



Technical Overview of Print Services

Microsoft Corporation

Published: July 2002

Abstract

Printer sharing, information retrieval, and data storage are among the most frequently used network services no matter the size of the business or organization. Microsoft® Windows® Server 2003 contains enhancements for many of the print features delivered with Windows 2000 to ensure enterprise grade reliability, manageability, security, and agility for print services. This technical overview outlines the features and benefits provided by Print Services in Windows Server 2003 and discusses key improvements in print server manageability.

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Introduction

Printer sharing, information retrieval, and data storage are among the most frequently used network services no matter the size of the business or organization. Microsoft® Windows® Server 2003 contains enhancements for many of the print features delivered with Windows 2000 to ensure enterprise grade reliability, manageability, security, and agility for print services. This technical overview outlines the features and benefits provided by Print Services in Windows Server 2003 and discusses key improvements in print server manageability.

What's In This Article

Topics covered in this article include:

- [Benefits](#)
- [New Features and Improvements](#)
- [Key Improvements in Print Server Manageability](#)
 - [Centralized Printer Configuration](#)
 - [Printer Scheduling and Access Controls](#)
 - [Managing Print Drivers](#)
 - [Driver Distribution](#)
 - [Scripting Support](#)
 - [Device Support](#)
 - [Clustering](#)
 - [Easy to Install](#)
 - [Active Directory Integration](#)

Benefits

The Windows Server 2003 family provides the following print system benefits:

Benefit	Feature
Reliability	<ul style="list-style-type: none">• Increased reliability with print driver control• Performance improvements for spooling on heavily loaded servers• Mission-critical applications are highly available and scalable• Print cluster driver installation propagates to all nodes automatically
Manageability	<ul style="list-style-type: none">• Enhanced print server setup for clustering• Windows Management Instrumentation (WMI) Print Provider• More secure Spooler service• Universal print driver versioning• Kernel-mode driver blocking (on by default)• Performance improvements for Terminal Server• Printer redirection
Internet Enabling	<ul style="list-style-type: none">• More secure “point-and-print” for Internet printing
Best for New Devices	<ul style="list-style-type: none">• Greater device support—over 3,800 printer devices are supported• High-end color printer support (Unidrv Color PCLXL)• USB 2.0 support
Availability	<ul style="list-style-type: none">• Automatic restarting of the Spooler service• Customizable to meet individual IT needs

New Features and Improvements

The Windows Server 2003 family provides many enhancements to the print system infrastructure. The features and descriptions listed in the following table provide a general overview of what's new and improved in Print Services for Windows Server 2003.

Improved Printing Features

Feature	Description
Command-line Interface	Windows Server 2003 provides new and expanded command-line functionality for many print management tasks, including: extending printer management and configuration, job and queue control, port management, and driver management.
Print Cluster Support (Enterprise & Datacenter Editions only)	This new feature in Windows Server 2003 improves productivity by making it easier to install print drivers on server clusters. When installing a printer driver on a virtual cluster, Windows Server 2003 automatically propagates the driver to all nodes of the cluster.
64-Bit Printing Support	A new feature in Windows Server 2003 is support for 64-bit drivers and applications. "Point-and-print" provides client-server printing support for interoperability of 32-bit to 64-bit clients and servers.
Wide Range of Devices	Windows Server 2003 improves connectivity with built-in support for more than 3,800 printer drivers.
Reliability Improvements	Windows Server 2003 increases the reliability of print servers by providing kernel mode driver blocking. This gives administrators fine grain control of driver installation on the server.
Active Directory Enhancements	By publishing printers in Active Directory® directory service, you enable users to quickly locate and connect to printers based on criteria such as location, ability to print color, or the speed of the printer.
Performance Improvements	Windows Server 2003 improves performance over Windows 2000 by optimizing file spooling (read/write from disk) for higher print volume management. Users benefit by getting their documents faster.
Plug and Play Enhancements	Windows Server 2003 improves your productivity by recognizing and adapting to hardware configuration changes automatically.
Easier Printer Management	You can easily monitor the operations of local and remote printers. With System Monitor you can control counters for a variety of criteria, such as: bytes printed per second, job errors, or total pages printed.

<p>Increased Performance for Network Printing</p>	<p>Standard Port Monitor, Microsoft's primary method for fast and robust printing to network attached printers, has been updated to provide better performance and richer device status.</p> <p>Windows Server 2003 also includes wireless (802.1X, Bluetooth) printing support. In addition, print drivers are downloaded automatically when client computers connect to print servers, a benefit that simplifies printing across a network and saves time.</p>
<p>Security Enhancements</p>	<p>Two new group policies have been added to provide tighter security control of the print environment. These include a policy to prevent managed clients from connecting to un-trusted print servers, and a policy that prevents the print spooler from allowing client connections if the server is not providing print services</p>
<p>Broad Interoperability</p>	<p>Using AppleTalk, LPR/LPD, and IPX protocols, Windows print servers can accept jobs from other client operating systems such as Macintosh, UNIX, Linux, or Novell. Conversely, Windows-based client computers can print to servers running other operating systems.</p>

Key Improvements in Print Server Manageability

Key improvements in print server manageability for Windows Server 2003 include:

Centralized Printer Configuration

By providing print services through a Windows print server, administrators can control the availability of print devices by using appropriate change control management, high-availability practices, and so on. Administrators can set default printing behavior to enable users to use the advanced features of print devices without having to understand printer configurations. Additionally, settings such as “duplex by default” represent a cost-saving opportunity for businesses of all sizes.

Printer Scheduling and Access Controls

To manage print device resources, administrators can use printer scheduling and access controls to manage print access, priority and load distribution. For example, an administrator can create two printers for the same device: configuring one to take print jobs all day, and configuring the second printer to accept jobs only during off-peak hours. Large batch print jobs can be set to use the second printer throughout the day, (those jobs will simply queue up until they can be printed) with minimal impact on the normal printer requirements of other users.

Managing Print Drivers

Windows Server 2003 maintains the same blocking functionality for ‘known-bad’ drivers that was introduced with Windows 2000, and adds to that the ability to block ‘known-bad’ user mode drivers. A new policy introduced with Windows Server 2003 provides an administrator with the ability to control whether kernel mode printer drivers can be installed. By default, kernel mode drivers are set to “disallowed” on Windows Server 2003.

Driver Distribution

Windows point-and-print provides seamless distribution of drivers and settings to a wide range of clients. In addition, Windows 2000- and Windows XP-based clients provide rich support for automatic settings updates, driver version updates and more.

Scripting Support

WMI Print Provider for Windows Server 2003 provides very rich scripting support. Printer information can be gathered, manipulated and used to re-create (or clone) printers and settings on new or existing servers. The Windows Server 2003 Resource Kit contains more information about the WMIC console, support and features.

Note The Microsoft Windows Management Instrumentation Command-line (WMIC) is a command-line interface to Windows Management Instrumentation (WMI).

In-box Scripts

Six in-box scripts for command-line/GUI-less management include:

- Prnqctl—pause, resume, purge and print test page

- Prnport—enum, add, remove tcpmon ports
- Prnmngr—add, remove, list printers and connections
- Prnjobs—pause, resume, cancel, list jobs
- Prndrvr—enum, add, remove drivers
- Prncnfg—set printer config (share, location, name, etc)

Device Support

Device support is outstanding in Windows Server 2003. In addition to covering the top Windows 95 drivers, Windows Server 2003 includes additional enterprise printer model drivers and introduces PCL-XL color functionality in the core printing engine—Unidrive.

Clustering

Installing printers on a cluster is much simpler and faster with Windows Server 2003. In addition to propagating printer port information, Windows Server 2003 delivers automatic distribution of printer drivers from the cluster spooler resource to all member nodes of the cluster. This cuts down on new deployment effort by approximately 30%.

The following are new clustering features in Windows Server 2003:

- IA4 clustering support
- Up to 8 nodes supported
- Consolidated print driver management (only install drivers once)
- Majority node set quorum
- Reduces shared disk requirements (no quorum partition is needed)
- Terminal Services and printer server clusters can now co-exist on the same nodes

Note Clustered print servers will still need shared storage for spooler resources. Shared storage is always required for virtual servers.

Requirements for Print Clusters

Clustering in Windows Server 2003 has similar requirements to Windows 2000 clustering. Windows Server 2003, Enterprise Edition and Datacenter Edition include support for clustering, and both support up to eight node clusters.

IA64 clustering is new in Windows Server 2003 and supports up to four nodes in the Enterprise Edition. Shared storage SCSI support is also available on the Enterprise Edition for two nodes.

See Figure 1 below to find out what the requirements are for Windows Server 2003 print clusters.

Operating System	Number of Nodes	Storage Interconnect
Enterprise Edition (x86)	2	SCSI or Fiber Channel (FC-AL and FC-SW)
Enterprise Edition (x86)	>2 nodes	Fiber Channel (FC-SW)
Datacenter Edition (x86)	2 - 8	Fiber Channel (FC-SW)
Enterprise Edition (ia64)	2 - 4	Fiber Channel (FC-SW)
Datacenter Edition (1a64)	2 - 8	Fiber Channel (FC-SW_)

Figure 1. Requirements for Windows Server 2003 print clusters

Ease of Installation

Standard TCP/IP Port Monitor (SPM) brings a new level of ease and efficiency to installing network printer ports. SPM provides a detailed status of printer events through a Web-based interface from any Internet-connected client. In addition to detailed status, SPM allows for more accurate error reporting such as “paper out,” as compared to the limited print error messages enabled by port monitors such as line printer remote (LPR).

The WMI interface in Windows Server 2003 provides powerful capabilities for installing and configuring printers remotely and via scripts.

Active Directory Integration

The integration of Print Services with Active Directory means that users can go to a limited set of print servers and browse for a printer that best meets their needs. Using logical and standard server and printer naming conventions will maximize this benefit. Using well-developed standards for printer names, comments and location entries will provide for a very accessible and efficient printing environment.

Searching for Printers

Combining Printer Location Tracking—a feature available in Windows 2000—and Windows Server 2003 Active Directory, will allow users to search for printers based on a standard identification for buildings, cities or other specifications. Active Directory will also let users search for print devices by printer features and capabilities, such as duplex, color, or speed. By using these Active Directory and Print Services integration features, administrators can simplify troubleshooting if a problem with a particular printer or server occurs.

Summary

Windows Server 2003 replaces Windows 2000 as the premier printing platform by building on advancements in device support, protocol improvements and stability from Windows 2000. Microsoft's continued focus on greater performance and better print server manageability leads to a lower total cost of ownership.

Related Links

See the following resources for further information:

- [What's New in File and Print Services for Windows Server](http://www.microsoft.com/windowsserver2003/evaluation/overview/technologies/fileandprint.asp) at <http://www.microsoft.com/windowsserver2003/evaluation/overview/technologies/fileandprint.asp>
- [Introducing the Windows Server Family](http://www.microsoft.com/windowsserver2003/evaluation/overview/default.asp) at <http://www.microsoft.com/windowsserver2003/evaluation/overview/default.asp>
- [Windows Server Family Beta 3 Technical Overview](http://www.microsoft.com/windowsserver2003/techinfo/overview/default.asp) at <http://www.microsoft.com/windowsserver2003/techinfo/overview/default.asp>
- [What's New in Storage Management](http://www.microsoft.com/windowsserver2003/evaluation/overview/technologies/storage.asp) at <http://www.microsoft.com/windowsserver2003/evaluation/overview/technologies/storage.asp>
- [Windows 2000 File and Print Services](http://www.microsoft.com/windows2000/technologies/fileandprint/default.asp) at <http://www.microsoft.com/windows2000/technologies/fileandprint/default.asp>

For the latest information about Windows Server 2003, see the [Windows Server 2003 Web site](http://www.microsoft.com/windowsserver2003) at <http://www.microsoft.com/windowsserver2003>.