

# iPrint

## Access a Printer From Anywhere

by Cheryl Walton

**R**ecently, Jeff Christensen, a Novell product manager, was working on a project at home. When Christensen tried to print his project, he discovered that his color printer was out of ink. You may think that Christensen had two choices: buy new ink cartridges or take his project files to work, find a color printer on the network, and print the files to that printer from his workstation.

Christensen had another way to print his files, however: He had iPrint, Novell's implementation of Internet Printing Protocol (IPP). (IPP is an Internet standard protocol that defines operations and attributes for application-level printing over the Internet.)

Using a beta version of iPrint, Christensen located a color printer on Novell's network, installed the printer on his home computer, and sent his print job to that printer. "I just picked up my documents as I came in the door," Christensen concludes.

Of course, Christensen's story is compelling from a user's perspective. When users discover that iPrint is available, they will want—and probably get—it. After all, printing over the Internet certainly makes working offsite easier.

In addition, iPrint should also interest you, the network administrator. For example, did you notice that Christensen did not need to call the IT department to learn the exact location of the color printer to which he sent his print job? Instead, Christensen used iPrint to locate the printer himself.

As a network administrator, you probably handle plenty of calls from users who need help locating or printing to a particular printer. These calls are unavoidable if your company has a large number of printers on its network. As Christensen's story illustrates, however, these calls won't be unavoidable for long. Users on and away from your company's network can use iPrint to locate printers without having to call you.

You may also have noticed that Christensen didn't worry about how secure his documents were as they traversed the Internet. Neither did Novell, even though most companies would be justifiably concerned about security. Neither Novell nor Christensen worried that eavesdroppers or corporate spies would intercept Christensen's documents, because iPrint sent Christensen's documents in encrypted form. You can configure iPrint to encrypt print jobs using Secure Sockets Layer (SSL). (See "Revamp Your Existing Printers" on p. 10.)



### IPRINT IS COMING SOON

iPrint, which was in closed beta at the time this article was written, will be included in NetWare 6. (NetWare 6 is scheduled to ship later this year.) In addition, iPrint will soon be available to Novell's NetWare 5.1 maintenance customers as a free enhancement pack for NetWare 5.1. In other words, if your company either plans to upgrade one or more servers to NetWare 6 or is a NetWare 5.1 maintenance customer, iPrint won't cost an extra dime.

### A BRIEF HISTORY OF SIMPLIFIED PRINTING

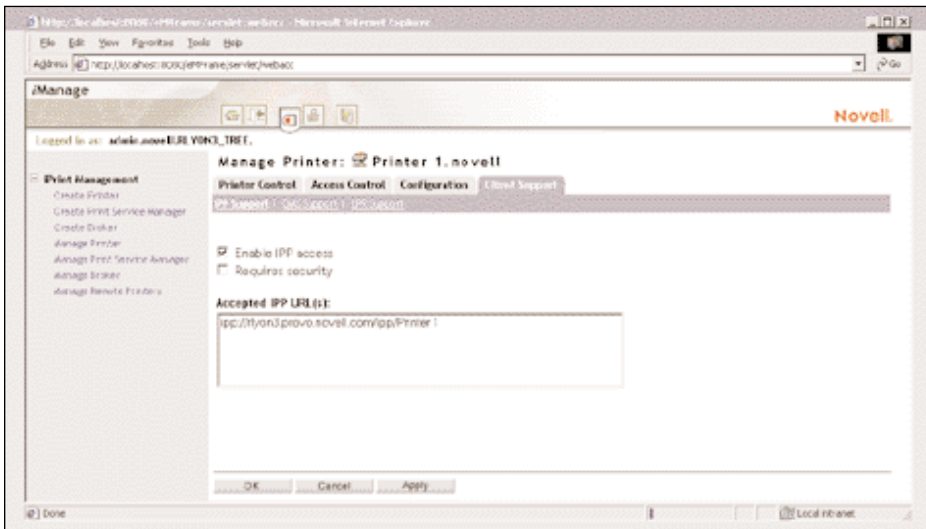
iPrint runs on top of Novell Distributed Print Services (NDPS) 2.1.2 or later. (NDPS version 2.1.2 is included in Support Pack 2a for NetWare 5.1. You can download Support Pack 2a from <http://support.novell.com/misc/patlst.htm#nw>.) NDPS, as you probably know, is Novell's print services software for NetWare 4.11 and above. NDPS meets two complementary goals:

- Simplify printer setup and management
- Simplify users' printing experience

For example, NDPS 1.0 for NetWare 4.11—the first version of NDPS—replaced queue-based print services with distributed print services. As a result, you create only one Novell Directory Services (NDS) object for each printer on your company's network. You also use only one utility to manage all print tasks through this one object.

In contrast, with queue-based printing, you must create three NDS objects for every printer. To manage print tasks for these printers, you then use several utilities—including the NetWare Administrator (NWADMIN) utility, the PSERVER utility, and the printer management utilities provided by the manufacturers of the printers.





**Figure 1.** iManage, the iPrint web-based management tool, replaces the NDPS snap-in module for the NWADMIN utility. Using iManage, you deploy and manage NDPS and iPrint printers on your company's network.

NDPS 1.0 also simplifies printing for users. For example, users no longer need to perform queue-based tasks such as capturing printer ports. (For more information about the benefits of NDPS 1.0, see “NDPS: Good-bye, Queue World!” *Novell Connection*, Oct. 1997, pp 6–22. You can download this article from [www.ncmag.com/past/](http://www.ncmag.com/past/).)

Novell provides another tool that further simplifies network printing, NetWare Enterprise Print Services (NEPS). NEPS—which is a separate printing product for NetWare 4.11 and 5.0 servers—adds management capabilities to NDPS running on these servers. These capabilities are also available for NetWare 5.1 servers with NDPS 2.1.1, which ships with NetWare 5.1. Specifically, NEPS and NDPS 2.1.1 further simplify administra-

tive tasks by enabling you to manage print services for UNIX, Macintosh, and mainframe users. Prior to NEPS and NDPS 2.1.1, you had to set up and manage print services for these users separately. (For more information about NEPS, See “NetWare Enterprise Print Services: Print Services Made Easy,” *Novell Connection*, Dec. 1999, pp. 24–35. You can download this article from [www.ncmag.com/past/](http://www.ncmag.com/past/).)

NEPS and NDPS 2.1.1 include a Line Printer Remote/Line Printer Daemon (LPR/LPD) server. LPR is a UNIX print command that links files to a spooling area on a print server. LPD then copies these files to a printer. You can also configure Macintosh workstations and several mainframe systems to use LPR/LPD.

NEPS and NDPS 2.1.1 also include an IPP 1.0 server, which enables users

who have IPP client software and an Internet connection to print to NDPS printers over the Internet. iPrint updates and enhances NDPS to make printing over the Internet as easy for users as printing over the local network. In fact, iPrint essentially extends NDPS to include IPP access to NDPS printers.

### NDPS TAKES A RIDE ON THE INFORMATION HIGHWAY

As mentioned earlier, IPP enables users and applications to send print requests over the Internet. IPP also enables users and applications to request information about IPP-enabled printers—and to receive responses to those requests. (For more information about IPP, see Internet Engineering Task Force [IETF] Request for Comments [RFC] 2910 and 2911. You can download these documents from [www.ietf.org/rfc/rfc2910](http://www.ietf.org/rfc/rfc2910) and [www.ietf.org/rfc/rfc2911](http://www.ietf.org/rfc/rfc2911) respectively.)

In fact, IPP is the “first printing protocol that is able to give you status information about your printer and your [print] job,” Shivaun Albright, an engineer scientist for Hewlett-Packard (HP), explains. (HP offers several printers that support IPP. For information about these printers, visit [www.hp.com/hpinfo/newsroom/press/20mar01a.htm](http://www.hp.com/hpinfo/newsroom/press/20mar01a.htm).)

iPrint updates the NDPS Print Manager to handle IPP requests and responses. Specifically, the NDPS Print Manager forwards IPP requests to NDPS Printer Agents and forwards responses from NDPS Printer Agents to the Novell IPP server.

The NDPS Print Manager is software that enables you to create NDPS Printer Agents, which are software representations of physical printers. The NDPS Print Manager also enables NDPS Printer Agents to share server resources. (For more information about NDPS Manager and NDPS Printer Agents, see “NDPS: Good-bye, Queue World!”)

iPrint also updates the NDPS IPP 1.0 server to support IPP 1.1. Among other things, IPP 1.1 extends the number of optional operations that IPP 1.0 defines. For example, IPP 1.1 includes optional operations such as Pause-Printer, Resume-Printer, and Purge-Jobs. IPP 1.0 does not include these optional operations. (For a list of the differences between IPP 1.0 and IPP 1.1, see RFC 2911.)

iPrint includes the following components to help you deploy, manage, and use IPP-enabled printers:

### Exercise Your Options

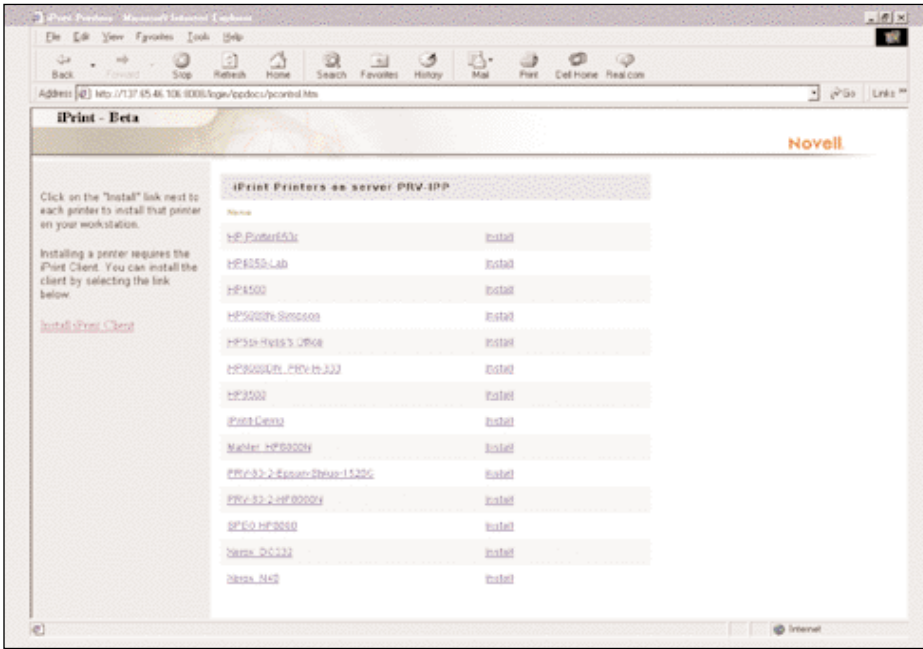
In addition to enabling you to manage and configure Internet Printing Protocol (IPP) access to Novell Distributed Print Service (NDPS) printers, iManage enables you to set installation parameters for those printers. For example, you can use iManage to configure the following driver parameters for the following mapped printers:

- **Paper size.** You can set the Paper-size parameter to any size of paper. For example, you can set this parameter

to letter, legal, A4, and envelope.

- **Orientation.** You can set the Orientation parameter to portrait or landscape.
- **Copies.** You can set the Copy parameter for a printer to a specific number. When users submit print jobs to that printer, the printer then automatically prints that number of copies for each submitted print job.
- **Color.** You can set the Color parameter to yes, no, true, or false for color printers.
- **Duplex.** You can set the Duplex parameter to simplex, horizontal, or vertical.
- **Collate.** You can set the Collate parameter to yes, no, true, or false. ●





**Figure 2.** iPrint automatically creates and maintains a web page that contains a list of iPrint printers (printers to which you have enabled Internet access). You can make this web page available to users, who can then use the list to install iPrint printers on their desktop.

- iManage
- iPrint Map Designer
- iPrint client software

### LITTLE I, BIG MANAGEMENT CAPABILITIES

iManage is a web-based management tool that you can use to add and manage both IPP-enabled printers and NDPS printers. For example, you can perform tasks such as the following:

- Creating Printer objects
- Setting or removing printer access

- controls
- Configuring spooling options
- Setting printer configurations, such as the number of copies a user can print

iManage also enables you to define the level of security you want to use for printer access—high security or medium security. iPrint uses NDS eDirectory for high-security access. If you choose high security, users must log in to eDirectory before they can access the printer. On the other hand, if you leave that printer's security level at its default setting—which is medium

security—users can access the printer without first logging in to eDirectory.

Furthermore, you can use iManage to specify printer installation parameters, such as print driver parameters. For example, you can configure the number of copies and specify if the copies should be collated. (For more information about the installation parameters that you can set with iManage, see “Exercise Your Options” on p. 8.)

In short, you can use iManage to manage any aspect of NDPS printing that you now manage through the snap-in module for the NWADMIN utility. In NetWare 6, iManage replaces this snap-in module.

This shift to a web-based management tool for NDPS and iPrint printers demonstrates Novell's continued commitment to the one Net vision. With iPrint and iManage, you can manage your company's print services from anywhere you have an Internet connection.

Of course, you can also use iManage to add NDPS and IPP-enabled printers to your company's network. In fact, using iManage, you can add IPP-enabled printers simply by enabling IPP access to the NDPS printers that are already on your company's network. As Christensen explains, with iPrint, you can IPP enable “any printer that can work with a server.” (For more information about how to IPP enable NDPS printers using iManage, see “Revamp Your Existing Printers.”)

Without iPrint, on the other hand, you may have to replace your company's existing printers if you want to print over the Internet. In lieu of Novell's printing software, you may need to purchase IPP-enabled printers, which include printer-specific internal or external IPP servers.

**Note.** To avoid confusion, printers to which you enable IPP access using iPrint will hereafter be called iPrint printers. Printers that include printer-specific internal or external IPP software will be called IPP-enabled printers.

Although iPrint does not require that you purchase IPP-enabled printers to provide printing over the Internet, iPrint works nicely with these printers. iPrint is IPP-compliant, which means that you can use iPrint client software to access IPP-enabled printers, even if these printers are not also iPrint printers. Likewise, you can use other IPP-compliant client software (such as the IPP client software that is included with Windows 2000) to access iPrint printers.

## Revamp Your Existing Printers

Using iManage, you can enable Internet Printing Protocol (IPP) access to any Novell Distributed Print Service (NDPS) printer on your company's network. You can also use iManage to enable Secure Sockets Layer (SSL) encryption for iPrint printing. You simply complete the following steps:

1. Access iManage and log in. You access iManage by launching a supported browser and typing the following URL in that browser's Address field: `http://yourserveraddress:8008/eMFrame/eMFrame.htm`. iManage supports Net-
2. Select Manage Printer from the task menu in the left frame. iManage then displays a browser, which you use to select the NDPS printer you want to manage. When you select a printer, iManage displays the Manage Printer page for this printer.
3. Select the Client Support tab on the Manage Printer page.
4. Click the check box to enable IPP access to this printer. (See Figure 1 on p. 8.) To enable SSL encryption for iPrint printing, you can also check the Requires Security box on the Manage Printer page. ●

If you use iPrint client software to send a print request to an IPP-enabled printer that is not also an iPrint printer, you must provide the IP address of the IPP-enabled printer—just as you would if you accessed this printer using any other IPP-compliant client software. For example, if you use Windows 2000 IPP client software to access that printer, you must also provide the IPP-enabled printer's IP address.

In contrast, when you use iPrint client software to access an iPrint printer, iPrint provides the IP address for you. iPrint also provides features such as job spooling and access control, which are not available when you access non-iPrint printers via iPrint client software.

### IPRINT PUTS IPP ON THE MAP

iPrint Map Designer is a web-based map design tool that you can use to help users locate iPrint printers. iPrint automatically creates and maintains a default web page containing a list of these printers. (See Figure 2.)

To provide users with access to iPrint printers, you can simply let users know where to find the default web page. This web page includes only printer names, however. Suppose a user wanted to print to the iPrint printer outside a particular conference room and didn't know the name of that printer? Of course, you already know the answer to this question: That user would call you.

Depending on the number of iPrint printers on your company's network and the number of users who need to access those printers, calls for help could add to the already large number of printing-related calls you receive. To avoid these additional calls, you can use iPrint Map Designer to create a map that displays the exact location of every iPrint printer on your company's network. (Christensen estimates that even at Novell—which mainly employs technically savvy individuals—40 to 50 percent of help-desk calls are printing related.)

To create a map that shows the location of the iPrint printers on a particular floor of an office building, you complete the following steps:

1. Copy an image of the floor plan to the `login/ippdocs/images/maps` directory of the iPrint server.
2. Launch your browser and type the following URL in that browser's Address field to launch iPrint Map

Designer: `http://yourserveraddress/login/ippdocs/maptool.htm`.

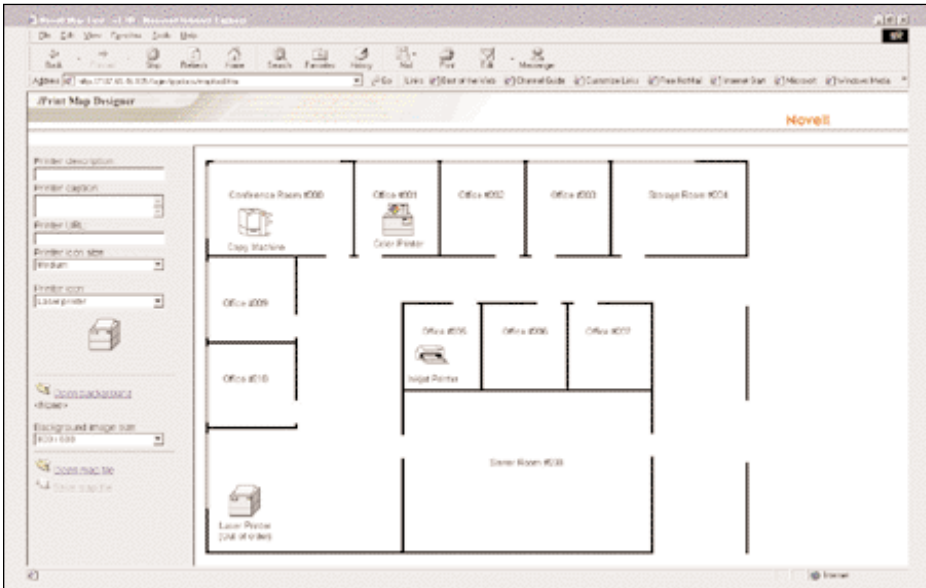
**Note.** iPrint Map Designer supports Internet Explorer 5.0 or above and Netscape Navigator 4.7 or above running on Windows 2000, NT, 98, and 95.

3. Select Open Map File in the left frame of iPrint Map Designer to open the floor plan image. This image then appears in iPrint Map Designer's right frame, which is called the *sandbox*.

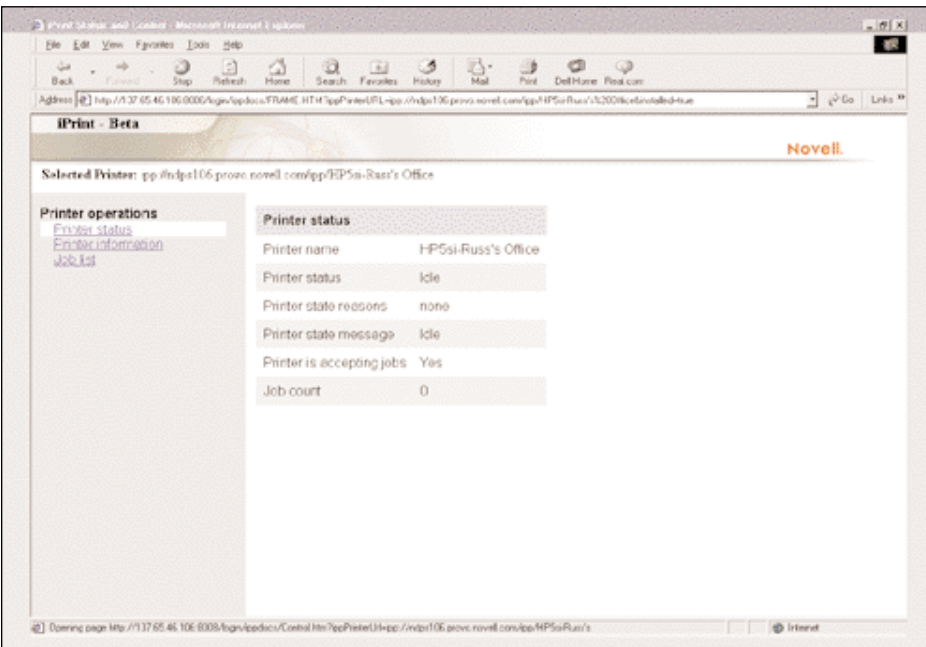
(See Figure 3 on p. 12.)

4. In iPrint Map Designer's left frame, provide the first printer's URL in the Printer URL field. You can also provide additional information for the printer in the Printer description and Printer caption fields. (Providing information for the Printer description and Printer caption fields is optional.)
5. Select the printer icon that represents this printer from the drop-down list.

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**Figure 3.** iPrint Map Designer enables you to create as many maps as you need to display the location of the iPrint printers on your company's network. iPrint Map Designer saves these maps as web pages, which you can make available to users. These users can then access the web pages to locate and install iPrint printers on their desktop.



**Figure 4.** The Printer Operations page enables you to view a printer's status before you send a print job to that printer. You can also access printer information—such as whether or not a printer has a duplexing unit—through this page.

6. Select a display size for the icon.
7. Drag the printer icon to the sandbox and drop that icon in the printer's location. (See Figure 3.)
8. Repeat steps 4 through 7 for all of the iPrint printers in the floor plan.
9. Select Save Map File in iPrint Map Designer's left frame to save this map as a web page.

This map is then available to all users—including those users who are working onsite. After users know where to find this map, they can locate iPrint printers without having to dial your extension. Putting these printers on a map could decrease the number of calls you receive from users who need to find those printers.

### When One Map Won't Do

As mentioned earlier, the iPrint Map Designer saves iPrint printer maps as HTML files. If you cannot easily show the location of all your company's iPrint printers on one map, you can create several maps and then link these maps together using standard HTML.

For example, suppose your company has three office buildings, each of which contains ten iPrint printers. To create a map of all of your company's iPrint printers, you can use the map design tool to create three separate maps—each showing the location of the ten iPrint printers in a particular building. You can then use HTML to link these maps together.

When a user wants to print to a printer in a particular building, that user can select the link that takes the user to the iPrint printer map for that building. The user can then install the printer of his or her choice by clicking its printer icon on that map.

### IPRINT CLIENT PRIVILEGE

When a user clicks to install a particular iPrint printer, iPrint first queries that user's browser to determine whether or not iPrint client software is installed on that user's workstation. iPrint client software plugs in to Internet Explorer 5.0 or above or Netscape Navigator 4.7 or above running on Windows 2000, NT, 98, and 95.

iPrint client software acts as a gateway, translating Windows print requests to IPP and sending those requests to the Novell IPP server. The Novell IPP server receives those requests, translates them to NDPS, and sends the requests to the NDPS Print Manager. The NDPS Print Manager sends the requests to the NDPS Printer Agents, which must then execute those requests and formulate responses.

If the user has not already installed the iPrint client software, iPrint displays a message that prompts the user to accept the installation of the iPrint client software. When the user clicks to accept iPrint client software, iPrint pushes a zipped file to the user's browser. The client software automatically unzips and installs itself. (iPrint client software requires only about 1.2 MB of memory.)

After iPrint verifies that the client software is installed, the iPrint client software downloads and installs the driver for the requested printer. Specifically, iPrint client software downloads a zipped file containing this driver from the NDPS

Print Manager running on the same server as the requested printer.

**Note.** The NDPS Print Manager obtains this driver from the Resource Management System [RMS]—a central repository for network resources such as print drivers. (For more information about RMS, see “NetWare Enterprise Print Services: Print Services Made Easy.”)

After iPrint client software unzips and installs this print driver, the client software installs the requested printer in the user’s Windows Printers file. The user can then access and manage this printer just as the user would access and manage the printer if he or she were printing on your company’s network. For example, the user can select this printer from an application—such as Microsoft Word or Microsoft Excel—and can then configure printer properties, such as page orientation, directly from this application.

The user can also configure printer properties or view the status of a submitted print job by opening the printer in the Windows Printers file. In other words, users won’t need to learn any new tricks to manage the old printers on your company’s network. As a result, these users won’t often need to call you for help.

Because iPrint automatically downloads and installs its own client software, your company can make IPP-enabled printing available to its customers as easily as it can make IPP-enabled printing available to its users. For example, a hotel can provide maps on its web site that enable customers to print—rather than fax—reservation requests. As a result, customers save the price of long-distance telephone calls.

In addition, a hotel can make IPP-enabled printers available to its guests. In each guest room, the hotel can provide a map that enables guests to print to the hotel’s business center.

#### **EXTRAS! EXTRAS! READ ALL ABOUT THEM**

After users install an iPrint printer on their computer, they can use iPrint client software to access that printer’s NDPS Printer Operations page. As you probably know, the Printer Operations page includes printer information that you can’t access through the Windows Printers folder. For example, the Printer Operations page enables you to view the number of print jobs that have been submitted to a printer before you send a print job to that printer. In contrast, as you

know, you must send a print job to a printer before you can view this information through the Windows Printers folder. (See Figure 4.)

Users can also use the Printer Operations page to find out if an iPrint printer is experiencing a paper jam, is low on toner, or is out of paper before they print to that printer. In addition, the Printer Operations page displays information about the printer’s make and model, the languages the printer supports, and whether or not the printer is a color printer.

To view the Printer Operations page for an iPrint printer that is already installed on a user’s computer, the user uses his or her browser to access either the iPrint default web page or an iPrint map. When the user clicks to select a previously installed printer from either of these locations, iPrint client software displays the Printer Operations page for that printer.

#### **CONCLUSION**

If you were one of the more than 7,000 people who attended BrainShare 2001 in Salt Lake City, you may have already seen

a demonstration of iPrint. Eric Schmidt, Novell chairman of the board, and Craig Miller, Novell Platform Group vice-president, introduced iPrint by its then working name—Novell Internet Printing—during the first BrainShare keynote address. You may also have seen demonstrations of iPrint in the BrainShare Technology Lab or the “Printing Using Novell Internet Printing” break-out session.

Whether or not you’ve actually seen a demonstration of iPrint, however, you can undoubtedly appreciate the fact that iPrint integrates with your company’s existing NDPS printers. You can also appreciate iManage, the web-based management tool that allows you to enable IPP access to the NDPS printers your company already owns and to manage those printers from anywhere you have an Internet connection. Most of all, you can appreciate the convenience of iPrint to users. After all, everybody who uses your company’s network is a user sometimes, including you.

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