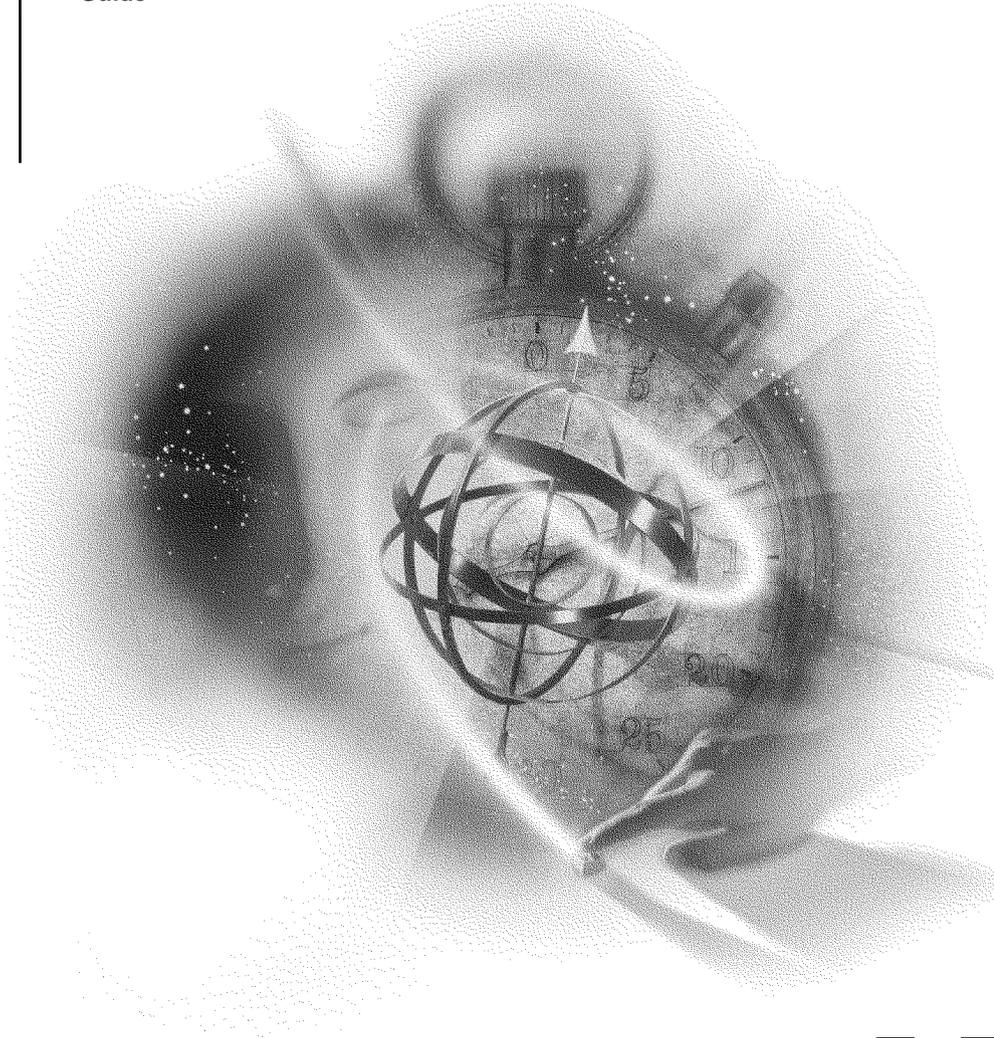


Installation
Guide



NetWare® Enterprise
Print Services

Novell®

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**Novell, Inc.
122 East 1700 South
Provo, UT 84606
U.S.A.**

**NetWare Enterprise Print Services Installation Guide
May 1999**

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Welcome to NetWare Enterprise Print Services

NetWare[®] Enterprise Print Services, an NDPS[®] solution, expands the power of Novell's Distributed Print Services by adding the capability to print from UNIX* clients to NDPS printers using LPR/LPD and by allowing print jobs to be sent to a URL using the Internet Printing Protocol (IPP).

For additional documentation about optimizing and managing NetWare Enterprise Print Services, access the HTML documentation on the Internet by doing the following:

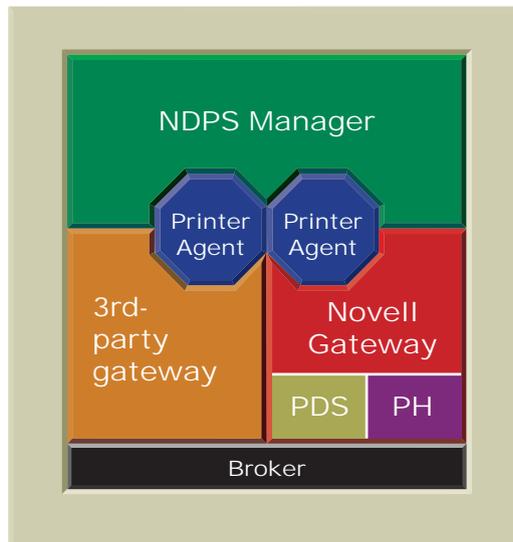
- 1. Open your HTML browser.**
- 2. Point the browser to www.novell.com/documentation/lg/endps/docui/index.html.**

1 **NDPS Architecture**

Printer Agent

To understand exactly how NDPS[®] works, you should begin by understanding its major architectural components:

- Printer Agent
- NDPS Manager
- Gateways
- NDPS Broker



Printer Agent

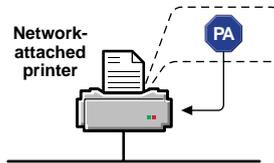
Before a printer can be incorporated into an NDPS printing environment, it must be represented by a Printer Agent.

No Printer Agent can represent more than one printer, and no printer can be represented by more than one Printer Agent.

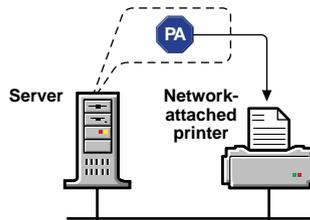
The Printer Agent lies at the heart of NDPS, combining the functions previously performed by a printer, print queue, print server, and spooler into one intelligent and simplified entity.

The printer agent can be any of the following:

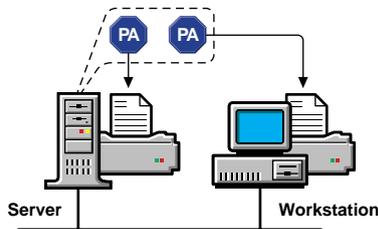
- A hardware entity embedded within a network-attached printer



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

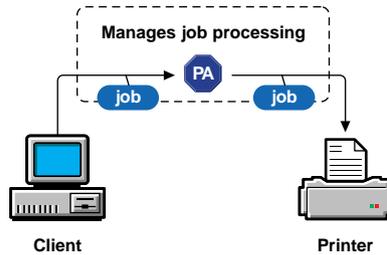


- A software entity running on a server that represents a printer attached to a server or workstation

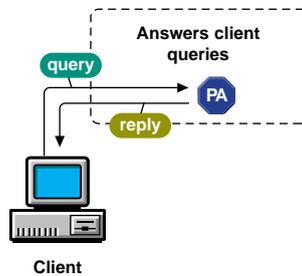


A printer agent provides the following services:

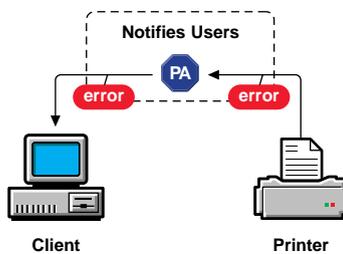
- Manages the processing of print jobs and many operations performed by the printer itself.



- Answers queries from network clients about a print job or document or about the attributes of the printer.



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



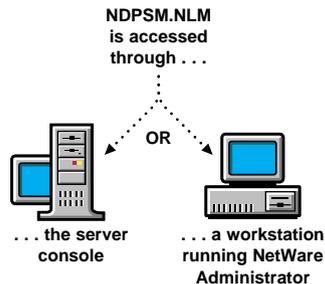
- Ensures the scalability of the printing environment, allowing you to print in LAN, WAN, and enterprise document production environments. It also allows you to print to devices ranging from simple dot-matrix printers to laser printers and large-scale production devices.

Printer Agents can be used immediately as public access printers, or they can be configured as controlled access printers by adding them to the NDS™ tree. A public access printer is available to anyone on the network but is not registered as an NDS object, and thus does not take full advantage of services such as security and event notification. A controlled access printer is an NDS object and can take advantage of these network services.

NDPS Manager

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

The NDPS Manager object stores information used by the NDPSM.NLM NetWare® Loadable Module™ (NLM™). You can manually load this module at the server console, or it will be automatically loaded when you create a Printer Agent with NetWare Administrator.



A single NDPS Manager can control multiple Printer Agents. (There is no hard limit.) A specific NDPS Manager can be loaded on only 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 NDPS Manager console interface, NetWare Administrator is the main tool for performing these tasks. See “Creating an NDPS Manager” on page 19 for instructions.

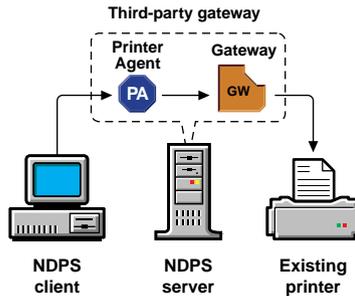
Gateways

Gateways allow NDPS clients to send jobs to printers that are not NDPS-aware (that is, printers that are not equipped with an embedded NDPS Printer Agent).

You select and configure a printer gateway when you create a new Printer Agent. Gateways translate NDPS queries or commands to printer-specific

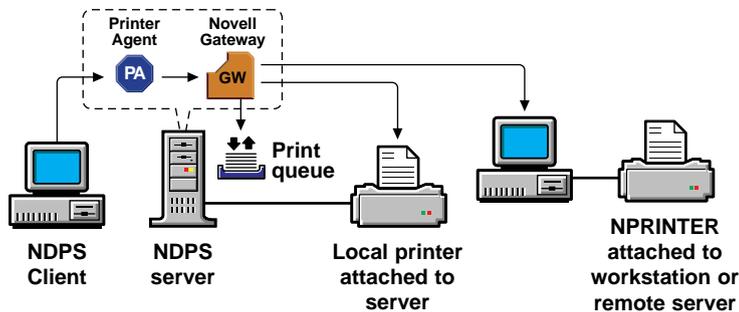
language that the physical printer can use. This is possible because gateways are configured to know the specific type (make and model) of printer they are servicing.

The following diagram illustrates a typical gateway.



Third-party gateways are developed by printer manufacturers to support printers directly attached to the network. Examples include the HP* gateway that ships with this product. This gateway, because it is developed to interact with specific proprietary printers, 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 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 for which a proprietary, third-party gateway is not yet available.



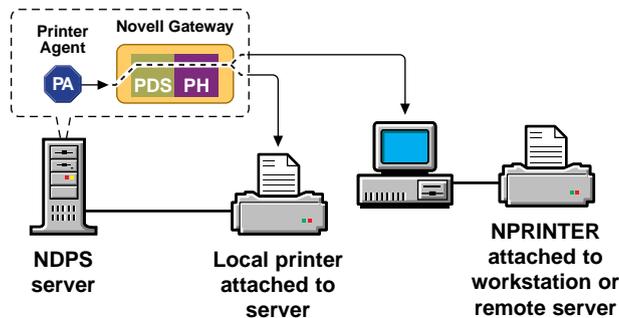
The Novell Gateway is implemented through a Print Device Subsystem (PDS) and Port Handler.

Print Device Subsystem

The Novell PDS is a component of the Novell Gateway that retrieves printer-specific information and stores this information in a database. The PDS loads automatically when a Printer Agent is created using the Novell Gateway.

You should use the Novell Gateway when you are creating a Printer Agent for either of the following:

- A printer that is directly connected to the network but whose manufacturer does not yet provide a proprietary NDPS gateway.
- A printer that is not connected directly to the network. This includes local printers and remote printers. See the illustration below.

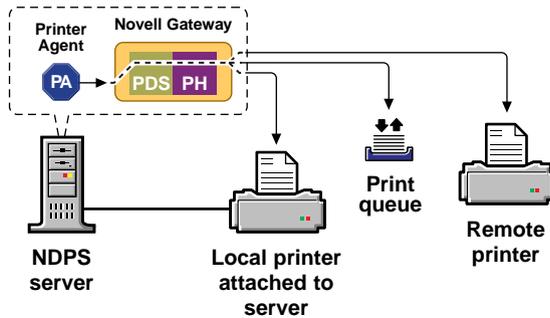


Port Handler

The Port Handler is an abstraction of the physical connection between the Print Device Subsystem (PDS) and the physical printer. It ensures that the PDS can communicate with the printer regardless of what type of interface is being used.

The NDPS Port Handler allows NDPS to communicate through hardware ports and legacy methods:

- Local printers cabled directly to a server's serial or parallel port
- Queue-based printers
- Remote printers (RP mode in IPX environments, LPR in TCP/IP environments)



NDPS Broker

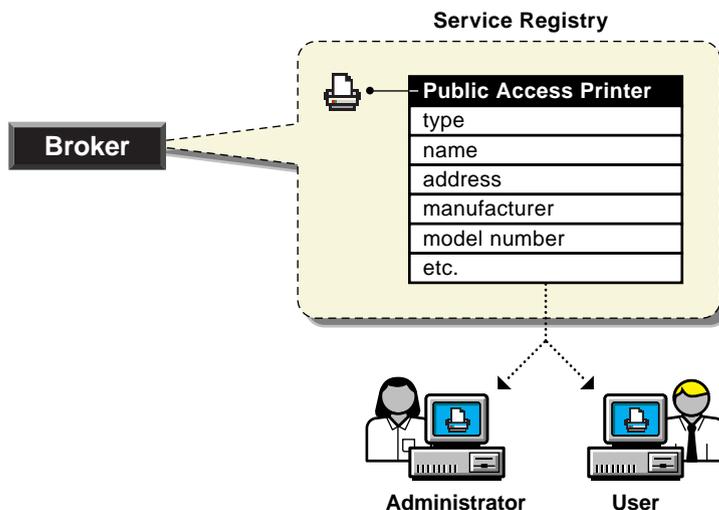
The Broker provides three network support services not previously available in NetWare:

- Service Registry Service
- Event Notification Service
- Resource Management Service

While these services are invisible to end users, administrators should be aware of them.

Service Registry Service

The Service Registry Service (SRS) 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 of a specific device.



Before NDPS, each printer had to periodically advertise its availability through the Novell Service Advertising Protocol (SAP), which was effective but it 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. 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.

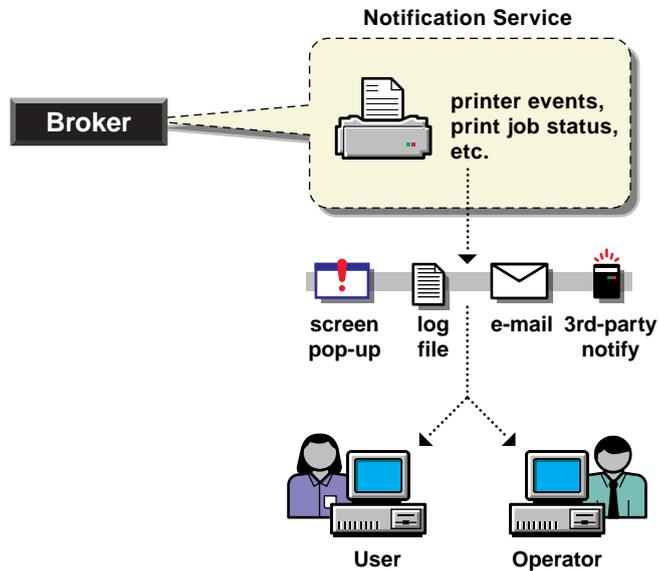
Through the SRS, plug-and-print public access printers as well as those created manually are immediately discovered and made available to users. If there are multiple Service Registries running on the network, they synchronize automatically. This synchronization allows users to select public access printers anywhere on the network.

In addition to printer information, the SRS also maintains lists of other resources, such as Event Notification Services and Resource Management Services.

Event Notification Service

NDPS printers can be configured to provide event notification regarding print jobs and printer status. In NetWare Administrator, administrators can configure Event Notification Service (ENS) for interested parties—that is, non-job owners that you want to be notified of a defined printer or server event that occurs during the processing and printing of a job. At the workstation,

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



Delivery Methods

The availability of the following event notification delivery options are dependent on which of them you have enabled.

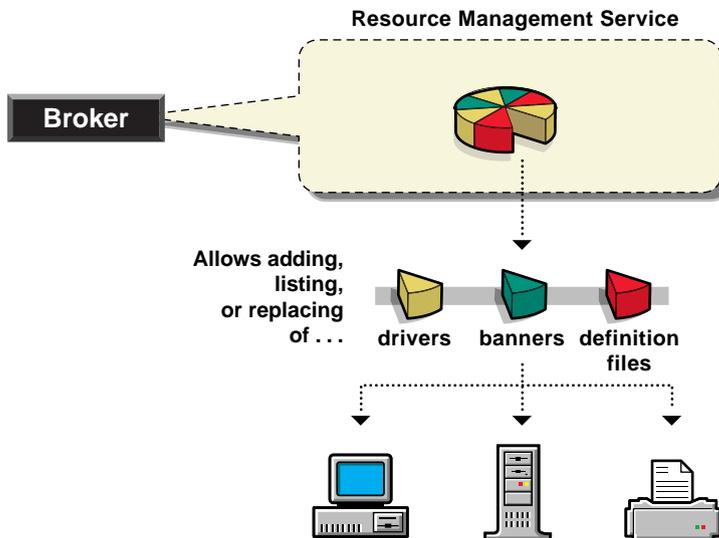
- Pop-up notification. Messages will pop up on the screen of individuals designated to receive them. (Pop-up notification is always available when the ENS is enabled.)
- E-mail notification. Messages will be sent to the recipient through GroupWise®, Novell's industry-leading scheduling and messaging system, or through MHS, depending on what system is installed on your network.
- Log file notification. Messages are written to a file at a designated location on a NetWare server that the recipient has rights to.
- Third-party notification methods. The open architecture of NDPS allows third parties to develop additional delivery 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 them. It provides a single place where a variety of file types are stored for immediate access by NDPS.

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

- Banners
- Windows* 95, Windows NT*, and Windows 3.x printer drivers
- Novell Printer Definition (NPD) files



Some of the benefits provided by the RMS include

- Improved resource sharing
- More manageable resource distribution and updating
- Automatic printer driver download from a central repository
- Remote workstation printer installation

- Plug-and-print printer availability
- Availability of network resources to applications through a common interface

2 Getting Started with NetWare Enterprise Print Services

Configuring NetWare Enterprise Print Services

Before you begin setting up your new NDPS[®] printing system, we recommend that you read the “Planning” section in the NDPS online documentation on the Internet at www.novell.com/documentation/lg/endps/docui/index.html.

Creating your new NDPS system will not automatically disable your current printing setup. Your users can continue to print just as they always have until you decide to dismantle the old printing setup and replace it with the new NDPS setup. This can be done gradually or all at once.

The following are the basic steps you must go through to create a new NDPS printing system. These steps assume that you have already installed on your server and that a Broker is running. (A Broker is created automatically during installation.)

1. An NDPS Manager provides a platform for Printer Agents that reside on the server (similar to the way PSERVER is used on servers to manage printing resources in legacy printing). You must create an NDPS Manager on each server you will be controlling NDPS printers from.
2. NDPS printers must be represented by a logical entity known as a Printer Agent. No Printer Agent can represent more than one printer, and no printer can be represented by more than one Printer Agent. Unless your printer has an embedded Printer Agent, you will need to create one for each printer.

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

3. Ensure that the correct version of the Novell[®] Client[™] software is loaded in order for NDPS features to be available on your client workstations. Other clients can print to NDPS printers through the backward compatibility feature, but only NDPS clients can take full advantage of the advanced features offered by NDPS.

4. Designate printers to be automatically installed on users' workstations through the NDPS Remote Printer Management feature available through NetWare Administrator.
5. Install printers manually on each workstation using the Novell Printer Manager workstation utility or the Windows 95 or Windows NT Add Printer function in the Printers folder.

Creating an NDPS Manager

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

A user creating an NDPS Manager must have at least Read, Write, Modify, and Create rights for the container in which the object will be created, and at least file system rights of Read, Write, Modify, Create, and File Scan at the root of the volume.

1. **In NetWare Administrator, select the container where you want the NDPS Manager object to reside.**
2. **Click Object > Create > NDPS Manager.**
3. **Enter a name in the NDPS Manager Name field.**
4. **Browse to select the Resident Server that you want this Manager assigned to.**

This can be any server in the current NDS tree where you have installed NDPS. It will be the only server you will be able to load this NDPS Manager on. The NDPS Manager will store its database on a volume of this server.

5. **Browse to select the Database Volume that you want the NDPS Manager database assigned to.**

This must be a volume on the Resident Server you selected.

6. **Click Create.**

Creating Public Access Printers

Public access printers are printers that anyone can print to. Unlike controlled access printers, public access printers are not associated with an NDS Printer object and, therefore, cannot take advantage of security and notification features provided through NDS. However, public access printers can be installed by users on their workstations just as controlled access printers can.

Public access printers can be created in the following ways:

- Using gateways provided by third-party vendors. Some of these gateways can be configured to search for new printers attached to the network and automatically create Printer Agents to represent them. (See “Creating Printer Agents with Third-Party Gateways” on page 16.)
- Using the NDPS Manager object in NetWare Administrator. (See “Creating Public Access Printers in NetWare Administrator” on page 15.)
- Using NDPSM.NLM at the server console. (See “Creating Public Access Printers at the Server Console” on page 16.)

Public access printers can be converted to controlled access printers at any time. For more information, see “Converting a Public Access Printer to a Controlled Access Printer” on page 18.

Creating Public Access Printers in NetWare Administrator

This procedure assumes that a Broker is running and that you already have created an NDPS Manager object.

- 1. Double-click the NDPS Manager object you will be using to control this Printer Agent.**
- 2. At the Details (Identification) window for the NDPS Manager object you want to use, click Printer Agent List > New.**
- 3. Enter a name in the NDPS Printer Name field.**
- 4. Select the Gateway Type you want to use and click OK.**
- 5. Complete the tasks required for the gateway you selected.**

These tasks vary depending on the gateway type you are using. Use the online help for specific information on each task.

- 6. If prompted, select the printer driver for each client operating system.**
- 7. Click Continue to finish creating the printer.**

Creating Printer Agents with Third-Party Gateways

Included with NetWare Enterprise Print Services is the NDPS gateway provided by Hewlett-Packard that supports several of their more popular printers. This gateway is accessed through the same procedures that are described above for NetWare Administrator. Instructions for using third-party gateways are included on the NDPS CD under the \PDFDOCS directory. Other vendors offer NDPS gateways for their printers as well. If you are unsure of whether a gateway is available for your particular printer, consult with the hardware vendor.

Creating Public Access Printers at the Server Console

- 1. Load NDPSM.NLM or, if it is already loaded, press Alt+Esc to access the NDPSM console screen.**
- 2. From the main menu, select the NDPS Manager you want to use.**
- 3. From the Printer Agent list, click Ins.**
- 4. In the name box, enter a name for the new Printer Agent.**
- 5. Click Configuration Utilities and then select a gateway from the Gateway Types list.**
- 6. Configure the gateway type you have selected. Refer to the online help (F1) for detailed information on each task.**

Creating Controlled Access Printers

NDPS printers added to the NDS tree by the administrator are referred to as controlled access printers. As NDS objects, access to them is controlled and they are no longer available directly as public access printers.

Prerequisites for this procedure are the following:

- 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 NDPS Manager that will control this Printer Agent
- Have a Broker running
- Have created an NDPS Manager object

To create a controlled access printer, complete these steps:

- 1. In NetWare Administrator, select the container where you want the NDPS Printer object to reside.**
- 2. Click Object > Create > NDPS Printer.**
- 3. Enter a name in the NDPS Printer Name field.**
- 4. At the Printer Agent Source field, click Create a New Printer Agent > Create.**
- 5. Confirm the Printer Agent name. (The default is the name of the new printer you are creating).**
- 6. Browse to select the NDPS Manager you want to assign it to.**
- 7. Click OK.**
- 8. Complete the tasks associated with this gateway.**
- 9. If prompted, select the printer driver for each client operating system.**
- 10. Click Continue to finish creating the Printer object.**

Converting a Public Access Printer to a Controlled Access Printer

To take full advantage of the security and management features provided by NDS, you might want to convert public access printers to controlled access printers.

For example, if you used a third-party gateway to get a printer up and running immediately (plug-and-print), the gateway automatically created a public access printer. Later, you might want to convert that printer to a controlled access printer. Before doing this, verify the following 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 NDPS Manager that will control this Printer Agent
- Have a Broker running
- Have created an NDPS Manager object

To convert a public access printer to a controlled access printer, complete these steps:

- 1. In NetWare Administrator, select the container where you want the NDPS Printer object to reside.**
- 2. Click Object > Create > NDPS Printer.**
- 3. Enter a name in the NDPS Printer Name field.**
- 4. At the Printer Agent Source field, click Public Access Printer.**
- 5. Select the public access printer you want to convert to a controlled access printer and then click OK > Create.**

Configuring IPP Services with NetWare Enterprise Print Services

The Internet Printing Protocol (IPP) allows users running an IPP client to set up a printer that sends print jobs to a URL instead of a Printer Agent or a legacy Print Queue. This is a more natural way to print across the Internet. For more information about IPP, see the documents available at <http://www.pwg.org/ipp/index.html> or <ftp://ftp.pwg.org/pub/pwg/ipp/>.

Before configuring IPP services, verify the following prerequisites:

- Netscape Enterprise Server for NetWare (ships with NetWare 5 and NetWare 4.2) installed on same server where the Printer Agent is running. To include other Printer Agents on other servers, you need to install the web server on those servers too. IPP is enabled on a per-printer basis.
- IPP client software loaded.
- TCP/IP configured on the server.

Changes to Web Sever Configuration Files

If the web server was already installed at the time NDPS was installed, the installation program updated the web server's configuration files. If the web server is to be installed later, follow the instructions found in *server\SYS:\SYSTEM\IPP\NDPSIPP.TXT* on the server where NetWare Enterprise Print Services was installed.

Setting Up IPP with NetWare Administrator

- 1. From NetWare Administrator, select the printer you want to enable IPP printing for and then click NetWare Enterprise Print IPP Support > Change Web Server.**
- 2. Enter the web server's valid TCP/IP address or DNS name.**
- 3. Distribute the IPP URL displayed on the NetWare Enterprise Print IPP Support page to users with an IPP client. It is required when users set up printers on their workstations.**

4. **Make these changes effective by clicking Enable > OK.**

Disabling/Enabling IPP Services

Once IPP services are enabled, you can disable the services by returning to the Enterprise NDPS IPP Support page and clicking Disable. To re-establish IPP services, click Enable.

Security

Several factors determine the level of security used by IPP. For more information, see the Managing section of the HTML documentation at www.novell.com/documentation/lg/endps/docui/index.html.

Setting Up LPR/LPD Printing

The added features for LPR/LPD printing allow UNIX clients to submit print jobs to NDPS printers. This is separate from the existing ability of NDPS to send jobs out to UNIX stations and LPR printers.

Configuring LPR/LPD Printing with NetWare Administrator

LPR/LPD printing should work with any UNIX client or any other job source capable of using the LPR protocol.

1. **From NetWare Administrator, select the printer you want to enable LPR printing for and then click the NetWare Enterprise Print LPR/LPD Support page.**
2. **(Optional) If address and user restrictions are desired for this printer, click Add and then specify a lower and upper address for LPR clients which are allowed to use LPR printing. If only user restrictions are desired, use 0.0.0.0 for the lower limit and 255.255.255.255 for the upper limit. If no ranges are listed, no address or user restrictions will apply.**
3. **(Optional) If user restrictions are desired for this printer, click Add and then specify the UNIX username. Repeat this for each user. If no names are listed, no user restrictions will apply.**

4. (Optional) Add a comment for this address range and user list.
5. Make these changes effective by clicking **Enable > OK**.

Disabling/Enabling LPR/LPD Services

Once LPR/LPD services are enabled, you can disable the services by returning to the NetWare Enterprise Print LPR/LPD Support page and clicking **Disable**. To re-establish LPR/LPD services, click **Enable**.

