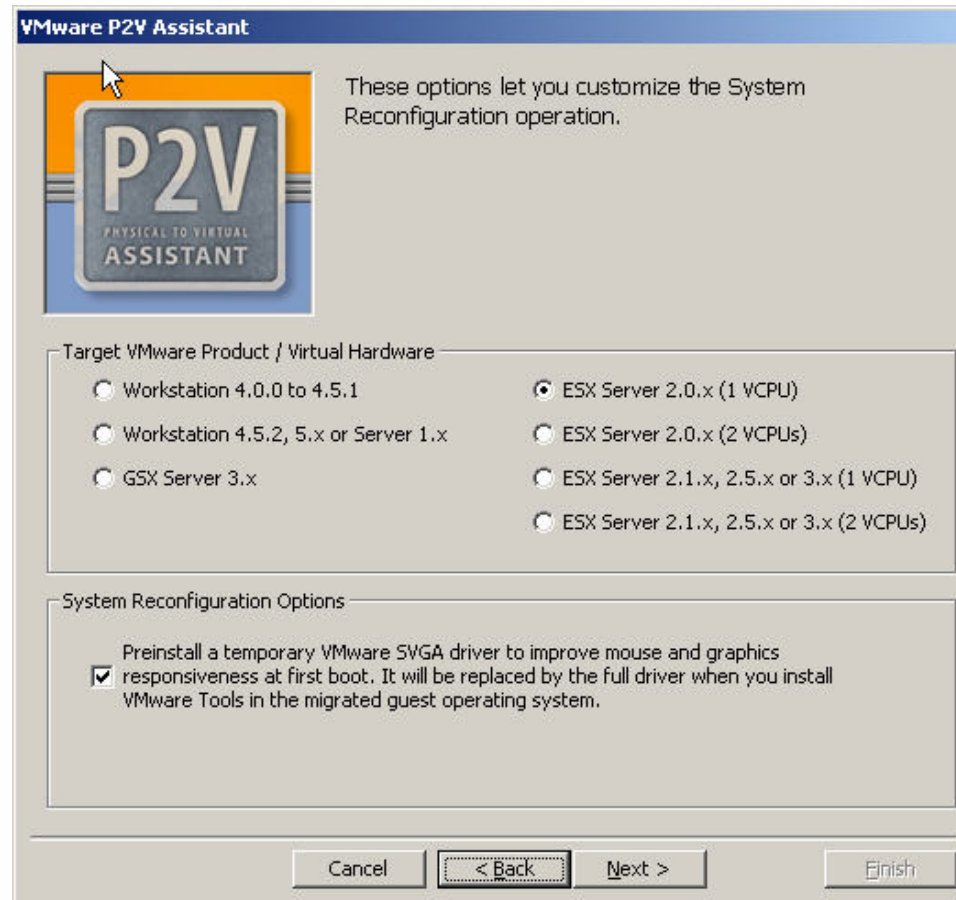
- 5. Use the helper machine and P2V Assistant to mount and reconfigure the new virtual disk



P2V Best Practices

- 5. Use the helper machine and P2V Assistant to mount and reconfigure the new virtual disk

Select Target Platform



P2V Best Practices

- 6. Clean Up (power on detects new hardware)
 - After reboot - remove unneeded drivers and services, installing VMware Tools, and testing
 - Remove old hardware drivers
 - Fiber Channel HBA Software
 - Remove old hardware specific services
 - UPS Software
 - Install VMware Tools
 - virtual video card driver (VMware SVGA II)
 - Optimized VMware mouse
 - NIC Driver for VMXNet (VMware NIC)
 - Optimized VMware SCSI drivers
 - memory management driver for ballooning (ESX only)
 - Test and Check for Errors
 - Check the event logs for any not so obvious issues

P2V Best Practices

- Things to note
 - Don't clone data drives
 - It's slow
 - Why not wait until you know OS is working in VM
 - Don't include proprietary vendor partitions
 - Could take opportunity to move non-OS partitions to their own separate .vmdk's
 - Adjust VM resource settings based on performance monitoring
 - Create virtual disks as SCSI (ESX does not support virtual IDE drives)
 - Helper VM should use SCSI for versatility
 - Leave CD-ROM disconnected on cloned VM - it will grab a drive letter
 - Cloned disk can be connected to both new and helper VMs but only one can be powered on at a time
 - Only reconfigures scsi drives
 - Apply service packs and hot fixes before migration

P2V Best Practices

- Things to Note (2)
 - Cloning always creates partitions (“n” just stops copying of data)
 - Use disk administrator to remove unwanted partitions after reconfiguration
 - Drive letters may be remapped (particularly P and Q drives for Citrix machines) which can cause problems
 - Use disk administrator to remap drive letters
 - Will clone 64 bit OS but will not reconfigure
 - If you are going to leave the physical computer powered on while the VM is running don't have them on the same network or sysprep one
 - Check kb, forums and documentation for additional problems/fixes

P2V Best Practices

- Virtual Machine Importer – downloadable
 - Will import from
 - Microsoft Virtual PC and Virtual Server
 - Symantec Backup Exec System Recovery images¹
 - Move between VMware products
 - VMware Workstation 4.x virtual machine (compatible with VMware GSX Server 3.x)
 - VMware Workstation 5.x virtual machine (compatible with VMware Player and VMware Server 1.0)
 - VMware ESX Server 3.0
 - VMware VirtualCenter 2.0
 - VMware ESX Server 2.5.x (when managed by VirtualCenter 2.0)

P2V Best Practices

- Virtual Machine Importer will import into
 - VMware Workstation 4.x virtual machine (compatible with VMware GSX Server 3.x, ESX Server 2.5.x)
 - VMware Workstation 5.x virtual machine (compatible with VMware Player and VMware Server 1.0)
 - VMware ESX Server 2.5.x (when managed by VirtualCenter 2.0)
 - VMware ESX Server 3.0 (when managed by VirtualCenter 2.0)
 - VMware ESX Server 3.0 (standalone)
 - **Not Supported:**
 - VMware ESX Server 2.5.x when managed by VirtualCenter 1.x
 - VMware ESX Server 2.5.x standalone

P2V Best Practices

- Virtual Machine Importer can be downloaded from <http://www.vmware.com/products/vmimporter/>

P2V Best Practices

- Next generation – VMware Converter
 - Combines functions of P2VA and Virtual Machine Importer
 - Remote cloning
 - Hot cloning
 - Session TAC9453 for more info

P2V Best Practices

- Resources
 - Labs - LAB3809
 - Self Paced P2V lab includes VMImporter
 - Doc Web Site
 - http://www.vmware.com/support/pubs/p2v_pubs.html
 - Forum
 - <http://www.vmware.com/community/forum.jspa?forumID=73>
- Session - TAC9453 - Pang Chen, VMware
 - Introducing the Next Generation of P2V: VMware Converter 3.0

P2V Best Practices Notes from the Field

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Technical Trainer/Consultant
Perry Consulting



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P2V Best Practices

- What Typically Goes Wrong?
 - Hardware Issues
 - Imaging Issues
 - Reconfiguration Issues
 - Other Troubleshooting
- Preferred Process using VMware P2VA Tools
- Resources
 - Knowledge Base and P2V User Forums

P2V Best Practices

- Hardware Issues
 - What is the physical machine's hardware make-up
 - Document Hardware Configuration
 - Is the Hardware on the Compatibility List?
 - Hardware ACPI compliant?
 - Any legacy devices
 - Token Ring
 - Serial Boards
 - Any Printers Connected?
 - Does the Physical server use software RAID?
 - When was the last known backup?
 - Any weirdness, may not be a good candidate?

P2V Best Practices

- Imaging Issues, Licensing & Boot CD
 - P2V Licensing
 - VMware P2V Boot CD
 - Physical Machine does not boot
 - Check MD5 checksum on website against downloaded copy

P2V Best Practices

- Imaging Issues - Networking
 - Physical Machine has Network Problems
 - DHCP working?
 - At least one NIC recognized during boot
 - May have to install a readily recognizable NIC such as Intel Pro 100/1000
 - Disconnect and/or remove all NICs but the one needed
 - What is the NICs Speed/Duplex?
 - `sudo ethtool -s eth0 speed 100 duplex full`

P2V Best Practices

- Imaging Issues - Storage
 - P2V Boot CD Doesn't see all Volumes
 - Are any volumes hanging off secondary controllers?
 - May not be seen by Boot CD
 - Use the Hardware Support Customizer
 - Does the Physical server use software RAID?
 - The P2VA will not see data across multiple disks using software RAID

P2V Best Practices

- Imaging Issues - Operating System
 - Document the following
 - Operating System version
 - NT Helper VM for NT cloning
 - Make sure your Helper VM \geq for cloning
 - What is the Administrator Password
 - Event Viewer errors
 - Correct any errors and clear the logs
 - Any hardware specific services that will not be needed
 - These can be disabled during the last phase of cleanup on the Target VM
 - Is there a utility partition?
 - Delete partition on VM after image is taken and edit boot.ini

P2V Best Practices

- Imaging Issues - Installed Applications
 - Software tied to MAC addresses
 - Set MAC in Guest OS, not in vmx file (this fix may not work correctly with the newer default vSwitch/Port group security settings)
 - Uninstall PCAnywhere in the image
 - Citrix, make note of mapped drive letters P: and Q:
 - May have to remap after conversion

P2V Best Practices

- Imaging Issues - Third Party Tools
 - Why not use the Imaging software you already have?
 - Infrastructure is already in place
 - Some older versions have problems
 - If image has already been taken, VMware Virtual Machine Importer might be used (see [v2v15_manual.pdf](#) for compatibility)
 - Use BartPE CD to boot Physical machine instead of floppy disks

P2V Best Practices

- Reconfiguration Issues
 - Most likely problem to arise is a utility partition gets in the way
 - Don't image if possible
 - Delete with Disk Administrator or fdisk (image, not physical server)
 - Edit boot.ini file
 - Clean up file, single entry usually all that is needed
 - May have to set partition "Active" with Disk Administrator
 - Don't run P2VA with a Terminal Services session
 - Always start with clean installations of Helper VMs and their associated operating systems
 - Do not install other VMware software into Helper VMs

P2V Best Practices

- Reconfiguration Issues - VM Booting
 - Virtual Disk reconfigured?
 - After image was taken, was the Target VM powered on to see if it would attempt to boot?
 - Did you get a Blue Screen (this is actually a good thing 😊)
 - If not, utility partition may be in the way
 - Boot.ini pointed to wrong partition number
 - For Windows 2003 VMs, use LSILogic driver (newer versions of Virtual Center and P2VA may warn of mismatch)

P2V Best Practices

- Other Troubleshooting
 - Display issues
 - May be PC Anywhere interfering, uninstall in image
 - Mouse erratic
 - Make sure “Hardware Acceleration” slider all the way to the right, especially for Windows 2003
 - Network connectivity
 - If Windows NT, you will have to uninstall old NIC and manually install AMD NIC
 - If physical system brought back online, make sure VM is on separate network
 - IP address already in use on old physical NIC
 - “Show Hidden Devices” and remove old physical adapter

P2V Best Practices

- Other Troubleshooting (2)
 - VM will not shutdown
 - Windows NT – not supported
 - Windows 2000 – use `gui.exitOnCLIHLT= "TRUE"` in vmx file (non-ACPI)
 - Windows 2003 – When shutting down from Virtual Center, default lock-out screen saver in use
 - Errors upon login
 - Clean-up unused services by disabling them. Don't remove unless you have taken a snapshot.
 - Check Event logs for any errors and clean-up

P2V Best Practices

- Preferred Process using P2VA
 - Create P2V Helper VMs that will have access to same storage as the imaged VMs are created on
 - Shutdown after creation
 - Create Target VM with at least one virtual disk
 - This creates the proper directory structure on the VMFS3 volumes
 - Power-off after creation
 - Boot physical machine with P2V Boot CD
 - Reconfigure P2V Helper VM to use Target VM's virtual disk as second drive
 - Power-on P2V Helper VM
 - Image Physical server
 - Shutdown P2V Helper VM
 - Power-on Target VM and hopefully get "Blue Screen"

P2V Best Practices

- Preferred Process using P2VA (2)
 - Shutdown Target VM
 - Power-on P2V Helper VM
 - Reconfigure P2V Helper VM's second drive
 - Shutdown P2V Helper VM
 - Reconfigure P2V Helper VM by removing Target VM's virtual disk
 - Power-on newly reconfigured Target VM
 - Proceed with clean-up (the amount of cleanup will depend on version of operating system)

P2V Best Practices

■ Resources

➤ Use your Resources!

➤ Knowledge Base -

<http://kb.vmware.com/vmtnkb/supportcentral/supportcentral.do?id=m1>

➤ P2V User Forum –

<http://www.vmware.com/community/forum.jspa?forumID=73>

➤ Doc Web Site

• http://www.vmware.com/support/pubs/p2v_pubs.html

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and return it to the room monitors
as you exit the session

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Password: cbvfor9v9r

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