

**70-290: MCSE Guide to Managing
a Microsoft Windows Server 2003
Environment, Enhanced**

**Chapter 8:
Implementing and
Managing Printers**

Objectives

- Understand Windows Server 2003 printing terms and concepts
- Install and share printer resources
- Configure and manage installed printers
- Publish printers in Active Directory
- Troubleshoot printer problems

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**Windows Server 2003 Printing
Concepts**

- These concepts are required for configuring and troubleshooting Windows Server 2003 printing:
 - Print device
 - Printer
 - Print driver
 - Print server
 - Print client

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Windows Server 2003 Printing Concepts (continued)

- For efficient printing, network has following hardware requirements:
 - One or more computers as print servers
 - Sufficient space on a hard drive for the print server
 - Sufficient RAM beyond that of minimum Windows Server 2003 requirements

Understanding Network Printing

- User sends job to local printer
 - Job is spooled on local computer
 - Directed to specific port, e.g., LPT1
- User sends job to network printer
 - Print client generates a print file
 - Print file is rendered
 - Print job is spooled on client machine
 - If print server ready, remote provider at client transmits spooled file to the Server service
 - Server service spools file at print server
 - Print monitor sends it to the printer

Installing and Sharing Printer Resources

- The following sections discuss:
 - Installing a local printer
 - Sharing printers for access to network users
 - Connecting to an existing network printer

Adding a Printer as a Local Device

- Smaller networks may share print devices connected directly to a local port
- Need administrator privileges to install
- Use Add Printer Wizard for Windows Server 2003, configuration options include:
 - Make, model, driver, port, default status, sharing
- Printers can be detected by Plug & Play or manually configured

Adding a Printer as a Local Device (continued)

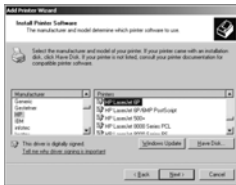


Figure 8-2 Manually configuring a printer



Figure 8-3 Configuring printer port settings

Adding a Printer as a Network Device

- Print device can be installed as a network device rather than directly connected to local print server
 - Will communicate via TCP/IP (or other protocol)
 - Add Printer Wizard also used to install a print device on the network
- Primary difference in configuration
 - Create a new TCP/IP port rather than using local port using the Add Standard TCP/IP Printer Port Wizard

Configuring and Managing Printer Resources

- Initial configuration of a printer done at installation through Add Printer Wizard
- Additional configuration can be done through Properties of installed printer

Printer Permissions

Table 8-1 Printer permissions

Permission	Description
Print	Allows connection to a printer, printing of documents, and editing a user's own print jobs; the Everyone group has this permission by default
Manage Documents	Allows all of the Print permissions with the addition of controlling document print jobs for all users; the Creator Owner group has this permission by default
Manage Printers	Allows all of the Print and Manage Documents permissions and also allows sharing, modification, and deletion of printers and their properties; the Administrators, Print Operators, and Server Operators have this permission by default
Special Permissions	Much like NTFS special permissions these provide a more granular level of control over printer security including: controlling user ownership of a printer, viewing printer permissions, and changing printer permissions

Printer Pools and Priorities

- A printer pool is a single printer connected to a number of print devices
 - Multiple physical print devices function as a single logical printer
 - High-volume environments
 - Reduced printing time
- Configured on Ports tab of printer's Properties

Printer Pools and Priorities (continued)



Figure 8-12 Enabling printer pooling

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Printer Pools and Priorities (continued)

- The priority of a printer is set from the Advanced tab of the printer's Properties
- Priority is a number from 1 (lowest) to 99 (highest)
- To ensure that a specific user always has the highest priority, allow only that user access to the highest priority printer

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Printer Pools and Priorities (continued)



Figure 8-13 Printer priority settings

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Setting Up Priorities

- Create 2 printers – share each one – connect each to the same physical device
- Change the priority on one of the printers – set it to a number higher than 1 (1 is lowest priority)
- Change the permissions on the high priority printer to only allow high priority users to print to the printer
- Connect the high priority users to the high priority shared printer – connect all other users to the ‘other’ printer share

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Setting Up and Updating Client Computers

- After printer is installed and configured
 - Set up client computers to print to the print server
- Clients running Windows 2000, Windows Server 2003, or Windows XP automatically download print driver upon connection
- Windows 95, 98, ME and NT 4.0 download if available, otherwise can be manually added
- Older Windows versions and non-Windows must have print driver manually installed

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Managing Print Queues

- Print jobs are queued while waiting for an available printer to be ready
- To view print queue, double-click the printer icon in the Printers and Faxes tool
- Users with Print permission can pause, resume, restart, or cancel printing of their own documents
- Users with Manage Documents permission can pause, resume, restart or cancel printing of other users’ documents

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Internet Printing Protocol

- The Internet Printing Protocol (IPP) specification allows printers to be managed via a Web browser
 - URL of the form `http://printservername/printers`
- IPP support is build into Windows Server 2003 but requires Internet Information Services (IIS)
 - IIS not installed by default

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Internet Printing Protocol (continued)

- Clients running Windows 2000, XP and Server 2003 can connect to existing printers using Web interface or Add Printer Wizard
 - Add Printer Wizard URL is `http://printservername/printers/printername/.printer`

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Internet Printing Protocol (continued)

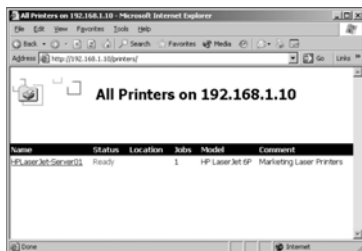


Figure 8-16 Web-based printer management

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Internet Printing Protocol (continued)

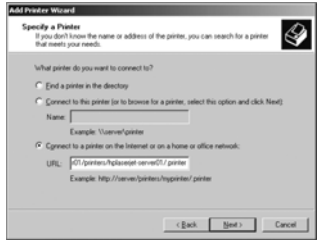


Figure 8-18 Specifying a URL in the Add Printer Wizard

Internet Printing Protocol (continued)

- Benefits of using IPP
 - Simplifies administrative management of printers from any system on the network
 - Does not require printers to be installed on local client system
 - Can print to other locations over the Internet, allows users access to remote printers

Printer Command-Line Utilities

- Windows Server 2003 provides a number of built-in VBScript files
 - Allow printers to be managed from command line
- Because the utilities are VBScripts, they must be invoked using Windows Script Host (WSH)
 - Command-line version is cscript.exe

Printer Command-Line Utilities (continued)

- Example command to display current configuration of a printer named HPLaserJet-Server01
 - `cscript prncnfg.vbs -g -p hplaserjet-server01`

Print Spooler

- Jobs are spooled on the hard disk of the print server by default
- For Windows Server 2003, spooling occurs in the `WINDOWS/system32/spool/PRINTERS` folder by default
 - Not optimal for high-volume printing because it is located in the same volume as the Windows operating system files

Print Spooler (continued)

- For best performance
 - Move the print spool folder to a different partition
 - On a dedicated disk optimally

Publishing Printers in Active Directory

- Shared printers can be published into Active Directory to help users find network printer resources
- Windows 2000- and Windows Server 2003-compatible printers installed on a domain print server are automatically published
 - On earlier Windows versions, can be published manually
 - Use VBScript pubprn.vbs to automate process

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Troubleshooting Printer Problems

- Print jobs will not print
 - Ensure printer is online, there is enough disk space for spool folder, not out of paper
- Printer output appears garbled
 - Ensure that you have the correct drivers
- Users receive an Access Denied message when attempting to print
 - Review and correct permissions

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Troubleshooting Printer Problems (continued)

- Users cannot find an existing printer when searching Active Directory
 - Ensure printer is published
- Printer only works at certain times of the day
 - Change printer availability or direct user to a different printer
- Windows 95/98/ME users cannot connect to a printer
 - Make required drivers available

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Troubleshooting Printer Problems (continued)

- Print jobs become stuck in the print queue
 - Restart from the print server
- Print device failure
 - Redirect print jobs if necessary

Summary

- Components of a printing system include print devices (local and network), printers, print drivers, print servers, print clients
- A printer is a configurable object that controls the connection to a print device
- Main tool for installing printers is the Add Printer Wizard
- Printer configuration options can be modified through the Properties of the printer

Summary (continued)

- Printer permissions include:
 - Print, Manage documents, Manage printers, Special permissions
- Printer priorities can be set from 1 to 99
- A printer pool is a single printer connected to a number of print devices
- A print queue contains jobs that are waiting to print
 - Can be managed by users with appropriate permissions

Summary (continued)

- Alternatives to managing printers via the Printers and Faxes tool:
 - Internet Printing Protocol
 - Printer command-line utilities (VBScripts)
- Spool folder should be located carefully
- Shared printers can be published into Active Directory for ease in locating appropriate features
- Common printer problems and standard fixes are used for troubleshooting
