Windows 2000 Essay, Research Paper

Microsoft? Windows? 2000 Professional,

Windows 2000 Server, and

Windows 2000 Advanced Server

Release Notes

This document provides late-breaking or other information that supplements the Microsoft Windows 2000 documentation.

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Introduction

This document provides late-breaking or other information that supplements the Microsoft Windows 2000 documentation. The Windows 2000 compact disc (CD) includes the following release notes files:

? Read1st.txt, which contains important preinstallation information and is located in the Windows 2000 CD root directory

? Installation chapters from the Getting Started Guide, which include system requirements information and are located in the \Setuptxt folder on your Windows 2000 CD

? Readme.doc, which contains compatibility and post-installation notes and is located in the Windows 2000 CD root directory

? The Hardware Compatibility List. For the most up-to-date list of supported hardware, see the Hardware Compatibility List at the Microsoft Web site (http://www.microsoft.com/hcl/). Your Windows 2000 CD includes a copy of this list (drive:\Support\Hcl.txt) that was accurate as of the date Windows 2000 was released.

To review the latest Application Compatibility information, see the Microsoft Windows 2000 Product Compatibility Web site at:

http://www.microsoft.com/windows2000/compatible/

To review the latest release notes and updated information for Windows 2000, see the Microsoft Knowledge Base on the Microsoft Personal Online Support Web site at:

http://support.microsoft.com/support/

Networking and Communications

The following sections describe Windows 2000 issues related to networking and communications.

Routing and Remote Access

This section describes a known issue related to Windows 2000 Routing and Remote Access.

Enabling Windows NT? 4.0 RAS Servers in a Windows 2000 Domain

If you are using Windows NT 4.0 Remote Access Service (RAS) servers in a Windows 2000 domain, they must be running Service Pack 4 (SP4) or later. Otherwise, they cannot access the Windows 2000 domain controllers to verify that a user has dial-in permissions. Also, if you set up a Windows NT 4.0 RAS or Routing and Remote Access Service (RRAS) server as a member of a Windows 2000 domain, you must make certain adjustments to Active Directory™ so that the server can access the Remote Access credentials of domain accounts.

You can adjust Active Directory to allow Windows NT 4.0 RAS servers by using either of the following methods:

? When you create a Windows 2000 domain by using the Active Directory Installation wizard to upgrade a server to a domain controller, select the option to allow legacy servers to access Active Directory. If you enabled this access when you created the domain, no further action is required.

? If you add a Windows NT 4.0 RAS server to a domain that has not been adjusted to allow legacy server access, you can use the following command to adjust domain security for legacy server access:

net localgroup “Pre-Windows 2000 Compatible Access” everyone /add

After executing this command, you must restart the domain controller.

TAPI

This section describes issues related to TAPI in Windows 2000.

ATI-TV Tuner Video Cards Are Not Supported for Use With TAPI

TAPI does not support the use of ATI video cards that incorporate TV tuners, including but not limited to ATI-TV, ATI-TV WONDER, and All-in-Wonder models. This will be addressed in a future release.

Kodak USB Cameras Are Not Supported

Windows 2000 does not include drivers for Kodak Universal Serial Bus (USB) cameras. To download the latest drivers, visit the Kodak Web site at:

http://www.kodak.com/

This will be addressed in a future release.

Note

Web addresses can change, so you may be unable to connect to the Web site mentioned here.

DHCP

In the online Help for the Dynamic Host Configuration Protocol (DHCP) servers, the instructions that describe how to move a DHCP database from one server to another are incomplete. For complete instructions, see the Knowledge Base on the Microsoft Personal Online Support Web site at:

http://support.microsoft.com/support/

Autonet

On a multi-homed computer, if two or more interfaces are using an Automatic Private Internet Protocol Addressing (APIPA)-based address simultaneously, the routing behavior of the computer for any destination on the APIPA subnet is inconsistent. For more information about this Autonet issue, visit the Knowledge Base on the Microsoft Personal Online Support Web site at:

http://support.microsoft.com/support/

Change and Configuration Management (IntelliMirror)

The following section describes Windows 2000 issues related to change and configuration management.

Group Policy

It is strongly recommended that you limit the computer name used by domain controllers to 15 characters. Longer computer names may cause the installation failure of applications that are deployed by using the Software Installation snap-in to Group Policy. For more detailed information, see the Knowledge Base on the Microsoft Personal Online Support Web site at:

http://support.microsoft.com/support/

Also, to review information about a related issue, see the “Active Directory Domain Name Length Restriction” topic later in this document.

Windows Management Instrumentation

The following section describes Windows 2000 issues related to Windows Management Instrumentation (WMI).

WMI ODBC Driver

When you upgrade your computer to Windows 2000, the previous installation of the WMI open database connectivity (ODBC) driver is deleted. The Windows 2000-compatible driver for WMI ODBC is located on the Windows 2000 CD in the ValuAdd\MSFT\MGMT\WBEMODBC folder.

Security

The following sections describe issues related to Windows 2000 security features.

Certificate Services

This section describes issues related to Certificate Services in Windows 2000.

Certificate Services Setup Fails

If the name of the computer contains non-International Alphabet 5 (IA5) characters, such as non-English characters, Certificate Services Setup fails. Use only IA5 characters to name a computer. This will be addressed in a future release.

PKI Services Fail If the DNS Computer Name Is Greater than 64 Characters

If the fully qualified Domain Name System (DNS) computer name is greater than 64 characters, Public Key Infrastructure (PKI) services fail. This causes the following processes to fail:

? Enterprise Certificate Authority (CA) installation

? Domain controller and computer automatic enrollment

? Internet Protocol Security (IPSec) enrollment

Installation of Certificate Services in a Child Domain

To install Certification Services for a child domain in the enterprise, you must be a member of the Enterprise Administrators group, which is in the parent domain.

CA Service Stops Running After a File System Upgrade from FAT to NTFS

The CA service stops running after a file system upgrade from FAT to the NTFS file system. The following message appears in the application log:

“Certificate Services did not start: Unable to initialize the database connection for \*Your CA Name here\*. Class not registered 0×80040154.”

As a workaround, uninstall the CA service and then re-install it using the same CA name, key pair, and database as the previous installation.

Upgrade of Subordinate CA from Windows NT 4.0 Certificate Server

After you upgrade a subordinate CA that is running Windows NT 4.0 Option Pack Certificate Server 1.0 to Windows 2000, you must perform a CA renewal operation and create a new CA certificate with the Basic Constraints field set to TRUE for the CA value. Before the SP6 release of Windows NT 4.0, the Certificate Server 1.0 product did not set the CA value to TRUE in the Basic Constraints field in the CA certificate. In SP6, if you are installing the CA for the first time, the CA value is set to TRUE in the CA certificate. In Windows 2000, if you are installing the CA for the first time or if you are performing a CA renewal operation on an existing CA, the CA value is set to TRUE in the CA certificate.

Default Security Settings

This section describes issues related to the default security settings in Windows 2000.

File and Registry Permissions Are Changed During Upgrade

The default security settings for a clean installation are also applied when you upgrade to Windows 2000. Applying the same default security settings ensures that access permissions for the registry and for Windows 2000 system directories and files are set consistently. However, if the default security settings are not sufficient after you upgrade to Windows 2000, you should reapply any custom settings that you applied before the upgrade.

Windows NT 4.0 Users May Need Power User Capabilities After Upgrade

The default security settings for a clean installation are also applied when you upgrade to Windows 2000. For more information about how these default security settings are applied, see “File and Registry Permissions Are Changed During Upgrade,” earlier in this document.

In Windows 2000, the permissions for users who do not have administrator or power user privileges are substantially more secure than in Windows NT 4.0. As a result, most non-certified legacy applications do not run successfully for typical users of Windows 2000. Therefore, after you upgrade to Windows 2000 and default security settings are applied, you may need to give power user capabilities to Windows NT 4.0 users.

When you upgrade from Windows NT 4.0 Workstation, you can provide power user capabilities automatically by adding the Interactive group to the Power Users group. Then, when Windows NT 4.0 users log on locally, they become power users on Windows 2000. Because Windows 2000 power users have the same access control permissions as Windows NT 4.0 users, these users can continue to run non-certified legacy applications after they upgrade to Windows 2000.

Notes

When you upgrade from previous versions of Windows 2000 or install Windows 2000 Server, the Interactive group is not added to the Power Users group.

Certified Windows 2000 applications run successfully for a typical user on Windows 2000. Therefore, certified applications offer the highest level of security without sacrificing application functionality.

Service Account Must Be Manually Added to the Power Users Group After Upgrade

The default security settings for a clean installation are also applied when you upgrade to Windows 2000. For more information about how these default security settings are applied, see “File and Registry Permissions Are Changed During Upgrade,” earlier in this document.

After the default security settings are applied in Windows 2000, services that previously ran under a non-administrative or non-system context on Windows NT 4.0 may no longer work properly. This occurs because Windows 2000 users have fewer permissions than Windows NT 4.0 users. Therefore, after you upgrade to Windows 2000, you must manually add the service account to the Power Users group.

High Encryption Pack—Upgrading from 128-bit Encryption on Down-Level Platforms

When you upgrade the 128-bit version of Windows 95 with Microsoft Internet Explorer 3.02 to Windows 2000, the encryption is reduced to 40-bit. As a workaround, you can install the Windows 2000 High Encryption Pack, which enables you to upgrade to 128-bit encryption.

EFS Recovery and Private Key Issues When Joining a New Windows 2000 Domain

When you upgrade a computer from Windows 95 or Windows 98 to Windows 2000, you may experience problems after joining the new domain because of issues with Encrypting File System (EFS) recovery and migrating private cryptographic keys. After you upgrade the computer, you should not use EFS until the computer actually joins the new domain. If you use EFS before your computer joins the domain, any files that you encrypt with EFS are inaccessible to your domain logon account. In addition, you should not run applications that use private cryptographic keys until the computer actually joins the new domain. If you generate and use private cryptographic keys before your computer joins the domain, these keys are unavailable to your domain logon account.

Directory Services

The following sections describe issues related to Windows 2000 directory services features.

Active Directory Domain Name Length Restriction

The fully-qualified DNS name of an Active Directory domain, for example example.microsoft.com, is restricted to 64 USC Transformation Format 8 (UTF-8) bytes in length. This limit does not apply to computer names.

One ASCII character is equal to one UTF-8 byte in length. Non-ASCII characters, such as other Unicode characters, have a variable length encoding that can be up to three bytes in length. To estimate the size of a name in bytes, count each ASCII character as one byte and each non-ASCII character as three bytes.

Before you deploy Active Directory, verify that all of your planned domain names do not exceed 64 UTF-8 bytes in length.

Message Queuing

This section describes issues related to the installation of Message Queuing.

Installing Message Queuing on Computers that Do Not Have MSMQ 1.0 Installed

This section describes issues related to the installation of Message Queuing on computers that do not have Microsoft Message Queue Server (MSMQ) 1.0 installed.

Administrative Permissions Required to Run Message Queuing Setup

The following permissions are required to install Message Queuing on a computer:

? When you install Message Queuing in either a workgroup or a domain environment, you must have local administrative permissions for the computer.

? If you are installing Message Queuing on a Windows 2000 domain controller, you must have permission to create the msmqSettings object that represents the computer on which you are installing Message Queuing. The msmqSettings object is located under the applicable server object. This applicable server object is located under the Servers object, which is located under the applicable site object in Active Directory Sites and Services.

Alternatively, you can have domain administrative permissions, or you can belong to the Domain Administrators group, which has this permission by default.

? If you are installing a Message Queuing server with routing enabled on a non﷓domain controller, you must have permission to create the applicable server object that represents the computer on which you are installing the Message Queuing server. This object is located under the Servers object, which is located under the applicable site object in Active Directory Sites and Services.

Alternatively, you can have enterprise administrative permissions, or you can belong to the Enterprise Administrators group, which has this permission by default. In addition, if?when you are prompted during Message Queuing Setup?you enter the name of a Message Queuing server that is running on a Windows 2000 domain controller in the local domain, domain administrative permissions are sufficient.

For more information about object permissions for Message Queuing, see Windows 2000 Help.

Installing Message Queuing in a Windows 2000 Workgroup

For a computer that is a member of a Windows 2000 workgroup, Message Queuing is automatically installed to operate in workgroup mode. Workgroup mode means that the ability of the computer to access Active Directory is disabled. For more information about workgroup mode, see Windows 2000 Help.

In addition, if you move a computer from a workgroup to a domain, Message Queuing automatically attempts to join the new domain. However, the new domain must be a Windows 2000 domain, and it must contain a Message Queuing server that is running on a Windows 2000 domain controller with a Global Catalog server enabled. In this case, Message Queuing operates in domain mode, which means that access to Active Directory is enabled.

Installing Message Queuing in a Windows 2000 Domain

This section describes issues related to installing Message Queuing in a domain environment.

Operating in Workgroup or Domain Mode

If you are installing Message Queuing in a domain environment, you can select whether or not the computer operates in workgroup mode (no access to Active Directory) or in domain mode (access to Active Directory) by clicking the Manually select access mode to Active Directory tab at the beginning of Message Queuing Setup.

Security Limitations for Windows 2000 Domains

All operating configurations?other than Windows 2000 domain users’ computers that are running Message Queuing on Windows 2000?introduce security limitations in Windows 2000 domains. These limitations pertain to the following operating configurations:

? In a mixed-mode domain environment where users’ computers are running MSMQ 1.0 on Windows NT 4.0, Windows 95, or Windows 98, and these computers access Message Queuing servers running on Windows 2000 domain controllers. If these users are logged on with Windows 2000 domain accounts, this limitation also applies.

? In a mixed-mode domain environment where users’ computers are running Message Queuing on Windows 2000 in a Windows NT 4.0 domain, and these computers access MSMQ 1.0 controller servers.

? In a Windows 2000 domain environment where users’ computers are running Message Queuing on Windows 2000, and these users are logged on with Windows NT 4.0 domain accounts.

? In a Windows 2000 domain environment where users’ computers support only the Internetwork Packet Exchange (IPX) protocol.

? In an environment where users are logged on with a Local User account regardless of the operating system.

If any of these operating configurations apply to your organization, then to support these users, you should weaken security for Active Directory. When Message Queuing Setup prompts you during the first installation of Message Queuing on the first Windows 2000 domain controller in your forest, select the weakened permissions option.

Specifying a Server Name During Message Queuing Setup

Message Queuing Setup may prompt you to enter the name of a server. In most cases, you should enter the name of a Message Queuing server that is running Windows 2000. You can specify the name of an MSMQ 1.0 controller server (such as the primary enterprise controller [PEC] or a primary site controller [PSC]) instead, but this scenario is supported only if you are installing an independent client. For all other installation types, Setup fails.

First Installation of Message Queuing in a Domain Must Be on a Domain Controller

You must install Message Queuing on a Windows 2000 domain controller before you install Message Queuing software on any other computer in your domain. In addition, to support Message Queuing clients, this domain controller must have the Trust computer for delegation property enabled.

On a Windows 2000 domain controller running Windows 2000, this property is enabled by default. If this property is disabled, Message Queuing clients cannot connect to the domain controller, and the clients display symptoms similar to when a Message Queuing server is offline.

Message Queuing with Routing Enabled and Message Queuing on a Domain Controller Must Be Installed at Every Site

You must install Message Queuing on a Windows 2000 domain controller for each Windows 2000 site. In addition, you must install Message Queuing with routing enabled on a non-domain controller at every site that has Message Queuing clients; this can be installed on the same server computer. Failure to install Message Queuing and Message Queuing with routing enabled may cause messages not to reach their destinations across sites.

Also, to support MSMQ 1.0 clients running on Windows NT 4.0 in a Windows 2000 domain, you must install Message Queuing on a Windows 2000 domain controller that is configured as a Global Catalog server.

Installing Message Queuing on an IPX-Only Computer

When you install Message Queuing on an IPX-only computer that is running Windows 2000, you must enter the name of a Message Queuing server that is running on a Windows 2000 domain controller when you are prompted to do so during Setup. This server must be in the local domain.

Installing Message Queuing Using a Windows NT 4.0 Domain User Account

When you install Message Queuing on a computer that is running Windows 2000 and you use a Windows NT 4.0 domain user account, you should have at least one Message Queuing server that is running on a Windows 2000 domain controller in the local domain. If this is not possible, you must enter the name of a server that meets this criteria when you are prompted to do so during Setup.

Installing MSMQ 1.0 on Windows NT 4.0 in a Windows 2000 Domain

When you install MSMQ 1.0 on a computer that is running Windows NT 4.0 in a Windows 2000 domain, you must enter the name of a Message Queuing server in the local domain when you are prompted for the name of a PSC during Setup. This Message Queuing server must be running on a Windows 2000 domain controller that is also configured as a Global Catalog server.

In addition, if you plan to install MSMQ 1.0 on computers that are running Windows NT 4.0 in a new Windows 2000 domain, you should select the pre﷓Windows 2000 compatible check box when you run Setup for the first Windows 2000 domain controller in the local domain.

If you plan to install MSMQ 1.0 on computers that are running Windows NT 4.0 in an existing Windows 2000 domain, you should verify that the Everyone group is a member of the “pre-Windows 2000 Compatible Access” group in this domain.

? To add the Everyone group to the pre-Windows 2000 Compatible Access group

1. In the MMC, open the Active Directory Computers and Users snap-in.

2. In the console tree, double-click Builtin.

3. Right-click pre-Windows 2000 Compatible Access, and then click Properties.

4. On the Members tab, click Add, and then in the list, select Everyone (if needed).

5. Click OK.

Installing MSMQ 1.0 on Windows 95 or Windows 98 in a Windows 2000 Domain

When you install MSMQ 1.0 on a computer that is running Windows 95 or Windows 98 in a Windows 2000 domain, you must enter the name of a Message Queuing server in the local domain when you are prompted for the name of a PSC during Setup. This Message Queuing server must be running on a Windows 2000 domain controller that is also configured as a Global Catalog server.

Also, you must be granted the Create Computer Objects permission, which is located under the Computers folder object in Active Directory Users and Computers, because the computer object for these computers does not exist in Active Directory. For more information about the Create Computer Objects permission, see Windows 2000 Help.

Reinstalling Message Queuing in a Multi-Domain Environment

When you uninstall Message Queuing on a computer in a multi-domain environment, you must wait for Active Directory replication to occur before you reinstall Message Queuing on the same computer.

Installing Message Queuing on a Windows 2000 Server Cluster

Message Queuing is dependent on the Microsoft Distributed Transaction Coordinator (MS DTC) service on a server cluster. To successfully install Message Queuing on a Windows 2000 server cluster, you must first manually cluster the MS DTC service.

? To manually cluster the MS DTC service

1. Create a cluster virtual server, which is a cluster group containing a Disk resource and a Network Name resource.

2. On the computer node that hosts the cluster virtual server, run Comclust.exe, which is located in the Winnt\System32 folder.

3. Run Comclust.exe on the other nodes. Do not restart any node until Comclust.exe has been successfully started on all nodes in the server cluster.

4. Restart each computer node.

Now you can install Message Queuing on each node.

Note

The installation may fail, and a message may appear indicating that you lack the necessary permissions. In this case, grant yourself permission to create the MSMQ configuration (msmq) object, which is located under the computer object representing your cluster virtual server, and then run Message Queuing Setup again. This permission is also required to manage the cluster virtual server by using the Computer Management snap-in.

As an alternative, you can run Message Queuing Setup with an account that has domain administrative permissions. By default, domain administrative permissions include the permission to create the msmq object. This will be addressed in a future release.

Configuring Cluster Resources for Message Queuing

In Windows 2000 Help, the procedure that describes how to configure a cluster resource for Message Queuing is incorrect; you should complete Step 11 before you complete Step 10. The sequence of all the other steps is correct.

Installing Message Queuing Using Unattended Setup

When you use unattended setup to install a Message Queuing server with routing (RS installation type), the answer file script automatically attempts to resolve the site to which the computer belongs. If subnets in your network are not configured correctly, Message Queuing Setup may fail to resolve the site. In this case, you must specify the default site containing the Message Queuing server that is running on a Windows 2000 domain controller with which this server will communicate.

? To specify the default site

\* Add the following entry to your unattended setup answer file:

Site = \*your\_domain\_controller\_site\_name\*

Upgrading MSMQ 1.0 on Computers Running Windows 2000

This section describes issues related to upgrading MSMQ 1.0 on computers that have been upgraded to the Windows 2000 operating system.

Upgrading an MSMQ 1.0 Enterprise to Windows 2000

The process of upgrading your MSMQ 1.0 enterprise to Windows 2000 is called migration. You must perform this multi-step process correctly and in the proper sequence. It is important that you understand all the issues and implications involved in migration. For specific information about the issues, preparation, and execution of migration, see “Migrating from MSMQ 1.0” on the Migration FTP site at:

ftp://ftp.microsoft.com/bussys/distapps/Msmq/Win2000/Migration/

Upgrading MSMQ 1.0 on a Server Cluster

This section provides detailed information about how to upgrade the different MSMQ 1.0 computer types on a server cluster. Unless otherwise stated, use the following general order of events to upgrade MSMQ 1.0 on all computer types on a server cluster:

1. For a clustered PEC or PSC, run the Message Queuing Upgrade wizard (Mqmig.exe). See the note below.

2. Upgrade the operating system of the node to Windows 2000 Advanced Server.

3. Upgrade the MS DTC resource.

4. Upgrade the MSMQ resource.

To upgrade a cluster node to Windows 2000 Advanced Server, the computer must be running Windows NT Server 4.0 Enterprise Edition with SP4 or SP5. Windows 2000 does not support a rolling upgrade of a Windows NT 4.0 server cluster with MSMQ 1.0 installed.

Note

When you upgrade the MSMQ resource, the Message Queuing Upgrade wizard may prompt you for the name of a server. You should enter the name of a Message Queuing server that is running on Windows 2000 rather than the name of an MSMQ 1.0 controller server such as the PEC or a PSC. Otherwise, the upgrade fails.

Upgrading the MS DTC Resource

After you upgrade the operating system on each node to Windows 2000 Advanced Server, and before you upgrade the MSMQ resource on any node, you must use Cluster Administrator to upgrade the MS DTC resource to an active/active configuration.

To upgrade the MS DTC resource on a server cluster, complete the steps in the following procedure.

? To upgrade the MS DTC resource on a server cluster

1. Take the MS DTC cluster resource offline.

2. Verify that all services dependent on the MS DTC cluster resource?including the services for Message Queuing, Component Services, Microsoft SQL Server, and Microsoft COM Transaction Integrator (COMTI)?are stopped.

3. On the node that hosts the cluster virtual server containing the MS DTC cluster resource, from the command prompt, run Comclust.exe. This program is located in the system folder (typically, C:\Winnt\System32).

4. On each of the remaining nodes, run Comclust.exe. Do not bring the MS DTC cluster resource back online until Comclust.exe is running on all nodes in the server cluster.

5. Manually restart all dependent services, and then bring the MS DTC cluster resource back online.

Upgrading the MSMQ Resource

After you successfully complete the procedure for upgrading the MS DTC resource as described in the previous topic, “Upgrading the MS DTC Resource,” use the Configure Message Queuing Cluster Resources wizard to upgrade the MSMQ resource to provide active/active fail-over support.

? To upgrade the MSMQ resource

1. Click Start, point to Programs, point to Administrative Tools, and then click Configure Your Server.

2. From Configure Your Server, click Finish Setup, and then click Configure Message Queuing Cluster Resources.

3. Follow the instructions that appear in the Configure Message Queuing Cluster Resources wizard.

You must have enterprise administrative permissions or belong to the Enterprise Administrators group to run the Configure Message Queuing Cluster Resources wizard on computers that hosted MSMQ 1.0 servers (PEC, PSC, BSC, or Routing servers) before the upgrade.

Upgrading MSMQ Routing Servers, BSCs, and Independent Clients on a Server Cluster

You should upgrade the MSMQ 1.0 routing servers and MSMQ 1.0 Backup Site Controllers (BSCs) on a server cluster to Message Queuing servers with routing enabled. You should upgrade MSMQ 1.0 independent clients to Message Queuing independent clients.

To upgrade these computers on a server cluster, complete the steps in the following procedure.

? To upgrade the MSMQ routing servers, BSCs, and independent clients on a server cluster

1. Upgrade the operating system on each node to Windows 2000 Advanced Server.

2. Use Comclust.exe to upgrade the MS DTC resource on each node.

3. Use the Configure Message Queuing Cluster Resources wizard to upgrade the MSMQ 1.0 resource on each node.

Upgrading the PEC and PSCs on a Server Cluster

In Windows 2000 Message Queuing deployment, the role of the PEC and the PSCs is delegated to Message Queuing servers running on Windows 2000 domain controllers. Because Windows 2000 domain controllers cannot be clustered, upgrading the PEC and PSCs to Windows 2000 is a multi-step process. During this process, the MSMQ Information Store (MQIS) data is imported from the PEC or PSC to a Message Queuing server that is running on a Windows 2000 domain controller located outside of the server cluster.

You must perform this upgrade process correctly and in the proper sequence. It is important that you understand all the issues and implications involved in this process. For specific information about the issues, preparation, and execution of the PEC and PSCs upgrade on a server cluster, see “Migrating from MSMQ 1.0” on the Migration FTP site at:

ftp://ftp.microsoft.com/bussys/distapps/Msmq/Win2000/Migration/

NTLM Version 2 Authentication for Windows 95 and Windows 98 Directory Services Clients

For information about how to enable and disable Windows NT LAN Manager (NTLM) version 2 and LAN Manager (LM) authentication for Windows 95 and Windows 98 Directory Services clients, visit the Knowledge Base on the Microsoft Personal Online Support Web site at:

http://support.microsoft.com/support/

Component Services

The following sections describe issues related to Windows 2000 Component Services features.

Component Services Setup

Depending on the current configuration of your operating system, you may encounter some of the following issues that relate to upgrading existing installations of Microsoft Transaction Service (MTS) and Component Services:

? If you are using either MTS 2.0, which is part of the Windows NT 4.0 Option Pack, Component Services automatically replaces MTS. All user-defined packages will be upgraded to COM+ applications. All components should work as they did under MTS 2.0.

? If you are using MTS 1.0, Component Services automatically replaces MTS. However, user-defined packages are lost, and you must re-create them.

? If you are using either MTS 1.0 or MTS 2.0 and you have installed the SDK option, the SDK files are removed. You may want to install the latest Component Services SDK, which is available with the Microsoft Platform SDK.

? If a Component Services application is marked as not changeable, the Comrepl.exe utility or the Iissync.exe utility does not properly replicate its identity. For this release, you must mark the application as changeable before initiating the replication. For additional information about Comrepl.exe, see the Component Services online documentation. For additional information about Iissync.exe, see the Internet Information Services (IIS) documentation. This will be addressed in a future release.

? When you re-install over a Component Services application that has been marked as not deletable, neither the Component Services snap-in nor the Component Services administrative interfaces return an error. However, the application is not updated. For this release, you must either mark the application as deletable or modify the installation code to check whether an application exists before installing it.

To download Component Services documentation and samples, see the Microsoft Platform SDK: COM Components Web site at:

http://www.microsoft.com/msdownload/platformsdk/com.htm

Upgrading MTS 2.0 Installations to

Windows 2000 with Component Services

When you upgrade a computer running Windows NT 4.0 with Windows NT 4.0 Option Pack, Windows 95 with Personal Web Server from the Windows NT 4.0 Option Pack, or Windows 98 with Personal Web Server to Windows 2000, Setup automatically migrates all existing MTS packages to Component Services applications.

Note

Before you use, import, or export the migrated packages, it is important to review the migration log file that is generated during the migration process even if the upgrade appears successful. If this migration fails or encounters a problem that is not fatal, a message appears and an event log entry or log file is generated that describes the reason for the failure.

As an alternate approach to migrating MTS 2.0 packages to Component Services, do the following:

1. Use the MTS 2.0 Package Export feature to export the MTS packages on the computer running Windows NT 4.0, Windows 95, or Windows 98. This export process produces a .pak file for each exported package and a collection of other files.

2. Perform a clean installation of Windows 2000, or delete the MTS packages and upgrade to Windows 2000.

3. Use the Application Install feature of the Component Services administrative tool to install the .pak files on a Windows 2000 computer.

Application Proxy Installation

If an application proxy (.msi file) for the same server application is re﷓exported, before you install the new application proxy, you must uninstall the earlier application proxy from the computer. Otherwise, both application proxies appear when you open Add/Remove Programs in Control Panel. Additionally, changes contained in the new application proxy may not be applied to the computer. No message or error log is generated. This will be addressed in a future release.

Upgrading from Component Services (Beta Version) with MSCS

If you are upgrading from a previous beta version of Windows 2000 on a Microsoft Cluster Server (MSCS) cluster with the Component Load Balancing (CLB) router enabled, you may have configured the cluster for use with the CLB service. You need to remove the earlier configurations to avoid unnecessary errors in the event log.

? To remove the earlier configurations

\* At the command prompt, type:

comclust -r

Microsoft Distributed Transaction Coordinator

This section describes issues related to the MS DTC.

Performing Distributed Transactions with

Windows NT 3.51 and Windows NT 4.0

MS DTC uses a new protocol for performing distributed transactions on Windows 2000. As a result of this protocol change, a distributed transaction can no longer flow from a Windows 95, Windows 98, Windows NT 3.51, or Windows NT 4.0 computer to a Windows 2000 computer. However, a distributed transaction can flow from a Windows 2000 computer to any of these computers.

If you are running the Window NT 4.0 Option Pack, you can circumvent this limitation by installing either Windows NT 4.0 SP4 or SP5. If you are running Windows NT 4.0, you can also circumvent the problem by installing QFE 810, which is located at:

ftp://ftp.microsoft.com/bussys/distapps/MTS/Public-Fixes/usa/DTC/SvcPack/

No patch is available for Windows 95, Windows 98, or Windows NT 3.51.

Reinstalling MS DTC After Installing Microsoft SQL Server™

Whenever you install SQL Server 6.5, SQL Server 7.0, or any SQL Server 6.5 or SQL Server 7.0 SP release, you must reinstall MS DTC. This reinstallation is necessary because SQL Server Setup installs an obsolete version of MS DTC that is incompatible with Component Services on Windows 2000.

? To reinstall MS DTC on a non-clustered system

1. Stop the MS DTC service. Also stop any services that depend on MS DTC, including Component Services, Microsoft SQL Server, Microsoft Message Queuing, and Microsoft COMTI.

2. Execute the Dtcsetup.exe program, which is located in the System32 folder.

3. Restart any services that depend on MS DTC.

? To reinstall MS DTC on a cluster with an existing MS DTC cluster

1. Use the MSCS Cluster Administrator to stop the MS DTC cluster resource. Also stop any services that depend on MS DTC, including Component Services, Microsoft SQL Server, Microsoft Message Queuing, and Microsoft COMTI.

2. Execute the Dtcsetup.exe program, which is located in the System32 folder, on the node that controls the MS DTC cluster resource. When you are prompted to install MS DTC on the other nodes in the cluster, run Dtcsetup.exe on those nodes.

Do not restart any system until MS DTC Setup has been successfully run on all systems in the cluster.

3. Restart all systems and also any services that depend upon MS DTC.

MS DTC Does Not Support

Rolling Upgrades on MSCS Clusters

MS DTC does not support rolling upgrades on MSCS clusters. When you install MS DTC on a cluster, you must do the following:

1. Stop MS DTC.

2. Upgrade MS DTC on all nodes in the cluster.

3. Restart MS DTC.

These steps are necessary because MS DTC maintains a single MS DTC log file for the entire cluster, and the new information has been added to the MS DTC log file for the Windows 2000 release.

In-Memory Database

After evaluating customer feedback from the Microsoft Windows 2000 Beta Program, Microsoft has determined that the In-Memory Database (IMDB) does not completely address the needs of most customer scenarios. The IMDB does not support query processing or stored procedures, and it requires customers to implement a different database access method.

The Transactional Shared Property Manager (TSPM), which was built on top of IMDB, has also been removed from Windows 2000. However, the Shared Property Manager technology that was initially released with MTS in Windows NT 4.0 is still available with Component Services in Windows 2000.

For additional information about IMDB, see the “What Happened to IMDB?” topic on the MSDN Web site at:

http://msdn.microsoft.com/library/techart/whatimdb.htm

Removing COMTI Components with Component Services and Windows 2000

COMTI is a component of SNA Server 4.0 and later. When you remove a COMTI component from a Component Services application, it does not disappear from the COMTI Remote Environment pane. However, the component is removed from the COM+ Application Components pane. Although this produces an inconsistent display, you can deploy a new component with the same Class ID without causing an error.

Microsoft Data Access Components

Microsoft Data Access Components (MDAC) is automatically installed with Windows 2000. To obtain the most current information about MDAC 2.5 and known MDAC issues, see the MDAC release notes, which are installed at:

\*system drive\*:\Program Files\Common files\System\ADO

\MDACReadme.htm

For more information about MDAC, see the Microsoft Universal Data Access Web site at:

http://www.microsoft.com/data/

Internet Services

The following section describes Windows 2000 issues related to Internet services features.

Internet Information Services

To obtain the most recent information about installation, documentation, and other known IIS issues, type the following link into the address bar of your browser (or click Start, click Run, and type the link):

file:\\%systemroot%\Help\Iishelp\Iis\Htm\Core\Readme.htm

where %systemroot% is your Windows 2000 installation path, including drive and directory (for example, C:\Winnt).

IIS is not installed by default on Windows 2000 Professional. If you cannot view the IIS release notes from the link above, you need to install IIS by using Add/Remove Programs in Control Panel.

Client Certificate Is Not Trusted or Is Invalid

A problem in the certificate trusts list (CTL) may cause the following 403.16 message to display for valid certificates:

“Client certificate untrusted or invalid”

As a workaround, install a copy of the root certificate from the Trusted Root Certification Authorities to the Intermediate Certification Authorities store for the Local computer. This will be addressed in a future release.

Cannot Change Anonymous Account

IIS 5.0 restricts changes to the Windows 2000 user account for anonymous authentications that are made below the service level and that contain an “IUSR\_” account prefix. This restriction ensures proper functioning of the IUSR\_computername account, which should not be altered in any way. If you require multiple anonymous authentication accounts, create new accounts that do not contain the “IUSR\_” account prefix, assign account permissions to log on locally, and then add the accounts to the Guest User group.

Microsoft Windows 2000 Server Media™ Services

The following sections provide information and describe issues that affect Windows Media Services, an optional component of Windows 2000.

Logging Multicast and Unicast Client Information in Netscape Navigator

Netscape Navigator 3.04 may fail to obtain the Uniform Resource Locator (URL) of the Web page that contains the embedded client. This prevents the client information—the URL value of the cs(Referrer) field—from being properly logged when you use Netscape Navigator 3.04.

Using Windows Media Services Components and Microsoft Site Server with the Membership Authentication Plug-In

A known “boot race” problem exists when you use Windows Media Services components with Microsoft Site Server version 3.0 and you have enabled the Site Server Membership Authentication plug-in. This plug-in does not load when Windows Media Services starts, and clients cannot connect to Windows Media Services.

When this problem occurs, the Windows 2000 Server Event Log service does not log the error. To verify the failure, use Windows Media Administrator to connect to Windows Media Services. Windows Media Administrator messages appear, indicating that the plug-in has not started and prompting you to restart the Windows Media Unicast service.

As a workaround, restart the Windows Media Unicast service.

HTTP Streaming Can Cause Errors

After enabling Hypertext Transfer Protocol (HTTP) streaming in the Windows Media Administrator, you must restart your computer. Otherwise, the Windows Media Services Event Log fills up with error events.

Storage Notes

The following sections describe Windows 2000 issues related to storage.

Offline Folders

Do not use the Offline Folders feature with Distributed File System (DFS) volumes or shares.

File Systems

After you convert a FAT file system to NTFS, all files and folders are set with the following Access Control List (ACL):

? Administrators Full Control (not inherited)

? System Full Control (not inherited)

? Everyone Full Control (inheritable)

You can fix the inheritance settings at the root of the volume in Microsoft Explorer.

? To fix the inheritance settings at the root of the volume in Microsoft Explorer

1. In Microsoft Explorer, right-click the root directory, and then click Properties.

2. On the Security tab, click Advanced.

3. Double-click the Administrators entry.

4. On the Permission Entry page, change Apply onto: to This folder, subfolders and files.

5. Double-click the System entry.

6. On the Permission Entry page, change Apply onto: to This folder, subfolders and files.

7. Click OK.

Logical Disk Manager

This section describes known issues that apply to the Logical Disk Manager.

Disks That Are Members of Fault﷓Tolerant Sets (Mirror or RAID﷓5)

If you upgrade from a previous version of Windows 2000, a disk that is a member of a fault-tolerant set (mirror or RAID﷓5) may become orphaned during graphical user interface (GUI)﷓mode Setup. No data is lost. You can use the Disk Administrator MMC snap-in to rebuild the disk.

? To use the Disk Administrator MMC snap-in to rebuild the disk

1. Start the Disk Administrator MMC snap-in.

2. For a mirror disk, click Resynchronize Mirror, or for a RAID﷓5 disk, click Regenerate Parity.

The redundant information for the volume is rebuilt.

Creating Logical Drives Within Extended Partitions on Basic Disks

If you are upgrading from Windows NT 4.0 to Windows 2000 and you attempt to create logical drives within extended partitions on basic disks, a drive geometry translation error may cause the Logical Disk Manager to display the following message:

“Parameter is incorrect.”

This may also occur with raw installations on disks with no signatures. No workaround is available at this time.

Converting System or Boot Volumes from Basic to Dynamic

You should convert system or boot volumes from basic to dynamic independent of any other volume conversion. In particular, before you attempt to import disks from another computer, restart your computer.

Mirroring Combined System﷓Boot Volumes on Systems with OEM Partitions

Mirroring combined system﷓boot volumes on systems with Original Equipment Manufacturer (OEM) partitions may require extra care. Whenever you mirror your system or boot partition, you should verify that the system starts from both the original and newly created mirrored partitions. On systems with OEM partitions, complete the following steps:

1. Ensure that the target disk for the mirror is basic.

2. Create a basic partition equal to the size of the OEM partition.

3. Convert the disk to dynamic.

4. Mirror the system﷓boot volume.

Backup

This section describes known issues that apply to Windows 2000 Backup.

Backup of Remote Storage Files by Legacy Backup Applications

Legacy backup applications include Windows NT 4.0 and earlier versions of Backup, and also any third-party backup applications that do not ship with Windows 2000 and do not recognize remote storage files. When using legacy backup applications to back-up remote storage files which are migrated to tape, Remote Storage opens by default the files with the FILE\_OPEN\_NO\_RECALL option and streams the migrated data from tape directly to the backup application. On a volume with large quantities of remote storage files, this may tie up the server for long periods of time as it reads the data from tape and streams it to the backup application. Also, the legacy backup client may take an extended period of time to completely backup the volume.

If you do not need to backup the data in the remote storage files using the legacy backup application, you can skip these files. On the server containing the remote storage files, if a registry value of type REG\_DWORD: exists and is set to a non-zero value for the HKEY\_LOCAL\_MACHINE \System\CurrentControlSet\

Services\RsFilter\Parameters\SkipFilesForLegacyBackup registry key, the remote storage files are skipped by the legacy backup application. By default this value is not present in the registry. Therefore, you must add this to the registry to skip the backup of remote storage files by the legacy backup application.

Caution

Incorrectly editing the registry may severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

? To skip the backup of remote storage files

\* Cut and paste the following text into a .reg file, and load it into the registry by using regedit.exe:

REGEDIT4

[HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\RSFilter\Parameters]

“SkipFilesForLegacyBackup”=dword:00000001

Restoring the IIS Metabase While the IIS Administration Service Is Running

The IIS Administration Service does not hold open the metabase file. Therefore, if you restore the metabase file while the IIS Administration Service is running, the file is overwritten by the copy in memory when the service shuts down. Then, when you restart the computer, the IIS-managed services do not work.

As a workaround, before restoring the IIS metabase, stop the IIS Administration Service and all the other IIS-managed services. If you do not have the IIS Administration Service installed when you restore the IIS metabase, no action is required.

Restoring the System State from a Backup Set

When you restore the system state on a computer that is running Windows 2000 from a backup set, do not attempt to re-join the Windows domain until after the system state has been restored. If you attempt to rejoin the domain before the system state is restored, the computer may respond with a message indicating that its computer account is missing.

Mounting Required Media During a Backup or Restore Operation

Do not use the Removable Storage Manager to mount tapes. When you perform a backup or restore operation, always rely on Windows 2000 Backup to mount the required media.

Computer Not in Domain After System State Restore

After you restore everything on the computer, you must rejoin the computer with the domain, even though the Network Identification indicates that the computer is already part of the domain. If the computer does not rejoin the domain, the following message appears:

“Trust relation failure.”

This occurs because the unique identifier for the computer on the network changed during the system state rebuild process. As a workaround, join a workgroup, restart the computer, rejoin the domain, and then restart the computer again.

Restoring Applications with Long File Names

In some cases, when you restore application with long file names, Microsoft Office applications may fail after the restore operation. This failure occurs because some components (specifically Office) register the location of their binaries in the registry using the short name (8.3 name). This short name may point to an incorrect location after the application is restored because the short name generation is based upon which application was installed first. Therefore, after you restart the computer, you must reinstall the applications that failed.

Target Must Be as Large as the Original Backup Drive

You must perform the restore operation on partitions that are the same size (or larger) as the partitions that are backed up. In some cases, Windows 2000 Backup may run out of disk space while restoring to the same volume. As a workaround, make sure that sufficient free space is available for the restore operation. When Backup restores active files, it requires some extra disk space. Backup restores files to temporary locations, and then moves them to the correct location when you restart the computer. This process also requires extra disk space.

Removing Only One Piece of Media from a Backup from a Library

If you remove only one piece of media from a backup from a library, you may lose data. If you remove the first piece of media from a spanned save set and then select the delete media from system option in Removable Storage Manager for any of the other elements of that save set, all media belonging to that save set on the drive is erased. If you do not want to erase your tapes, keep all of your spanned save sets together.

Backup Fails to Start a Scheduled Job Because the Wrong Media is in the Drive

When an unexpected tape is mounted in the drive, Windows 2000 Backup does not start the scheduled backup operation. When Backup runs, it expects to write to a specific piece of media. If this media is not in the drive and you are not using a changer, the backup operation fails. No notification of this failure is provided because the backup operation is running without the user interface (UI). The backup log identifies the failure.

Backup Stops While Spanning Multiple Disks

When Windows 2000 Backup encounters a write-protected disk while spanning multiple disks, it stops running. As a workaround, make sure that none of the media using for the backup operation is write-protected.

Backup Shows Incorrect Elapsed and Estimated Times

Windows 2000 Backup shows the elapsed and estimated times incorrectly. No workaround is available at this time. You can ignore the displayed time.

Backup Cannot Detect If a Remote Drive Is Removable

Windows 2000 Backup cannot detect if a remote drive is removable. It assumes that all mapped drives are fixed disks. If a removal storage device (for example, a Jazz drive) is located and shared from another computer on the network, and the remote device is mapped to the local computer, Backup does not detect that the device is removable. As a workaround, do not map a remote drive that is removable. Instead, perform the backup operation to a remote hard disk, and then copy the files to the removable media.

Restore Does Not Recognize Media When Spanned Across Different Formats

The restore operation does not recognize media when it is spanned across different formats. If you restore data that has been spanned across several pieces of media and if the file systems differ across the media (for example, some media are in NTFS and some are in FAT), the restore operation does not recognize some media as being part of the backup set.

Backing Up to an 8-mm AME Tape on an Exabyte EXB-220 Changer

When you back up to 8-mm AME tape on an Exabyte EXB-220 changer, Windows 2000 Backup reports a “write file mark” failure. You should upgrade this firmware to the latest 6.4.3 version.

Files Located at the End of a Large Backup Set

Files that are located at the end of a large backup set may not restore. This can affect millions of files on data volumes larger than 100 GB. As a workaround, you can use independent software vendor (ISV) backups that use autoloaders. Alternately, run your backup operation in segments (start lower in the volume tree).

Backup Restores Some Additional Files from Remote Storage Media

Windows 2000 Backup restores some additional files from Remote Storage media. When Backup is used to restore tapes created by Remote Storage, additional files may be created. Remote Storage Manager uses these files, and they have no value outside of the this system. No workaround is available at this time. You can ignore these files.

Path Names Greater than 1000 Characters in Length

When path names are greater than 1000 characters in length, an access violation occurs in NTBackup.exe. Avoid using long path names for restore operations.

Restoring an Encrypted File

that has a File Hard-Linked to it

Restoring an encrypted file that has a file hard-linked to it destroys the link to the original file. You must manually re-link the file after the restore operation is completed.

Running Backup over Terminal Services

When you run Windows 2000 Backup over Terminal Services, some settings may get confused. Backing up drive letters that are mapped on both the local computer and the remote computer may cause Backup to stop responding at the prompt (Task Manager) for scheduled backup operations.

Restoring Exchange

If you attempt an Exchange restore operation, the Exchange Service must be running. If this service is not running, no options display for the Exchange restore operation.

Performing a Complete System Restore

If you perform a complete system restore operation from tape, you must first complete a minimal installation of Windows 2000 in the same directory as the previous installation. If the directory or drive is different, the system restore operation fails. Note that clean installations do not allow an installation location other than the default directory. In the case where the previous installation was not in the default \Winnt directory, you must complete a second, minimal installation in the non-default location. If there is one installation already on the hard disk, Setup prompts you about whether you want to overwrite the current installation or install to an alternate location.

Beginning a Backup or Restore Operation

When Windows 2000 Backup begins a backup or restore operation, it always attempts to mount a tape. If the requested tape has already been mounted by another process, the backup operation fails.

Hardware

The following sections describe issues related to hardware installed on computers running Windows 2000.

Network LAN and WAN Adapters

The Windows 2000 CD includes network adapter drivers from third-party vendors. These drivers meet Windows Hardware Quality Lab (WHQL) standards for installation and operation. During installation, Windows 2000 detects and successfully installs most adapters, such as Peripheral Component Interconnect (PCI), PC Cards, and Industry Standard Architecture (ISA) Plug and Play adapters. After Windows 2000 installation completes, you may need to manually install some adapters.

Some adapters may not function after you upgrade to Windows 2000. Changes in the registry?such as adapter driver name changes, service dependency changes, or the use of an obsolete network adapter driver?may cause these problems. Contact your hardware vendor about updated files for your drivers.

You should not use 8-bit network adapters with Windows 2000. Because of customer requirements, Windows 2000 still supports some of these adapters, but they may not perform reliably.

Hardware Compatibility List

For the most up-to-date list of supported hardware, see the Hardware Compatibility List at the Microsoft Web site (http://www.microsoft.com/hcl/). Your Windows 2000 CD includes a copy of this list (drive:\Support\Hcl.txt) that was accurate as of the date Windows 2000 was released.

Plug and Play

Windows 2000 is a Plug and Play operating system. If your computer contains ISA cards, they may be set in a manually configured mode that requires you to define the resources. These adapters?such as sound cards, network cards, and modems?operate better in Windows 2000 if you set them to operate in ISA Plug and Play mode. For more information, refer to your hardware vendor documentation.

Upgrading from Windows 95 or Windows 98

When you upgrade from Windows 95 or Windows 98, Windows 2000 may list the following adapters as not supported:

? 3Com EtherLink III EISA 10/100 (3C597-TX)

? IBM Etherjet ISA Adapters

? Crystal LAN CS8920 ISA Adapter

? Olicom Plug and Play Token-Ring ISA 16/4 (OC-3118) Adapters

However, after you install Windows 2000, they work correctly. In some instances, you may need to reset static network settings.

Upgrading from Windows NT 4.0

When you upgrade from Windows NT 4.0, Windows 2000 may list the following adapters as not supported:

? 3Com EtherLink 905x 10/100 series of Adapters

? Compaq Ethernet or Fast Ethernet PCI Adapters

? DEC FDDI Controller PCI (Defpa) Adapters

? HP EN1207D-TX PCI 10/100 Fast Ethernet Adapters

? Intel EtherExpress PRO/10 Adapters

? Intel Pro/100 Intelligent Server Adapters (I960)

However, after you install Windows 2000, they work correctly. In some instances, you may need to reset static network settings.

Wireless LAN Devices—Upgrading from Windows 95 or Windows 98 to Windows 2000

During the upgrade process from Windows 95 or Windows 98, site-specific configurations (SSIDs) for wireless LAN cards do not get upgraded. In order to regain connectivity after the upgrade, you must reapply the site-specific settings.

You can access the configuration for any adapter from the Device Manager by using the Advanced Properties tab. You can also use some vendor-supplied utilities that are designed for this task.

Setup Does Not Load Drivers During Upgrade (Code 32)

When you upgrade from previous beta versions of Windows 2000, some devices may be disabled with a “Code 32” message in Device Manager. Although it is theoretically possible that this problem could occur for multiple types of devices, it is a race condition that is most likely to effect CardBus cards. This problem has not been encountered on other types of devices. Also, it does not effect other upgrade paths, such as Windows 95, Windows 98, or Windows NT 4.0, nor does it effect clean installations of Windows 2000.

As a workaround, you can uninstall and then re-install the device in Device Manager.

? To uninstall and then re-install the device in Device Manager

1. In Device Manager, highlight the device.

2. On the Action menu, click Uninstall.

3. After the device is uninstalled, on the Action menu, click Scan for hardware changes.

This re-installs the device and it should work properly without displaying a yellow “!” indicator in Device Manager.

PCI Network Adapters and Media Sense

When connecting through non-N-way compliant 10/100 switches and hubs, some PCI Network adapters that are N-way compliant cannot detect Network Media Speeds.

Adapters that Do Not Support Media Sense and Other Issues

The following adapters do not support Media Sense, do not show the correct connection speed, cannot update the connection speed after being disabled and enabled, or do not show that they are connected when the cable is inserted if they are restarted without network cables attached:

? Hewlett Packard HP 27247A PC LAN/16 ISA Adapters

? Hewlett Packard HP 27250 PC LAN/8 ISA Adapters

? Hewlett Packard HP 27247B PC LAN/16 TP Plus ISA Adapters

? Hewlett Packard HP DeskDirect J2973A 10baseT PCI LAN Adapters

? Intel Pro/10+ PCI Adapters

? SMC EtherEZ 8416

? SMC EtherCard Elite 16 Ultra (8216)

LAN Adapters

This section describes issues with LAN adapters installed on computers running Windows 2000. Some LAN adapters have limited support or no support in Windows 2000.

Adapters with Known Issues

This section identifies LAN adapters with known issues related to installation and operation on computers with Windows 2000 installed. Adapters are listed in alphabetical order by manufacturer.

Sporadic Loss of Connectivity Under Heavy Network Load

If you have an adapter that stops sending or receiving data under heavy network load con