

Novell NetWare® 6.5

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IPRINT ADMINISTRATION GUIDE



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iPrint Administration Guide

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About This Guide

This guide describes how to install, configure, and customize iPrint. This guide is intended for network administrators and is divided into the following sections:

- ◆ Chapter 1, “Overview,” on page 11
- ◆ Chapter 2, “Setting Up iPrint on Your Server,” on page 15
- ◆ Chapter 3, “Setting Up iPrint on Client Workstations,” on page 21
- ◆ Chapter 4, “Advanced iPrint Features,” on page 25
- ◆ Chapter 5, “Customizing iPrint,” on page 31
- ◆ Chapter 6, “Managing Your Print System,” on page 37
- ◆ Appendix A, “Configuring the iPrint HTML Interface,” on page 69

Documentation Updates

The latest documentation is available at [Novell documentation Web site](http://www.novell.com/documentation/lg/nw65). (<http://www.novell.com/documentation/lg/nw65>)

Documentation Conventions

In this documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

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1

Overview

This section will help you understand the following:

- ◆ [What is iPrint?](#)
- ◆ [Understanding the iPrint components](#)
- ◆ [“iPrint Solutions” on page 12](#)
- ◆ [What’s new in this release of iPrint](#)

What is iPrint?

iPrint lets mobile employees, business partners, and customers access printers from a variety of remote locations using existing Internet connections. Whether users are located in an office building, telecommuting from home, or attending a sales meeting in another country, iPrint ensures that they can print documents quickly, easily, and reliably.

Using a Web browser, users point to a Web page that displays the available printers. By clicking a printer, the iPrint client is installed (if not installed previously), the printer’s driver is downloaded, and a printer is created in the user’s Printer folder, enabling the user to send documents to the printer from any application on the desktop.

Using iPrint, mobile users no longer have to contact a busy network administrator to find out a printer’s name and context and the required print driver. Instead, mobile users work within a Web browser to locate nearby printers and download and install the latest print drivers. Companies can reduce communication costs by reducing the need to fax documents between offices. Instead, companies can use their existing Internet connections to print documents to remote printers.

iPrint Uses Industry Standards

iPrint uses the Internet Printing Protocol (IPP), an industry standard, to eliminate the complexities of printing over the Internet and to make location-based printing a reality.

The benefits of IPP include the following:

- ◆ Uses the IP protocol
- ◆ Provides broad vendor support
- ◆ Works over local networks and the Internet
- ◆ Provides for print data encryption (SSL, TLS)
- ◆ Provides a standard print protocol for all platforms (Windows*, Macintosh*, Linux*, UNIX*, etc.)

For more information about IPP, see the documents available at the [Printer Working Group \(http://www.pwg.org/ipp/index.html\)](http://www.pwg.org/ipp/index.html) Web site.

iPrint Benefits

In addition to the benefits of IPP, Novell's implementation of iPrint adds the following value:

- ◆ Print driver download and installation
- ◆ Location-based printing
- ◆ Browser-enabled print interface
- ◆ Customizable user interface
- ◆ Secure information transfer

For secure printing needs, iPrint integrates with Novell® eDirectory™ to ensure that only authorized users can access the printer. Users are required to authenticate with their eDirectory username and password. Print data is also encrypted to ensure that sensitive print data is kept secure and unaltered.

iPrint Component Overview

Novell iPrint utilizes the NDPS® infrastructure. iPrint enhances the users' experience by providing a Web view of their printing environment. In addition to NDPS, iPrint uses the following components:

- ◆ A print provider and a set of browser plug-ins.
These are installed on a user's workstation. The Novell Client™ is not required.
- ◆ Ippsvr.nlm. This runs on the NetWare® server.
When an eDirectory Printer object is configured as an iPrint printer, the Print Services Manager automatically loads this NLM™ on the server, which generates a URL for the printer.
- ◆ A set of HTML pages.
These are provided to install the iPrint client software and printers as well as to view and manage print jobs. These pages are customizable. For more information, see [Chapter 5, "Customizing iPrint,"](#) on page 31.

After setting up iPrint for your network, it easily expands to support the following scenarios.

iPrint Solutions

Printing across the Internet

John is an employee working at home who wants to send a document to a printer at his office. John does not want to dial into the company's network, but he has access to the Internet.

1. John points his Web browser to the company's print URL, <http://Printing.MyCompany.Com/443/ipp>.
2. From the Web page, John selects the printer to install. The iPrint client is automatically downloaded and installed on his computer. The printer driver is also downloaded and the printer installed in his computer's Printers folder.
3. From any application on his home computer, John can now print to the company's printer.

Mobile Users

Gail is visiting her company's branch office in Paris. She needs to print a handout for an upcoming meeting. Gail knows she can print to the branch office printer, even though she does not know the printer's name, eDirectory context, make, model, or required print driver.

1. Gail connects her laptop to the company network, clicks the iPrint link on the company's intranet Web page, and then clicks a link for the branch office she is visiting. A map of the branch office and iPrint printers displays.
2. Gail locates the office she is using and clicks the icon for the printer just outside her office.
3. The print driver is downloaded and a printer is created in the her laptop's Printer folder. She didn't need to install the iPrint client software again because she had used iPrint previously at a different branch office.
4. From her application, Gail prints her handouts for the upcoming meeting.

Printing Instead of Faxing

Dan has just returned to his hotel room in Chicago after visiting with some clients. While checking his e-mail, he is reminded that he needs to submit a report to his boss in the corporate office in New York. The report is due by 8 a.m. Although he could send the report by fax, he wants a high-quality printout in color and he does not want to incur long distance telephone charges.

1. Dan uses his laptop to dial in to a local Internet Service Provider.
2. Using his Web browser, Dan accesses the company's intranet Web page. Using the iPrint map pages, he locates an iPrint color printer adjacent to his boss' office.
3. After downloading and installing the print driver, Dan uses his application to send the report to the printer.
4. Dan returns to the iPrint Web page and clicks the printer again to display printer management options. He monitors the printer job list to see that his print job is completed.
5. Dan sends an e-mail to his boss telling him that the report is available at the printer.

What's New

The following features have been added to NetWare 6.5:

iPrint Map Designer

- ◆ Multiselect printer icons and simultaneous property modifications.
- ◆ Set print driver default properties such as paper size, orientation, color, collate, etc.
- ◆ Set an attribute on a printer so that after it is installed, the printer is removed from the workstation upon the next reboot.
- ◆ Obtain a list of printers from the Print Services Manager without having to authenticate.

Novell iManager

- ◆ View and manage retained print jobs
- ◆ Remove or set holds on print jobs.
- ◆ Move printer agents to a different Print Services Manager.

- ◆ Load and unload the Print Services Manager and Broker from iManager.

Additional management screens have been added to iManager such as printer settings, and editing gateway load strings.

- ◆ Display SNMP traps from the Novell Gateway.

iPrint Client

- ◆ Install printers from the command line.
- ◆ Capture LPT ports and redirect print jobs to an iPrint printer using the `icapture.exe` command or LPT Port Redirection Windows utility.
- ◆ Install printers on a Windows NT/2000/XP workstation without having PowerUser or Administrator rights.
- ◆ Set a proxy server for iPrint.
- ◆ Redesigned default page.

See http://server_IP_address_or_dns_name:631/IPP.

General iPrint Enhancements

- ◆ You can bind to network interface cards other than the primary card for the Broker and its services.
- ◆ A command line switch, `/NOADVERT`, has been added to the Broker to turn off SRS advertising.
- ◆ The Print Services Manager database does an automatic backup five minutes after the creation of a Printer Agent.
- ◆ A command line switch, `/NOSRS`, has been added to the Print Services Manager to turn off SRS advertising.
- ◆ You can shut down and restart a printer agent using the Print Services Manager Health Monitor in NetWare Remote Manager.
- ◆ You create reports about your print system using the Print Services Manager Health Monitor in NetWare Remote Manager.
- ◆ You must authenticate before accessing the Print Services Manager Health Monitor.
- ◆ LPT Port Redirection utility lets you capture LPT ports to iPrint printers.
- ◆ User Printers lets users who share a workstation install specific printers that only they can use.
- ◆ The Novell Gateway is the default gateway when creating a new Printer.
- ◆ You can load and unload the Broker or Print Services Manager from Novell iManager.

What's Next

- ◆ “iPrint Setup Requirements” on page 15
- ◆ “Setting Up DNS for the Print Services Manager” on page 16
- ◆ “Configuring iPrint” on page 19

2

Setting Up iPrint on Your Server

Complete the following tasks to create an iPrint print system:

1. [Meet iPrint system setup requirements.](#)
2. [Install iPrint](#) (if not already installed).
3. [Set up DNS for the print manager.](#)
4. [Configure iPrint.](#)

iPrint Setup Requirements

Before you set up iPrint, you should complete the following:

- Set up DNS:** When you create an iPrint printer, a URL is associated with the printer. If DNS is not setup for printing, the URL will contain the server's IP address.

For more information about DNS, see, "[Setting Up DNS for the Print Services Manager](#)" on [page 16](#).

- Create a Broker:** A broker provides three network support services: [Service Registry Service](#), [Event Notification Service](#), and [Resource Management Service](#). The resource management service is a provides storage for printer drivers that are automatically downloaded and installed on client workstations.

For more information, see "[Creating a Broker](#)" on [page 17](#)

- Install a Print Services Manager:** A print services manager

For more information, see "[Creating a Print Services Manager](#)" on [page 17](#)

- Create Printer Objects:** Printer objects represent the printer in eDirectory and are associated to a printer agent that combines the functions previously performed by a printer, print queue, print server, and spooler.

For more information, see "[Creating a Printer](#)" on [page 18](#)

- Novell iManager** provides browser-based management of Novell eDirectory™. For more information, see the .

For information on Client requirements, see "[Client Requirements](#)" on [page 21](#).

Installing iPrint Software

If iPrint was selected during the during the NetWare® NetWare 6.5 installation, the iPrint software components were automatically installed on the server. If iPrint was not selected during the installation, you need to install the iPrint software.

- 1 From the GUI screen on the server, click Novell > Install.

- 2** (Conditional) If an entry does not exist, click Add.
If an iPrint entry is listed, iPrint is already installed.
- 3** Insert the *NetWare 6.5 CD 2 (Products)* CD into the drive.
- 4** Browse to the `product.ni` file at the root of the CD.
- 5** Follow the installation prompts to install iPrint.

Setting Up DNS for the Print Services Manager

Prior to configuring printers for iPrint, you should configure a DNS name for each print services manager. When iPrint is enabled for a printer, a URL is generated based upon the Print Services Manager's IP address or DNS Name.

For example, if the Print Services Manager's DNS name is `Printing.MyCompany.Com` and the printer name is `Printer1`, then the URL is `ipp://Printing.MyCompany.Com/ipp/printer1`. If no DNS name is associated with the Print Services Manager, the URL would be `ipp://111.222.333.444/ipp/printer1`.

By using a DNS name, you can change an IP address without affecting a printer's URL. If a printer's URL changes, users have to delete and reinstall their printers.

To correctly enable DNS for each print services manager, you must complete the following tasks:

1. [Add the DNS Name to the DNS Namer Server](#)
2. [Enable NS on the Print Services Manager](#)

NOTE: If DNS is not set up for the print services manager and the manager is moved to another server, users will have to reinstall their iPrint printers.

If a DNS name is added to the print services manager after iPrint is set up, iPrint printers enabled before DNS will not use the DNS name until the manager is restarted.

If users install printers before the DNS name is added, their printing will work only until the IP address of the print services manager changes. Then users will have to reinstall their printers.

Adding the DNS Name to the DNS Name Server

After you enable the DNS name on the print services manager, you need to add the DNS name to your DNS name server. For more information, see the [Novell DNS/DHCP Management Utility Administration Guide](#).

Enabling DNS on the Print Manager

To configure a DNS name for the print manager, use the print services manager command line startup switch, `/dnsname=DNS_name`.

Syntax

```
ndpsm Print_Manager_Object_Name /dnsname=Print_Manager_DNS_Name
```

Example

```
ndpsm PrintManager1 /dnsname=Printing.MyCompany.Com
```

where `PrintManager1` is the print services manager name and `Printing.MyCompany.Com` is the desired DNS name.

NOTE: You need to use the DNS startup switch only once. After the startup switch is used, the Print Services Manager will remember the DNS name. To change the DNS Name, use the switch with the new DNS name.

If you do not specify an IP address or DNS name when you load the Print Services Manager, the manager uses the address stored in `sys:\etc\hostname`. If either the IP address or DNS name specified on the command line or in the `hostname` file is invalid, you will receive the following error:

```
IP Address xxx.xxx.xxx.xxx, specified at load time, is not bound.  
Program execution cannot continue normally. Press Escape to continue.
```

To resolve this error, use a valid DNS name or IP address at the system console prompt or edit the `sys:\etc\hostname` file to contain a valid address.

Creating a Broker

Each eDirectory™ tree should have at least one Broker. You might want to create additional Brokers in certain situations. For example, you might want to create a Broker on a local server for each site on a wide area network (WAN). See [“Managing the Broker” on page 53](#) for information on broker placement.

- 1** In Novell iManager, click iPrint Management > Create Broker.
- 2** Fill in the fields.
Click help for explanations about the fields.
- 3** Click OK.
- 4** To autoload the Broker when you bring up the server, add the following line to your server's AUTOEXEC.NCF file:

```
load broker Broker_name_and_context
```

For example:

```
load broker .broker1.corp.acme
```

To modify the Broker properties, click Manage Broker, and then select the Broker you want to modify.

Creating a Print Services Manager

A Print Services Manager provides a platform for Printer Agents that reside on the server. An Print Services Manager must be created as an object in the eDirectory tree before you can create server-based Printer Agents.

The Print Services Manager object stores information used by the NetWare Loadable Module™ (NLM™), NDPSM.NLM. You can manually load this NLM at the server console.

A single Print Services Manager can control any number of Printer Agents.

A specific Print Services Manager can be loaded only on one server. If it controls a local printer, it must be loaded on the server the local printer is attached to.

While you can perform some configuration and management tasks directly through the Print Services Manager console interface, Novell iManager is the main tool for performing these tasks.

Ensure you have at least Read, Write, Modify, and Create rights for the container where the Print Services Manager object will be reside.

- 1 In Novell iManager, click iPrint Management > Create Print Services Manager.
- 2 Fill in the fields.

Click help for explanations about the fields.

IMPORTANT: If you move the Print Services Manager to a different server, its database will move also. As a result, local printers assigned to this Print Services Manager will no longer work. To avoid this, you can assign a DNS name to the Manager before creating Printer Agents associated to it using the / dnsname= startup switch. For more information, see [“Print Services Manager Startup Switches” on page 40](#).

Any printer you designate as a local printer when you are configuring Printer Agents assigned to this Print Services Manager must be directly attached to this server.

- 3 Click OK.
- 4 To autoload the Print Services Manager when you bring up the server, add the following line to your server's AUTOEXEC.NCF file:

```
load ndpsm Print_Manager_name_and_context
```

For example:

```
load ndpsm .sales_manager.corp.acme
```

To modify the Print Services Manager properties click Manage Print Services Manager, and then select the Manager you want to modify.

For a discussion of Access Control roles, see [“Setting Access Control for the Print Services Manager” on page 64](#).

Creating a Printer

Printers can be either *public access*, no eDirectory printer object exists, or *controlled access*, access is controlled by eDirectory. In most cases, you should make all of your printers controlled access printers as soon as possible in order to take full advantage of the management and security benefits offered by eDirectory.

Before you can create a printer, you must first have created an Print Services Manager on your server. See [“Creating a Print Services Manager” on page 17](#) for more information.

After creating an Print Services Manager, you can create printers. Printers added to the eDirectory tree by Novell iManager are referred to as controlled access printers. As eDirectory objects, access to the printers can be controlled depending on the level of security chosen and if SSL is required.

When you use Novell iManager to create an Printer Object you will need to select a gateway. The gateway handles communication between the print services manager and the printer. Most printers will work with the Novell gateway, (NDPSGW.NLM). Some printer vendors have created their own gateway to provide proprietary printer specific information. Unless you need this additional information , you should use the Novell gateway.

When you use NetWare Administrator to create a Printer object and select the Novell Gateway, the Novell gateway comprised of PH.NLM and NDPDS.NLM is used. This is the only version of the gateway that supports the RP protocol and local ports.

To use a third-party print vendor’s gateway, you must use NetWare Administrator to create the Printer object.

Prerequisites

- Have at least Read, Write, Modify, and Create rights for the destination container where its associated Printer object will reside
- Be designated as a Manager of the Print Services Manager that will control this Printer Agent
- Have a Broker running
- Have an Print Services Manager object created

Procedure

1 In Novell iManager, click iPrint Management > Create Printer.

2 Fill in the fields.

Click help for explanations about the fields.

3 Click OK.

4 Select the printer driver for each client operating system.

These drivers will be automatically downloaded to users' workstations when they install this printer in the future.

If you choose a Windows 3.x driver but not a Windows 95/98/ME or Windows NT/2000 driver, a 16-bit driver will be selected. Normally this will not create problems.

Since the list of printer drivers shipped with this product is limited, you can add drivers to the Resource Management Service database. (See [“Adding or Updating Printer Drivers”](#) on page 56 for more information.)

If the driver you need is not in the drivers list, rather than adding it to the RMS, you can select [None] at the top of each list. Users will then be asked to provide a disk with the appropriate driver the first time they install this printer on their workstations.

5 Click Continue.

Configuring iPrint

With your print system setup, you can configure iPrint printers.

- ◆ [“Using Novell iManager for Network Management”](#) on page 19
- ◆ [“Configuring iPrint Printers”](#) on page 20
- ◆ [“Other Management Tasks”](#) on page 20

Using Novell iManager for Network Management

Novell iManager is the Web-based management utility used to manage iPrint. Using iManager, you can create, delete, and modify printers, brokers, Print Services Manager and other objects.

The iPrint Management plug-in for Novell iManager works only with Internet Explorer 5.5 with Service Pack 2 or later.

Configuring iPrint Printers

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to enable IPP printing for.
- 3** Click Client Support > IPP Support.
- 4** Check the Enable IPP Access check box.

The URL that appears in the Accepted IPP URL(s) box is the URL used when the printer is created on a workstation. This is also the URL you should use when creating iPrint maps. For more information, see [“Using the iPrint Map Designer” on page 31](#).

- 5** (Optional) For secure printing, check the Require Security check box.

For more information, see [“Secure Printing Using SSL” on page 66](#).

This requires users to authenticate to eDirectory using their usernames and passwords.

- 6** To update the printer settings, click Apply or OK.

Other Management Tasks

Disabling iPrint Services

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the Printer you want to modify.
- 3** Click Client Support > IPP Support.
- 4** Uncheck the Enable IPP Access check box.
- 5** To update the printer settings, click Apply or OK.

Enabling iPrint on All Printers Simultaneously

If you have a large number of printers that you want to enable iPrint on, use this iManager task to avoid enabling iPrint on each individual Printer object.

- 1** In Novell iManager, click iPrint Management > Enable iPrint Access.
- 2** Browse to and select the print service manager you want to enable IPP printing on.
- 3** To enable all printers associated with this print services manager, check the first check box next to Enabled.

To select printers individually, check the check box next to each printer in the Enabled column.

- 4** (Optional) To enable all printers associated with this print services manager to use Secure printing, check the first check box next to Secure.

To select secure printers for specific printers, check the check box next to each printer in the Secure column.

For more information on implementing secure printing, see [“Secure Printing Using SSL” on page 66](#).

- 5** To update the printer settings, click Apply or OK.

3

Setting Up iPrint on Client Workstations

In order for users to use iPrint, they need to install the Novell® iPrint Client software and a printer. When a user selects a printer to be installed by iPrint, iPrint checks to see if the Novell iPrint Client software is installed and then installs it if necessary. Then the printer driver is downloaded and the printer is installed in the user's Printer folder.

iPrint Client files and printers can be installed from a Web page, or they can be distributed using ZENworks®. For more information, see [“Using ZENworks to Distribute iPrint” on page 22](#).

This chapter helps you with the following:

- ◆ [“Client Requirements” on page 21](#)
- ◆ [“Using the Default Printer Lists Generated by iPrint” on page 21](#)
- ◆ [“Creating Location-based Printing” on page 22](#)
- ◆ [“Using ZENworks to Distribute iPrint” on page 22](#)
- ◆ [“Uninstalling the Novell iPrint Client” on page 23](#)

Client Requirements

In order for iPrint to work properly, workstations should have the following:

- Windows 95/98/ME or Windows NT*/2000/XP

IMPORTANT: To install a printer on Windows NT/2000/XP, you must have Administrator rights or be a Power User.

- Web browser with JavaScript* enabled and
 - ◆ Microsoft Internet Explorer 5.0 or later
 - ◆ Netscape 4.76 (iPrint is not supported on Netscape 6)

Using the Default Printer Lists Generated by iPrint

To enable users to use iPrint, you must give them the iPrint URL, which is `http://server_IP_address_or_dns_name:631/IPP`.

For example, if the DNS name is `printing.mycompany.com`, then the user would access IPP from the following URL:

`http://printing.mycompany.com:631/ipp`

If users need to print through a secure port using SSL, they should use port 443. This requires users to authenticate using their eDirectory™ usernames and passwords. Using the above example, this URL would be the following:

<https://printing.mycompany.com:443/ipp>

From a Netscape or Internet Explorer browser, users enter the URL provided. A Web page displays a listing of available printers they can install and a link to install the client software. Users should select Install iPrint client software to install the client pieces required. If they try to install a printer before installing the iPrint client software, they are prompted to install the client software first.

If you associate a printer driver with a printer being installed, the driver is automatically installed on the user's workstation. If the driver already exists, that driver is overwritten even if it is a newer driver.

After installing a printer, it is added to the user's Printer folder. Users can print to the printer by selecting it from any application. For more information on using Resource Management Systems to distribute and update printer drivers, see [Appendix C, "Configuring Remote Printers," on page 95](#).

Creating Location-based Printing

Location-based printing lets users select printers based on location by using a list view or a map. Using a list view, printer locations can be displayed by building, office location, eDirectory context, etc. You can configure the lists in a way that best suits the users' needs.

For more information, see ["Creating Printer Lists" on page 34](#).

Using the iPrint Map Designer, you can create maps of printer locations by using drag-and-drop technology. Once the maps are created, they can be posted on a Web server for users to access. As users view the maps, they find a printer close to their location and then click its icon. The client software (if not yet installed) and the printer are installed on their workstation.

For more information, see ["Using the iPrint Map Designer" on page 31](#).

Using ZENworks to Distribute iPrint

You can use ZENworks to distribute the Novell iPrint Client and printers to users' workstations. You take a snapshot of a workstation before installing the client and another snapshot after. ZENworks creates a list of files to install and makes the necessary changes to the Windows Registry.

You could also use ZENworks to install an HTML file on the users' workstations that would take them to your iPrint Web site. This would save you from having to distribute a URL to your users. Many other implementations are at your fingertips depending on your specific needs. For more information on using ZENworks, see the [ZENworks online documentation \(http://www.novell.com/documentation-index/index.jsp?category=ZENworks\)](http://www.novell.com/documentation-index/index.jsp?category=ZENworks).

Auto-client Update

Periodically, users will need to update their Novell iPrint client. When a user boots his machine, iPrint checks the default printer to ensure the user is using the latest Novell iPrint Client. When needed, a newer client is installed. Using a configuration file, you can control how this update takes place.

An `iprint.ini` file is located in `sys:\apache2\htdocs\ippdocs` on each server where iPrint is installed. This file controls whether the user should be prompted before the updated client is installed or the

updated client is installed without user intervention. When the client is installed without user intervention, the user will still see the installation program.

Using a text editor, edit the `iprint.ini` file to reflect the settings you want. Information on the different settings is contained in the file.

IMPORTANT: The `iprint.ini` file should be synchronized across all servers where iPrint and a Print Services Manager are running.

Saving Passwords for Secure Printers

When users print to a secure printer, they are prompted for the eDirectory username and password. Users can select to have their workstations remember their password for printing. For Windows NT/2000 users, passwords are saved on a per-user basis.

By default, the Remember Password feature is enabled. To disable it, use a text editor to edit the `sys:\apache2\htdocs\ippdocs\iprint.ini` file to reflect the settings you want. Information on the settings is contained in the file.

IMPORTANT: The `iprint.ini` file should be synchronized across all servers where iPrint and a Print Services Manager are running.

Uninstalling the Novell iPrint Client

To remove the Novell iPrint Client, use Remove Programs option in the Windows Control Panel, or use the uninstall program that is available under the Novell iPrint program group in the Start menu.

WARNING: When you uninstall the iPrint client, all iPrint printers are removed from the workstation.

4

Advanced iPrint Features

The following iPrint features will help you to install and configure printers.

- ◆ “Using Novell iCapture LPT Port Redirector Utility” on page 25
- ◆ “Using a Proxy Server” on page 25
- ◆ “Using DOS Commands” on page 26
- ◆ “Installing User Printers” on page 27
- ◆ “Setting Printer Persistence” on page 27

Using Novell iCapture LPT Port Redirector Utility

Novell iCapture LPT Port Redirector lets you capture LPT ports and redirect the output to iPrint printers. Novell iCapture is installed when you install the iPrint Client. Before using the LPT Port Redirector, you must have iPrint printers installed on the workstation and the Print Services Manager and Printer Agents must be up and running.

To run the utility:

- 1** Click Start > Programs > Novell iPrint > iPrint Settings > iCapture.
- 2** Select the port you want to capture.
- 3** Click Select Printer, select the iPrint printer you want, then click Capture.

If the printer you want is not listed, check to see that the printer agent is up and running and that the printer has been installed as an iPrint printer.

- 4** Click Close.

You can use the LPT Port Redirector to also end a printer capture by selecting a port and clicking End Capture.

IMPORTANT: Existing port assignments are not displayed, and iPrint port assignments will supersede all other port assignments. iPrint port assignments remain in effect, even after the workstation restarts, until you end the capture.

Using a Proxy Server

You can configure workstations to submit iPrint print jobs through a proxy server using the Proxy Server setting in iPrint Settings. Proxy servers are sometimes needed when you are trying to access network services through a firewall.

- 1** Click Start > Programs > Novell iPrint > iPrint Settings > Proxy.
- 2** Click the check box to use a proxy server, and enter the URL for the proxy server.
- 3** Click OK.

To disable using a proxy server, uncheck the check box.

Using DOS Commads

Using Icapture.exe to Capture Printer Ports

Icapture.exe is a DOS command line utility that lets you capture LPT ports and redirect the output to iPrint printers. The utility is installed when you install the iPrint Client, and it can be used a DOS-box command line, called from a batch files, or called from a login script.

IMPORTANT: Icapture.exe requires that the iPrint printer be installed before the command is run. You can install a printer from the DOS command line using [iprintcmd.exe](#).

Use the following parameters when executing the icapture.exe command.

Parameter	Description
LPTx or L=x where x is the port number	The port you want to capture.
P= <i>printer_name</i>	The name of the printer that appears in the Printers Folder after the iPrint printer is installed.
EndCap	Ends the capture to the specified port. NOTE: Captured ports remain captured, even through a workstation restart, until you end the capture.
Show	Displays status of currently captured ports and their associated printers.

For example, to capture a printer named Printer1 to port number 2, you would enter the following:

```
icapture l=2 p=printer1
```

or

```
icapture lpt2 p=printer1
```

To end the capture you would type the following:

```
icapture endcap l=2
```

or

```
icapture endcap lpt2
```

Using Iprntcmd.exe to Install iPrint Printers

If you need to install an iPrint printer but cannot use a Web browser, you can use the iprintcmd.exe command at a DOS prompt. The iprintcmd.exe command can install, remove, or set a printer as the

default printer. This command is most often used in login scripts in conjunction with the [icapture.exe](#) command. Use the following parameters when executing the [icapture.exe](#) command.

Parameter	Description
add	Installs the specified printer.
remove	Removes the specified printer.
temporary	Installs the specified printer for this session only. When the workstation is rebooted, the printer is removed.
default	Sets the specified printer as the default.

Syntax

```
iprintcmd iprint_printer_url options
```

Example

To install a printer and set it as the default printer, you would enter the following:

```
iprintcmd http://printing.mycompany.com/ipp/Colorprinter /add /default
```

Installing User Printers

Typically, when users install an iPrint Printer on Windows NT/2000/XP, they need to have Administrator or Power User rights to install the printer and driver. User Printers allows users to install a printer without having those rights, but that printer is available only to that individual user when he logs on to Windows.

NOTE: To install the iPrint client you must have Administrator or Power User rights.

For example, three workers — Albert, Juan and Carla — share the same computer during the day. Albert prints to an accounting printer, Juan prints to a plotter, and Carla prints to a printer in the CEO's office. Using User Printers, each worker can install the printer they need but will not see printers installed by the other users.

To configure User Printers, edit the `iprint.ini` file located in the `sys:\apache2\htdocs\ippdocs` directory of the server where the iPrint html pages are installed by changing the value for the `AllowUserPrinters = entry`. The `iprint.ini` file contains information about the different possible values for this entry.

Setting Printer Persistence

You might want printers to remove themselves automatically from a workstation. For example, if you have a printer in your lobby for customers to use, you would want the printer to be removed from the customer's laptop when the customer leaves. Setting the persistence of the printer lets you automatically remove the printer when the customer reboots his laptop.

To use Printer Persistence, you must use the iPrint Map Designer where you can specify a printer's default settings and set the persistence of a printer. The following table shows the different settings

for persistence. For more information on the iPrint Map Designer, see [“Creating Location-based Maps with iPrint Map Designer” on page 31](#).

Option	Description
persistent	Printer will not be removed.
volatile-reboot	Printer will be removed when the workstation reboots.
volatile-date-time	Printer will be removed at the indicated time. Use the numerical format of year, month, day, hour, minute. For example, 8:16 pm on March 2, 2004, would be formatted as 2002,3,12,20,16

Setting Up Printer Pooling

You can create a pool of printers to share the load of printing. Using this page you can add and remove printers to a pool. Users install one of the printers in the pool. When a printer in the pool has a print job waiting, the print services manager can redirect that print job to an idle printer in the pool. Printers that are included in a pool should be the same model and use the same print drivers. You can only include printers from the same print services manager in a pool.

To set up printer pooling

- 1 From Novell iManager, click iPrint Management > Printer Pooling.
- 2 Select the print services manager for this pool.
- 3 Select Create Pool from the Select An Operation list, and click Next.
- 4 Enter the name of the printer pool.

This name is only used to identify the pool within Novell iManager.
- 5 Select the printers you want included in the pool.
- 6 Click Create.

To modify or delete a pool, just follow the above steps and select the desired action from the Select an Operation list.

Using iPrint with Terminal Servers

You can setup iPrint on a terminal server to allow terminal server clients to install and print to iPrint printers.

Install iPrint Client

- 1 Log in to the terminal server with administrator or equivalent rights.
- 2 Install the iPrint client.

The iPrint client can be downloaded from the iPrint default page or by copying and executing nipp.exe from the iPrint server in sys:\apache2\htdocs\ippdocs on the iPrint.

NOTE: On terminal servers, the client auto update will not work. To update the client with a newer release, you will have to install in manually.

Configure iPrint for Terminal Server Clients

You can configure iPrint to work in one of the following ways, depending on the rights the terminal server client has.

- ♦ **Install User Printers Only:** User printers can only be installed and deleted by the user that installed the printer. User printers are not available to other users on the workstation.
- ♦ **Install Workstation Printers Only:** Workstation printers can only be installed and deleted by users with sufficient rights. After a workstation printer is installed, all users using the workstation can print to it.
- ♦ **Try to Install Workstation Printer First:** If the user has insufficient rights to install the printer, the printer is installed as a user printer.

To configure the iPrint for terminal server clients

- 1** Log in to the terminal server with administrator or equivalent rights.
- 2** Click Start > Programs > Novell iPrint > iPrint Settings.
- 3** Click Terminal Server.
- 4** Select the configuration option you want.
- 5** Click OK.

Moving Printer Agents to Another Print Services Manager

Using Novell iManager, you can move printer agents to a different print services manager.

- 1** From Novell iManager, click iPrint Management > Move Printer Agent.
- 2** Select the print services manager where the printer agent is currently located, and click Next.
- 3** Select the printer agents you want to move by checking the checkbox next to them.
- 4** Click Move, and then select the print services manager where you want the printer agents moved to.
- 5** Click Ok.

You will want to ensure that the same print drivers are available to the printer agents.

Using Print Auditing

Auditing allows administrators to see who printed how many pages to which printer on a given date. Once turned on, auditing creates a log of print jobs submitted to the print services manager. This information can be downloaded into a spreadsheet.

Enable Auditing

You will need to enable auditing for each printer you want to audit.

- 1** In Novell iManager, click iPrint Management > Enable Auditing.

- 2** Select the printers you want to enable auditing for by clicking the check box in the Auditing column.

Viewing Auditing Information

Auditing information for all printers is saved into one log file. This file can be viewed in the NDPS Manager Health Monitor or downloaded to a spreadsheet.

- 1** In NetWare Remote Manager, click NDPS Manager Health Monitor > Advance NDPS Manager Information > Internal Auditing.
- 2** Choose the action you want to take.

5

Customizing iPrint

This chapter describes how to customize iPrint for your company by using the iPrint Map Designer and modifying the HTML pages and iPrint Client interface.

- ◆ [“Setting Up Location-based Printing” on page 31](#)
- ◆ [“Customizing the iPrint HTML Interface” on page 34](#)
- ◆ [“Changing Printer Driver Default Install Options” on page 35](#)

Setting Up Location-based Printing

Using the iPrint Map Designer tool, you can quickly create a map showing printer locations. The tool lets you import floor plans that can be used to drag and drop printers to actual locations. These maps are then published on a Web server so users can install printers that are closest to their location.

Creating Location-based Maps with iPrint Map Designer

Prerequisites

- Microsoft Internet Explorer 5.5 or later
- Novell® iPrint Client installed on the workstation

Using the iPrint Map Designer

Use the iPrint Map Designer to create location-based maps using background images of your buildings. When the map is created, you must use the iPrint Map Designer to modify or update your maps. Changes to a map file that are made outside of the iPrint Map Designer are not supported. If you need to add links to a map, you should create a frameset file and then display the map file in one frame and display your links in a different frame.

- ◆ [“Creating a Map for Printing” on page 31](#)
- ◆ [“Adding Printers from Different Print Service Managers” on page 33](#)
- ◆ [“Hosting Maps on a Web Server” on page 33](#)

Creating a Map for Printing

Before creating the map, ensure the following:

- Ippsrvr.nlm must be loaded.
- All of your background images (maps) are copied to `sys:\apache2\htdocs\ippdocs\images\maps` on the server, and any custom printer icon images are copied to `sys:\apache2\htdocs\ippdocs\images\printers`.

A default set of printer icons is included.

These files are autodected by iPrint Map Designer at startup.

File types that can be used for background and printer icon images are JPEG, GIF, and BMP.

1 To start iPrint Map Designer, do one of the following:

- ◆ Using a mapped drive, open `sys:\apache2\htdocs\ippdocs\maptool.htm` in Microsoft Internet Explorer.
- ◆ Open `http://server_address:port/apache2\htdocs/ippdocs/maptool.htm` where *server_address* is the server's IP address or DNS name of the server where the printer agent is running.

If you are want to save the map to this server, you need to be authenticated to the server.

2 Select a map from the Background drop-down list.

3 (Optional) Add a printer to the map.

3a Click the printer icon and drag the printer to the desired location on the map.

3b From the printer Icon field, select the type of printer and size.

Sizes range from 1 to 6, with 1 being the largest. Icons with a C indicate color printers.

3c Next to the Printer List field, click the Browse icon and enter the IP address or DNS name of the server where the print services manager is running.

3d From the printer list, select the printer agent you want associated with this printer icon.

If the printer is not listed, then you have not enabled IPP for the printer. See [“Configuring iPrint Printers” on page 20](#) for more information.

The Printer URL and Mouse Over Text is automatically filled in with the printer agent information.

Printer URL: The URL created for the printer when IPP is enabled for the printer. You should not need to change the URL.

Mouse Over Text: By default, displays the printer agent's name. You can override this information by entering the text you want to display when a user moves the mouse over the Printer icon.

3e (Optional) In the Printer Caption field, enter the information to display, using Enter to parse the information onto multiple lines.

3f Repeat Step 4 through Step 8 to add additional printers to your map.

4 (Optional) Edit a printer's information by clicking the desired printer's icon and then editing the printer information fields.

To deselect a Printer icon while in the map, click anywhere in the design area.

5 Click Save and save the map to `sys:\apache2\htdocs\ippdocs`.

WARNING: If you click Refresh or exit Internet Explorer without saving the map, all changes made since the last time the map was saved will be lost.

To retrieve and modify an existing map file, click Open and browse to the directory where the map is located.

Adding Printers from Different Print Service Managers

You can add printers from different print services managers to the same map. First, add the printers from one print services manager. Then click the Browse icon and select a different manager.

If you need to add or modify printers from a previously used print services manager, click a Printer icon from that manager and the Printer List will be populated with printers from that manager.

Hosting Maps on a Web Server

After creating your maps, you need to post them on a Web server. Copy the contents of the \ippdocs directory and its subdirectories to the Web server in order for your maps and iPrint to work properly. You can link to your maps from your company's internal Web page or send the URL out to your users.

Modifying Printer Driver Defaults and Printer Persistence of a Map

By editing the HTML code of the map file you create, you can specify the default settings of printers in the map.

For example, if you use a specific printer for printing 8-1/2x14 documents in duplex mode, you can set the default paper size to Legal and turn on duplexing. The following procedure shows you how to make this change:

- 1 Using an editor, open the map file you created using the iPrint Map Designer.
- 2 Scroll down the file until you find the printer you want to modify.

The printer definition code will look like the following example:

```
<!-- ipp_printer_1-->
<DIV id="ipp_printer_1" style="position:absolute;left:505;top:373;" ALIGN="center">
<A name="ipp_printer_1" href="http://print.mycompany.com:631/apache2/htdocs/ippdocs/
ISINSTF.HTM?ippPrinterURL=ipp://print.mycompany.com/ipp/corporate-
hp4050n&onInstalled=status&onNotInstalled=install">
<IMG name="ipp_printer_1" src="images/printers/ple.gif" alt="CORPORATE-HP4050N" border=0></A>
<DIV ID="ipp_printer_1_caption"></DIV></DIV>
```

- 3 Edit the code using either or both of the following syntaxes:

```
&driver-options=parameter:value;
```

```
&persistence=parameter:value;
```

The resulting code will look like this:

```
<A name="ipp_printer_1" href="http://print.mycompany.com:631/apache2/htdocs/ippdocs/
ISINSTF.HTM?ippPrinterURL=ipp://print.mycompany.com/ipp/corporate-
hp4050n&onInstalled=status&onNotInstalled=install&driver-
options=papersize:legal;duplex:yes;persistence=volatile-reboot">
```

- 4 Save the file.

For more information on these settings, see [“Changing Printer Driver Default Install Options” on page 35](#) and [“Setting Printer Persistence” on page 27](#).

Using the Keyboard with iPrint Map Designer

You can use the keyboard to create maps using iPrint Map Designer. The following table lists the tasks to complete and the corresponding keystrokes required.

Task	Press
Move between fields	Tab
Insert printer icon	Insert
NOTE: Before you can insert a printer, your focus must be the design area.	
Move printer icon within the design area	Arrow keys
Select a field	Enter

Creating Printer Lists

Printer lists allow users to select printers using categories that are meaningful to them. For example, you could create a list of printers by building location, department names, eDirectory Context, etc. iPrint provides a default list of printers organized by print services manager. To create a custom list, you must use an HTML editor and create links to the printer's IPP URL. This URL is displayed when you enable IPP for a printer.

To view a printer's URL:

- 1 From Novell iManager, click iPrint Management > Manage Printer.
- 2 Browse to and select the printer you want.
- 3 Click Client Support > IPP Support.

The printer's URL is displayed under Accepted IPP URL.

Customizing the iPrint HTML Interface

You can edit any of the HTML files provided or you can create your own to customize iPrint for your environment. The HTML files are installed in the `sys:apache2\htdocs\ippdocs` directory. For information on the HTML interface, see [Appendix A, "Configuring the iPrint HTML Interface," on page 69](#).

Some examples of ways to present printers to users are located in the `sys:apache2\htdocs\ippdocs\examples` directory:

- ◆ Example 1 shows a fully graphical interface for locating and installing printers using standard HTML. This type of approach can also be created using the iPrint Map Designer. For more information, see ["Using the iPrint Map Designer" on page 31](#).

Using your Web browser, view this example from `sys:\apache2\htdocs\ippdocs\examples\example1\innerweb.htm`

- ◆ Example 2 shows a lower maintenance approach for locating and installing printers using standard HTML.

Using your Web browser, view this example from `sys:\apache2\htdocs\ippdocs\examples\example2\innerweb.htm`

Changing Printer Driver Default Install Options

You can choose the default settings for a printer driver when it is installed on the workstation. For example, in a law office you might want the default paper size to be 8-1/2 x 14. This means every time the printer and corresponding driver are installed on a workstation, the paper size is set to 8-1/2 x 14.

To set modify the printer's default settings, you must use the iPrint Map Designer where you can specify a variety of printer settings. The following table shows the different settings and corresponding values. For more information on the iPrint Map Designer, see [“Creating Location-based Maps with iPrint Map Designer” on page 31.](#)

Printer Setting	Acceptable Parameter Values
orientation	landscape, portrait
papersize	letter, lettersmall, tabloid, ledger, legal, statement, executive, A3, A4, A4small, A5, B4, B5, folio, quarto, 10x14, 11x17, note, env_9, env_10, env_11, env_12, env_14, csheet, dsheet, esheet, env_dl, env_c4, env_c5, env_c6, env_c3, env_c65, env_b4, env_b5, env_b6, env_italy, env_monarch, env_personal, fanfold_us, fanfold_std_german, fanfold_lgl_german, iso_b4, japanese_postcard, 9x11, 10x11, 15x11, env_invite, letter_extra, legal_extra, tabloid_extra, letter_transverse, A4_extra, letter_extra_transverse, a_plus, b_plus, letter_plus, A4_plus, A4_transverse, A5_transverse, B5_transverse, A3_extra, A5_extra, B5_extra, A2, A3_transverse, A3_extra_transverse
copies	The number of copies you want printed.
color	Yes indicates the printer supports color. No or false indicates that the printer is monochrome printer.
duplex	simplex, horizontal, vertical
collate	yes or true=collate no=do not collate

6

Managing Your Print System

Use the following to manage the different components of your iPrint system.

- ◆ [“Managing the Print Services Manager” on page 37](#)
- ◆ [“Managing Printers” on page 42](#)
- ◆ [“Managing the Broker” on page 53](#)

Managing the Print Services Manager

Although the default settings allow your users to print without further configuration being necessary, you will probably want to modify some of those settings so that you can manage your printing resources most effectively.

This chapter discusses the following:

- ◆ [“Using the Print Services Manager Health Monitor” on page 37](#)
- ◆ [“Optimizing Fault Tolerance” on page 39](#)
- ◆ [“Moving the Print Services Manager” on page 40](#)
- ◆ [“Print Services Manager Startup Switches” on page 40](#)

Using the Print Services Manager Health Monitor

The Print Services Manager Health Monitor provides administrators with a global view of their print system. The Health Monitor’s shows you the current status of printer agents, and allows you to configure settings and generate reports about your system.

Understanding the Print Services Manager Health Monitor

The Print Services Manager Health Monitor is a powerful tool to manage and troubleshoot your print system. The following examples show some of the features and information available in the Health Monitor.

How can I tell which printers are not being used?

The opening page of the Health Monitor shows all of your printers, their current state, and general statistics including the number of print jobs printed in the last hour, last day, and since the Print Services Manager was last started.

A quick look at these statistics will help you identify which printers are not being used. By clicking a printer name, you can see additional details about the printer that can help you troubleshoot why users are not using this printer.

For example, if the printer status shows `Error printing`, then you click the printer for a list of known problems. If one of the known problems is `Printer not connected`, then use the IP address listed in the `Load String` field to ping the printer to determine if the IP address is valid.

By looking at the statistical information, you can correct printer problems or make decisions about redeploying underused printers to departments that print a lot.

Are there any public access printers still in my print system?

Many companies implemented print systems with public access printers—printers that are accessible to anyone. As security and budgets have become important issues, companies are migrating their public access printers to control access printers so that access to the printers can be managed through eDirectory™.

Using the Print Services Manager Health Monitor, you can quickly scan all printers and determine if any public access printers still exist in the print system by generating a report of printer agents using the Associated NDS Printers report item. As you scan the report, you look for a printers with a listing of `False`, meaning they do not have an associated NDS® Printer object. If a printer does not have an associated Printer object, then it is a public access printer.

I am migrating to iPrint. How can I tell if the printers have the correct settings?

In order for iPrint to work correctly, printers must have IPP enabled and an associated printer driver. While you could use Novell iManager to look at each printer individually, you will find that generating a report showing all of your printers with these two settings to be a real timesaver.

Go to the `Generate a report` page, check the `iPrint Enabled` and `driver types` check boxes, and then generate a report. Now you can see which printers still need to be enabled for iPrint and which printers still need printer driver associated with them.

Accessing the Print Services Manager Health Monitor

The Health Monitor can be accessed from NetWare Remote Manager or from the `Manage Print Services Manager` screen in iManager. From NetWare Remote Manager, complete the following.

- 1** User your Web browser to log on to NetWare Remote Manager.
- 2** Under `Diagnose Server`, click `NDPS Manager Health`.

You can now view current printer agent states, startup/shutdown printer agents, and view other information about your print system.

Generating Reports

The report feature of the Health Monitor allows you to generate a report that can be displayed on the screen or saved as a comma-separated-value (.CSV) file that can be used in a spreadsheet program.

- 1** From the `NDPS Manager Health Monitor` main page, click `Advanced NDPS Manager Information > Generate Report`.
- 2** Select the information you want included in the report by checking the corresponding check boxes.
- 3** (Optional) If you want to save the report as a file, click the `File Options` settings.
- 4** Click `Generate report`.

Configuring Health Monitor Settings That Affect NetWare Remote Manager

You can configure settings in the Health Monitor to control how the Health Monitor affects the NetWare Remote Manager's overall health indicator.

- 1 From the NDPS Manager Health Monitor, click Configure Settings and Error Thresholds.
- 2 Adjust the settings
See the online help for more information about the available settings.

Posting Administrator Messages about a Printer

Suppose a printer has been taken offline and sent to the manufacture for repairs, but you keep getting phone calls from other administrators that the printer has an error in the Health Monitor. This can quickly be corrected by leaving a message about the printer in Health Monitor. Users can see the message, but only administrators can edit it.

- 1 From the NDPS Manager Health Monitor, click the printer you want.
- 2 Click Message From Admin.
- 3 Enter the text you want displayed for this printer in the NDPS Manager Health Monitor.
- 4 Click Apply.

To remove a message, follow the steps above but delete the text in [Step 3 on page 39](#).

Optimizing Fault Tolerance

The Print Services Manager uses a database to store information about the printers it controls. This database is backed up and replicated in eDirectory™. The database is automatically backed up, by default, once a day. You can modify the backup options or manually backup the database using server console interface for the Manager.

If the database fails to load through normal mechanisms, you can retrieve the database from eDirectory and load the Print Services Manager on any other server in the eDirectory tree.

IMPORTANT: You cannot restore a database from eDirectory to the same server that it was backed up from. In order to restore a database from eDirectory to its original source server, you must first restore it to a different server, and then back the database up to eDirectory from that server. You can then restore it to its original server.

Modifying the Database Backup Options

- 1 At the server console, go to the Available Options menu for the Print Services Manager.
- 2 Select NDPS Manager Status and Control > Database Options.
- 3 Modify the desired settings.
- 4 Escape back out to the Available Options menu.

Restoring a Database from eDirectory

- 1 At the server where you want to restore the database, enter

```
load ndpsm /dbvolume
```


See [“Print Services Manager Startup Switches” on page 40](#) for more information.
- 2 Select the name of the Print Services Manager whose database you want to restore.

If the server with the original database is up and running, its name will appear in this menu. If the server is down, no server name will appear here. The only Source option available will be eDirectory (existing jobs will be lost).

- 3 Select the source of the backup you want to restore.

In most cases, you will be selecting eDirectory as the source.

You will be prompted to select a volume.

- 4 Select the volume where you want the database placed.

The restored database is then copied to the location you selected.

Moving the Print Services Manager

Sometimes it is necessary to move the Print Services Manager from one server to another. If you assigned a DNS name to the Print Services Manager, you should update the DNS entry with the new IP Address the Manager is running on.

- 1 If the Print Services Manager is currently running, exit the Manager.

WARNING: All printing associated with this Print Services Manager will cease and waiting print jobs will be lost.

- 2 At the other server console enter

```
load ndpsm
```

If you need to use a startup switch, see “[Print Services Manager Startup Switches](#)” on page 40.

- 3 Select the Print Services Manager object you want to load.

A specific Print Services Manager can run only once.

You will be prompted to download the database, and the Manager will start running.

Print Services Manager Startup Switches

Syntax :

```
load ndpsm Print_Manager_name_and_context /startup parameter
```

Example:

```
load ndpsm .sales_manager.corp.acme /dbvolume=sales_sys
```

The following table lists the startup switches you can use when loading ndpsm.nlm.

Startup Parameter	Description
nodatabase	Load the Print Services Manager without opening the database. The Database Options menu is displayed which lets you examine, backup, restore, resynchronize, and uninstall the Print Services Manager database.
noipx	The Print Services Manager will not support the IPX™ protocol.

Startup Parameter	Description
noip	The Print Services Manager will not support the IP protocol.
dbvolume= <i>full_DNS_volume name</i>	Download the database from NDS® and reconnect pointers to the local server where the command is executed. This is useful for moving the Print Services Manager to a new volume.
dbvolume=nocheck	The Print Services Manager will not validate that the database volume is local. This is used with Clustering.
setens= <i>broker_name</i>	Set the Event Notification Service to the specified broker for all printers associated this Print Services Manager.
setrms= <i>broker_name</i>	Set the Resource Management Service to the specified broker for all printers associated this Print Services Manager.
qloadbalance	The Print Services Manager evenly distributes the waiting print jobs among printers that are ready. This is used when pooling printers.
iprinton	The iPrint attribute is turned on for all printers associated with the Print Services Manager.
dnsname= <i>NDPSM_DNS_name</i>	<p>This sets a DNS name to a Print Services Manager object. You will need to include the DNS information in your DNS lookup tables.</p> <p>You use this switch only once, and the Print Services Manager will use the same DNS name each time it is loaded. To change the DNS name, use the switch with the new name.</p> <p>If you included the DNS Name before deploying printing with this manager, then you can easily move the Print Services Manager to another server without disrupting printing.</p> <p>NOTE: The DNS name must be assigned before printing on the Print Services Manager is deployed.</p>

Managing Printers

Although the default settings allow your users to print without further configuration being necessary, you will probably want to modify some of those settings so that you can manage your printing resources most effectively. While most tasks can be done in Novell iManager, some tasks will require you to use NetWare® Administrator.

This chapter discusses the following:

- ◆ “Shut Down/Start Up Printer Agents” on page 42
- ◆ “Installing Printers on Workstations Automatically” on page 44
- ◆ “Using Remote Printer Management” on page 45
- ◆ “Setting Up Printer Configurations” on page 46
- ◆ “Creating Configurations” on page 47
- ◆ “Optimizing Event Notification” on page 50
- ◆ “Setting Print Job Spooling” on page 51
- ◆ “Supporting Queue-Based Client Workstations” on page 52

Shut Down/Start Up Printer Agents

From time to time it might become necessary to restart a printer agent. For example, if you have made configuration changes to the printer or if you need to take the printer offline for repairs.

You can shut down/start up a printer agent from the Print Services Manager screens at the server console or from a Web browser. Complete one of the following to shut down/start up a printer using your Web browser.

Using NetWare Remote Manager

- 1** From your Web browser go to the NetWare Remote Manager
- 2** Click NDPS Manager Health Monitor.
- 3** Click the name of the printer agent.
- 4** Click Shutdown Printer or Startup Printer to perform the action you want.

Using Novell iManager

- 1** From your Web browser , log in to Novell iManager.
- 2** Click iPrint Management >Manage Printer.
- 3** Select the printer you want to shutdown/startup.
- 4** Click Shutdown/Startup to perform that action you want.

Managing Print Jobs

The following sections provide specific information about the print job management features. All of the procedures listed below can be performed either through NetWare Administrator or through the Novell Printer Manager. Users designated as Managers or Operators for a printer can perform these tasks for all jobs routed to that printer; individual job owners can only perform these tasks for their own print jobs.

Viewing Print Job Information

You can view information about individual print jobs waiting to be processed by a specific printer by using the following procedure.

- 1** In Novell Novell iManager, click Print Management > Manage Printer.
- 2** Browse to and select the printer the job was sent to.
- 3** Click Printer Control > Jobs.

Information about the print jobs is displayed.

Deleting Print Jobs

Administrators can delete any print job after it has been submitted if the job has not yet started printing. Users can delete only their own print jobs.

You can delete a print job from the jobs list by using the following procedure.

- 1** In Novell Novell iManager, click Print Management > Manage Printer.
- 2** Browse to and select the printer the job was sent to.
- 3** Click Printer Control > Jobs.
- 4** Check the checkbox next to the job you want to delete.
- 5** Click delete.

Changing the Order of Print Jobs

Occasionally, you might need to print a job sooner than other jobs that have already been submitted to a printer and are awaiting servicing. Administrators can move jobs up or down the list. Users can only move jobs down the list.

Administrators can reorder any print job after it has been submitted if the job has not yet started printing. Users can reorder only their own print jobs.

The following procedure explains how this is done.

- 1** In Novell iManager, click Print Management > Manage Printer.
- 2** Browse to and select the printer the job was sent to.
- 3** Click Printer Control > Jobs.
- 4** Check the checkbox next to the job you want to modify.
- 5** Click Promote to move a print job up the list.

Moving Print Jobs

You can allow operators and job owners to copy or move a print job to another printer. The target printer must be running on the same server (managed by the same Print Services Manager) as the printer on which the job currently resides. Also, the target printer must be compatible with the driver that formatted the job. For example, if a job was formatted with an HP5si driver, it should not be copied or moved to an HP LaserJet* III.

Administrators can copy or move any print job after it has been submitted if the job has not yet started printing. Users can copy or move only for their own print jobs.

To move a print job using Novell iManager, do the following.

- 1** In Novell iManager, click Print Management > Manage Printer.
- 2** Browse to and select the printer the job was sent to.
- 3** Click Printer Control > Jobs.
- 4** Check the checkbox next to the job you want to modify.
- 5** Click Move to move the print job to another printer in the list.

Modifying Print Jobs

You can modify a print job in two ways:

- ◆ **Modifying the printer configuration**

Before the job is submitted, you can modify the printer configuration on your workstation. Then every time you send a job to that printer, those modifications will be used. For information, see [“Modifying Configurations” on page 48](#).

- ◆ **Modifying the specific job**

When a job is submitted, it inherits the properties of the installed printer's configuration. The configuration of the job can then be modified, if needed, by the job's owner or the printer's Operator.

When jobs are modified, additional configurable properties are available which are not included in the original printer configuration. For example, the job can be delayed, and advanced attributes can be viewed and modified.

Administrators can modify any print job after it has been submitted if the job has not yet started printing. Users can modify only their own print jobs.

To modify a job, do the following.

- 1** In NetWare Administrator, select the printer the job was sent to from the browser window, and then click Jobs/Job List.
If you want to see a list of jobs already processed and being retained, click the Show Retained Jobs option.
- 2** Select the job you want to modify.
- 3** Click Job Configuration > Job Options and then select Configurations from the drop-down list.
- 4** Select the properties you want and click OK.

Installing Printers on Workstations Automatically

By designating printers to be automatically installed on user workstations through the Remote Printer Management feature available in Novell iManager. See [“Using Remote Printer Management” on page 45](#) for more information.

Certain drivers (mostly older drivers) will not work when the printer name/port name has a long name (32 characters or more). The port name looks something like `\\tree_name\server_name\installed_printer_name`.

To resolve this problem, a new flag has been added to the Windows registry that will allow for printer names to be less than 31 characters in length so that old applications can still print. The key is as follows:

HKEY_LOCAL_MACHINE\Software\NDPS\RPM\TruncatePrinterNames

0 = use long names

1 = truncate the printer names

Using Remote Printer Management

While you can allow users to download and install printer drivers on their workstations, the Remote Printer Management feature also allows administrators to designate printers to be downloaded and installed automatically. These printers then appear in the Windows Printer Folder for the user's workstation. Administrators can also use this feature to remove printers, assign a printer to be the default printer, and update printer drivers from the Broker's Resource Management Service database (RESDIR).

Remote Printer Management configures printing on workstations based on a User object, group membership, and container.

How Remote Printer Management Works

After a printer has been designated for automatic installation on a user's workstation, this information is stored on the eDirectory container object where the administrator has configured it. When a user logs in after the machine is rebooted, the workstation's client software checks the container object where the User object resides for the Remote Printer Management configuration. The client software compares time stamps stored on the workstation and in eDirectory™ to determine whether any changes have occurred. If the time stamp is different, action is taken, and the printer list on the client is automatically updated to match the printer list maintained by eDirectory on the container.

- ◆ If the client finds a printer designated for installation that has not yet been installed, it is automatically installed.
- ◆ If a currently installed printer is added to the Printers to Remove list, that printer will be uninstalled automatically.
- ◆ If you designate a different printer to be the default in the Remote Printer Management list, the change will be automatically made on each client when it logs in.
- ◆ If the Do Not Update Workstations control is checked, you can update the Remote Printer Management configuration, but no changes will occur on the workstation.

When you install a printer using Remote Printer Management, its installed name will be limited to no more than 31 characters (including the periods). The name will be broken off at a logical point from the beginning of the installed name. This will not affect the ability of the printer to service jobs.

The reason that names are limited to this length is that some applications cannot handle printer names of over 31 characters.

Designating a Default Printer

When you use the Remote Printer Management (RPM) feature to designate a printer for automatic installation on each user workstation, you can also designate that printer to be the default for users in the same context (container). This way, the user never has to install or configure that printer or designate it as the default. Instead, a configured default printer is installed automatically on each workstation.

The assignments made through the RPM are limited to the specific container. They do not flow down to subcontainers.

Even though you designate a printer as the default, users can specify a different default printer if they want.

Accessing Remote Printer Management

Remote Printer Management can be accessed in any of the following ways using NetWare Administrator. Somewhat different functionality is available at each location.

- ◆ From the Tools menu in NetWare Administrator.
By selecting the NDPS Remote Printer Management option from this menu, you can manage printers in all containers for which you have the Supervisor right at the container object.
- ◆ From the Details page for the Container object
By pressing the NDPS Remote Printer Management button from this page, you can manage printers for this container only.
- ◆ From the Details page for a specific printer
By pressing the NDPS Remote Printer Management button from this page, you can remotely manage that printer.
- ◆ From Users and Groups

Setting Up Printer Configurations

If you use configurations wisely, they can help you manage your system more effectively. You can also create configurations that will help workstation users meet their specific printing needs efficiently and conveniently.

Configurations are properties assigned to a Printer object that specify how the printer will handle print jobs. For example, configuration properties can specify the number of copies to print, event notification, what kind of media to use, job priority, banner instructions, and whether to hold or retain a job and for how long.

The print system automatically assigns a default configuration to all Printer objects when they are created. However, administrators can modify that configuration or create new configurations for use by workstation users.

Printer objects can have multiple configurations. When a user installs a printer on his or her workstation, that user chooses one of those configurations. Each time a job with a particular configuration is submitted, the printer will handle the job according to the instructions contained in that configuration.

When a job is submitted, it inherits the properties of the installed printer's configuration. The configuration of the job can then be modified, if needed, by the job's owner or a printer Operator. When configurations are modified at the individual job level, additional configurable properties are available which are not included in the original configuration. For example, the job can be delayed, and advanced attributes can be viewed and modified.

- ◆ [“Creating Configurations” on page 47](#)
- ◆ [“Configuration Options” on page 47](#)

- ◆ [“Modifying Configurations” on page 48](#)
- ◆ [“Setting Configuration Locks” on page 49](#)

Creating Configurations

Use the following procedure in NetWare Administrator to create a new configuration based on the current Default Configuration.

- 1 Select the Printer object that you want to create a configuration for.
- 2 Click the Configuration button.

The Printer Configurations window in that dialog lists the Default Printer Configuration and any other configurations that have been created for this printer in NetWare Administrator.

- 3 Click Create.
- 4 Enter the name you want to assign to this configuration.
- 5 Assign the configuration properties you want for print jobs.

For specific information about these tabs, see [“Configuration Options” on page 47](#).

If you want to lock certain configuration properties so that workstation users cannot modify them, see [“Setting Configuration Locks” on page 49](#).

- 6 Click OK in the Printer Configuration dialog box.
- 7 Click OK in the NDPS Printer Details dialog box.

Your new configuration will not be saved until you have done this.

Configuration Options

The following sections describes the configuration options that are available.

General Properties

- ◆ **Copies:** The number of copies that will be printed for this configuration.
 - Max Copies:** The maximum number of copies that a user can print using this printer.
- ◆ **Priority:** The priority assigned to jobs using this configuration.
 - Max Priority:** The maximum priority (Low, Medium, High) set by the administrator for jobs using this printer. This setting determines when the job will print in relation to other jobs with different priorities sent to this printer.
- ◆ **Banner:** A list of banner pages users can select from. Banner pages will be printed at the beginning of print jobs using the configuration. (If multiple copies of a document are printed, the banner page will only be printed at the beginning of the first copy.)

If your client, printer, and server are not all configured for the same language, you may experience problems with the output of your banner pages, such as the job name being corrupted. If you are working in this type of mixed environment, you should consider not using banner pages.
- ◆ **Medium:** The medium (form) on which jobs can be printed without stopping the printer to mount a different medium (form). The default on the printer is Any Medium, which allows jobs to be printed using the currently mounted medium regardless of media specified in the job data. If a medium is specified for this configuration, and a different medium (anything other than Any Medium) is mounted on the printer, this condition will cause the printer to

pause for the given amount of time (default is 15 minutes) or until the new media is mounted. If this Job Wait Time expires, the job is placed on hold and returned to the spooling area.

Media are mounted by the administrator or Operator at the Printer Control/Control pull-down menu of NetWare Administrator.

Job Hold Properties

- ◆ **Operator Hold.** Jobs do not print until the Operator releases them.
- ◆ **User Hold.** Jobs do not print until the user who submitted the job releases it.
- ◆ **Delay Printing Until.** Jobs do not begin printing until the time and date specified.
- ◆ **Pause Printer on Job Start.** Force the printer to pause at the beginning of jobs submitted using this configuration. The message entered is sent to the printer Operator. Only an Operator can release the pause. (By default, the printer will resume printing after a 15-minute pause if an Operator does not intervene. This setting can be changed at the server console by changing the Configuration setting Job Wait Time.)
- ◆ **Pause Printer on Job End.** Force the printer to pause after printing each job that is submitted using this configuration. The message entered is sent to the printer Operator. Only an Operator can release the pause. (By default, the printer will resume printing after a 15-minute pause if an Operator does not intervene. This setting can be changed at the server console by changing the Configuration setting Job Wait Time.)
- ◆ **Retain Job No Longer Than.** The maximum amount of time that jobs using this configuration can be retained after printing before being deleted (Minutes, Hours, Days, Years). By default, jobs are not retained.
- ◆ **Retain Job For.** The amount of time that a job using this configuration should be retained (regardless of when it is printed) until it is deleted (Minutes, Hours, Days, Years).

Event Notification Properties

By specifying event notification for a printer configuration, you allow job owners to receive notification of printer or job events that occur during the processing and printing of a job. Notification configured in this way is sent by pop-up message box only.

Print job notification allows you to designate the event types for which notification messages should be generated (warnings, errors, or reports). For more information, see [“Optimizing Event Notification” on page 50](#).

In NetWare Administrator, administrators can use the Access Control feature to configure event notification for interested parties, that is, non-job-owners you wish to be notified of specific events. See [“Configuring Interested-Party Notification” on page 51](#) for more information. At the workstation, individual users can use the Novell Printer Manager to configure event notification pertaining to their own jobs only. See [“Configuring Job-Owner Notification” on page 50](#) for more information.

Modifying Configurations

To modify an existing configuration, complete the following procedure.

- 1** At the main Printer Details window in NetWare Administrator, click the Configuration button.
- 2** In Printer Manager, select the printer you want to work with and then select the Printer/Configuration option.

The Printer Configurations window lists the default printer configuration and any other configurations that have been created for this printer in NetWare Administrator.

3 Select the configuration you want to modify and click Modify.

4 Assign the configuration properties you want for print jobs.

For specific information about these tabs, see “[Configuration Options](#)” on page 47.

If you want to lock certain configuration properties so that workstation users cannot modify them, see “[Setting Configuration Locks](#)” on page 49.

5 Click OK in the Printer Configuration dialog box.

6 Click OK in the Printer Details dialog box.

Your changes will not be saved until you have done this.

Setting Configuration Locks

Properties of the Default Printer Configuration can be locked by the administrator to be nonconfigurable; that is, they cannot be modified or overridden by the user. Locked properties can be either of the following:

- ♦ **Maximum limits.** Certain properties, those that specify limits, are always locked: Maximum Copies, Maximum Priority, and Retain Job No Longer Than. Even if the Manager does not specify a limit for these properties, they are grayed out and inaccessible to users who are modifying their own configurations.

These properties relate to a range in which the maximum value in that range is specified. For example, if the default configuration has a locked property limiting the maximum number of copies of a job that can be printed to five, any number of copies up to five is allowed, but a job calling for 10 copies will be rejected.

- ♦ **Individual locked properties.** Many properties are tied to a specific setting. For example, you can lock the priority of jobs to be printed using this configuration, or designate a specific banner page that must be used when jobs are submitted.

Once a default configuration property has been locked, it will be locked for all jobs submitted to that printer and for all new configurations created for that printer as well, whether that configuration has been created with NetWare Administrator or by a workstation user when creating a new configuration for an installed printer.

Any job submitted to an old configuration must conform to the new locked property or the job will be rejected.

Use the following procedure to lock one or more properties for a printer.

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to lock a property on.
- 3** Click the Configuration tab.
- 4** Check the check boxes of the properties you want to lock.
- 5** Click OK.

Optimizing Event Notification

In NetWare Administrator, administrators can configure event notification for users who want to be notified of a defined printer or server event that occurs during the processing and printing of a job.

For example, the administrator for a specific printer (by default a Manager of that printer) can designate an Operator to be notified if the printer runs out of paper or if the toner is low.

Notification Types

In NetWare Administrator, administrators can configure two types of event notification:

- ◆ **Job-owner notification.** You can configure event notification for job owners only through the printer's Configuration dialog box. When notification is part of a configuration, the owner of a job submitted to a printer with that configuration will receive the notification specified. For more information, see [“Configuring Job-Owner Notification” on page 50](#).

At the workstation, individual users can use the Novell Printer Manager to configure event notification pertaining to their own jobs.

- ◆ **Interested-party notification.** You can use the Access Control Notification feature to configure notification to be sent to a printer's Managers, Operators, or other interested parties about specified events, normally those that require intervention of some kind.

Because this feature is tied to the Printer Access Control feature, it allows you to restrict the list of individuals who will be receiving this notification as much as you want. For more information, see [“Configuring Interested-Party Notification” on page 51](#).

Delivery Methods

The availability of the following delivery options are dependent on which of them you have enable. See [“Enabling Event Notification Delivery Methods” on page 57](#) for more information.

- ◆ **Pop-up notification.** Messages will pop up on the screen of individuals designated to receive them. Users designated for pop-up notification must have a default server defined in their User Environment specified in NetWare Administrator. They also must be currently authenticated to that server or they will not receive notification.
- ◆ **SMTP notification.** Messages will be sent to the recipient through SMTP (Simple Mail Transfer Protocol) in IP-based systems.
- ◆ **Log file notification.** Messages are written to a file at a designated location on a NetWare server that the recipient has rights to. This is especially useful for keeping a record of printing events for auditing purposes (such as job completions, how often the toner ran out, etc.).
- ◆ **Programmatic notification methods.** Two programmatic notification delivery methods are shipped: SPX™ and RPC.
- ◆ **Third-party notification methods.** The open architecture of the print system allows third parties to develop additional delivery methods.

Configuring Job-Owner Notification

Job-owner notification can be configured for specific print jobs or for printer configurations. This section provides procedures for each method.

Notification for Specific Print Jobs

Configuring notification for a specific print job can be done as follows.

- 1** From the main Printer Control view of the printer's Details page, click Jobs/Job List.
- 2** (Conditional) If you want to see a list of jobs being retained and not currently scheduled for processing, click Show Retained Jobs.
- 3** Click Options and select Configurations from the drop-down list.
- 4** Click Notification.
- 5** Select the notification methods and events you want.
- 6** Click OK.

Notification for a Configuration

The following procedure explains how to configure job-owner notification by modifying an existing configuration. You can also configure job-owner notification when creating a new configuration.

- 1** In NetWare Administrator, select the printer that you want to configure.
- 2** Click the Configuration button.
The Printer Configurations window lists the default printer configuration and any other configurations that have been created for this printer in NetWare Administrator.
- 3** Select the configuration you want to modify and click Modify.
- 4** Click the Notification tab.
- 5** Click the icon representing the method you want to use.
- 6** Select the notification methods and events you want.
- 7** Click OK.

Configuring Interested-Party Notification

The following procedure allows you to specify the users who will receive event notification for a Printer object, the method of notification, and the types of events they will receive notification for.

- 1** In NetWare Administrator, select the Printer you want to configure.
- 2** Click the Access Control button.
Three roles are available: Manager, Operator, and User.
- 3** Select the role you want to configure Access Control notification for.
- 4** Select the object you want to configure notification for and click Notification.
- 5** Click the icon representing the method you want to use.
- 6** Select the notification methods and events you want.
- 7** Click OK.

Setting Print Job Spooling

Although you do not need to send print jobs through queues, jobs submitted to printers will often need to be stored somewhere when the printer is already processing other jobs or when the job is

on hold or retain status. Job spooling allows you to specify where you want jobs to be stored while they await processing.

By default, the spooling area for a printer is located on the same volume as the database for the Print Services Manager supporting that printer. However, the Spooling Configuration option allows you to spool jobs to a different location through the following procedure.

Job spooling offers greater simplicity and management convenience than queue-based printing. Spooling requires only that a directory be designated where jobs can be stored while awaiting processing.

You can modify job spooling at any time, even when a job is already being processed.

The following procedure explains how to optimize job spooling.

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to enable Access Control for.
- 3** Click Configuration > Spooling.
- 4** Modify the spooling information.

Spooling Location: Specify the path where print job data will be stored while waiting to be printed. By default, the spooling area for a printer will be located in the same volume as the database for the Print Services Manager supporting that printer.

Available Disk Space: The amount of disk space available on the volume.

Limit Disk Space: To limit the amount of disk space to be used for spooling, check the check box and set the limits you want.

Spooling Space: The total amount of disk space in kilobytes (KB) you want to set aside for print job spooling.

Retained Job Space: The amount of disk space in kilobytes (KB) you want to set aside for holding retained print jobs. This amount should be sufficiently less than the total spooling space to ensure that new print jobs can be processed efficiently.

There are four common job scheduling algorithms available: First In, First Out, Print Shortest Job First, Minimize Media Changes, Backward Compatibility.

- 5** Click OK.

Supporting Queue-Based Client Workstations

If your network includes clients like Macintosh and OS/2 that are not able to send jobs to Printer Agents directly, the backward compatibility of the Novell print system allows these clients to submit jobs to the same queues they always have. Then the Printer Agent can retrieve jobs from these queues and print them.

If you want a printer to service legacy queues, here's how to set it up.

- 1** In Novell iManager click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to enable Access Control for.
- 3** Click Client Support > QMS Support.
- 4** Modify (add to/delete from) the Service Jobs from NetWare Queues list.
- 5** Click OK or Apply to save the settings.

Managing the Broker

Although the default settings allow your users to print without further configuration being necessary, you will probably want to modify some settings so that you can manage your printing resources most effectively.

This chapter discusses the following:

- ◆ “Accessing the Broker Health Monitor” on page 53
- ◆ “Adding or Updating Brokered Resources” on page 53
- ◆ “Changing the Location of a Broker” on page 54
- ◆ “Adding Banner Pages” on page 54
- ◆ “Adding or Updating Printer Drivers” on page 56
- ◆ “Enabling Event Notification Delivery Methods” on page 57
- ◆ “Enabling and Disabling Brokered Services” on page 58
- ◆ “Reconfiguring a Broker” on page 58
- ◆ “Broker Startup Switches” on page 59

Accessing the Broker Health Monitor

You can use the Broker Health Monitor to monitor and view statistics about the brokered services. To access the Health Monitor from NetWare Remote Manager, complete the following

- 1** User your Web browser to logon to NetWare Remote Manager.
- 2** Under Diagnose Server, click NDPS Broker Health.

Adding or Updating Brokered Resources

The following procedure explains how to add banner pages, printer drivers, and printer definition (NPD) files to the resource database available through a Broker's Resource Management Service.

Resources cannot be installed from multiple diskettes. If a printer driver or other resource is shipped on more than one diskette, copy the files to a directory on a hard disk or network drive and install it from there.

To add new resources through the Resource Management Service, do the following.

- 1** Make sure the Resource Management Service is enabled either in Novell iManager or by going to your server console and viewing the Broker status screen.
- 2** In Novell iManager, click Manage Broker and then browse to and select the Broker you want to work with.
- 3** Click Resource Management Service and then the resource you want to work with.
- 4** Add or delete resources.
- 5** Click OK.

Changing the Location of a Broker

You can customize your printing setup for maximum efficiency. You might occasionally want to change the location of one or more Brokers. For example, you might want a Broker to be in a different eDirectory container. If you want to change the location of a Broker after it has been created, you can use NetWare Administrator to move the Broker object into the desired container, provided you have Supervisor or equivalent rights to the new container.

Adding Banner Pages

Banner pages are pages that are printed at the beginning of a print job and that normally contain job identification information. Banner pages can be configured for PostScript*, PCL*, and text formats.

There are a variety of options for creating and selecting banner page designs. You can choose from several ready-to-use banner page designs, or you might create a unique design that includes your company's logo, a drawing, or even a photograph.

When you add a new banner, it will be immediately available for printer configurations. If you want a banner page to be printed, you can select which banner design you want to use at the General tab on the Configuration page. The Configuration page lists only banners available in the format your printer supports. For example, if you are using a PostScript printer, only banners in PostScript format will be available at the General configuration page.

Each banner page includes the following information in an information box at the bottom of the page: Job Name, Job Owner, Time Printed, Date Printed.

If your client, printer, and server are not all configured for the same language, you might experience problems with the output of your banner pages, such as the job name being corrupted. If you are working in this type of mixed environment, you should consider not using banner pages.

Banners are added to the resource database through the Broker's Resource Management Service.

See the following topics for information about specific tasks associated with using banners.

Adding Banners to the Resource Management Service

- 1** Make sure the Resource Management Service is enabled either in Novell iManager or by going to your server console and viewing the Broker status screen.
- 2** In Novell iManager, click Manage Broker and then browse to and select the Broker you want to work with.
- 3** Click Resource Management Service > Banners.
- 4** Add or delete banners.
- 5** Click OK.

What Printer Types Support What Kind of Banner

A list of supported banners is supplied by both the Novell Gateway (through the PDS) and third-party gateways. The gateway first determines which file extension (.pcl, .ps, or .txt) is appropriate for the way the Printer object (or Printer Agent) was configured during creation. It then queries the associated Broker for a list of banner page files with that extension. For a list of formats supported by a specific printer, go to the main Printer Details page and click the Features button.

Creating Banner Files

Administrators with knowledge of printer languages can create custom banners. Three types of custom banners are currently supported:

- ♦ **PCL** (.pcl extension). See [“Creating a PCL Banner” on page 55](#).
- ♦ **PostScript** (.ps extension). See [“Creating a PostScript Banner” on page 55](#).
- ♦ **Generic text** (.txt extension). See [“Creating a Generic Text File” on page 56](#).

All custom banners that are created should have one of these extensions. When creating custom banners, keep in mind that complex banners will increase the print time for jobs. Here are some tips for creating an efficient banner:

- ♦ Use internal/resident printer fonts instead of rasterized system fonts.
- ♦ When using graphics, use vector graphics when possible. Bitmaps take up a lot more space.
- ♦ Avoid half-toned images.

Creating a PCL Banner

A working knowledge of the Hewlett Packard* (HP*) PCL printer language is needed in order to create a custom PCL banner. The easiest way to create a PCL banner is to create the banner using an application like WordPerfect or MS Write. Be sure to leave the lower third of the custom banner page blank because the print system will overlay the following information in a PCL banner page:

Job Name

Job Owner

Time Printed

Date Printed

- 1** After formatting the banner page, print the banner document to a file using the appropriate PCL printer definition.

The driver properties will have to be changed from printing to a port/network to printing to a file on disk. All PCL banners must have the .pcl extension.

- 2** Remove the form feed and reset commands in the file that was printed to disk.

You will need a binary editor to remove the form feed and any reset commands from the file. The form feed and reset commands will be in the overlay that the print system provides. A form feed in PCL is a decimal 12 (hex 0C). There are several possible reset commands that need to be removed. Decimal 27, 69 (hex 1B,45) is the printer reset in PCL. The following Universal Exit Command (UEL) also needs to be removed:

```
Decimal 27,37,45,49,50,51,52,53,88  
(Hex 1B,25,2D,31,32,33,34,35,58)
```

Once the form feed and reset are removed, you have a banner file that can be used.

- 3** Add the banner to the Resource Management Service.

See [“Adding or Updating Brokered Resources” on page 53](#) for more information.

Creating a PostScript Banner

A working knowledge of the Adobe* PostScript printer definition language is needed in order to create a custom PostScript banner. The easiest way to create a PostScript banner is to create the banner using an application like WordPerfect or MS Write. Be sure to leave the lower third of the

custom banner page blank because the print system will overlay the following information in a .ps banner page:

Job Name

Job Owner

Time Printed

Date Printed

- 1** After formatting the banner page, print the banner document to a file using the appropriate PostScript printer definition.

The driver properties will have to be changed from printing to a port/network to printing to a file on disk. All PostScript banners must have the .PS extension.

- 2** Using a text editor, remove the PostScript operator called *showpage* from the file that was printed to disk.

The driver will probably have a procedure that includes the showpage command. (The showpage command will be in the overlay.) Sometimes showpage is embedded in another function within the driver and you will have to use care in removing it.

- 3** Add the banner to the Resource Management Service.

See “[Adding or Updating Brokered Resources](#)” on page 53 for more information.

Creating a Generic Text File

A generic text banner must have a .txt extension. The banner can be formatted in any printer language. The print system will not overlay any additional information on this banner page.

Adding or Updating Printer Drivers

A printer driver is a software entity that directly supports a physical printer, enabling it to carry out the functions it is intended to perform.

Hardware vendors develop printer drivers, which are specific to each printer. Most printers require different printer drivers for each operating system they interact with. You can view a complete list of printer drivers currently loaded in the Broker's Resource Management Service (RMS) for Windows, and to add additional printer drivers from diskettes and Windows .cab files.

The print system ships with only English-language drivers. To make drivers in other languages available for installation on workstations, you will first need to add those drivers to the RMS through the procedure described in this section.

While the majority of printer drivers in common use today can be used, some cannot. A few drivers do not work on a network at all, while others might not contain an index file or have an index file that is incorrectly formatted. If you attempt to add a printer driver to the Resource Management Service from a diskette and receive an error message stating that a printer driver cannot be found, you should contact the driver's vendor.

Prerequisite

Printer drivers cannot be installed to the Resource Management Service from multiple floppy disks. If a printer driver is shipped on more than one disk, copy the files to a directory on a hard drive or network drive and install the driver from there.

Procedure

- 1 Make sure the Resource Management Service is enabled either in Novell iManager or by going to your server console and viewing the Broker status screen.
- 2 In Novell iManager, click Manager Broker and then select the Broker you want to work with.
- 3 Click Resource Management Service and then the type of printer driver you want to add.
- 4 Add or delete printer drivers to or from the list.

When adding a resource, you will need to browse to the location of the print driver's .inf file. If the file contains multiple print drivers, you will need to select the drivers you want to add to RMS.

- 5 Click OK or Apply to save your changes to the database.

The drivers will not be added to the database until you do this.

The process described above might not work if the driver installation .inf file uses subdirectory paths in filename designations within the Copy Files sections of the .inf file. This format is not currently supported. There are two possible solutions for this problem:

- ♦ Look for an .inf file that does not use this format for filenames. Often one exists in a subdirectory of the installation disk.
- ♦ Edit the .inf file and remove path information from filenames. Then ensure that all the files are in the same directory as the .inf file.

Enabling Event Notification Delivery Methods

The Broker provides an Event Notification Service (ENS) that allows printers to send customized notifications to users and operators about printer events and print job status. ENS supports a variety of delivery methods, including pop-up messages, log files, e-mail and programmatic. Third parties can also develop additional methods.

The Event Notification Service allows you to enable delivery methods such as e-mail and third-party methods not provided directly. The executable files for these methods have an .enm extension (*filename.enm*) and must be added to the *server*\sys:system directory or another location in the server's search path.

For more information about Event Notification, see [“Enabling and Disabling Brokered Services” on page 58](#).

- 1 Be sure the Event Notification Service is enabled by going to your server console and viewing the Broker status screen.
- 2 In NetWare Administrator, select the Broker you want to work with.
- 3 Select the Event Notification view.
- 4 Click the Load or Unload button.

WARNING: Do not unload the RPC and SPX™ Programmatic Notification methods. These are needed for communication between printers and the workstation Printer Manager utility to occur and for driver download to take place.

- 5 Specify the ENM filename for the notification method you want to load.

This ENM must be in your *server*\sys:system directory or in another location in your server's search path in order to be loaded.

The Broker object will load this notification method automatically in the future.

Enabling and Disabling Brokered Services

When the print system is initially installed, the three network services provided by the Broker are automatically enabled on the Broker object. As your printing needs grow or change and you add additional Brokers to your network, you might want to disable certain services provided through a Broker on a specific server and allow them to be provided through a different Broker (to save disk space on the first server, for example), or you might want to enable services on a Broker that are currently disabled. This procedure explains how these tasks are performed.

- 1** In NetWare Administrator, select the Broker object you want to work with.
- 2** Click the button for the service you want to enable or disable.
- 3** At the *Service* Status line, select either Enable or Disable.

The service is now either enabled or disabled. If disabled, services will need to be provided by a different Broker.

Printer Agents using the services that were disabled will automatically search for another Broker on the network that will provide these services, so normally these printers should continue to be available for processing jobs.

However, if you want to specify a preferred Broker for a Printer Agent to use for these services, you must do this from each printer's Printer Control page in NetWare Administrator by selecting Features/Services.

If a Broker is unloaded and then is brought back up, Printer Agents that have designated that Broker as their preferred service provider will not be automatically reconnected to it. In order to reconnect to the preferred service provider, you must either unload each Printer Agent and bring it back up, or unload the Print Services Manager that controls the affected Printer Agents and bring it back up, thus bringing up all the Printer Agents with it.

If the Resource Management Service cannot be enabled, check for one of the following problems:

- ◆ The Broker object does not have rights to access the RMS data storage area (the default is `ndps\resdir\`). Use NetWare Administrator to grant the Supervisor right to the Broker for that subdirectory.
- ◆ The RMS data storage area has a directory name that is longer than eight characters or includes invalid characters.

Reconfiguring a Broker

In most instances, the default configuration for the three support services it provides will result in satisfactory performance. However, in certain circumstances you might want to change that configuration. Here are a couple of examples:

- ◆ As you gain experience with your print system setup, you might want to reconfigure the default properties assigned to the Broker.
- ◆ If disk space on your volume is limited, you might want to move the managed resources database accessed by the Resource Management Service to a different volume on the same server or to a different server in the same eDirectory tree where more disk space is available. (The default location for the RMS resources is `server\sys:ndps\resdir\`)

Prerequisites

- ◆ To reconfigure a Broker, you must have at least Read, Write, and Modify rights for the container where the Broker resides.
- ◆ If you change the location of your Resource Management Service database, you need to have rights to the new location.
- ◆ If you change the location of your Resource Management Service database, you need to have an existing Resource Management Service database directory to point to when you specify the volume for the RMS during this process. The path you specify must point to a directory that currently exists and that already contains resources. (The RMS data storage area must not have a directory name that is longer than eight characters or includes invalid characters.) If you point to an empty directory, you will receive an error message from the server when loading the Broker saying that the Broker cannot be enabled. (You can copy resources from another RMS to this directory if you want.)

Procedure

The following procedure explains how to reconfigure an existing Broker object or move your brokered resources to a different location.

- 1** In NetWare Administrator, select the Broker object you want to reconfigure.
- 2** If you want to change the location of your resources, complete the following:
 - 2a** Click Resource Management.
 - 2b** Enter in the resource path you want to use for storing these resources.

You might need to assign the Broker all rights (Supervisor right) to the new area.
- 3** If you want to modify the Access Control list, click Access Control and add or remove users from the Managers list.

See [“Managing the Broker” on page 53](#) for more information.
- 4** If you want to enable or disable your Service Registry, click Service Registry Service.

See [“Enabling and Disabling Brokered Services” on page 58](#) for more information.
- 5** If you want to load or unload Notification methods, click Event Notification.

See [“Enabling Event Notification Delivery Methods” on page 57](#) for more information.

Broker Startup Switches

Syntax:

```
load broker broker_name_and_context /startup_parameter
```

Example:

```
load broker .sales_manager.corp.acme /dbvolume=sales_sys
```

The following table lists the startup switches you can use when loading broker.nlm.

Startup Parameter	Description
noui	Loads the Broker without displaying the user interface.

Startup Parameter	Description
noipx	The Print Services Manager will not support the IPX™ protocol.
noip	The Print Services Manager will not support the IP protocol.
allowdup	The NLM™ will not check for two brokers using the same Broker object.

7

Setting Up a Secure Printing Environment

Setting up a secure printing environment can be done on three different levels.

- ♦ **Access Control** lets you assign users to a User, Operator, or Manager role to control printers, print services managers, and brokers.
- ♦ **Printer Security** defines how rights to a printer are determined and enforced.
- ♦ **Using SSL with iPrint** requires users to authenticate before installing and printing to a printer.

Setting Access Control for Your Print System

Your print system is designed to take full advantage of eDirectory™. You receive all the benefits of eDirectory security and the easy management provided by the industry's most advanced and robust directory service. The Access Control feature allows you to specify the access each User, Group, or container object will have to your printing resources.

Access control roles are mutually exclusive, even though the same individual might need to perform tasks reserved for different roles. For example, only printer Managers can add or delete printer Operators or printer Users. In a similar way, Managers and Operators must also be designated as Users for a printer before they can submit print jobs to it.

In actual implementation, the defaults prevent most problems that might occur from these distinctions. For example, a printer Manager is automatically designated an Operator and User as well, while an Operator of a printer is automatically designated a User of that printer also. You cannot remove the User role from an Operator, and you cannot remove the Operator and User roles from a Manager.

The creator of an object is automatically granted privileges for all available roles for the type of object being created.

The following sections illustrate some of the security issues and features you might find useful as you plan your print system setup.

- ♦ **“Setting Printer Security Levels”** on page 65
- ♦ **“Setting Access Control for Printers”** on page 61
- ♦ **“Setting Access Control for the Print Services Manager”** on page 64
- ♦ **“Setting Access Control for Brokers”** on page 65

Setting Access Control for Printers

Printer security is ensured through the assignment of the Manager, Operator, and User access control roles and by the strategic placement of your printers and printer configurations.

You can assign multiple Printer objects to represent a single Printer Agent. You can then make different access control assignments to each Printer object. This can be an especially useful option if you want to allow users in different containers to use the same printer, because each group of users can be given different rights to the printer.

A physical printer cannot be a controlled access printer and a public access printer at the same time. However, if you delete all the Printer objects representing a Printer Agent, that printer will become a public access printer.

The following sections discuss security options for printers in more detail.

- ◆ [“Printer Access Control Roles” on page 62](#)
- ◆ [“Assigning Printer Access Control Roles through Printer Objects” on page 63](#)
- ◆ [“Assigning Printer Access Control Roles through User Objects” on page 63](#)
- ◆ [“Planning Your Printer Connections and Locations for Better Security” on page 63](#)

Printer Access Control Roles

Different User, Group, or Container objects can have different access rights to the same printer. For example, if you want only certain users to be able to send jobs to a particular printer, you can specify which users should have access and what access roles each will have.

The following table describes the rights and privileges associated with each of the printer access control roles.

Role	Description
Manager	<p>Tasks performed exclusively by the Printer Manager are those that require the creation, modification, or deletion of Printer objects, as well as other eDirectory administrative functions. Printer Managers are automatically designated as printer Operators and Users as well, so they can perform all tasks assigned to the Operator role. Typical Manager functions include the following:</p> <ul style="list-style-type: none"> ◆ Modifying and deleting Printer objects ◆ Adding or deleting Operators and Users for a printer ◆ Adding other Managers ◆ Configuring interested-party notification ◆ Creating, modifying, or deleting printer configurations
Operator	<p>Printer management tasks performed by the Operator include the following:</p> <ul style="list-style-type: none"> ◆ Performing all of the functions available through the Printer Control page ◆ Pausing, restarting, or reinitializing printers ◆ Reordering, moving, copying, and deleting jobs ◆ Setting printer defaults, including locked properties ◆ Configuring print job spooling <p>Operators cannot create, modify, or delete eDirectory objects or perform other eDirectory administrative functions.</p>

Role	Description
User	<p>Tasks performed by Users include the following:</p> <ul style="list-style-type: none"> ♦ Submitting print jobs ♦ Managing print jobs they own (Users cannot copy, move, reorder, or remove jobs they do not own) <p>To simplify administration, the container a printer resides in is automatically assigned as a User for that printer, so all users in that container and its subcontainers can use that printer without being added to the list. You can delete the container from the list if you want to limit access to certain users, groups, or roles.</p>

Assigning Printer Access Control Roles through Printer Objects

Different User, Group, or container objects can have different access rights to the same printer. For example, if you want only certain users to be able to send jobs to a particular printer, you can specify which users should have access and what access roles each will be given.

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to enable Access Control for.
- 3** Click the Access Control tab.
- 4** Add or delete Users, Groups, or Container objects to the different Access Control roles.
- 5** Click OK.

Assigning Printer Access Control Roles through User Objects

In addition to configuring access control through printers, you can also configure access control through User objects.

The following procedure assumes that you are modifying the attributes for an existing User. You can also adapt this procedure if you are creating a new User object.

- 1** From the NetWare Administrator browser's Object menu, select the User object you want to configure access control for, and then click Printer Access Control.

A list of available printers is displayed with icon representations of the three Access Control roles: User, Operator, and Manager.
- 2** Select the printer that you want to assign this user an access control role for.
- 3** Check the roles you want this user to be assigned for this printer.

If you check Manager, this user is automatically assigned Operator and User roles as well. Operator and User roles are assigned independently. Keep in mind that a User object must be assigned the access control role of User in order to submit print jobs to that printer.
- 4** (Optional) Click the Event Notification button to configure event notification for this user.
- 5** Click OK.

Planning Your Printer Connections and Locations for Better Security

Depending on your organization's needs, the network administrator can attach printers directly to NetWare[®] servers or to the network. Both types of setup can provide security and administrative

advantages. The ideal combination for each installation is different and will change as needs change. Be sure to consider the advantages of each approach when you set up your network.

Connecting the printer to the server places the two resources in close proximity to each other. If the server is in a secure location, this means that the printer is locked up with the server. This might be an advantage. For example, your company might use that printer to print confidential documents. Having the printer in a secure location protects these documents.

Because most printers are already network-enabled, the most common type of network setup includes printers attached directly to the network. This allows the printer to be placed in a convenient location for all users, and places it away from the server for security reasons. Users who use the printer normally will not have access to the server console. Security is still maintained by requiring users to use a password to log in to the network before they can use the printer.

Setting Access Control for the Print Services Manager

Print Services Manager security is ensured through the assignment of the Manager access control role.

Print Services Manager Access Control Role

The only access control role available for the Print Services Manager is that of Manager. The following table explains the tasks performed by the Manager role.

Role	Description
Manager	<p>Tasks performed exclusively by the Manager are those that require the creation, modification, or deletion of eDirectory objects, or that involve other eDirectory administrative functions. Typical Manager functions include the following:</p> <ul style="list-style-type: none">♦ Creating Printer Agents and Print Services Manager objects♦ Adding or deleting Operators and Users for a printer♦ Adding other Managers♦ Configuring interested-party notification♦ Creating, modifying, or deleting printer configurations

Assigning the Manager Role for Print Services Managers

The following procedure explains how to make Manager assignments for your Print Services Manager objects.

- 1** In Novell iManager, click iPrint Management > Manage Print Service Manager.
- 2** Browse to and select the Print Service Manager you want to enable Access Control for.
- 3** Click the Access Control tab.
- 4** Add or delete Users, Groups, or Containers to the Manager role.
- 5** Click OK

Setting Access Control for Brokers

Broker security is ensured through the assignment of the Manager access control role and by the optional assignment of a password to the Broker.

Broker Access Control Roles

The access control roles available to the Broker are Manager and Public Access User. The following table explains the roles

Role	Description
Manager	Tasks performed exclusively by the Broker Manager are those that require the creation, modification, or deletion of Broker objects, as well as those that involve other eDirectory administrative functions. Typical Manager functions include the following: <ul style="list-style-type: none">♦ Creating, modifying, and deleting Broker objects♦ Adding other Managers♦ Enabling or disabling brokered services♦ Adding resources to the Resource Management Service♦ Assigning or changing a Broker password
Public Access User	A public access user is a role assigned to all individuals on the network who are users of printers receiving services and resources provided by the Broker. This role is assigned by default and does not require specific administrative action by the Broker Manager.

Assigning Managers for Brokers

The following procedure explains how to make Manager assignments for your Broker objects.

- 1** In Novell iManager, click iPrint Management > Manage Broker.
- 2** Browse to and select the Broker you want to enable Access Control for.
- 3** Click the Access Control tab.
- 4** Add or delete Users, Groups, or Containers to the Manager role.
- 5** Click OK.

Setting Printer Security Levels

Printer security levels affect how rights to a printer are determined and enforced. The default security level is Medium. With sensitive print data, you might want to set the security level to High; however, performance will be effected.

Printer Security Level	Secure Printing Enabled
Low	Security is enforced by the client applications only

Printer Security Level	Secure Printing Enabled
Medium (default)	Security is enforced by Print Services Manager if print data integrity is involved. Otherwise, security is enforced by the client applications.
High	Security is enforced by the Print Services Manager for all operations.

To set a printer's security level, do the following:

- 1** In Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the printer you want to enable Access Control for.
- 3** Click the Access Control > Security.
- 4** Select the level of security you want for the printer.
- 5** Click OK or Apply to save your changes.

Secure Printing Using SSL

Secure printing takes advantage of SSL, which requires users to authenticate using their eDirectory usernames and passwords. Users authenticate once per eDirectory tree per session. The print data is encrypted, and all print communication uses port 443. Without secure printing, the printer is available to anyone inside the firewall on the network and the print data is not encrypted. Secure printing works in conjunction with the security level set for the printer.

The following table shows how access is determined, depending on the level of printer security and if secure printing is enabled or disabled.

Table 1 Effects of Printer Security

Printer Security Level	Secure Printing Disabled (No SSL)	Secure Printing Enabled (With SSL)
Low	Full access	eDirectory authentication
Medium (Default)	Users granted access as if they had been assigned the User role.	eDirectory authentication and check user's effective rights
High	Users must use SSL and authenticate to eDirectory Users might receive an error if SSL is not enabled. (See "High Security Requires User Authentication" on page 67.)	eDirectory authentication, check user's effective roles, and connection verification SSL is automatically enabled when a printer's security is changed to High when using Novell iManager.

For more information on printer security levels, see **"Setting Printer Security Levels"** on page 65.

Considerations When Changing Printer Security

High Security Requires User Authentication

If you change the printer agent security level to high, the Requires Security check box (enabling SSL) on the IPP Support page of the printer's Client Support Page in Novell® iManager is enabled automatically.

NOTE: When setting printer agent security at the server console, SSL is not enabled automatically, and users might receive the following error

Error message: iPrint Client - "The request requires user authentication."

To avoid the error, ensure that the Requires Security check box is checked when a printer agent's security is changed to High. For more information, see ["Enabling SSL" on page 67](#).

Enabling SSL Changes the Printer URL

When you check the Requires Security check box, the URL for the associated printer will change. Users who have already installed this printer will have to delete and reinstall the printer in order to use the updated URL.

Lowering Printer Security

Once a printer's security is set to High and SSL is enabled with the Requires Security check box, SSL remains enabled even if the security level is lowered. If SSL is disabled, then the URL will change and users will have to reinstall the printer.

Enabling SSL

- 1** From Novell iManager, click iPrint Management > Manage Printer.
- 2** Browse to and select the Printer object you want to modify.
- 3** Click Client Support > IPP Support.
- 4** Check/Uncheck the Requires Security check box.
- 5** Click Apply or OK to update the printer settings.

A

Configuring the iPrint HTML Interface

This appendix discusses the HTML parameters and operations used in the iPrint interface. This information is provided to give administrators insight into how to customize their HTML files.

Using this information, HTML developers can create and edit iPrint Web pages to customize them for their companies.

The iPrint HTML files are located in the `sys:\apache2\htdocs\ippdocs` directory.

The following sections will help you customize the html interface:

- ◆ [“iPrint Client HTML Interface Description” on page 69](#)
- ◆ [“HTML Parameters” on page 70](#)
- ◆ [“Supported Operations Strings” on page 74](#)

iPrint Client HTML Interface Description

The list of operations and identifiers is the same for each browser. The printer name and the operation to be performed are required parameters for all operations except [“op-client-interface version” on page 74](#) and [“op-client-version-info” on page 75](#). All other parameters are operation-specific or optional. Operation-specific parameters that are used out of context are ignored.

If the desired output from the plug-in is HTML, a frameset needs to be used. This is to prevent some browsers from failing when they try to write to the document that invoked the plug-in. The name of the frame to receive the HTML page generated by the plug-in can be passed in using the target frame option. This target frame needs to be a named frame in the same frameset as the frame invoking the plug-in.

Internet Explorer Browser Customization

- ◆ [“HTML Script Example” on page 69](#)
- ◆ [“HTML Code Example” on page 70](#)

HTML Script Example

The `ExecuteRequest()` entry point simplifies HTML coding when working with Internet Explorer. It lets you pass/get information from the iPrint without having to reload a Web page.

A result type called *object* is implemented and should be used only in conjunction with `ExecuteRequest()`. You can use `ExecuteRequest` and have it return results via HTML, URL, message box, or cookie. All data can be passed via the `ExecuteRequest()` second parameter. The first parameter is the operation. Both of the parameters are strings.

Syntax: `variable=variable.ExecuteRequest("operation_string",additional_operation_strings);`

```

<object ID=iPrintAccess classid=clsid:36723f97-7aa0-11d4-8919-ff2d71d0d32c>
</object>
<script Language="javascript1.1">
var pStatus;
var params;
params = "printer-url=" + printerNameHere + "&result-type=object"
pStatus=iPrintAccess.ExecuteRequest("op-printer-get-status", params);
alert(pStatus);
</script>

```

HTML Code Example

The following defines the interface between HTML pages and the browser plug-in. The HTML element `<OBJECT>` is used to invoke the Internet Explorer plug-in (IENIPP.OCX).

```

<OBJECT ID=TESTID
    CLASSID="clsid:36723f97-7aa0-11d4-8919-FF2D71D0D32C"
    CODEBASE=v:\src\work\bart\ipp\ieNIpp\final\novipp.ocx>
<PARAM NAME=operation VALUE=op-printer-get-status>
<PARAM NAME=printer-url VALUE=http://100.100.100.100/ipp/lpr>
<PARAM NAME=result-type VALUE=html>
<PARAM NAME=target-frame VALUE=displayFrameName>
</OBJECT>

```

Netscape Browser Customization

The following defines the interface between HTML pages and the browser plug-in. The HTML element `<EMBED>` is used to invoke the Netscape plug-in (NPNIPP.DLL).

```

<EMBED TYPE=application/x-Novell-ipp
    width=100
    height=30
    operation=op-printer-get-status
    printer-url=http://1100.100.100.100/ipp/lpr
    result-type=html
    target-frame=displayFrameName
>

```

HTML Parameters

The following parameters can be used to enhance the iPrint HTML pages. The parameters are used in the HTML files as **PARAM NAME=parameter VALUE=identifier** statements.

- ◆ [call-back-url \(page 71\)](#)
- ◆ [debug \(page 71\)](#)
- ◆ [driver-options \(page 71\)](#)
- ◆ [error-type \(page 71\)](#)
- ◆ [file-path-name \(page 72\)](#)
- ◆ [job-list \(page 72\)](#)
- ◆ [job-list-options \(page 72\)](#)
- ◆ [persistence \(page 73\)](#)
- ◆ [printer-url \(page 73\)](#)
- ◆ [result-type \(page 73\)](#)
- ◆ [target-frame \(page 74\)](#)

call-back-url

Used to target the results from the onchange JavaScript function associated with selecting jobs from the job list. The JavaScript function causes the browser to reload the indicated control frame passing the list of selected jobs as a parameter.

Example:

PARAM NAME=call-back-url VALUE=CONTROL.HTM

debug

If debug is set to True, message boxes with debug and profiling information are displayed.

Example: PARAM NAME=debug VALUE=true

driver-options

As a printer is being installed, the plug-in can optionally set some default driver options. For a list of driver options, see [“Changing Printer Driver Default Install Options” on page 35](#).

Example:

PARAM NAME=driver-options VALUE=papersize:A4;duplex:vertical;color:false

error-type

Used to tell the plug-in how to report errors associated with the requested operation. The plug-in has the ability to return the errors in.

Option	Description
none	No response.
msgBox	Display results in a message box.
html	Display results as an HTML page generated by the plug-in.

Option	Description
cookie	Put the error information in a cookie.
url	Pass the results as a url parameter.

The plug-in defaults to the same reply mechanism that is specified in **results-type** if **error-type** is not specified.

Example:

PARAM NAME=error-type VALUE=html

file-path-name

Specifies a printer ready file that can be passed to the plug-in for printing. This mechanism bypasses the print provider and the print driver. The printer does not need to be installed on the workstation to use this operation.

Example:

PARAM NAME= file-path-name VALUE=*directory path\filename*

job-list

The plug-in can perform several operations on jobs. *job-list* is a comma-delimited string of job IDs to indicate which jobs to operate on. A job list with the job ID of -1 is equivalent to selecting all jobs

Example:

PARAM NAME=job-list VALUE=3,5,7

job-list-options

When the plug-in creates the HTML for job-list, it can add buttons to allow the user to hold, resume, delete, or display information for selected jobs. This parameter is used to specify which buttons to display and support.

The following are the possible buttons:

- ◆ [op-job-hold \(page 76\)](#)
- ◆ [op-job-hold-release \(page 76\)](#)
- ◆ [op-job-cancel \(page 75\)](#)
- ◆ [op-job-get-info \(page 75\)](#)

Example:

PARAM NAME=job-list-options VALUE= op-job-hold,op-job-hold-release,op-job-cancel, op-job-get-info

persistence

Printer installation can be temporary or permanent. If not specified, persistence defaults to persistent. Persistence is used to indicate the duration the printer is to be installed for. The choices include the following:

Option	Description
persistent	Printer will not be removed.
volatile-reboot	Printer will be removed as the workstation reboots.
volatile-date-time	Printer will be removed at the indicated time (year, month, day, hour, minute). NOTE: This option is not currently implemented.

Examples:

PARAM NAME=persistence VALUE=volatile-reboot

PARAM NAME=persistence VALUE=volatile-date-time:2001,3,22,8,30

printer-url

Indicates which printer the operation should be directed to.

Example:

PARAM NAME= printer-url VALUE=ipp://DNS name/ipp/printername

result-type

Used to tell the plug-in how to report the results of the requested operation. The plug-in has the ability to return the results in one of the following ways:

Option	Description
none	No response.
msgBox	Displays results in a message box.
html	Displays results as an HTML page generated by the plug-in.
cookie	Puts the results in a cookie.
url	Passes the results as a url parameter.

The plug-in defaults to none if **results-type** is not specified.

Example:

PARAM NAME=result-type VALUE=html

target-frame

Used to specify the name of the frame in which to put the results and/or error information into. If the operation results type is url, the target frame will be the one reloaded with the indicated URL.

Example:

PARAM NAME=*target-frame* VALUE=*FrameName*

Supported Operations Strings

All requests to the plug-in have two required parameters. The first is operation, and the second is results-type. All operations except **op-client-interface-version** and **op-client-version-info** require the parameter **printer-url**. All requests support the optional parameter **error-type**.

With the exception of **op-printer-send-test-page** and **op-printer-remove** the printer does not need to be installed to use the following operations:

- ◆ **op-client-interface-version** (page 74)
- ◆ **op-client-is-printer-installed** (page 75)
- ◆ **op-client-version-info** (page 75)
- ◆ **op-job-cancel** (page 75)
- ◆ **op-job-get-info** (page 75)
- ◆ **op-job-hold** (page 76)
- ◆ **op-job-hold-release** (page 76)
- ◆ **op-printer-get-info** (page 76)
- ◆ **op-printer-get-status** (page 76)
- ◆ **op-printer-install** (page 77)
- ◆ **op-printer-list-all-jobs** (page 77)
- ◆ **op-printer-pause** (page 77)
- ◆ **op-printer-purge-jobs** (page 77)
- ◆ **op-printer-remove** (page 77)
- ◆ **op-printer-resume** (page 78)
- ◆ **op-printer-send-file** (page 78)
- ◆ **op-printer-send-test-page** (page 78)

op-client-interface version

Description:	Determines a version associated with the plug-in's HTML interface. Can also determine if a client upgrade needs to be invoked or for any other client plug-in/HTML file compatibility issues.
Required information:	None

Supported return types:	URL, Cookie, Object
-------------------------	---------------------

op-client-is-printer-installed

Description:	Determines if the indicated printer is installed on the workstation.
Required information:	Printer URL
Supported return types:	URL, Cookie, Object

op-client-version-info

Description:	Determines the version of the Novell iPrint Client files running on the workstation.
Required information:	None
Supported return types:	Cookie, URL, Object

op-job-cancel

Description:	Deletes the indicated jobs.
Required information:	Printer URL, job-list
Supported return types:	None, Message box, HTML, URL, Cookie

op-job-get-info

Description:	Gets job information for indicated jobs. The information returned depends on the printer's capabilities. This information can include job name, ID, owner, size, bytes processed, hold until, priority, time created, time started printing, and time finished printing.
Required information:	Printer URL, job-list
Supported return types:	Message box, HTML, URL, Cookie

op-job-hold

Description:	Put sa hold on the indicated jobs. A job that is printing might not be held.
Required information:	Printer URL, job-list
Supported return types:	None, Message box, HTML, URL, Cookie

Supported parameter is indefinite.

op-job-hold-release

Description:	Removes the hold on the indicated jobs.
Required information:	Printer URL, job-list
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-get-info

Description:	Gets additional information about the printer. The information returned depends on the printer's capabilities. This information can include printer location, printer make and model, and supported document formats (PDLs).
Required information:	Printer URL
Supported return types:	Message box, HTML, URL, Cookie

op-printer-get-status

Description:	Gets status information from the indicated printer. The information returned depends on the printer's capabilities. Status can include printer state, printer state reasons, printer state message, printer accepting jobs, and printer job count.
Required information:	Printer URL
Supported return types:	Message box, HTML, URL, Cookie

op-printer-install

Description:	Installs the indicated printer to this workstation.
Required information:	Printer URL
Optional information:	driver-options, persistence
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-list-all-jobs

Description:	Lists jobs for this printer.
Required information:	Printer URL
Supported return types:	Message box, HTML, URL, Cookie

op-printer-pause

Description:	Pauses the printer. If results are requested for this operation, the op-printer-get-status operation is executed to provide the new printer status.
Required information:	Printer URL
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-purge-jobs

Description:	Deletes all jobs for this printer.
Required information:	Printer URL
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-remove

Description:	Deletes the indicated printer from this workstation.
--------------	--

Required information:	Printer URL
Supported return types:	None, Message box, HTML

op-printer-resume

Description:	Resumes the printer. If results are requested for this operation, the op-printer-get-status operation is executed to provide the new printer status.
Required information:	Printer URL
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-send-file

Description:	Sends a printer-ready file to this printer.
Required information:	Printer URL, file-path-name
Supported return types:	None, Message box, HTML, URL, Cookie

op-printer-send-test-page

Description:	Sends a test page to this printer.
Required information:	Printer URL
Supported return types:	None, Message box, HTML, URL, Cookie

B

Understanding Novell Distributed Print Services

Novell® Distributed Print Services™ (NDPS®) is the default and preferred print system in NetWare®. It is designed to handle the increased complexity of managing printing devices in any type of network environment, ranging in size from small workgroups to enterprise-wide systems. NDPS allows you to use Novell iManager, Novell's Web-based management tool. You can also designate those printers for automatic installation on user workstations, without any action by your users.

NDPS replaces the existing queue-based printing technology. You don't have to set up print queues, printer objects, or print servers, and link them together. Instead, all of your management tasks are focused on the printer itself, which can be configured as an eDirectory™ object.

To better understand how NDPS works, read the following sections:

- ◆ [“Overview of NDPS” on page 79](#)
- ◆ [“Comparing NDPS with Queue-Based Print Services” on page 83](#)
- ◆ [“Understanding NDPS Printers” on page 84](#)
- ◆ [“Understanding the Architecture of NDPS” on page 84](#)

Overview of NDPS

NDPS is the default and preferred print system in NetWare. Novell's legacy, queue-based print system is also fully supported, which allows your users to continue printing as they always have until you complete the transition to NDPS. NDPS provides full support for IP-based as well as IPX™-based printing, giving you a wide variety of system configuration options to fit your organization's specific needs.

Some of the most significant features of NDPS include the following:

- ◆ [“Bi-directional Feedback and Control” on page 80](#)
- ◆ [“Configurable Event Notification” on page 80](#)
- ◆ [“Tight Integration with eDirectory” on page 81](#)
- ◆ [“Automatic Printer Driver Download and End User Convenience” on page 81](#)
- ◆ [“Printer and Job Configuration Options” on page 81](#)
- ◆ [“Job Scheduling Options” on page 82](#)
- ◆ [“Protocol Independence” on page 82](#)
- ◆ [“Compatibility with Multiple Clients, Applications, and Operating Systems” on page 82](#)
- ◆ [“Support for Existing Printers \(Full Backward Compatibility\)” on page 83](#)

Bi-directional Feedback and Control

Novell Distributed Print Services lets clients and printers exchange information about printers and print jobs. For example, this interchange allows users and administrators to get real-time information about a printer such as

- ◆ Its status

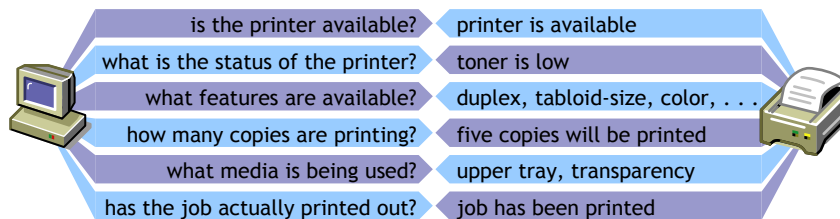
For example, it reports such information as whether the printer needs toner or paper, whether it is online, and whether the lid is open.

- ◆ Its configuration properties and features

For example, does it support color? Duplexing? How many pages has it printed since it was last serviced?

NDPS also lets you view information about a print job's properties and status, including

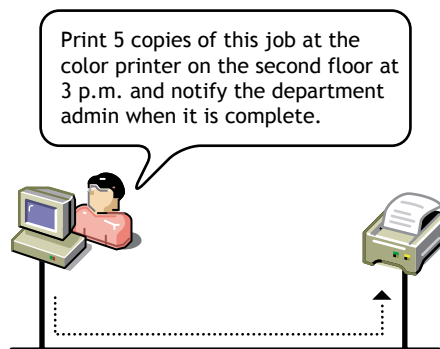
- ◆ The number of copies being printed
- ◆ Job hold and scheduling information
- ◆ Notification when the job has actually been completed



The bi-directional feedback provided by NDPS is limited only by the bi-directional capabilities of the printer itself. In many cases, NDPS actually enhances information provided about printers that do not have bi-directional capabilities.

Configurable Event Notification

With Novell Distributed Print Services, you can customize event notification. Event notification allows you to specify who should be notified of an event or problem, and how that person should be notified. It also allows you to identify the specific events or problems that you want notification messages sent for. For example, you can configure notification so that the owner of a print job will receive a screen pop-up message when the job has actually been printed.



You can also ensure that the printer operator is notified when a problem such as a paper jam occurs on the printer. Notification methods provided by NDPS include pop-up screen messages, e-mail, and log file records, while third-parties can develop other mechanisms such as beeper notification if they wish.

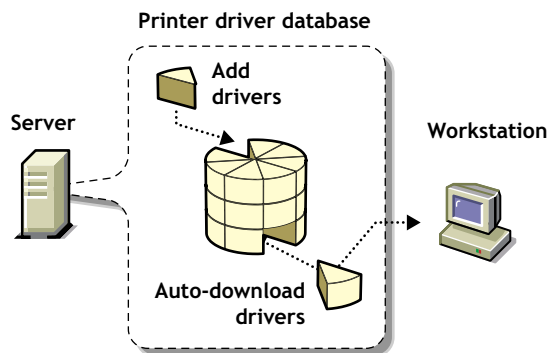
Tight Integration with eDirectory

Novell Distributed Print Services is designed to take full advantage of Novell eDirectory. Integration with eDirectory allows you to create a single eDirectory object—an NDPS Printer object—to represent each printer on the network. As a Printer object, printers become as secure as the other objects in the tree, and they are just as easy to manage.

In the eDirectory tree, printers can be conveniently grouped. For example, you can group and manage all of your printers by department, workgroup, or location. You can also search for printers with specific capabilities, because those capabilities are properties of the NDPS printer object.

Automatic Printer Driver Download and End User Convenience

Not only does NDPS make printer management easier for you as an administrator, it also makes printing easier for end users. NDPS provides a database that includes drivers for most printers in common use today. From this database, you can select drivers you want to be automatically installed on client workstations when a user adds a printer. This eliminates the need for users to provide the printer driver themselves. You can add drivers to this database as they become available.



An NDPS client can also modify printer configurations. For example, a user can configure a printer to use a different size paper or to print a cover page. Users can change the properties of any installed printer that the administrator has not locked. Also, using NDPS, users can view the current status of any available printer to see how many print jobs are waiting to be printed before they send their jobs. These NDPS features help make end-user printing easier and more effective than the methods of the past.

From this list, you can select drivers you want to be automatically downloaded and installed on client workstations. You can add drivers to this database as they become available.

Printer and Job Configuration Options

The NDPS interface supports many printer options in common use today, while the open architecture of NDPS allows printer manufacturers to add their own custom interfaces for specific printers. This means that as new printer features become available, you can access them through NDPS.

Job Scheduling Options

NDPS allows you to configure and schedule print jobs to be processed according to time of day, job size, or media availability.

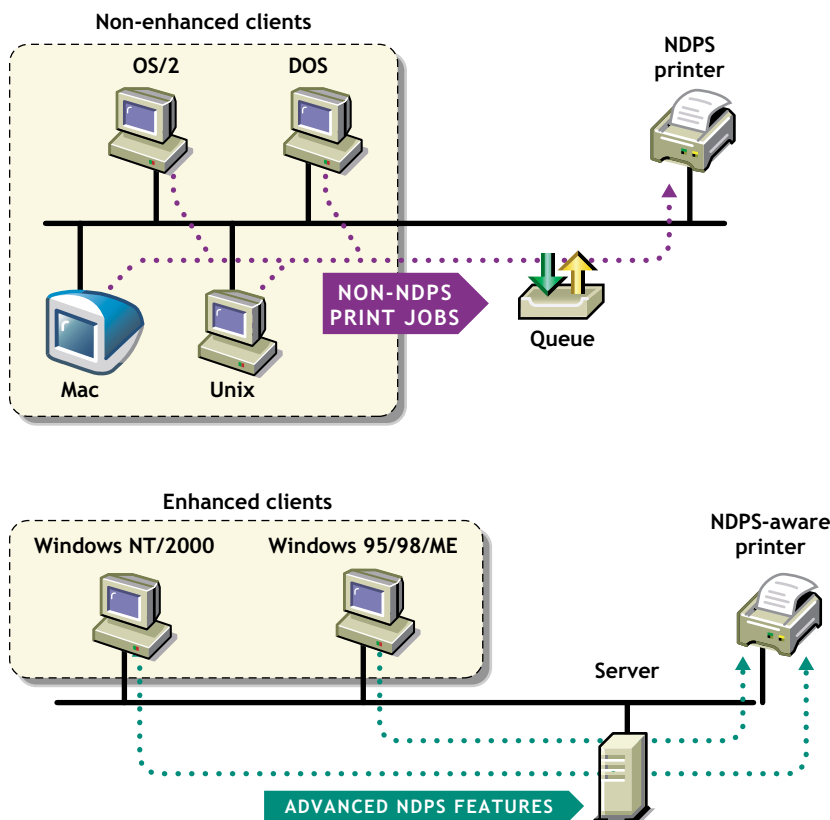
Protocol Independence

The entire NDPS architecture is protocol independent. NDPS can be used in an IPX-based environment, a pure TCP/IP environment, or a combination of both. The third-party gateways being developed to work with NDPS are also protocol independent.

Most printers that support TCP/IP today do not have a discovery protocol like SAP for IPX-based networks. The Service Locator Protocol (SLP) will eventually be embedded in printers and will provide a discovery protocol that can be used with NDPS.

Compatibility with Multiple Clients, Applications, and Operating Systems

NDPS provides an enhanced Windows* client to take advantage of all of the advanced features provided by NDPS. All clients that are not NDPS-aware can still print to NDPS printers, and you can use all of your existing applications with NDPS. Although your queue-based print clients won't be able to take full advantage of the advanced features available in NDPS, they won't lose any of the printing ability they have now. This backward-compatibility feature of NDPS makes it well-suited for heterogeneous networks.



Support for Existing Printers (Full Backward Compatibility)

NDPS lets you preserve your investment in your existing printing resources. All clients can print to legacy printers. All currently available printers can be used in NDPS environments. In fact, major printer manufacturers have developed gateways for their existing printers to enable them to take advantage of many new features available with NDPS.

Comparing NDPS with Queue-Based Print Services

The architecture of Novell legacy queue-based print services was based on the creation and linking of three components: printers, print queues, and print servers. Setting up queue-based printing was often a complex task. In order to print, users first had to capture the printer port. Then the client would redirect the data to a file in a print queue, where it was stored while waiting to be sent to a printer by the print server.

With NDPS, printer, print queue, and print server functions are combined into a single entity called a Printer Agent. The need to create print queues has been eliminated, and users send print jobs directly to printers.

Even though NDPS does not require queues, your networks might continue to include queue-based printers and clients not currently supported by NDPS. The backward compatibility of NDPS allows you to continue using these queue-based services and resources transparently, as is illustrated in the following scenarios:

- ◆ You can print through NDPS to an existing queue, allowing you to access systems that require a queue connection (for example, mainframe systems using NetWare HostPrint[®] and certain proprietary systems).
- ◆ NDPS can service existing queues, allowing you to use NDPS on the server even though your client platform is not currently running NDPS. This allows you to install and run NDPS while you are changing your client workstations to NDPS.

For a discussion of NDPS support for legacy printing, see [“Supporting Queue-Based Client Workstations” on page 52](#).

The following table summarizes the major differences between NDPS and queue-based printing services.

Queue-Based (Legacy) Print Services	Novell Distributed Print Services
Administrators create and link print queues, printers, and print servers, and users submit print jobs to the queues. These three objects must be maintained separately once the system is in place.	Administrators create Printer Agents, allowing users to submit print jobs directly to printers. All management functions are centered on the printer itself.
Uni-directional communications only. Feedback consists of pop-up windows reporting a nonconfigurable set of events.	Bi-directional communications supported. Configurable event notification includes e-mail, pop-up windows, event logs and other methods, including third-party methods such as beepers and faxes. Events reported are limited only by a printer's capability.
Does not accommodate add-ons or extensions from third parties.	Extensible framework for print devices, including snap-in interfaces.

Queue-Based (Legacy) Print Services	Novell Distributed Print Services
Administrators must create and configure Printer objects manually. Plug-and-print public access printing not available.	Plug-and-print option available for installing public access printers using specially designed third-party gateways.

Understanding NDPS Printers

NDPS printers can be any of the following types:

- ◆ Network-direct printers using a gateway provided by a third-party printer manufacturer
- ◆ Remote printers using RP, LPR, or queue-based protocols
- ◆ Local printers attached directly to a file server

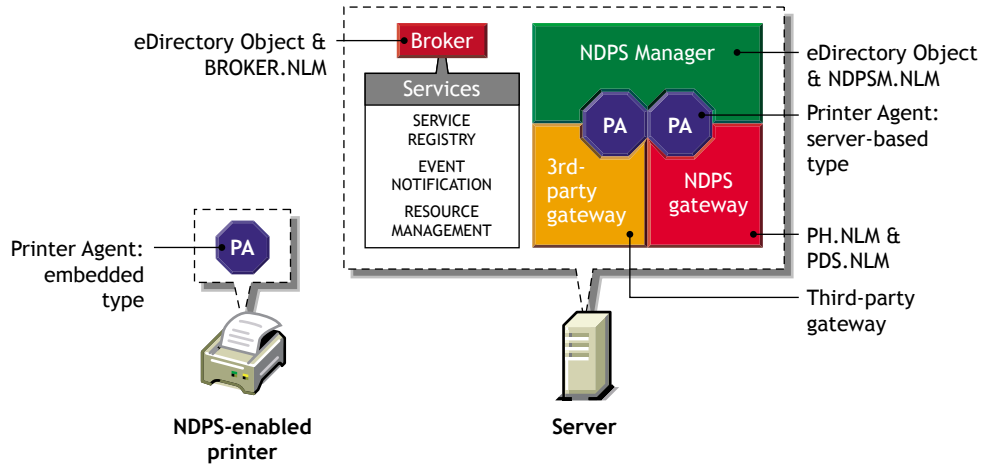
Any printer, regardless of its physical type or connection mode, can be configured as either a public access printer or a controlled access printer.

The following table compares the two types of printers.

Issue	Public Access Printers	Controlled Access Printers
Integration with eDirectory	Not associated with an eDirectory Printer object.	Associated with an eDirectory Printer object.
Availability	Immediately available to everyone on the network. Can be made automatically available through third-party gateways or embedded solutions.	Available only to network users who have rights assigned to them.
Administration	Require minimal administrative action.	Created and administered as an eDirectory object.
Network security	No network security.	Full range of network security options through eDirectory.
Event notification	Provide only job event notification.	Full range of event and status notification options including e-mail, pop-up windows, event logs and third-party methods, such as beepers and faxes.

Understanding the Architecture of NDPS

The architecture of Novell Distributed Print Services ensures the scalability of the printing environment, allowing you to print in LAN, WAN, and enterprise document production environments. It also allows you to print to devices ranging from simple dot-matrix printers to laser printers and large-scale production devices.



To understand exactly how NDPS works, you need to understand its major architectural components. See the following sections for information on the various components:

- ◆ “Understanding Printer Agents” on page 85
- ◆ “Understanding the NDPS Manager” on page 87
- ◆ “Understanding Printer Gateways” on page 88
- ◆ “Understanding the Broker” on page 89

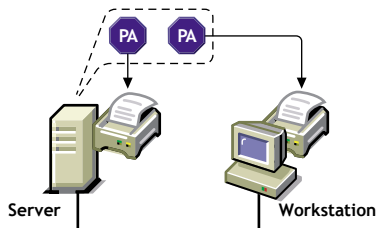
Understanding Printer Agents

Before a printer can be incorporated into a NDPS printing environment, it must be represented by a Printer Agent. No Printer Agent can represent more than one printer, and no printer can be represented by more than one Printer Agent.

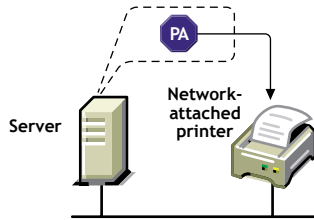
The Printer Agent lies at the heart of NDPS, combining the functions previously performed by a printer, print queue, print server, and spooler into one intelligent and simplified entity.

The Printer Agent can be any of the following:

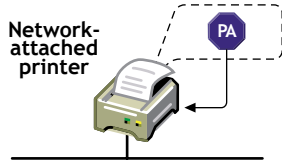
- ◆ A software entity running on a server that represents a printer attached to a server or workstation.



- ◆ A software entity running on a server that represents a network-attached printer.

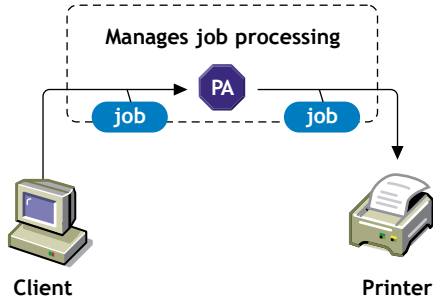


- ◆ An entity embedded within a network-attached printer.

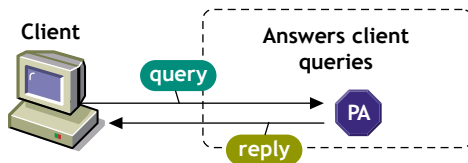


A Printer Agent provides the following services:

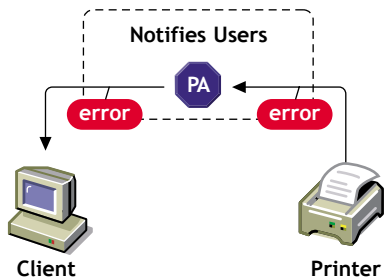
- ◆ It manages the processing of print jobs and many operations performed by the printer itself.



- ◆ It answers queries from network clients about a print job or document, or about the attributes of the printer.

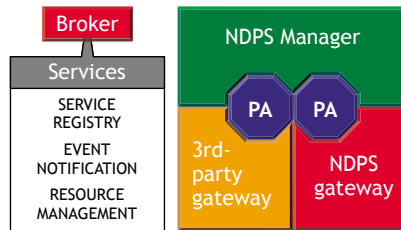


- ◆ It generates event notification so that interested parties can be notified of job completion, printing problems, errors, or changes in the status of a print job, document, or printer.



For information about other major NDPS components, see the following:

- ◆ “Understanding the NDPS Manager” on page 87
- ◆ “Understanding Printer Gateways” on page 88
- ◆ “Understanding the Broker” on page 89



Understanding the NDPS Manager

A NDPS Manager provides a platform for Printer Agents that reside on the server. An NDPS Manager must be created as an object in the eDirectory tree before you can create server-based Printer Agents.

The NDPS Manager object stores information used by the NetWare Loadable Module™ (NLM™), NDPSM.NLM. You can manually load this NLM at the server console.

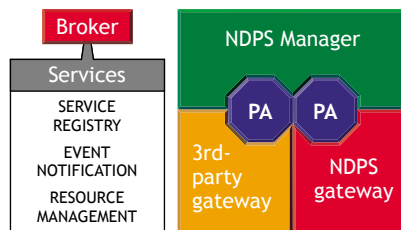
A single NDPS Manager can control multiple Printer Agents. (There is no hard limit.)

A specific NDPS Manager can be loaded only on one server. If it controls a local printer, it must be loaded on the server that the local printer is attached to.

While you can perform some configuration and management tasks directly through the NDPS Manager console interface, Novell iManager is the main tool for performing these tasks.

For information about other major NDPS components, see the following:

- ◆ “Understanding Printer Agents” on page 85
- ◆ “Understanding Printer Gateways” on page 88
- ◆ “Understanding the Broker” on page 89



Where to Place NDPS Managers

Use the following guidelines to determine where and when to place an NDPS Manager.

- ◆ Only one NDPS Manager can be loaded per server. Load this resource only on servers configured to service print jobs. The only exception to this rule is any server which has a

printer connected directly to it. In that case, the NDPS Manager must be loaded on that server as well.

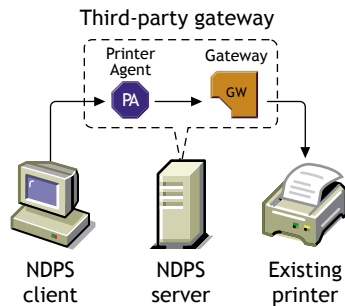
- ◆ Whenever possible, place the NDPS Manager and the printers it controls on the same LAN segment for optimal performance.
- ◆ You should consider distributing your printer agents across multiple NDPS Managers so that if one NDPS Manager goes down, not all of the printer agents are impacted.

Understanding Printer Gateways

Gateways allow NDPS clients to send jobs to printers that are not NDPS-aware (that is, printers that are not equipped with embedded NDPS Printer Agents). You select and configure a printer gateway when you create a new Printer Agent.

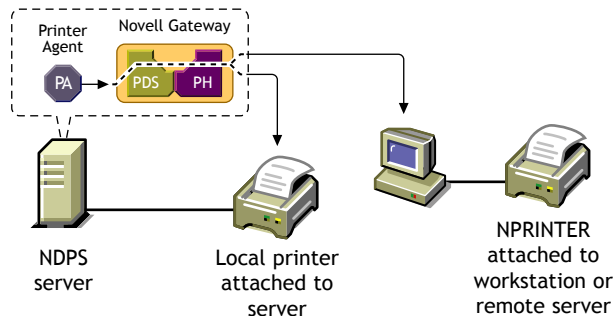
Gateways translate NDPS queries or commands to printer-specific language that the physical printer can use. This is possible because gateways are configured to know the specific type (make and model) of printer being used.

The following diagram illustrates a typical gateway configuration.



Third-party gateways are developed by printer manufacturers to support printers directly attached to the network. Because these gateways are developed to interact with specific proprietary printers, they can provide a wider array of information and offer options that are not available for the generic Novell gateway. Some third-party gateways provide utilities that can be configured to automatically create Printer Agents when one of their printers is attached to the network.

The Novell gateway (illustrated below) supports LPR/LPD and IPP printing, local and remote printers, including those using NPRINT or queue-based technology as well as those configured with RP mode enabled in IPX environments or LPR mode enabled in TCP/IP environments.

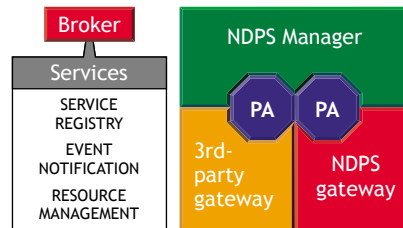


The Novell gateway is designed to be used with printers that don't have an embedded Printer Agent and don't yet have a proprietary, third-party gateway provided for them by their manufacturers.

RP printers are those that support Novell's legacy Remote Printer protocol. It is supported by many network-attached printers. LPR is a UNIX*-based printing protocol used by network-attached printers in TCP/IP environments to service jobs submitted to print queues.

For information about other major NDPS components, see the following:

- ◆ [“Understanding Printer Agents” on page 85](#)
- ◆ [“Understanding the NDPS Manager” on page 87](#)
- ◆ [“Understanding the Broker” on page 89](#)



Understanding the Broker

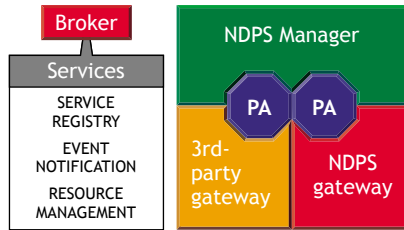
The Broker provides three network support services not previously available in NetWare: the Service Registry Service (SRS), Event Notification Service (ENS), and Resource Management Service (RMS).

While these services are invisible to end users, network administrators should be aware of them. NDPS uses these services in the following ways:

- ◆ **Service Registry Service.** The Service Registry allows public access printers to advertise themselves so that administrators and users can find them. This service maintains information about device type, device name, device address, and device-specific information such as the manufacturer and model number. See [“Understanding the Service Registry Service” on page 90](#).
- ◆ **Event Notification Service.** This service allows printers to send customizable notifications to users and operators about printer events and print job status. The Notification Service supports a variety of delivery methods including NetWare pop-up, log file, e-mail, and programmatic. See [“Understanding the Event Notification Service” on page 91](#).
- ◆ **Resource Management Service.** This service allows resources to be installed in a central location and then downloaded to clients, printers, or any other entity on the network that needs them. The Resource Management Service supports adding, listing, and replacing resources including printer drivers, printer definition (PDF) files, banners, and fonts. See [“Understanding the Resource Management Service” on page 92](#).

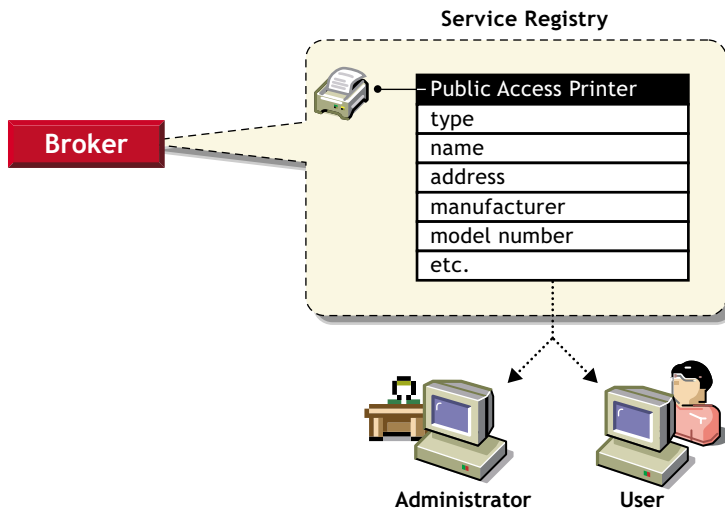
For information about other major NDPS components, see the following:

- ◆ [“Understanding Printer Agents” on page 85](#)
- ◆ [“Understanding the NDPS Manager” on page 87](#)
- ◆ [“Understanding Printer Gateways” on page 88](#)



Understanding the Service Registry Service

The Service Registry allows public access printers to advertise themselves so that administrators and users can find them. This service maintains information about device type, device name, device address, and device-specific information such as the printer manufacturer and model number.



Before Novell Distributed Print Services (NDPS), each printer had to periodically advertise its availability through the Service Advertising Protocol (SAP), which was effective but created a lot of traffic on the wire.

The Service Registry Service helps minimize the network traffic problem created by many printers advertising through the SAP. (For information on turning off the SAP, see the documentation for your printer.) When you attach a public access printer to the network, it registers with the SRS. When an application or user wants to use a printer, it can contact an SRS and retrieve a list of all registered printers on the network.

NOTE: For IPX, the SRS uses SAP type 8202; for IP environments, it uses Multicast.

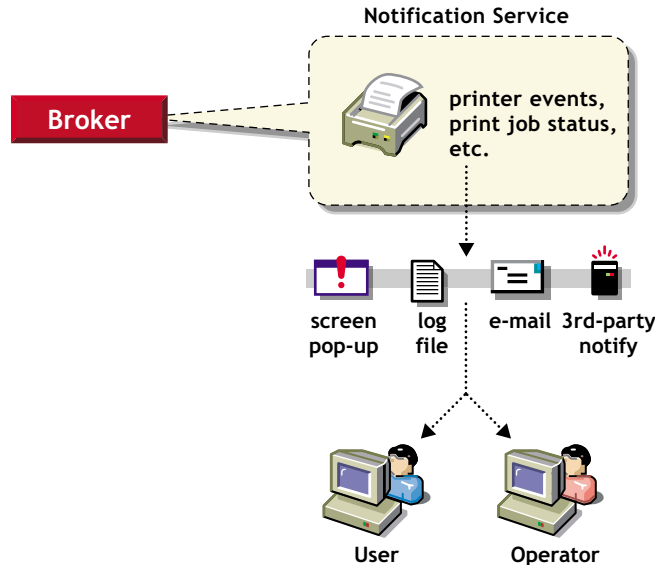
Through the SRS, plug-and-print public access printers, as well as those created manually, are immediately made available to users.

If there are multiple Service Registries running on the network, they synchronize automatically. This synchronization allows users to choose public access printers anywhere on the network.

In addition to printer information, the SRS also maintains lists of other services available, such as Event Notification Services and Resource Management Services. For more information, see [“Understanding the Event Notification Service” on page 91](#), [“Understanding the Resource Management Service” on page 92](#), and [“Enabling and Disabling Brokered Services” on page 58](#).

Understanding the Event Notification Service

Novell Distributed Print Services (NDPS) printers can be configured to provide event notification regarding print jobs and printer status. Administrators can configure event notification for interested parties, that is, non-job-owners that you wish to be notified of a defined printer or server event that occurs during the processing and printing of a job. See “[Configuring Interested-Party Notification](#)” on page 51 for more information.



The Event Notification service supports both consumers of events (users) and suppliers of events (printers). Users can register with the ENS by identifying the types of events they want to be notified about, while the printer can register the kinds of events it is capable of reporting. For example, the administrator for a specific printer (by default a Manager of that printer) can designate an Operator to be notified if the printer runs out of paper or if the toner is low. Similarly, users can be notified when their jobs have finished printing.

Delivery Methods

The availability of the following delivery options is dependent on which of them you have enabled. (See “[Enabling Event Notification Delivery Methods](#)” on page 57 for more information.)

- ◆ **Pop-up notification.** Messages will pop up on the screen for individuals designated to receive them. (Pop-up notification is always enabled when the ENS is enabled.)
- ◆ **SMTP notification.** Messages will be sent to the recipient through SMTP (Simple Mail Transfer Protocol) in IP-based systems.
- ◆ **Log file notification.** Messages are written to a file at a designated location on a NetWare server that the recipient has rights to.
- ◆ **Programmatic notification.** Two programmatic notification delivery methods are shipped with NDPS: SPX™ and RPC.

The open architecture of NDPS allows third parties to develop additional delivery methods as well.

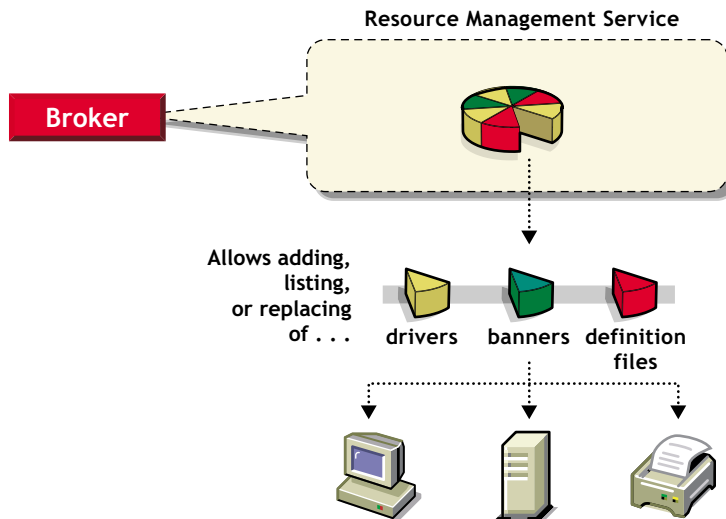
NDPS is enabled to work with SNMP. In addition, some third-party gateways are SNMP-enabled independently of the NDPS software.

For more information about other brokered services, see the following:

- ◆ “Understanding the Service Registry Service” on page 90
- ◆ “Understanding the Resource Management Service” on page 92

Understanding the Resource Management Service

This service allows resources to be installed in a central location and then downloaded to clients, printers, or any other entity on the network that needs that resource. It provides a single place where a variety of file types are stored for immediate access by Novell Distributed Print Services (NDPS). The Resource Management Service (RMS) supports adding, listing, and replacing resources including printer drivers, printer definition files (PDFs), banners, and fonts.



Resources

The Resource Management Service allows you to add, list, and replace the following resources:

- ◆ Banners (see “Adding Banner Pages” on page 54)
- ◆ Windows printer drivers (see “Adding or Updating Printer Drivers” on page 56)

Benefits

Some of the benefits offered by the Resource Management Service include

- ◆ Improved resource sharing
- ◆ More manageable resource distribution and updating
- ◆ Automatic printer driver download from a central repository
- ◆ Plug-and-print printer availability
- ◆ Availability of network resources to applications through a common interface

For more information about other brokered services, see the following:

- ◆ “Understanding the Service Registry Service” on page 90
- ◆ “Understanding the Event Notification Service” on page 91

Where to Place NDPS Brokers

Although the distribution of your Brokers is not really a critical issue initially, you will probably want to give some thought to this issue as you do your preliminary planning. You will not need to create a Broker on all of your servers, but you will want your Brokers sufficiently well distributed so that your brokered services (Service Registry Service, Event Notification Service, and Resource Management Service) will be readily available on the system when needed. When possible, you should run the Broker on the same server as the NDPS Manager.

As you gain experience with your new system, you might want to add or delete Brokers to optimize the efficiency of your system or to store your brokered resources (maintained in the Resource Management database) where you want them.

Given Novell's minimum design requirements, at least one Broker object should be created at each physical WAN location. To clarify this statement, let's take a quick look at the three services offered by the Broker object: Service Registry Service (SRS), Event Notification Service (ENS), and Resource Management Service (RMS). These services are transparent to end users, administrators must be aware of them and understand how they affect printing, LAN traffic, and the minimum implementation requirements needed.

Service Registry Service: The Service Registry Service allows public access printers to advertise themselves so that end users can find them. This service maintains information about device type, device name, device address, and device-specific information such as the printer manufacturer and model number. For more information, see [“Understanding the Service Registry Service” on page 90](#).

The following table summarizes the issues and recommendations regarding SRS.

Issue	Recommendations
Reliability of server / fault tolerance	On multi-server networks, enable at least two SRS per network. Network traffic (network layout) Enable at least one SR per site (WAN link).
Memory	1MB base for SR, an additional 10KB per resource added (such as NDPS Manager)

Event Notification Service: NDPS printers can be configured to provide event notification of print jobs and printer status. Administrators can configure event notification for all interested parties. That is, non-job owners as well can be notified of a defined printer or server event which occurs during the processing and printing of a job. For more information, see [“Understanding the Event Notification Service” on page 91](#)

Here are the issues and recommendations relating to ENS.

Issue	Recommendations
Number of trees	Enable at least one ENS per tree.
Reliability of server / fault tolerance	On multiserver networks, enable at least two ENs per tree.

Issue	Recommendations
Performance	Enable additional ENS as needed.
Methods availability	Make sure that the methods you need are enabled for each ENS you have installed. Novell provides NetWare pop-up, log file, e-mail, and programmatic methods. Third parties can develop other types of notification methods as well.

Resource Management Service: This service allows resources to be installed in a central location and then downloaded to clients, printers, or any other entity on the network that needs that resource. It provides a single place where a variety of file types are stored for immediate access by NDPS. For more information, see [“Understanding the Resource Management Service” on page 92](#).

Issue	Recommendations
Number of trees	Enable at least one RMS per tree.
Reliability of server / fault tolerance	On multiserver networks, enable at least two RMS per tree. Be sure to keep the databases synchronized after you have created them
Disk Space	Allow 50 MB for each RMS to ensure adequate space for resources added in the future. Size may vary considerably depending on the number of languages, platforms, and drivers your system supports.

C

Configuring Remote Printers

You can configure all of your current remote printers so that they will work just as they always have, whether they are attached to a workstation or a remote file server or are directly attached to the network running in RP mode. A remote printer controlled by a Printer Agent will emulate a legacy print server (PServer Emulation) and will no longer require PSERVER.NLM.

We recommend that you reconfigure your direct-connect printers currently configured for Queue Server mode to run in RP mode so that they can take advantage of the advanced features.

For detailed information, see the following:

- ♦ “Configuring Remote Printers Using NPRINT” on page 95
- ♦ “Configuring Remote Printers Running in RP Mode” on page 96
- ♦ “Configuring Remote Printers Running in LPR Mode” on page 97

Configuring Remote Printers Using NPRINT

Use the following procedure to configure a new printer attached to a workstation client or remote server that is running NPRINT.EXE or NPRINT.NLM.

- 1** In NetWare Administrator, select the container where you want the Printer object to reside.
- 2** From the Object menu, click Create > NDPS Printer.
- 3** Enter a name in the Printer Name field.
The name should distinguish it from other printers on your system.
- 4** In the Printer Agent Source field, select Create a New Printer Agent and click Create.
- 5** Confirm the Printer Agent name (default is the name of the new printer you are creating) and browse to select the Print Services Manager you want to assign it to.
- 6** In the Gateway Types window, select the Novell Printer Gateway.
- 7** Configure the PDS by selecting the Printer Type and Port Type and then click OK.
- 8** Configure the Connection Type as Remote and specify the Port Type as LPT, COM, or Other. Then click Next.
- 9** In the PServer Emulation field, modify or use the default SAP Name, specify a Printer Number, if needed, and specify any address restrictions you want to impose for this printer. Then click Next.
- 10** Configure the Controller Type and Interrupts, if needed, and then click Finish.
- 11** Select the printer driver for each client operating system.

These drivers will be automatically downloaded to users' workstations when they install this printer in the future. Select a driver for each operating system.

If you choose a Windows 3.x driver but not a Windows 95/98/ME or Windows NT/2000 driver, a 16-bit driver will be selected. Normally this will not create problems.

Since the list of printer drivers shipped with this product is limited, you can add drivers to the Resource Management Service database. (See “[Adding or Updating Printer Drivers](#)” on page 56 for more information.)

If the driver you need is not in the drivers list, rather than adding it to the RMS, you can select [None] at the top of each list. Users will then be asked to provide a disk with the appropriate driver the first time they install this printer on their workstations.

12 Click OK.

The main browser window appears with your new controlled access printer listed.

13 At the workstation or remote server that this printer is attached to, run NPRINT and select the SAP name specified in Step 10.

Workstation users can now select the printer and print to it.

Configuring Remote Printers Running in RP Mode

These instructions are for configuring a printer attached directly to the network and running in RP mode, unless that printer is an HP printer.

If you are using a direct-connect printer configured for Queue-Server mode, we recommend that you reconfigure that printer to RP mode and then configure it as a printer using RP. This allows you to gain the management benefits while eliminating a Queue object from your system.

- 1** From the browser's Object menu for the organization or organizational unit, click Create > NDPS Printer.
- 2** Enter a name in the Printer Name field.
- 3** In the Printer Agent Source field, select Create a New Printer Agent and click Create.
- 4** Confirm the Printer Agent name (default is the name of the new printer you are creating) and browse to select the Print Services Manager you want to assign it to.
- 5** In the Gateway Types window, select the gateway you want to use.
- 6** Configure the Novell PDS by selecting the Printer Type and Port Type, and then click OK.
- 7** Configure the Connection Type as Remote and specify the Port Type as LPT, COM, or Other. Then click Next.
- 8** In the PServer Emulation field, modify or use the default SAP Name, specify a Printer Number, if needed, and specify any address restrictions you want to impose for this printer. Then click Next.
- 9** Configure the Controller Type and Interrupts, as needed, then click Finish.
- 10** Select the printer driver for each client operating system.

These drivers will be automatically downloaded to users' workstations when they install this printer in the future. Select a driver for each operating system.

If you choose a Windows 3.x driver but not a Windows 95/98/ME or Windows NT/2000 driver, a 16-bit driver will be selected. Normally this will not create problems.

Since the list of printer drivers shipped with this product is limited, you can add drivers to the Resource Management Service database. (See “[Adding or Updating Printer Drivers](#)” on page 56 for more information.)

If the driver you need is not in the drivers list, rather than adding it to the RMS, you can select [None] at the top of each list. Users will then be asked to provide a disk with the appropriate driver the first time they install this printer on their workstations.

- 11** Click Continue.

Configuring Remote Printers Running in LPR Mode

Use the following procedure to configure a remote printer running in LPR mode in TCP/IP environments, unless that printer is an HP printer.

LPR will work only if TCP/IP is configured correctly.

- 1** From the browser's Object menu for the organization or organizational unit, click Create > NDPS Printer.
- 2** Enter a name in the Printer Name field.
- 3** In the Printer Agent Source field, select Create a New Printer Agent and click Create.
- 4** Confirm the Printer Agent name (default is the name of the new printer you are creating) and browse to select the Print Services Manager you want to assign it to.
- 5** In the Gateway Types window, select the Novell gateway.
- 6** Configure the Novell PDS by selecting the Printer Type and Port Type, and then click OK.
- 7** Configure the Connection Type as Remote LPR/TCP/IP and specify the Port Type as LPT, COM, or Other. Then click Next.
- 8** Select the printer driver for each client operating system.

These drivers will be automatically downloaded to users' workstations when they install this printer in the future. Select a driver for each operating system.

If you choose a Windows 3.x driver but not a Windows 95/98/ME or Windows NT/2000 driver, a 16-bit driver will be selected. Normally this will not create problems.

Since the list of printer drivers shipped with this product is limited, you can add drivers to the Resource Management Service database. (See [“Adding or Updating Printer Drivers”](#) on page 56 for more information.)

If the driver you need is not in the drivers list, rather than adding it to the RMS, you can select [None] at the top of each list. Users will then be asked to provide a disk with the appropriate driver the first time they install this printer on their workstations.

- 9** Click Continue.

The main browser window appears with your new controlled access printer listed.

D

Planning the Migration to Novell Distributed Print Services

There is no single ideal strategy for implementing the Novell[®] Distributed Print Services[™] (NDPS[®]) printing system or for upgrading your current queue-based system to take advantage of the many printer management and ease-of-use features provided by NDPS. However, the information provided in this section will help you understand the planning issues you should consider and the migration scenarios available to make a successful transition. Once the transition to NDPS is complete, you can follow the steps in [Chapter 2, “Setting Up iPrint on Your Server,” on page 15](#) to set up and configure iPrint.

Because NDPS provides full support for IP-based as well as IPX[™]-based printing, it offers a wide variety of system configuration options to fit your organization's specific needs. Novell's legacy, queue-based print system is also fully supported, which allows your users to continue printing as they always have until you complete the transition to NDPS.

Establishing a Planning Base

The key to a successful move to NDPS lies in understanding both what you are starting with and what you want when you have completed your move. As part of this understanding process, you should also anticipate the critical issues and decisions you will need to deal with as you implement the transition.

Establishing your planning base consists of the following tasks:

- ◆ [“Assessing Your Current Printing Environment” on page 99](#)
- ◆ [“Identifying Critical Planning Issues” on page 100](#)
- ◆ [“Designing Your New System” on page 101](#)

Assessing Your Current Printing Environment

Beginning with NetWare[®] 5, NDPS became the default and preferred print system while still offering compatibility with Novell's legacy, queue-based print system. Because both printing systems are supported, your users can continue printing as they always have until you complete the transition to NDPS.

Your first planning task should be to determine what kind of printing system you currently have. You can then begin narrowing down your options for how to proceed. In nearly all cases, your system will consist of one or more of the following:

- ◆ **NetWare Legacy (Queue-Based) Printing System**—If your current printing solution is based on the NetWare legacy, queue-based system, you will find information on upgrading to NDPS in [“Migrating from Queue-Based Printing to NDPS” on page 106](#).

- ◆ **NetWare 3.x Printing System**—If you currently have a NetWare 3.1x server bindery and file system and you are using a relatively small number of printers, you should consider implementing your NDPS system from scratch and then deleting all of your legacy printing objects. However if your system is large and you do not want to create your NDPS printing system from scratch, you can implement an NDPS printing system on your network using the process described in [“Migrating from Queue-Based Printing to NDPS” on page 106](#).
- ◆ **NetWare for UNIX or NFS Printing System**Several scenarios can be used to incorporate NDPS into environments that use NFS* Print Services:
 - ◆ [“NetWare-to-UNIX Printing” on page 111](#)
 - ◆ [“UNIX-to-NetWare Printing” on page 111](#)

Migrating any of these configurations to NDPS will result in simpler and more reliable printing, in addition to the benefits inherent in using NDPS.

- ◆ **Non-NetWare System**If you are implementing a new Novell network from scratch, or if you are changing over from a different networking system altogether (such as Windows* NT*, Windows 2000, 3COM*, or LAN Manager*), you should implement NDPS as your printing solution. If any of your current printers or print clients require queues, the backward compatibility of NDPS allows you to integrate those printers and clients into your system. In all other cases, we recommend that you use an all-NDPS printing setup.

Identifying Critical Planning Issues

The transition to your new printing system will go much more smoothly if you have identified the major issues involved before you begin the process. The following items provide a starting point for accomplishing this. We suggest that you develop your own checklist of issues, using the following as a starting point.

- ◆ [“Which Protocol\(s\) Will Be Used \(IP and/or IPX\)?” on page 100](#)
- ◆ [“When Will Clients Be Upgraded?” on page 101](#)
- ◆ [“How Much Network Security Will Be Needed?” on page 101](#)
- ◆ [“How Will Brokered Services Be Distributed?” on page 101](#)

Which Protocol(s) Will Be Used (IP and/or IPX)?

A prominent feature of NetWare is support for IP-based communication and system technologies. Selecting the protocol family (IP, IPX, or both) to be used by a network has a direct impact on the way you must configure your printers for NDPS. NetWare provides a rich variety of print configurations so that one or more print systems and one or more protocol families may be employed to best accomplish the goals of a system.

In NetWare, NetWare Core Protocol™ (NCP™) communication can travel on top of IPX or on top of IP in a configuration referred to as Pure IP (the IP NCPs are no longer IPX packets encapsulated inside IP). All applications that use NCP and do not interface directly with IPX or SPX™ can operate as Pure IP applications.

NetWare also supports existing applications that directly access IPX-based protocols (make IPX/SPX or SAP calls) through its Compatibility Mode (CMD). Compatibility Mode is implemented as a set of system components that allow IPX client or server applications to locate and communicate with their IPX counterparts without IPX packets being visible on the wire. Compatibility Mode components translate SAP advertise and query requests into their SLP

equivalents, allowing IPX applications to dynamically advertise and/or discover without generating IPX traffic on the wire.

All NDPS components are IP-aware and IPX-aware, so they do not rely on Compatibility Mode to implement IP-based communication.

When Will Clients Be Upgraded?

If you have a fairly large number of workstation clients, you might find it inconvenient to try to upgrade them to NDPS all at once. Because NDPS allows you to implement all of the server management components while allowing your workstation users to continue to print to queues just as they always have, you can upgrade these clients at a pace that suits your needs while you take advantage of the management benefits NDPS provides immediately. See [“Making the Transition Gradually” on page 103](#) for more information.

How Much Network Security Will Be Needed?

NDPS is tightly integrated with eDirectory™ to maximize both the security and ease-of-management that eDirectory provides. The level of security you desire for each of your printers can be as flexible as you want it to be, ranging from total public access to tightly controlled access. Printer security for controlled access printers is ensured through the assignment of the Manager, Operator, and User access control roles. For more information, see [Chapter 7, “Setting Up a Secure Printing Environment,” on page 61](#).

How Will Brokered Services Be Distributed?

While the distribution of your Brokers is not a critical issue initially, you will probably want to give some thought to this issue as you do your preliminary planning. You will not need to create a Broker on all of your servers, but you will want your Brokers sufficiently well distributed so that your brokered services (Service Registry Service, Event Notification Service, and Resource Management Service) will be readily available on the system when needed. As you gain experience with your new system, you may want to add or delete Brokers to optimize the efficiency of your system or to store your brokered resources (maintained in the Resource Management database) where you want them.

For guidelines on when and where to enable various brokered services, see [“Managing the Broker” on page 53](#).

Designing Your New System

As a final planning step, before you begin the implementation process, you should create a written record of all the network resources and components that will be incorporated into your new printing system (printers, servers, workstation clients, routers, etc.). Then, you should draw a diagram of how these components will fit together in your modified eDirectory tree.

The steps to designing your NDPS system are described below:

- Make a record of your printing resources.

Write a list that you can refer to as you make a diagram of your eDirectory tree. This record helps you to include all of the printing resources you need for your network when you start to create the eDirectory objects.

For example, you might record that you have two printers for one location on your network. One will be used for everyone in the office, and the other is used only by the production team. This information can guide you in creating your diagram.

- ❑ Create a diagram of the new eDirectory tree.

We recommend that you create a diagram of the printing layout you want to implement in your new system. The diagram will help you simplify and reorganize your setup.

The diagram you create can take a variety of forms. Drawing a tree diagram is the most common. You can also create a list that includes all the objects that will be in the tree. Or you might prefer to create an organization chart with responsibilities and resources listed by each name.

The diagram should be centered on the printers and the NDPS Manager. (Keep in mind that only one NDPS Manager can be loaded on a server.) Although there are other items that might be included in the diagram, such as the NDPS Broker; printer users, managers, and Operators; or printer configuration information, the printers and the NDPS Manager are all that is necessary at this stage. Place the printers in the appropriate areas. Place an NDPS Manager on the server that you want to handle the Printer Agents that correspond with those printers.

Determining Your Implementation Strategy

Now that you have done some initial information-gathering, identified the major issues you will face, and created a diagram of the new eDirectory layout you want to implement, you can now consider your strategy for implementing your new or upgraded NDPS system.

The following topics are discussed in this section:

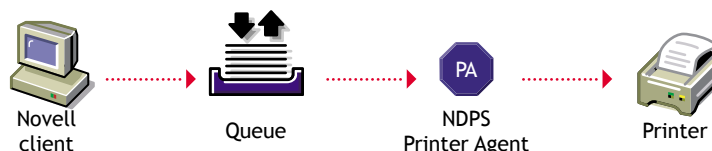
- ◆ [“General Transition Guidelines” on page 102](#)
- ◆ [“Making the Transition Gradually” on page 103](#)
- ◆ [“Maintaining Your Queues during the Transition” on page 103](#)
- ◆ [“Understanding Your Implementation Options” on page 104](#)

General Transition Guidelines

The following guidelines generically apply to any transition scenario and should expedite your decision process.

- ◆ NDPS provides simple and reliable configurations for Pure IP environments. You will need to use a gateway that supports IP like the Novell gateway or a third-party gateway.
- ◆ Migrate the server side first, then migrate your end-users gradually. A sensible approach to deploying NDPS into a system is to first replace the server components of your legacy printing system with the NDPS server components. Since the NDPS Manager (NDPSM.NLM) and the Print Server (PSERVER.NLM) can run simultaneously on a server, this transition can be accomplished one queue/printer at a time. Users can then be gradually switched to print directly to NDPS printers instead of queues.

This transitional configuration would look this way:



See [“Maintaining Your Queues during the Transition” on page 103](#) for more details on this printing configuration.

Eventually, only a few queues serviced by NDPS Printer Agents will remain to support your DOS and Windows DOS-box printing needs, while most printing will be through the following basic NDPS configuration and its variations, which will be explained in [“Using Legacy Printers and NDPS Gateways” on page 105](#).

- ◆ Determine which gateway you will use.

Making the Transition Gradually

If you are using a queue-based printing system, you can continue to use your existing system without modification. Because of the advantages provided by NDPS, however, we recommend that you begin the transition as soon as it becomes convenient.

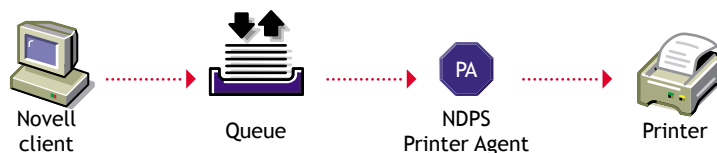
In general, we suggest you make the move gradually, and begin by implementing the NDPS server components and management features. This strategy allows you to set up your new printers and optimize the distribution of your brokered resources while your end users continue printing through the same queues they always have. Then, when you are satisfied that your NDPS printing components are set up and configured the way you want them, you can begin upgrading your end users to the new system gradually.

If you will be implementing iPrint, the Novell Client 32™ is not required. Instead, users install a browser plug-in that allows them to install printers and print drivers to their workstations.

Advantages to Running NDPS on the Server	Additional Advantages of Running NDPS on Clients Also
<ul style="list-style-type: none"> ◆ Easier (and in many cases, the only way) to support Pure IP ◆ Custom printer management tools ◆ Simpler management and configuration ◆ Advanced error reporting and troubleshooting tools for administrators 	<ul style="list-style-type: none"> ◆ Automatic driver download when a user logs on to the network (assuming that you have implemented this Remote Printer Management function) ◆ Remote workstation printer management ◆ Local printer installation and management integrated into native operating system facilities ◆ Public access printing ◆ Queues no longer needed ◆ Potentially less network traffic ◆ Improved error reporting and troubleshooting tools for users ◆ Advanced job-related event notification

Maintaining Your Queues during the Transition

NDPS Printer Agents can be configured to retrieve jobs from queues in addition to accepting jobs from NDPS users.



Maintaining your queues allows you to gradually migrate users to NDPS because users' workstations can continue to print to existing queues and be moved to NDPS as time permits. Workstations can even be configured to print to both queues and NDPS printers.

In addition to allowing for a gradual transition to NDPS, this configuration is also the only support currently available for DOS and Windows DOS-box printing and for handling printing requests from other systems such as UNIX or Macintosh*. It also allows Novell clients to submit jobs to NetWare queues, providing these clients with access to NDPS-managed printers.

After you have created NDPS Printer objects to represent the printers that are still servicing queues, you can delete your legacy Print Server and Printer objects (but not your Queue objects) if you want, reducing the number of objects in your tree you need to manage.

In most cases, you will want to upgrade your administrator workstations to NDPS first because NDPS allows administrators to quickly benefit from its advanced capabilities such as automatic printer driver download, extended job management, and event notification.

Administrators can accomplish much of the migration remotely by removing the CAPTURE statements from users' login scripts and installing NDPS printers on their workstations using the NDPS Remote Printer Management functionality.

Advantages to Maintaining Your Queues While Transitioning to NDPS	Disadvantages to Maintaining Your Queues While Transitioning to NDPS
<ul style="list-style-type: none"> ◆ Allows gradual migration to NDPS ◆ Allows administrators quick access to NDPS management tools ◆ Supports clients not directly supported by NDPS (UNIX, Macintosh, OS/2*, DOS) ◆ Supports NetWare 4 clients 	<ul style="list-style-type: none"> ◆ Users printing through queues don't have access to the NDPS advanced features ◆ Two levels of indirection for queue users ◆ Requires management of both NDPS printers and legacy queues

Understanding Your Implementation Options

Possible scenarios for printing with NetWare range from maintaining a legacy queue-based system (available only for IPX-based systems), to integrating NDPS into a heterogeneous print system, to implementing a pure NDPS printing system in a Pure IP environment. A wide range of heterogeneous configurations exist between all IPX and Pure IP systems, and between all-queue-based and all-NDPS systems. However, becoming one hundred percent Pure IP and utilizing the most advanced printing features of NetWare implies full deployment of NDPS.

Keep in mind that there is no requirement to modify current NetWare printing configurations immediately, and any modifications you make may be implemented gradually (see [“Making the Transition Gradually” on page 103](#)).

Using Legacy Printers and NDPS Gateways

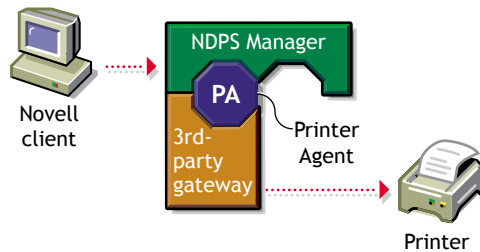
Gateways allow NDPS clients to send jobs to printers that are not NDPS-aware. You select and configure a printer gateway when you create a new Printer Agent.

Gateways translate NDPS queries or commands to printer-specific language that the physical printer can use. This is possible because gateways are configured to know the specific type (make and model) of printer being used.

You can implement NDPS through two types of gateways: third-party gateways and the generic Novell gateway. Each type of implementation is described here.

Printing through Third-party Gateways

A third-party gateway is designed specifically for a printer or printer family.



This scenario requires two components running on a NetWare server: the NDPS Manager and the third-party gateway. The NDPS Manager is an integral part of NDPS and implements a platform on which to run Printer Agents. The third-party gateway is provided by the printer manufacturer for a specific printer or class of printers.

Printer Agents are created to run on the NDPS Manager to front-end printers which do not contain NDPS capabilities and make them appear to users and administrators as full NDPS printers. The NDPS Manager uses NDPS to communicate with users and administrators on one end, but requires a gateway to communicate with the printer on the other.

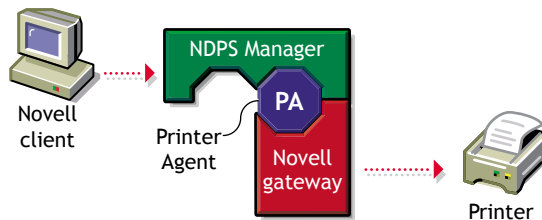
Some printer manufacturers have developed proprietary mechanisms for dynamically discovering their printers and for providing comprehensive access to their printers' capabilities. Gateways developed by these printer manufacturers can be snapped in to the NDPS Manager to give NDPS administrators and users enhanced access to the printers.

Different levels of NDPS functionality are available depending on the actual implementation of a specific gateway and the capabilities of the protocols used by the gateway.

Advantages of Printing through a Third-Party Gateway	Disadvantages of Printing through a Third-Party Gateway
<ul style="list-style-type: none">♦ Might support Pure IP♦ Might provide pseudo plug-and-print capabilities♦ Feedback and control as good as the protocols used by the gateway♦ Simple administration	<ul style="list-style-type: none">♦ Currently not all existing printers have third-party gateways♦ Some manual configuration might be required

Printing through the Novell Gateway

For legacy and specialized printers that are not supported by third-party gateways, NetWare includes a generic Novell gateway that allows the NDPS Manager to communicate with print devices using the LPR/LPD protocol on IP, the Internet Printing Protocol, and the RP protocol on IPX.



Using the Novell gateway, jobs can also be written to a queue as a way to route them to a different print system or to network printers set up in QServer mode.

Advantages of Printing through the Novell Gateway	Disadvantages of Printing through the Novell Gateway
<ul style="list-style-type: none">◆ Support for Pure IP via LPR as well as support for IPX◆ Feedback and control as good as the protocol employed	<ul style="list-style-type: none">◆ Some manual configuration required during the creation of the Printer Agent◆ Typically less printer information available than with third-party gateways

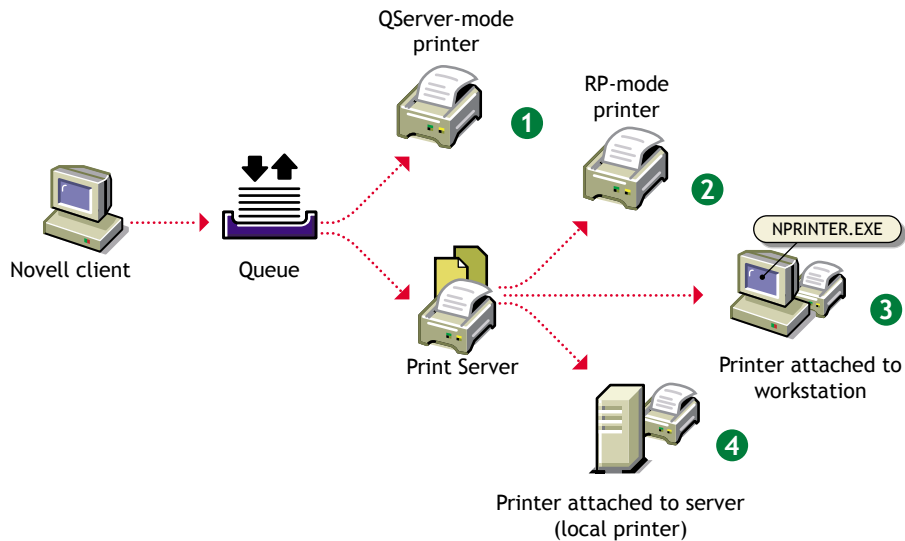
Migration Scenarios

The following scenarios will help you better understand the process for making the transition to a NDPS environment that will best meet your printing needs.

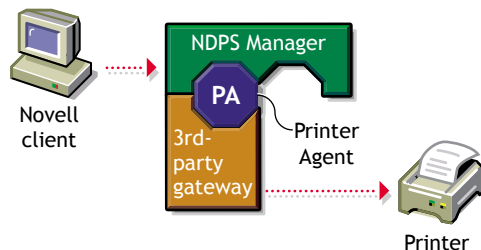
- ◆ [“Migrating from Queue-Based Printing to NDPS” on page 106](#)
- ◆ [“Migrating from IPX-Based NDPS to IP-based NDPS” on page 108](#)
- ◆ [“Migrating from NFS to NDPS” on page 110](#)

Migrating from Queue-Based Printing to NDPS

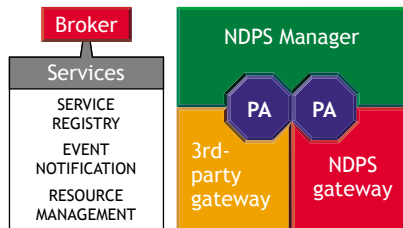
Most queue-based printing in NetWare networks is currently realized through one of the following configurations:



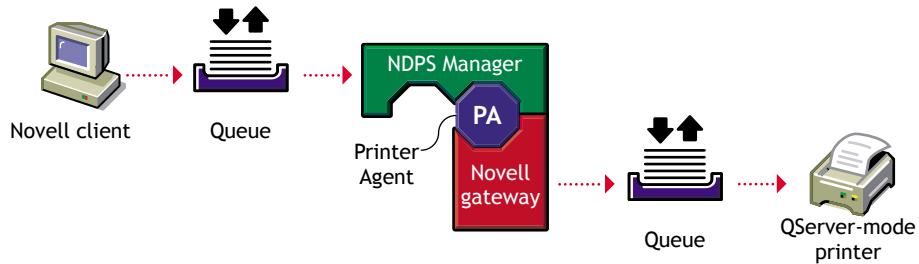
When migrating to NDPS from any of these configurations, you should first consider the protocols, connection methods used, and potential need to configure the printer in determining which gateway to use. If a third-party gateway is used, the resulting configuration would look as follows:



The Novell gateway provides a straightforward migration path. The NDPS configurations corresponding to the queue-based printing configurations illustrated earlier, as well as an additional configuration for Pure IP support, are shown in the following illustration:



The first NDPS configuration above is not recommended because a back-end queue is still required, increasing network traffic and delaying job completion. In addition, while transitioning to NDPS, there would be two queues in the print path as shown in the following illustration:



If you are migrating a QServer-mode printer, we recommend that you reconfigure it for LPR as in configuration #5 or RP as in configuration #2 if possible. Choose configuration #5 if the network supports IP and the printer supports LPR/LPD. Choose configuration #2 if the network supports IPX and the printer supports RP. Configurations #3 and #4 are available if the printer does not support LPR or RP, but you still want to benefit from many NDPS features without the need for a queue. Notice that configurations #2 through #5 require you to configure the print device to enable a new protocol.

Notice that if the NPRINT.EXE in configuration #3 is running on a NetWare client, it is possible to realize IP-only printing to a remote printer, though not Pure IP. However, if IP is desired, configuration #5 is preferable and is Pure IP.

Migrating from IPX-Based NDPS to IP-based NDPS

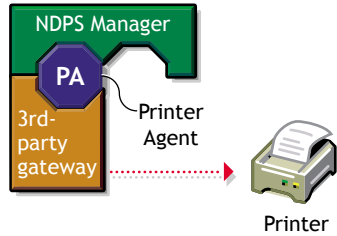


NDPS 3.0, which is included in NetWare 6, is written to support IP natively. All communication between NDPS clients and NDPS back-end services will automatically switch to use the protocol or protocols available at the client and server. Thus, much of the effort to switch to an IP network will consist of configuring the clients and servers to use IP only. (This is normally done during the installation process.) However, there are some protocols used by NDPS gateways to communicate with printers that have inherent IPX dependencies. This section provides guidelines for switching these configurations to use IP-based protocols. None of the changes described will require the clients' installation and configuration to change.

The following scenarios are described in this section:

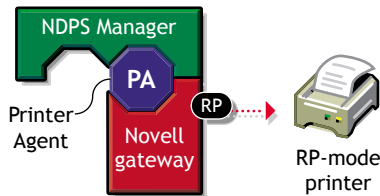
- ◆ “Migrating an IPX-Based Third-Party Gateway to IP” on page 109
- ◆ “Migrating a Printer in RP Mode to IP” on page 109
- ◆ “Migrating a Printer in QServer Mode to IP” on page 110

Migrating an IPX-Based Third-Party Gateway to IP

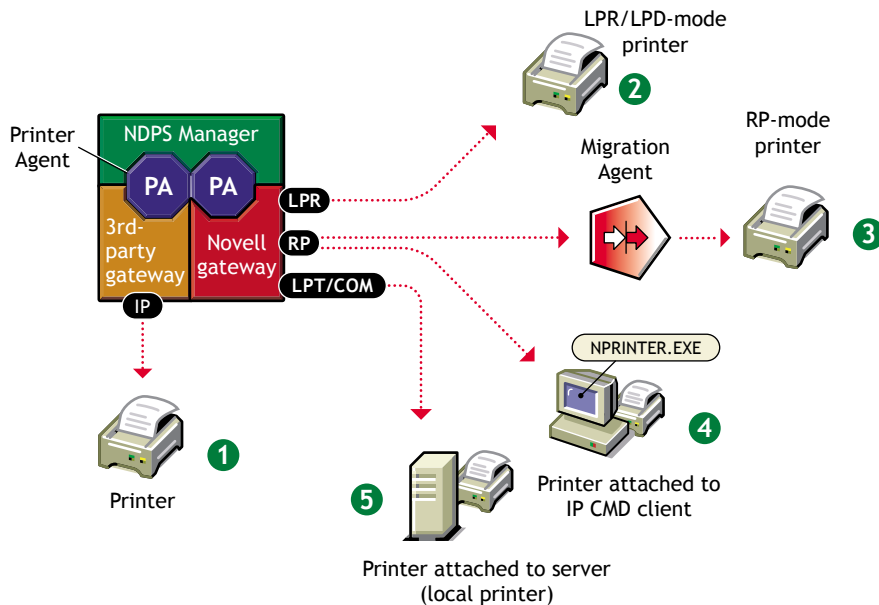


Several third-party gateways support both IPX-based and IP-based communication to printers. The process to switch a third-party gateway to use IP is likely to differ from gateway to gateway and should be explained in each gateway's documentation. If a specific third-party gateway doesn't support IP, you might need to use the Novell gateway.

Migrating a Printer in RP Mode to IP



The Remote Printer protocol (RP) is inherently IPX-based. Configurations using printers in remote printer mode can use one of the following configurations to conform to an IP setting:

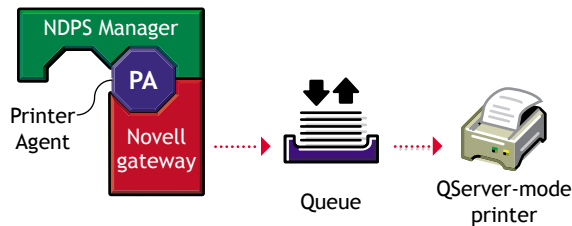


As stated before, the best way today to communicate to a printer with NDPS is through a third-party gateway. If you plan to reconfigure a printer to support IP, you should check whether a third-party gateway for that printer has become available.

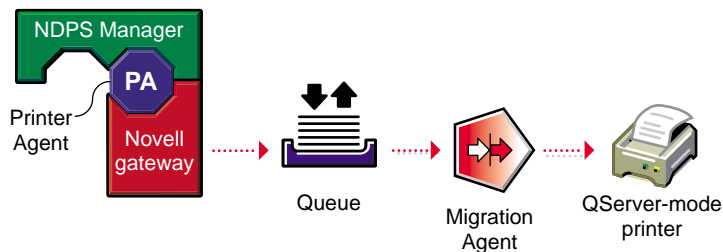
Option #2 is simpler and offers better performance than option #3, but it requires the printer to support LPR/LPD mode and have IP configured. Options #4 and #5 are also simple, but they might not be a viable option in some settings because they require the printer to be directly attached to a workstation or server. Of the three options, only #5 maintains a Pure IP environment.

Option #3 requires an isolated IPX segment to exist in the network. Communication with this segment can be filtered and/or translated by a Migration Agent, thus maintaining the IP segments free of IPX communication. The advantages of option #3 are that it doesn't require any changes to the current printing configuration and doesn't add much overhead to networks that already manage isolated IPX segments.

Migrating a Printer in QServer Mode to IP



The best alternatives for this scenario to support IP are to (1) use a third-party gateway (see [“Migrating a Printer in RP Mode to IP” on page 109](#)) or (2) reconfigure the Novell gateway to communicate with the printer through a different protocol altogether. If neither of these options are feasible, the following configuration is available to isolate the IPX traffic generated by printers in QServer mode:



The advantages of this option are that it doesn't require any changes to the current printing configuration and doesn't add much overhead to networks that already manage isolated IPX segments.

Migrating from NFS to NDPS

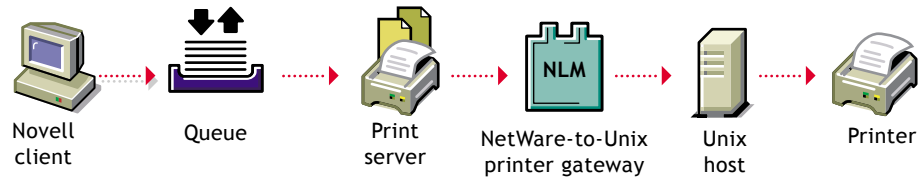
Several scenarios can be used to incorporate NDPS into environments that use NFS Print Services:

- ◆ [“NetWare-to-UNIX Printing” on page 111](#)
- ◆ [“UNIX-to-NetWare Printing” on page 111](#)

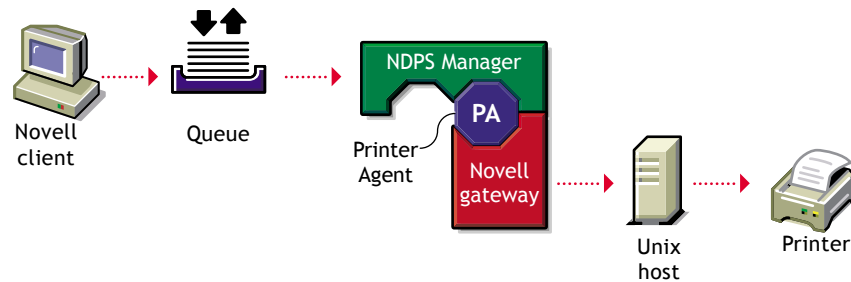
In most cases, migrating one of these configurations to NDPS will result in simpler and more reliable printing, in addition to the benefits inherent in using NDPS. This section discusses how NDPS can be used to replace or work with NFS Print Services.

NetWare-to-UNIX Printing

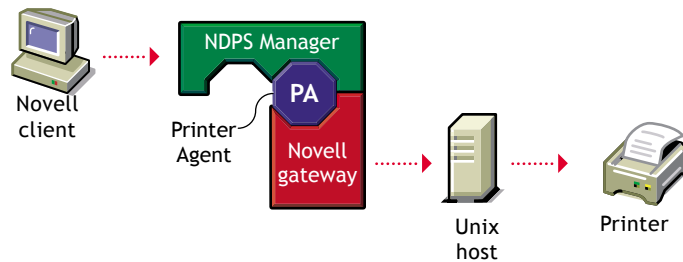
The following shows how to route jobs from NetWare out to a UNIX system. This configuration is as follows:



Again, by replacing the Print Server and NetWare-to-UNIX Printer Gateway with the NDPS Manager, the following configuration is possible:

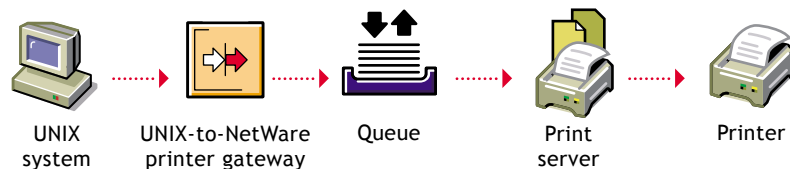


The Novell gateway uses LPR to communicate with the UNIX host. Eventually the clients can also be switched to NDPS, yielding the following configuration:

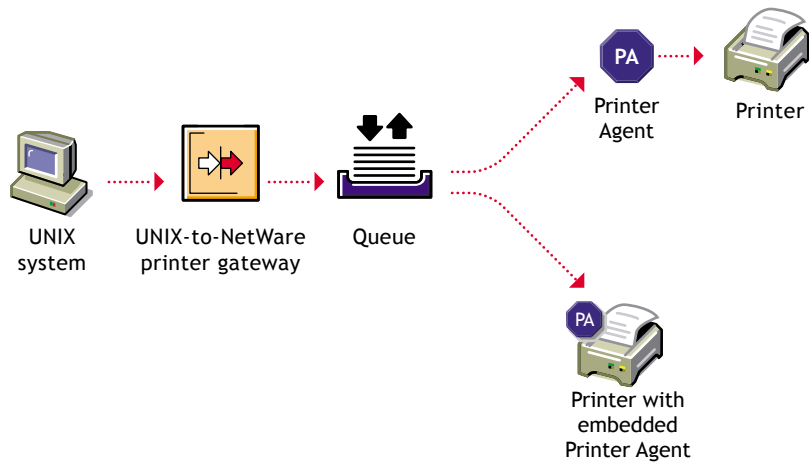


UNIX-to-NetWare Printing

This configuration uses the NFS Print Services to route print jobs from a UNIX system into NetWare. The following is a common use of the UNIX-to-NetWare Printer Gateway:



As discussed in [“Maintaining Your Queues during the Transition” on page 103](#), a Printer Agent can be set to service queues, enabling one of the following setups:



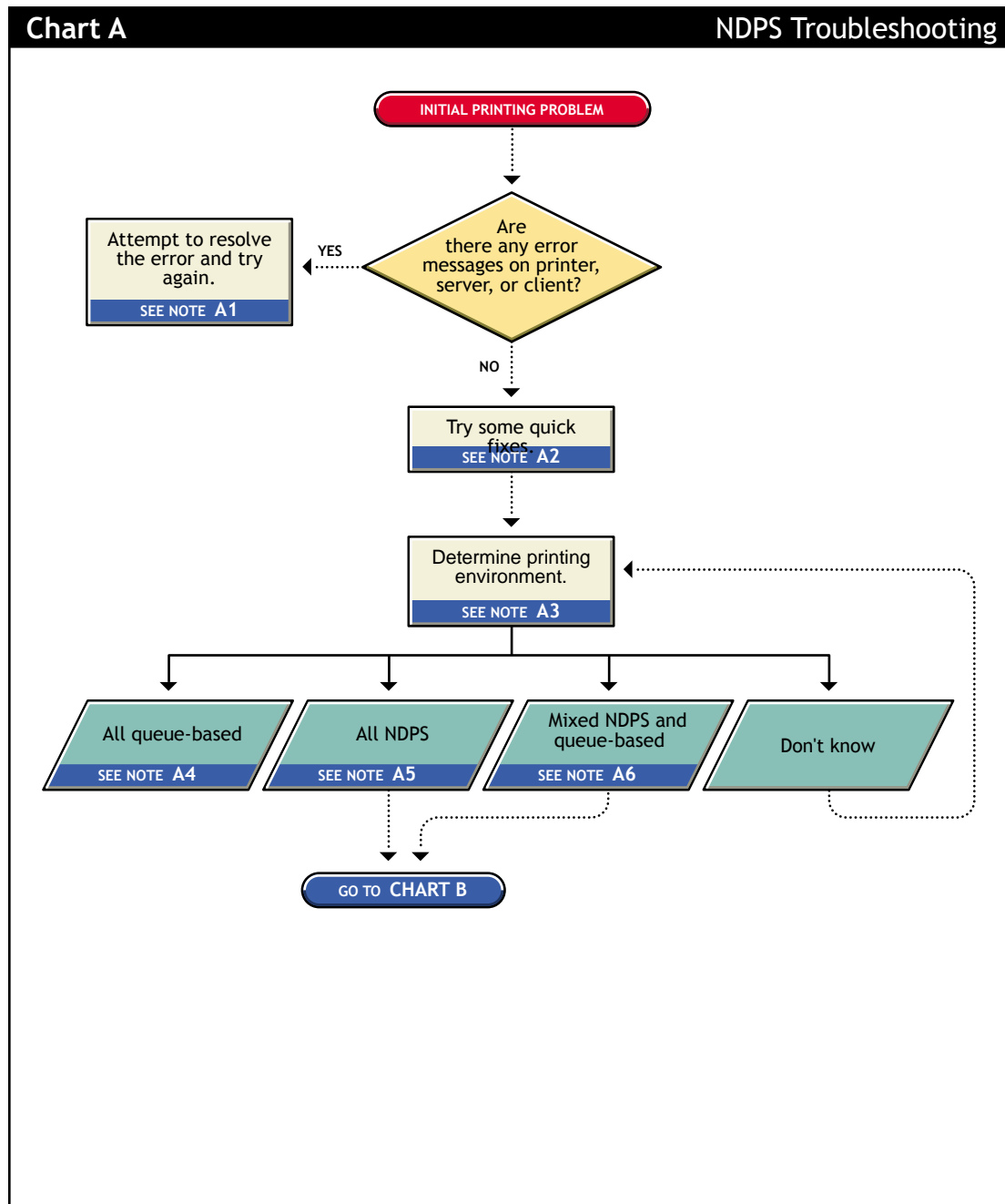
This configuration allows administrators to route jobs out of UNIX systems into NDPS using the same mechanism they use today, while giving them extended capabilities to manage the printers that service those jobs.

E

Troubleshooting Your Print System

This chapter focuses on troubleshooting issues that might arise with Novell® Distributed Print Services™ (NDPS®) printing. It also presents general principles that can be of value for a variety of network printer configurations, and it provides help for troubleshooting problems with the printer itself.

Initial Troubleshooting Steps



A1. Attempt to resolve the error and try again

With many printing problems, an error will be reported on the printer, the client trying to print, or the server. If an error condition exists, use the information provided to try to resolve the problem and then try again. If the error is on the printer, see your printer's operating manual.

A2. Try some quick fixes

Many times, printing problems occur due to simple or temporary conditions. The following are some common quick-fix techniques.

If the problem is limited to a single workstation client, try the following:

- ◆ Check the printer's job list to ensure the job is getting to the spooling area.
- ◆ Review what has changed since the printer was working properly.
- ◆ Check printer forms and job configurations.

If the problem is affecting other workstation clients, try the following:

- ◆ Check Printer Information in the Novell Printer Manager for NDPS error messages.
- ◆ Look for printer error conditions (such as beeps or LCD panel lights) and printing error messages.
- ◆ Turn the printer off and on.
- ◆ Check the printer's cabling.
- ◆ Look for messages on the server console.
- ◆ Check the printer's job list to ensure the job is getting to the spooling area.
- ◆ Review what has changed since the printer was working properly.
- ◆ Check printer forms and job configurations.
- ◆ Search the online Novell Support Connection™ for known issues.
- ◆ Make sure you have the most current NDPS software.

A3. Determining your printing environment

If there is no obvious solution to the problem, then you will need to begin analyzing your printing system. In order to find the problem, the printing environment being used must be identified.

NetWare provides two printing environments: the legacy queue-based printing (see “[A4. All queue-based environment](#)” on page 116) and NDPS (see “[A5. All NDPS environment](#)” on page 116). Either print system can be used alone or the two can be used together (see “[A6. Mixed NDPS and queue-based environment](#)” on page 116). Here are some ways to determine your printing environment:

- ◆ **User.** If the client platform is DOS, Macintosh, OS/2, or UNIX, these clients are not directly supported by NDPS and can only print to a network printer by submitting jobs to queues or use LPR printing.

If the client platform is Windows, then they can be using either NDPS or queues. Check the printer configuration under the Windows control panel and check its network setting. Identify the network object being printed to and determine if it is a Queue object or an NDPS Printer object.

- ◆ **Server files.** At the server console look to see if the following are loaded:

NDPSM.NLM (the server is using NDPS)

PSERVER.NLM (the server has been, or still is, using queue-based printing)

- ◆ **Novell iManager.** Load Novell iManager and look at printing object configurations to determine printing setup.

A4. All queue-based environment

If clients are submitting jobs to NetWare queues and the jobs are sent to the printer through the PSERVER.NLM, then you are using queue-based printing.

Printing in a queue-based system consists of submitting jobs to a queue, from which the print server sends the job to the printer based on the settings of the Printer object. In queue-based printing, a problem usually occurs in one of three general areas:

- ◆ Getting the print job into the print queue
- ◆ Transferring the job to the printer in the proper format
- ◆ Printing the job properly

For more information, see [Troubleshooting General Printing Problems \(http://www.novell.com/documentation/lg/nw51/printenu/data/hlgnvum.html\)](http://www.novell.com/documentation/lg/nw51/printenu/data/hlgnvum.html) in *NetWare 5.1 Queue-Based Print Services*.

A5. All NDPS environment

If you have the new client software and are submitting jobs to the printer through Printer Agents and a Print Device Subsystem, then you are using NDPS. See **“Narrowing Your Focus” on page 117** for more information.

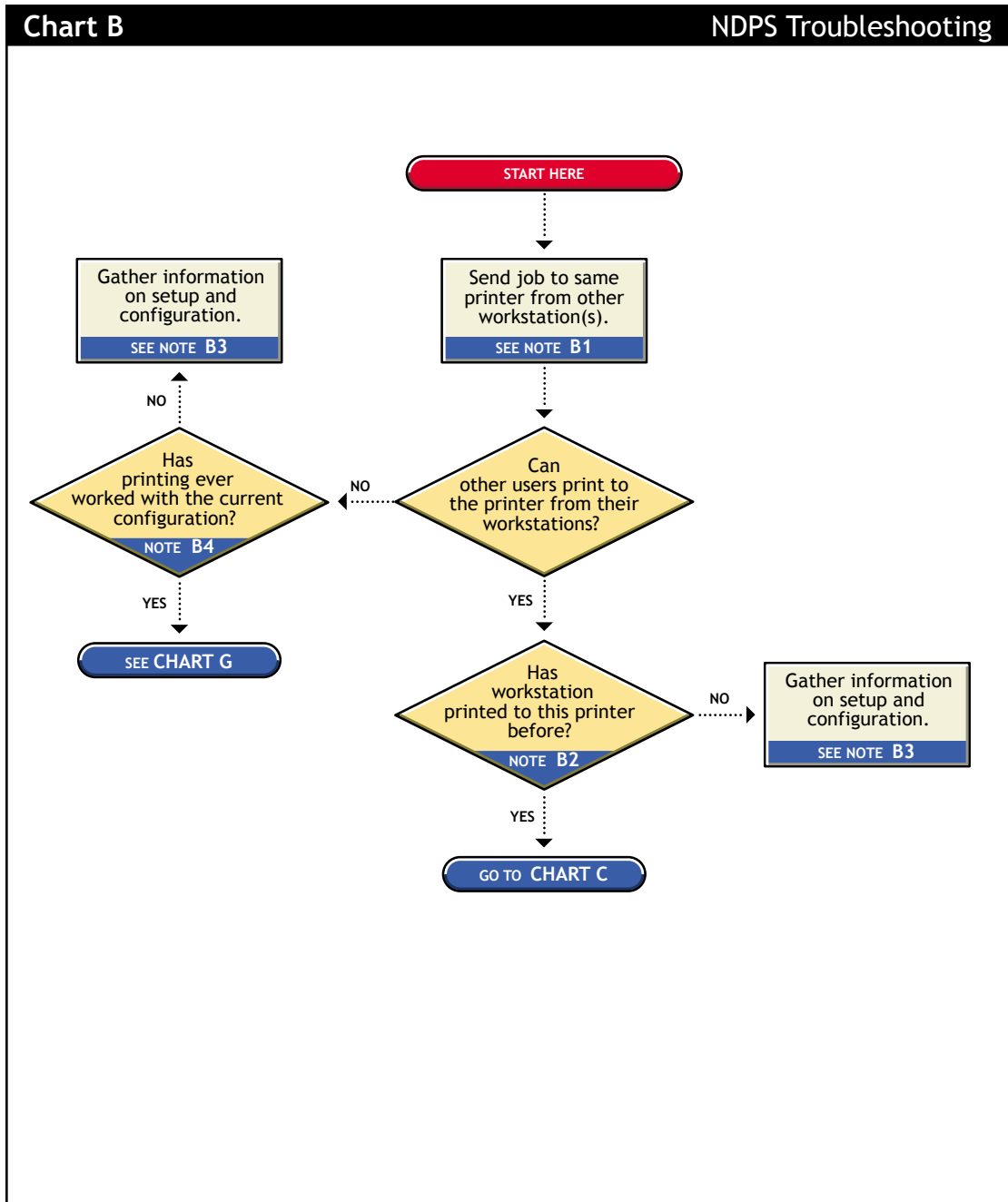
A6. Mixed NDPS and queue-based environment

For backward compatibility, it is possible to be using both queue-based printing and NDPS together. Here are the two ways this can happen:

- ◆ Clients such as DOS, Macintosh, OS/2, and UNIX are unaware of NDPS and are unable to submit jobs to NDPS Printer Agents directly. The clients must therefore send jobs to a print queue. An NDPS Printer Agent can be configured to emulate a print server and service jobs from the queue to an NDPS printer.
- ◆ Some network printers can receive jobs only from a NetWare queue and print server (for example, remote printers). If a client is configured to send jobs only to a Printer Agent, the Printer Agent might be configured to transfer the job to a queue where it can be serviced by a print server.

Because two different print systems are being used, the problem could exist in either print system. See **“Narrowing Your Focus” on page 117** to continue.

Narrowing Your Focus



B1. Send job to same printer from other workstations

Try printing to the same printer from one or more different workstation. This will help you narrow your search to the specific workstation or to the whole printing system.

B2. Has workstation printed to this printer before?

Has this workstation submitted jobs to this printer that printed successfully? Determine the following:

- ◆ Is this a new setup?
- ◆ Is this the first time printing was attempted from this workstation since any changes were made?
- ◆ Has this setup been working before and now is not?

If this is a new setup or a new configuration, then something might not be configured.

If a job sent from this workstation has been printed successfully before, go to [“Determining Your Platform When Problem Affects Only One Workstation” on page 119](#) to further track the problem.

B3. Gather information on setup and configuration

The initial setup might have been done incorrectly. Refer to [“Creating a Printer” on page 18](#) for more information.

B4. Has printing ever worked with the current configuration?

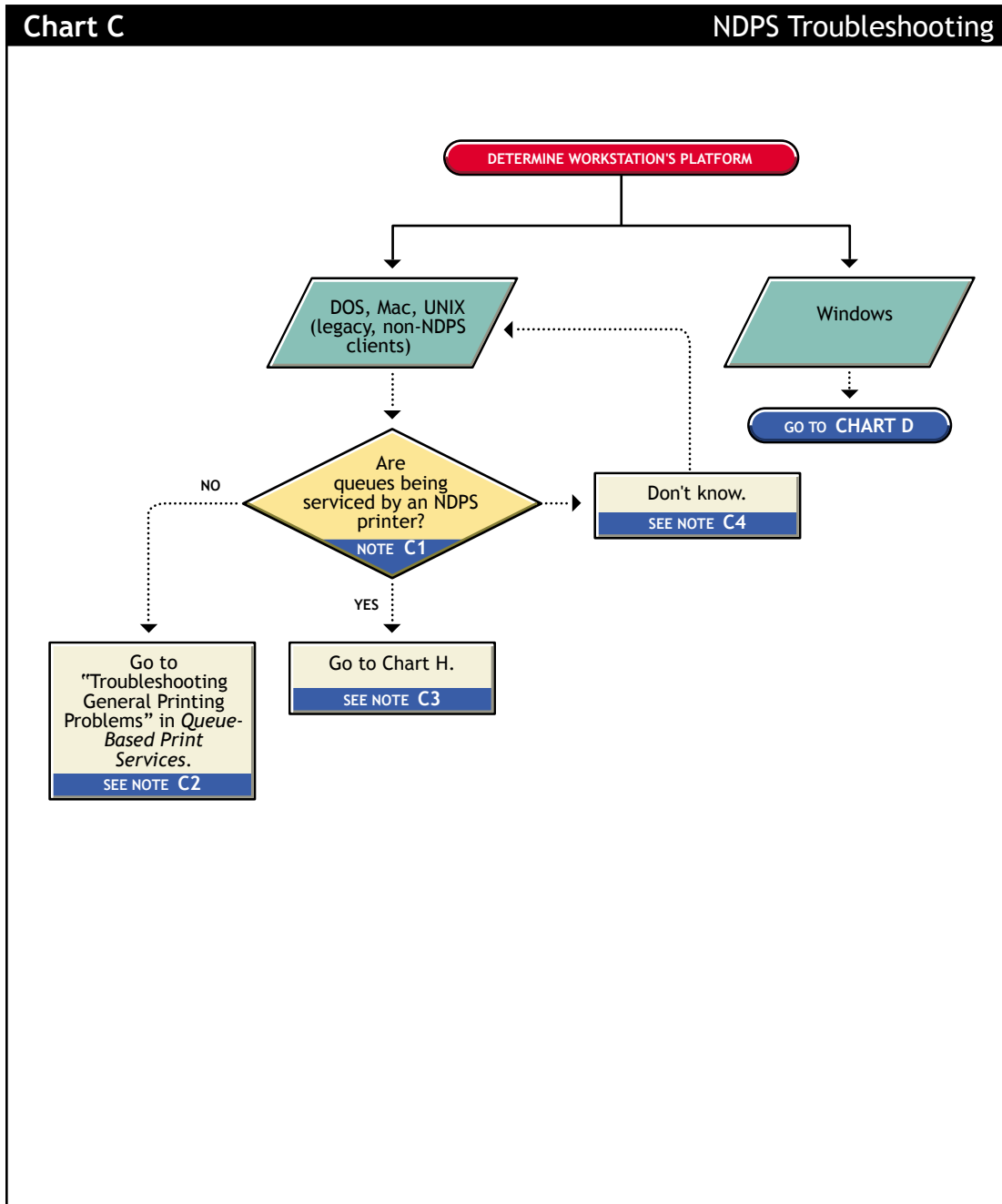
Have any users been able to print jobs from their workstations using this configuration? Determine the following:

- ◆ Is this a new setup?
- ◆ Is this the first time printing since any changes were made?
- ◆ Has this setup been working before and now is not?

If this is a new setup, or a new configuration then something might not be configured properly.

If other users have been printing successfully, then go to [“Tracking Jobs from a Workstation” on page 124](#) to further track the problem.

Determining Your Platform When Problem Affects Only One Workstation



C1. Are queues being serviced by an NDPS printer?

Clients running on DOS, Macintosh, OS/2, and UNIX platforms are either queue-based, meaning that they print to network printers by redirecting jobs to a queue, or set up for LPR printing. You will need to determine whether the network printer is being serviced by a queue-based print server (such as PSERVER.NLM) or if NDPS is redirecting jobs through a Printer Agent.

C2. All queue-based printing

If clients are submitting jobs to a queue that is being serviced by a print server, then the printing environment is all queue-based. For more information, see [Troubleshooting General Printing Problems \(http://www.novell.com/documentation/lg/nw51/printenu/data/hlgvum.html\)](http://www.novell.com/documentation/lg/nw51/printenu/data/hlgvum.html) in *NetWare 5.1 Queue-Based Print Services*.

C3. Queue-NDPS integration

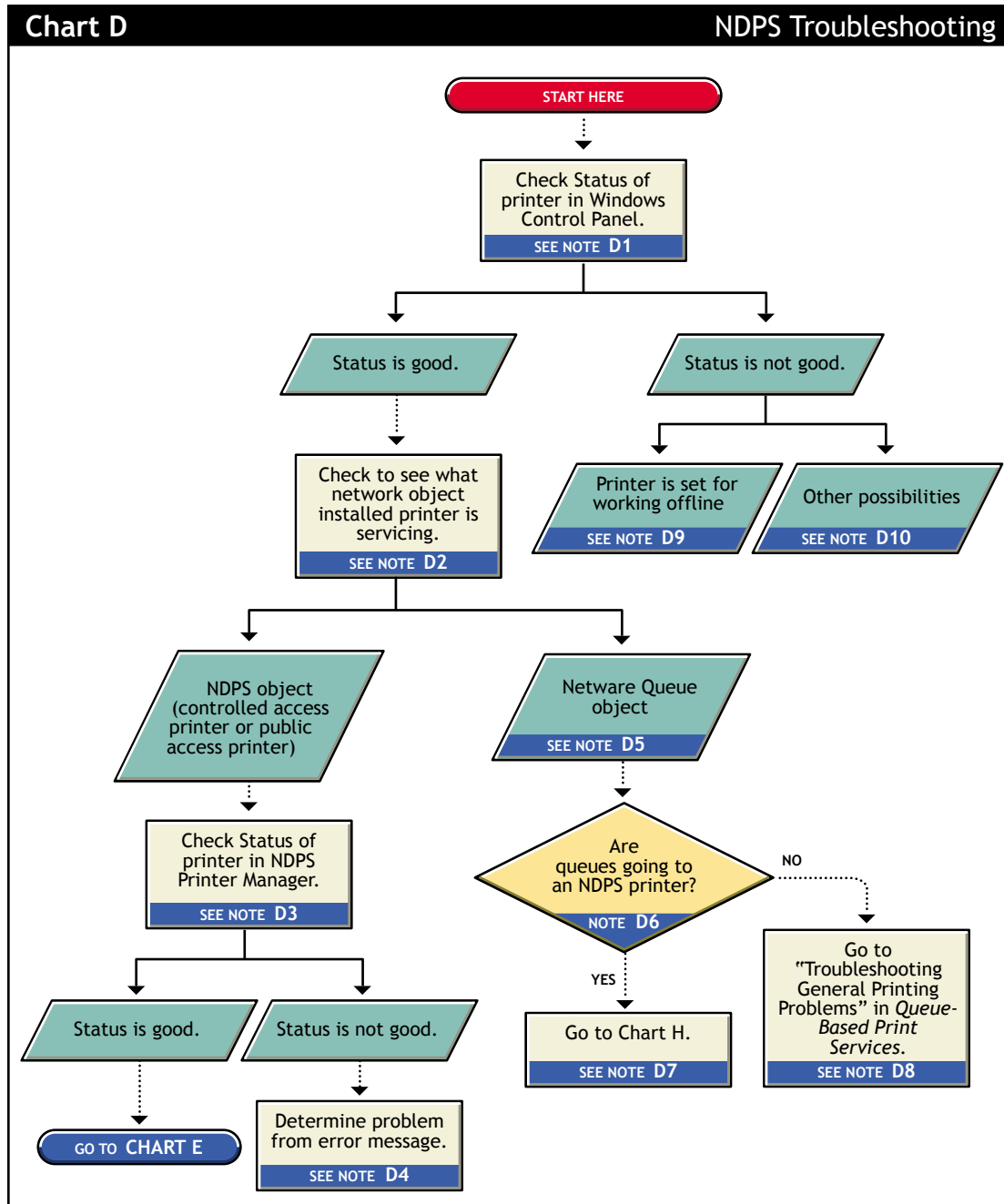
The clients are unaware of NDPS and are unable to submit jobs to NDPS Printer Agents directly. The clients must therefore send jobs to a print queue. An NDPS Printer Agent can be configured to emulate a print server and service jobs from the queue to a NDPS printer. See “[Supporting Queue-Based Client Workstations](#)” on page 52 for more information. Then go to “[Printing Problems Affecting All Users](#)” on page 128.

C4. Look in Novell iManager for NDPS Printer objects

Load Novell iManager and look to see if any NDPS Printer objects are defined.

- ◆ If no NDPS Printer objects are defined, there should be a Print Server object. Check the configuration of the print server to if the queue is configured to be serviced by it.
- ◆ If there are NDPS objects defined, look at the Printer objects to see if they are configured to emulate a print server and service jobs from a queue.

Isolating Printing Problems Affecting Only One Windows Workstation



D1. Check status of printer in Windows Control Panel

Printing from a Windows environment introduces several complexities which might or might not be related to the network or the printer. Some problems can be found and resolved right in the Windows environment. Check the status of the printer in the Windows Control Panel to see if any problems are evident.

D2. Check to see what network object the installed printer is servicing

Determine the network object print jobs are being redirected to.

- 1 Select the Printers folder from the Windows Control Panel or the Start/Settings menu.
- 2 Select the installed printer and click File/Properties (or use the right-click Properties option).
- 3 Click the Details tab.
- 4 Look at Print to the Following Port.

Identify the network object being printed to and determine if it is a Queue object or an NDPS Printer object.

D3. Check status of printer in NDPS Manager

If the job did not appear in the job list, view information about the specific installed printer using the NDPS Health Monitor.

D4. Determine problem from error message

With many printing problems, an error will be reported on the printer, the client trying to print, or the server. If an error condition exists, use the information provided to try to resolve the problem and then try again. If the error is on the printer, see your printer's operating manual.

D5. NetWare queue object

This printer is queue-based, meaning that the print driver prints to network printers by redirecting jobs to a queue.

D6. Are queues going to an NDPS printer?

The next thing you need to know is whether the network printer is being serviced by a queue-based print server (such as PSERVER.NLM) or if NDPS is redirecting jobs through a Printer Agent. Load Novell iManager and look to see if any NDPS Printer objects are defined.

- ◆ If no NDPS Printer objects are defined, there should be a Print Server object. Check the configuration of the print server to see if the queue is configured to be serviced by it.
- ◆ If there are NDPS objects defined, look at the Printer objects to see if they are configured to emulate a print server and service jobs from a queue.

D7. Queue-NDPS integration

The clients are submitting jobs to a print queue which is then being serviced by NDPS Printer Agents. See [“Problems Integrating with Queue-Based Components” on page 131](#) for more information.

D8. All queue-based printing

If clients are submitting jobs to a queue that are being serviced by a print server, then the printing environment is all queue-based. For more information, see [Troubleshooting General Printing Problems \(http://www.novell.com/documentation/lg/nw51/printenu/data/hlgnavum.html\)](http://www.novell.com/documentation/lg/nw51/printenu/data/hlgnavum.html) in *NetWare 5.1 Queue-Based Print Services*.

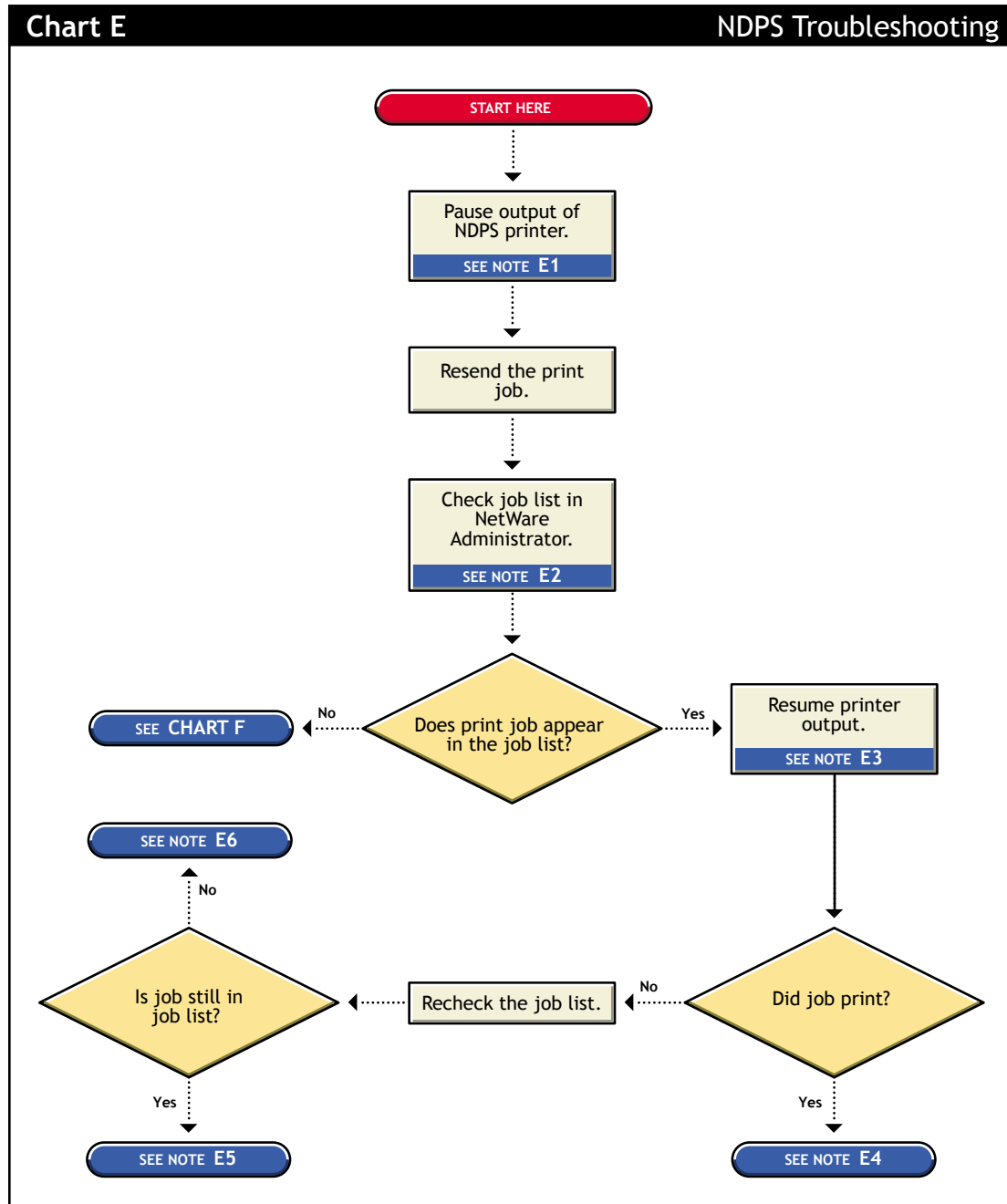
D9. Printer is set for working offline

Under certain circumstances, the printer might be set for working offline. This can happen if Windows loses communication with the network, for example. A user can also set it offline. If the printer is set to work offline, reset it to online and try to print. If you cannot set the printer to online, then Windows has lost communication with the network print system. Reboot the workstation and if the condition still exists, check the client's connection to the network.

D10. Other possibilities

Other negative status flags.

Tracking Jobs from a Workstation



E1. Pause output of NDPS printer

One method of troubleshooting is putting stops in the printing process and then resending a job and testing how far in the process the job gets. The first stop you can make is pausing the printer output.

Pausing printer output is a common technique used when troubleshooting printing; it forces NDPS to spool your print job and save it as a file. Stopping and evaluating the printing process midway helps you to identify early problems and limits your troubleshooting to a few components.

To pause printer output for a controlled access printer, do the following:

- 1 Locate the NDPS Printer object in Novell iManager.
- 2 Double-click the NDPS Printer object to open its Details page.
- 3 Click the Pause Output button.

The Pause Output button changes to a Resume Output button.

E2. Check job list in Novell iManager

You can view the job list for a NDPS printers from Novell iManager, the server console, or the workstation Printer Manager. To view the job list from Novell iManager, see [“Managing Print Jobs” on page 42](#).

The job list for a public access printer can be viewed from either the server console or the Novell Printer Manager.

E3. Resume printer output

To resume printer output for a controlled access printer, do the following:

- 1 In Novell iManager, click Manage Printer and then select the NDPS printer you want to control.
- 2 Click the Resume Output button.

The Resume Output button changes to a Pause Output button.

E4. Job printed this time but nothing was changed

If the job printed now, there is no authoritative explanation as to why it didn't print the first time. If you followed these steps, no configurations have been changed; the job was only paused and released. Try printing the job again and see if normal printing continues. If not, try pausing the printer again and see if any other symptoms occur.

E5. Job did not print and is still in the job list

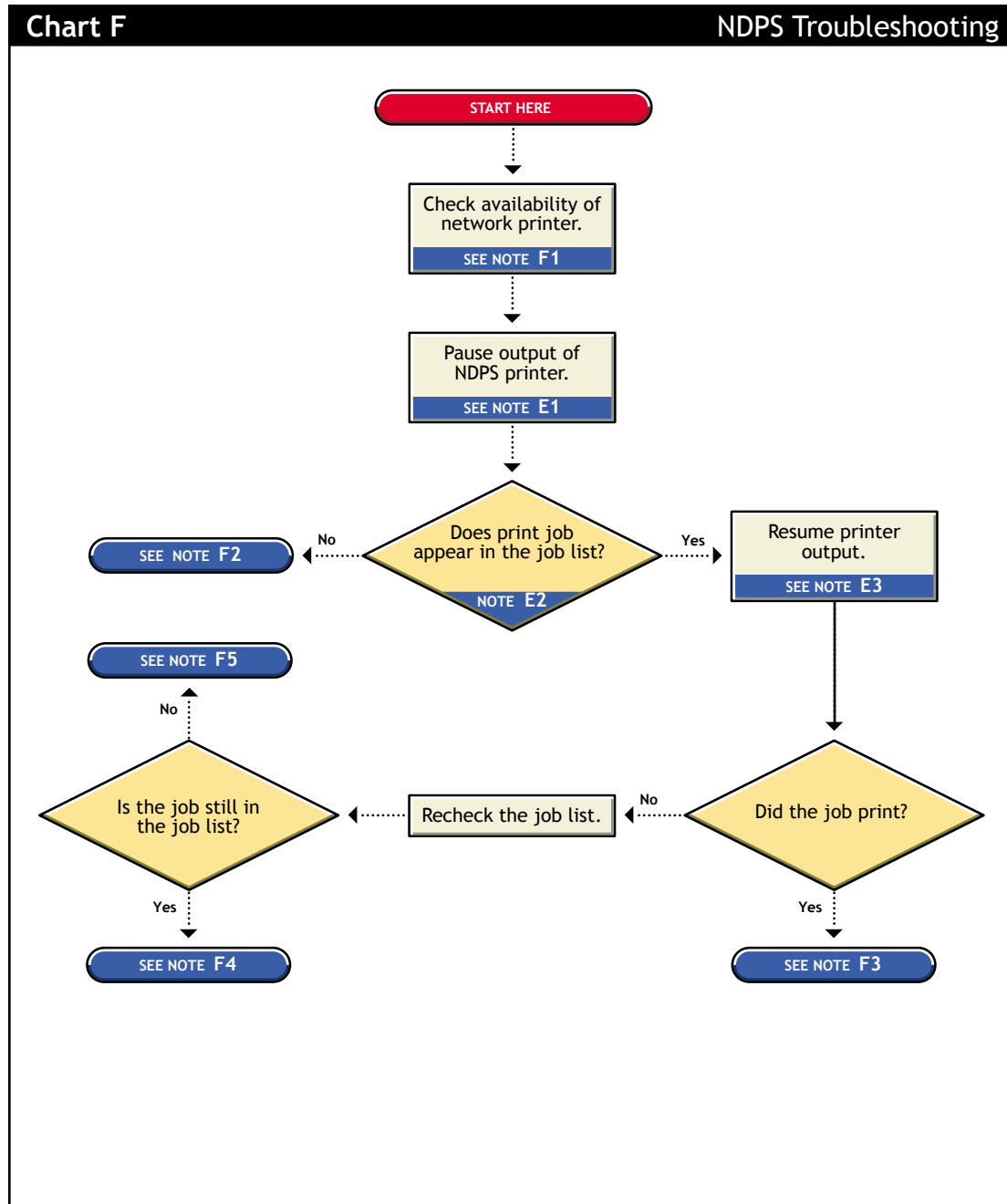
If the job does not print and is still in the job list, then check for job holds, delays, and priority settings.

E6. Job did not print but is no longer in the job list

If the job did not print, but it is not in the job list, then the job was sent to the printer and no error was reported back to the system. Check these issues:

- ♦ Are you are checking the correct physical printer?
- ♦ Are you are using the correct print driver in your application?
- ♦ Are your drivers and printers talking the same language (for example Postscript or PCL)?

Checking Printer Output and Using Test Files



F1. Check availability of network printer

Make sure that the printer is set to accept jobs. In Novell iManager, verify that input is not paused.

F2. Check for error messages

With many printing problems, an error will be reported on the printer, the client trying to print, or the server. If an error condition exists, use the information provided to try to resolve the problem and then try again. If the error is on the printer, see your printer's operating manual.

Also confirm that your NDPS objects are configured properly.

F3. Test file prints but jobs from application do not

If the test file prints but jobs from the application do not, then there is a problem with the way the job is being formatted by the application or handled by the driver. Reinstall the current print driver provided by the printer manufacturer. Also try printing from different applications to determine whether one application works while another does not. If this is the case, the problem is related to the application itself.

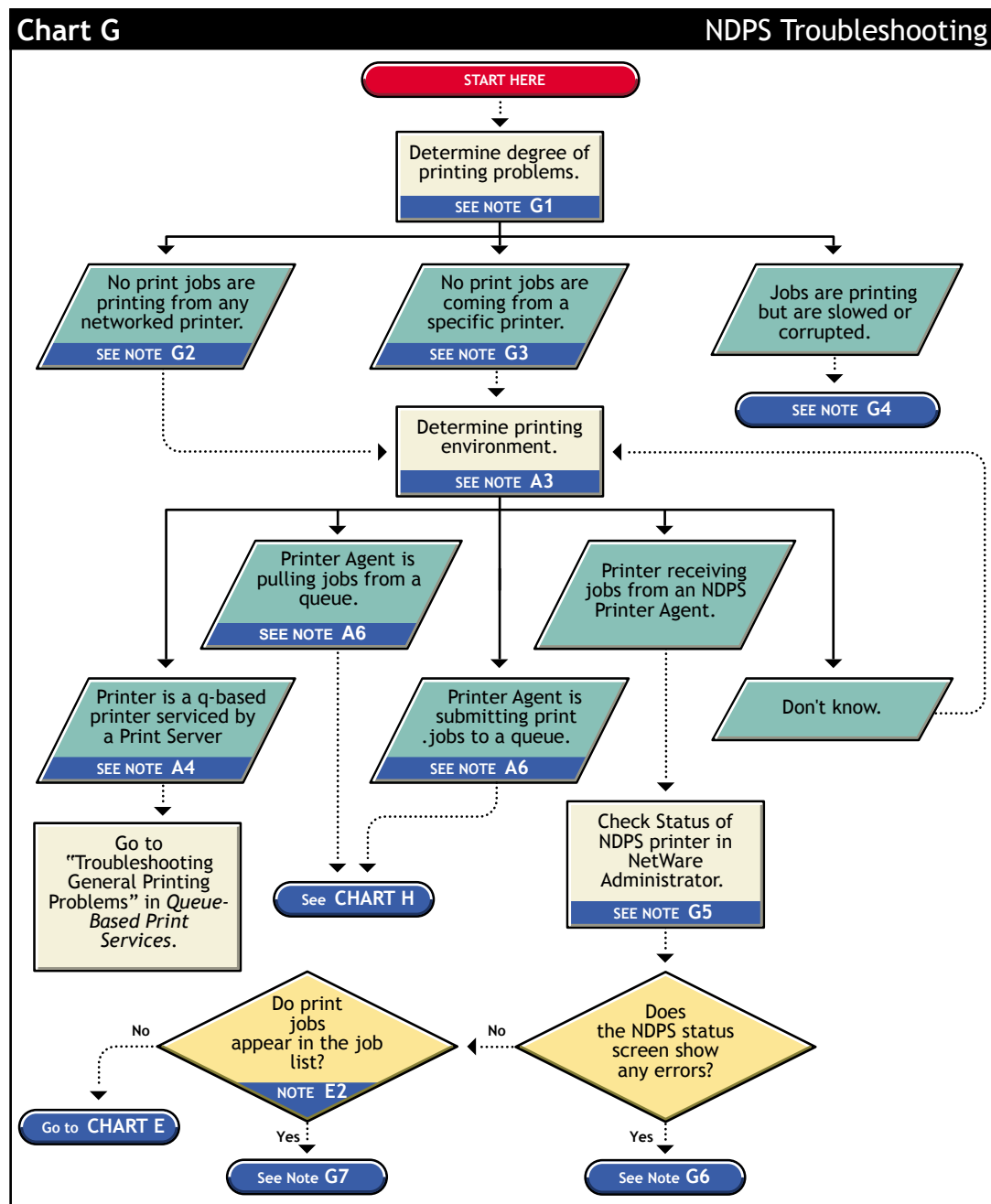
F4. Job is being held in spooler

The job is being held in the job spooler. Check for job holds, delays, and priority settings. If one of these conditions exists, change the status to print the job. If the job prints, then see [“F3. Test file prints but jobs from application do not” on page 127](#).

F5. Job did not print but is no longer in the job list

If the job did not print but it is not in the job list, then the job was sent to the printer and no error was reported back to the system. Make sure you are checking the right physical printer.

Printing Problems Affecting All Users



G1. Determine severity and scope of printing problems

If printing is affecting all users, determine the degree of severity of the printing problems. Can no users print from specific printers, or are no jobs printing from any network printer? Or are jobs printing, but printing slowly?

G2. No print jobs are printing from any networked printer

If no users can print at all from any network printer, the problem is probably a universal problem such as

- ◆ The printing system is disabled or printing system files are unloaded.
- ◆ The servers are in a critical state due to problems with memory, disk space, LAN connections, etc.
- ◆ The LAN has a bottleneck or is otherwise dysfunctional.

G3. No print jobs are coming from a specific printer

If the printing problem is limited to a certain printer, then the problem is either at the printer itself or the configuration of the printer. Continue to determine which printing environment you are using.

G4. Jobs are printing slowly or are corrupted

Jobs might be printing but are either slow or appear corrupt.

Slow Printing

There are several explanations for slow printing.

If only one workstation is having problems with slow printing, the application might be generating the output for the printer. This can cause a long delay before the job is even sent to the spooler. Look at the print status of the application to determine if this is the case.

If all workstations are having the problem, one of the following conditions might exist:

- ◆ Interrupt conflicts might exist between the port and another device. Configure the printer for no interrupts (polled mode).
- ◆ The baud rate might be slow (serial printers).
- ◆ XON/XOFF might need to be enabled (serial printers).
- ◆ Your hardware (cable, port, printer) might be faulty.

Job Corruption

If jobs are printing in pieces, the printer might not have sufficient memory to hold the entire page to be printed. If it does not, it will print the part of the page it has in memory and continue printing on the next page. This problem occurs when printing jobs that contain large graphics.

G5. Check status of NDPS Printer in Novell iManager

From Novell iManager, click Manage Printer and then select the NDPS printer you want to check. View the information on the Printer Control page.

G6. A problem is identified in an error message

Try to determine problem from the status or error message and resolve it.

- ◆ Make sure that job input or output is not paused.

- ◆ Check for any details that are grayed out and not available; these might show you a problem.

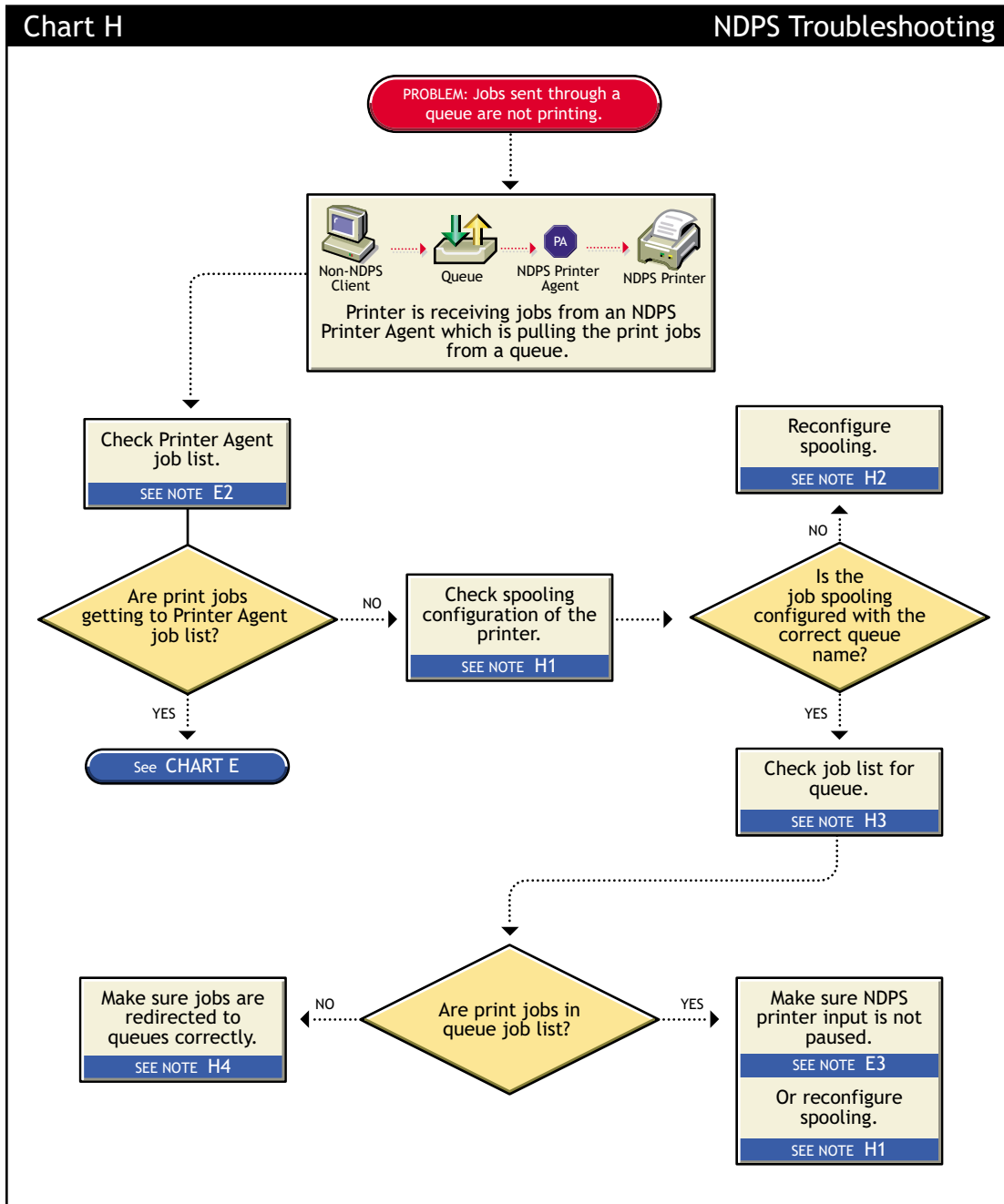
G7. Jobs are getting to the job list but the printer is unable to print them

Do the following:

- ◆ Make sure there are no holds or delays.
- ◆ Make sure the printer is configured properly.
- ◆ Check the status of the gateway if one is being used.

See [“Tracking Jobs from a Workstation” on page 124](#) for more information.

Problems Integrating with Queue-Based Components



H1. Check the printer's spooling configuration

Make sure the printer is configured to service the queue you are expecting the job to go to. See [“Setting Print Job Spooling” on page 51](#) for more information.

H2. Reconfigure spooling for this printer

The spooling configuration specifies a different queue than the one you want this printer to service. See [“Setting Print Job Spooling” on page 51](#) for information on how to configure job spooling.

H3. Check the job list for the queue

Make sure the job is actually getting to the queue.

H4. Make sure the job is being redirected to the queue properly

Many applications are not designed for network printing. CAPTURE is a command line utility that configures print job redirection from applications not designed for NetWare print services.