

RE: Server Migration

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How to Move a Windows 2000 Installation to Different Hardware

View products that this article applies to.

This article was previously published under Q249694

Warning The issues that are discussed in this article and in the linked articles are the most common problems and limitations that may appear when you try to restore a backup to different hardware. Other issues may appear because of differences in software and hardware configurations. Many of those issues can be resolved through troubleshooting the particular problems that occur, but there may be compatibility issues that limit the success of the restoration of a backup to dissimilar hardware.

SUMMARY

This article describes how to move a Windows 2000 installation and the programs that are installed on one computer to a different computer with minimal down time. You can also use this procedure to replace a small system/boot disk drive with a larger system/boot disk drive, or to restore a Windows backup from a non-working computer to a different computer for disaster recovery purposes.

Important This procedure is not recommended for domain controllers.

MORE INFORMATION

Windows Backup (Ntbackup.exe) can merge differences in hardware configuration information between a source computer and a destination computer and maintain critical registry entries that are unique to the destination computer.

Windows Backup handles registry restoration operations by first querying the following registry key in the registry of the destination computer:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\BackupRestore\KeysNotToRestore

This registry key indicates to Windows Backup that certain registry keys under the HKEY_LOCAL_MACHINE\SYSTEM key should not be overwritten at the time of restoration.

An entry that ends with a backslash (\) indicates a key that is protected. Windows Backup does not restore any keys and values below that key. If the entry ends with a backslash and an asterisk (*), Windows Backup merges it and all its subkeys; that is, Windows Backup looks at the start values of the keys in the backup set (the source) and the current registry (the destination) to determine which key takes precedence. The key with the lower start value takes precedence. If the start values are equal, no change is made. This process ensures that all services and devices start correctly after a system state restoration, even on dissimilar hardware.

For example, if the value of the following key on the backup set has a lower start value, it takes precedence:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Dhcp

If the value of the same key in the current registry has a lower start value than the key you want to restore, it takes precedence.

Backup Current Result after restoration

DHCP Running: YES NO YES

DHCP Running: NO YES YES

DHCP Running: NO NO NO

Note Computers that are upgraded from Microsoft Windows NT to Windows 2000 will have the start value for

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip = 0x02 in the system state backup. New installations of Windows 2000 will have a start value of 0x01 for the Tcpip service. This means that Tcpip settings will not be restored from the backup unless the start values are equal. To resolve this behavior, either change the start value to 0x01 on the source computer before the backup, or change the start value to 0x02 on the destination system before the system state restoration.

After you restart the destination computer, Windows Plug and Play handles any minor differences in hardware configuration.

Things to Consider Before Deciding to Use this Procedure

Drive Letters and the %SystemRoot% Folder

For a complete migration to work correctly, the drive letters for any destination volumes that contain a system state component and the %SystemRoot% folder (the Winnt folder in Windows 2000) must be the same on both the source and destination computers. This means that if Windows on the source computer is installed in the C:\Windows folder and has Active Directory (NTDS) and SYSVOL are installed on drives D and E, respectively, the destination computer must have Windows pre-installed in a C:\Windows folder and contain drives D and E before you can run the restoration operation successfully. For additional information, click the following article number to view the article in the Microsoft Knowledge Base: 235478 Recovering from Failed System Drive with Non-Default %SystemRoot% Folder

Hardware Abstract Layer (HAL)

The source and destination computers should be using the same HAL types to get favorable results. Although matching HAL types is not a requirement,

the migration may not work correctly if the HALs do not match. To determine the computer HAL type you are using on each computer:

Click Start, point to Settings, click Control Panel, and then double-click System.

On the Hardware tab, click Device Manager, and then view the listing under the Computer branch. Possible values for the system description and associated HAL include:

ACPI Multiprocessor PC = Halmacpi.dll

ACPI Uniprocessor PC = Halaacpi.dll

Advanced Configuration and Power Interface (ACPI) PC = Halacpi.dll

MPS Multiprocessor PC = Halmps.dll

MPS Uniprocessor PC = Halapic.dll

Standard PC = Hal.dll

Compaq SystemPro Multiprocessor or 100% Compatible = Halsp.dll

The %SystemRoot%\Repair Folder

The Winnt\Repair folder that contains your source computer hardware and software configuration files and the Setup.log file may not be valid for the destination computer hardware. To update these files so you can make the appropriate repairs in the future if you need to, perform an in-place upgrade on the destination computer.

NTFS Volumes

You may have to start special filter drivers before you can restore files that contain reparse points to NTFS volumes. To do this, restart the destination computer after you restore the operating system. Examples of these types of files include Remote Installation Services (RIS) images that rely on Single Instance Storage (SIS), Remote Storage Server (RSS) files that you are restoring to managed volumes, or other third-party services that use reparse points and require filter drivers.

Networking

When you restore a backup, either to the original computer or to another computer, you may experience problems with networking components. For additional information, click the following article number to view the article in the Microsoft Knowledge Base:

810161 Network Adapters Are Missing or Incorrect in Device Manager After You Run NTBackup to Restore System State Data

Move a Windows Installation

Important: To back up and restore the system state data so that devices work correctly after you restore the data, install hotfix 810161 before you back up the source system, and then install the hotfix on the destination system before you restore the system state data. If the hotfix is not available, follow these steps to make the changes manually:

Start Registry Editor.

Locate and then click the following subkey:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\BackupRestore\KeysNotToRestore

Right-click Plug & Play, and then click Modify.

In the Value Data box, delete the CurrentControlSet\Enum entry.

Quit Registry Editor.

Now follow these steps to back up and restore the Windows 2000 installation from one computer to a different computer:

On the source computer, log on as Administrator, and stop all services that you typically stop before performing a backup.

Using Ntbackup.exe, back up the system\boot volume, the system state, and associated NTDS and SYSVOL volumes, if applicable.

On the destination computer, perform a new installation of Windows by using the same product type that matches the source computer. Make sure that the drive letter and %SystemRoot% folder names match those of the source computer. If you are using a non-default (Winnt) folder name, click the following article number to view the article in the Microsoft Knowledge Base:

235478 Recovering from Failed System Drive with Non-Default %SystemRoot% Folder

After the new installation is completed, log on to the destination computer as Administrator. If the system you want to restore is a domain controller, press F8 on the Start menu, and then click Directory Services Restore mode before you log on as Administrator. Using Disk Management, create, format, and assign drive letters to any additional volumes that may be required to hold a system state component (for example, SYSVOL, Active Directory, or Active Directory Log files). Make sure that all drive letters match those of the source computer.

Make a copy of the Boot.ini file in the root of the system partition. This copy may be required in a later step.

Start Ntbackup.exe, on the Tools menu, click Options, click the Restore tab, and then click Always replace the file on my computer. Restore the system\boot volume, the system state, and associated volumes from the backup that you performed earlier. Make sure that you select the option to restore them to the "original location."

Note To have access to all removable media (tape or magneto-optic [MO] disk) from the source system after the full system restoration is complete, you must also click Restore Removable Storage Database under the Advanced button before you start the restoration.

After the full restoration is completed (and before you restart the destination computer), replace the Boot.ini file with the copy that you made in step 5. This is only necessary if the ARC path in the restored Boot.ini file is different from the source Boot.ini file. Finally, disconnect the network cable to avoid name conflicts if the source system is still online.

Restart the computer. Log on as Administrator and initiate an in-place upgrade by running Winnt32.exe from the I386 folder on the Windows CD-ROM. This refreshes the Setup.log and registry files in the %SystemRoot%\Repair folder.

Note If the computer does not restart after restoration because of HAL mismatches, perform an in-place installation to make repairs. To do this: Restart the computer from the installation media. On the "Welcome to Setup" screen, press ENTER as if performing a new installation. When the licensing screen appears, accept the licensing agreement. Setup will then search for

previous installations to repair.

When the installation that is damaged is found, press R to repair the selected installation. Setup re-enumerates your computer's hardware (including HAL) and performs an in-place upgrade while maintaining your programs and user settings. This also refreshes the %SystemRoot%\Repair folder with accurate information that you can use for typical repairs if they are required in the future.

Note In Windows NT 4.0, user profiles are stored as a subfolder of the %SystemRoot%\Profiles folder. In Windows 2000, if the installation is an upgrade, the existing profile path continues to be used. In new Windows 2000 installations, a "Documents and Settings" folder is created on the same volume as the Windows 2000 installation to hold user profiles. If the source system was an upgrade from Windows NT, after the restoration, the original profiles are used. However, after an in-place upgrade is performed, you may have to change the profiles paths in the registry back to %SystemRoot%\Profiles by modifying the keys under the following path: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\ProfileList

For additional information about user profiles, click the article numbers below to view the articles in the Microsoft Knowledge Base:

214653 How to Set the Path for the All Users Profile

228445 User Profile Storage in Windows 2000

After the upgrade is completed and you are sure that everything works, you can remove the source computer from the network and connect the destination computer in its place.

Note The difference between the time of the backup and the time of the restoration to the new computer may affect the computer account on the domain controller. You may have to join a workgroup and then rejoin the domain.

For additional information, click the article numbers below to view the articles in the Microsoft Knowledge Base:

162797 Trust Relationship Between Workstation and Domain Fails

240240 Programs Do Not Work After Restoring Computer with Backup

233427 Files and Folders Not Backed Up Using the Ntbackup.exe Tool

237556 How to Troubleshoot the Windows 2000 Hardware Abstraction Layer Issues

305356 Windows XP Prompts You to Re-activate After You Restore Your Computer

318715 A Network Adapter Is Missing in Device Manager After a Full Restore

292175 How to Perform an In-Place Upgrade of Windows 2000

microsoft.public.win2000.setup_upgrade: RE: Server Migration

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