# IBM ®

## Worldwide
## *Support Center*
## Education

### Version 5 Release 2 Project

## OS/400 Support For The Internet Printing Protocol

**This course will begin with a brief description and history of the Internet Printing Protocol (IPP). It will review the OS/400 V5R1 support for IPP printing, then identify what new support is provided with OS/400 V5R2. Next, it will summarize the total IPP support provided with V5R2. Several topics relative to using the new IPP print driver will be presented, followed by troubleshooting tips, a listing of IBM printers that can be IPP-enabled,  OEM devices that can be IPP-enabled, IPP references and a lab exercise.**

◆ **Support Center personnel and field representatives who will be supporting OS/400 V5R2, particularly in the print area.**

◆ **A general iSeries support background would be a plus. Also, a background in iSeries printing and/or Transmission Control Protocol/Internet Protocol (TCP/IP) would be useful.**

# *Objectives*

**Upon completion of this course, students will be able to:**

◆ **Explain what IPP is, and the key points of its history**

◆ **Recall what was new in OS/400 V5R1, relative to IPP printing**

◆ **Articulate what is new in OS/400 V5R2, relative to IPP printing**

◆ **Explain the IPP printing 'complete picture' relative to V5R2**

◆ **Create and use a pritner device description on the iSeries that uses the new IPP printer driver**

◆ **Perform basic troubleshooting relative to using the IPP printer driver**

◆ **List some of the IBM printers that can be IPP-enabled, and some OEM devices that can be IPP-enabled.**

◆ **Locate a number of good resources relative to IPP printing**

◆ **IPP In A Nutshell**

◆ **IPP History**

◆ **IPP Printing - What Was New With V5R1 ?**

◆ **IPP Printing - What's New With V5R2 ?**

◆ **IPP Printing - The 'Complete Picture' With V5R2**

◆ **Using The New IPP Print Driver**

■ **Overview**
■ **Configuration Example**
■ **Screenshots**
■ **Restrictions**

◆ **Troubleshooting The IPP Print Driver Configuration**
■ **General**
■ **New iSeries messages**

◆ **Miscellaneous**
■ **IBM printers that can be IPP-enabled**
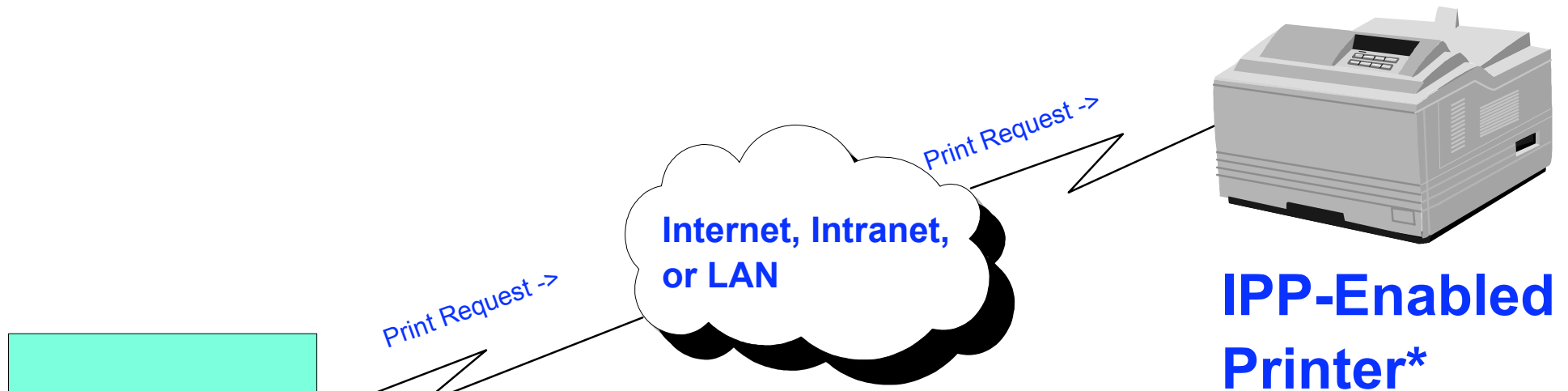■ **Some OEM devices that can be IPP-enabled**

◆**IPP Printing - References**

◆**IPP Print Driver Configuration - Lab Exercise**

# IPP In A Nutshell

# *IPP In A Nutshell*

**Internet, Intranet, or LAN**

Print Request ->

Print Request ->

IPP-Enabled Client

**IPP-Enabled Printer***

◆ **IPP**

- Is a client-server protocol
- Is an industry standard, expected to replace LPR/LPD
- Allows an IPP-enabled client to submit a print request over the internet, an intranet, or LAN to an IPP-enabled printer

**\*Note, this may also be a printer configured on an IPP-enabled server, such as an iSeries.**

# Notes:  IPP In A Nutshell

◆ **IPP is a client-server protocol that allows an IPP-enabled client to submit, over the internet, an intranet, or  LAN, a print request to an IPP-enabled printer or to an IPP-enabled server, such as an iSeries.**

◆ **The HTTP/1.1 protocol is used to transport the IPP data.**

◆ **IPP is a versatile  printing method, and should be supported by a variety of IPP-enabled printers,  IP-enabled clients, and IPP-enabled servers**

◆ **IPP provides excellent security by providing for a secured connection and authentication**

# IPP History

# *IPP History*

**Summer 1996:** Novell    Initiated contact with other companies

xerox    Expressed interest in internet printing

Novell **And** xerox **Drafted outline**

IBM    Had started work on proposal for Inernet printing

Microsoft **And** hp    had started work too on new generation of print services

**November 1996:** pwg    Printer Working Group started the IPP project

**March 1997:** IETF    IPP Project accepted by Internet Engineering Task Force (IETF)

**Currently:** pwg    PWG continues work on IPP project

# Notes: IPP History

In 1996, Novell approached a number of companies to determine if they were interested in participating in a printing protocol project for printing over the internet. Xerox and some other companies expressed interest. Soon, Novell and Xerox came up with a draft document outlining the protocol project. In a parallel effort, IBM had started work on a proposal for printing over the internet using Web technology. About this same time, it was known that Microsoft and HP had started work on solutions for a new generation of print services.

The initiators knew from the beginning that they wanted the project to become an acknowledged project with the Internet Engineering Task Force (IETF). It was clear to them that, to accomplish this, they first needed to assemble a group of experts. The decision was made to start the activity in the Printer Working Group (PWG). This group had representation from various printer and print server vendors.

The PWG started the IPP project in November 1996. After some discussions, it was decided to pool the earlier efforts of Novell, Xerox, and IBM into what is now named the Internet Printing Protocol project. In March 1997, the IPP project was accepted as a new working group of the IETF.

◆ Among the goals of the the working group are:

   ■ "...to develop requirements for internet printing and to describe
      a model and semantics for internet printing."

   ■ "...to define a new application level Internet Printing Protocol for the following core functions

      ▶ for a user to find out about a printer's capabilities
      ▶ for a user to submit print jobs to a printer
      ▶ for a user to submit print jobs to a printer
      ▶ for a user to cancel a previously submitted job"

# *IPP Printing - What Was New With V5R1 ?*

# IPP Printing - What Was New With V5R1 ?

**V5R1**

Print Request ->

Print Request ->

**Internet, Intranet, or LAN**

**Print Data**

**IPP Server**

Print Request ->

**IPP-Enabled Client**

**New Function For The iSeries**
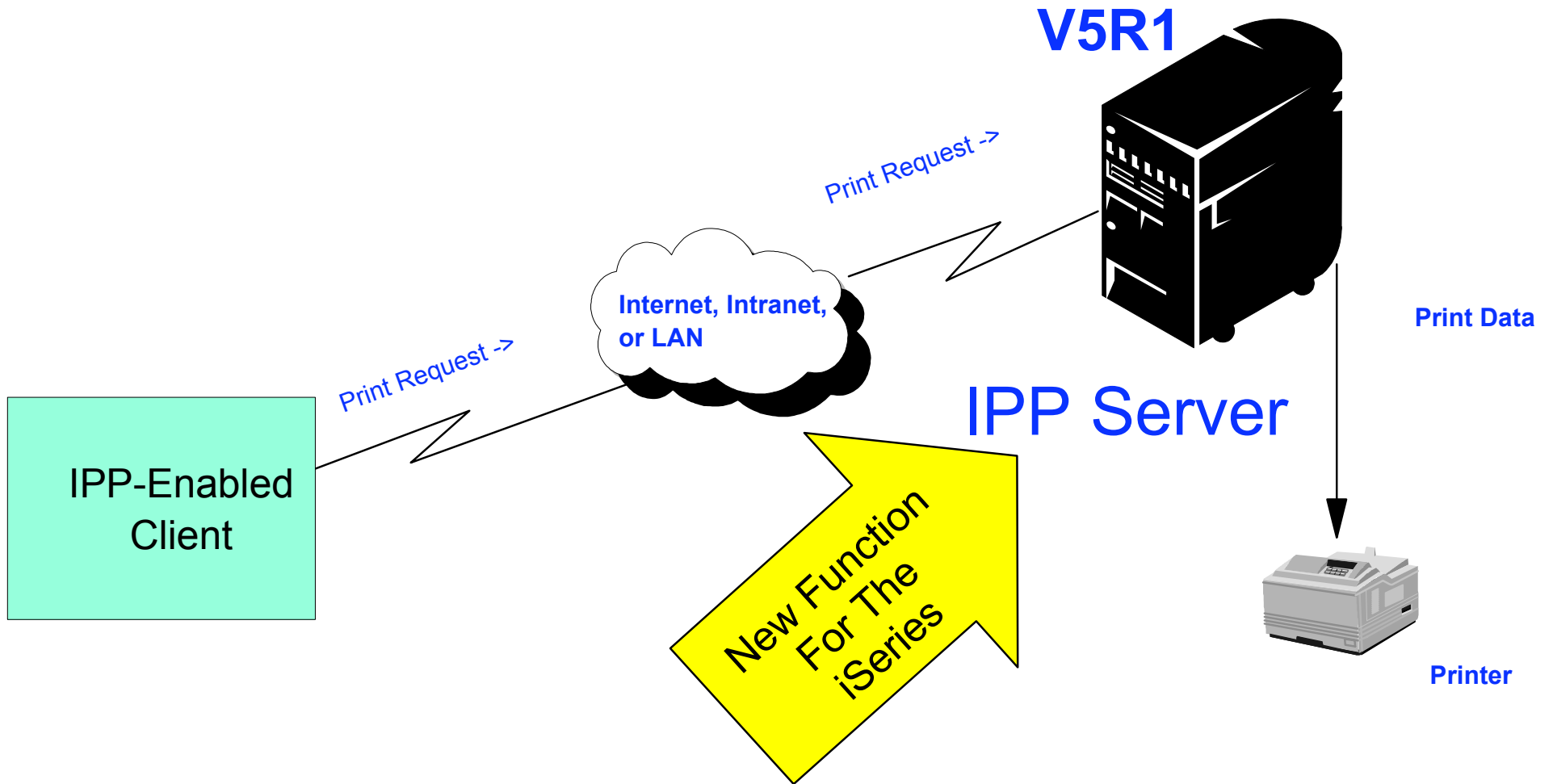
**Printer**

◆ **An IPP-enabled client was able to submit a print request, over the internet, an intranet or LAN to an IPP-enabled iSeries server**

◆ **This, for example, allowed a user with a Windows 2000 client to print over the internet, an intranet, or LAN, to a printer configured on an IPP-enabled iSeries.**

# IPP Printing - What's New With V5R2 ?
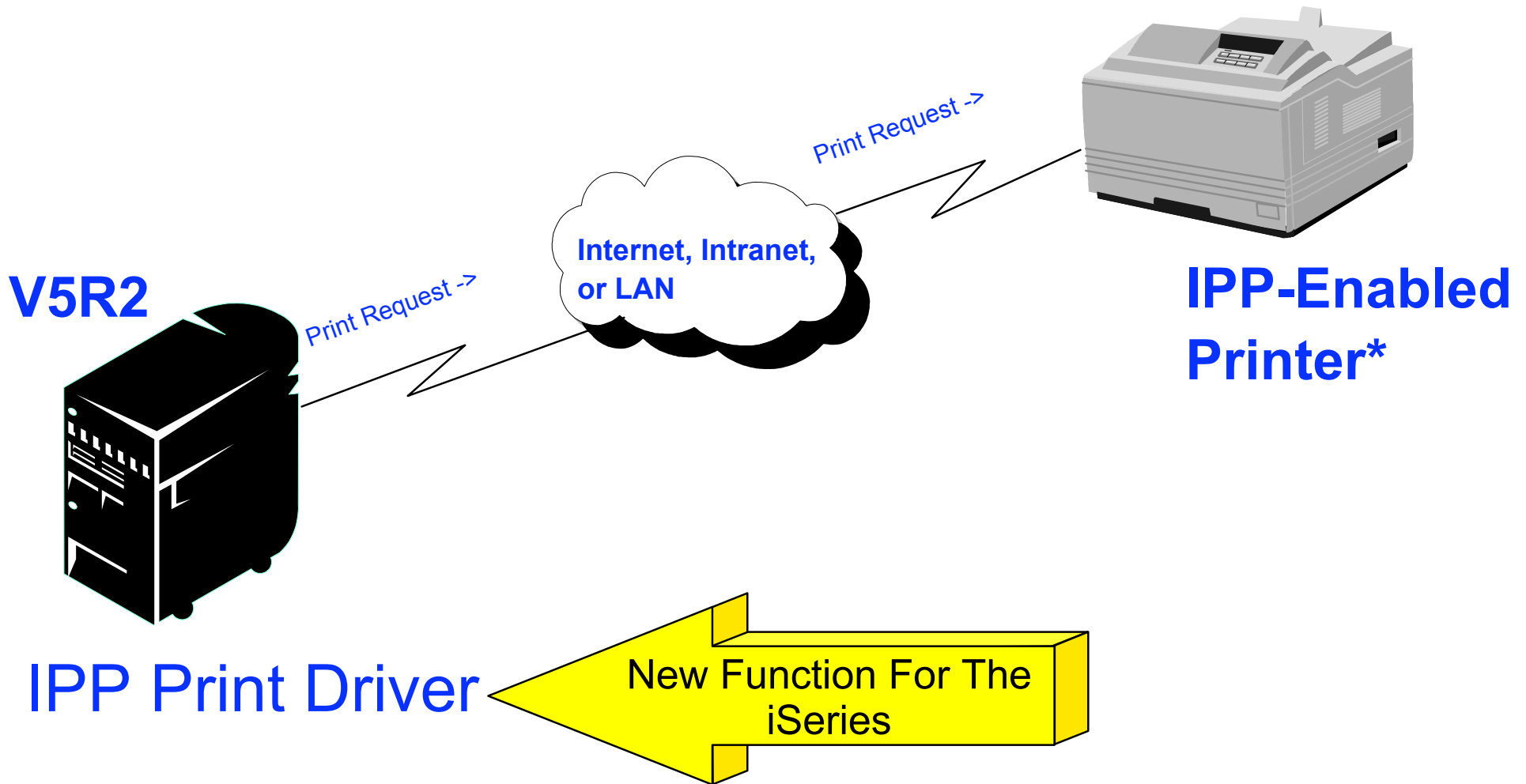
**V5R2**

Print Request ->

Print Request ->

**Internet, Intranet, or LAN**

**IPP-Enabled Printer***

**IPP Print Driver**

New Function For The iSeries

*Note, this may also be a printer configured on an IPP-enabled server, such as an iSeries.

With OS/400 V5R2, the iSeries can now function as an IPP client. The following provide this new function:

◆ **New OS/400 print driver**

■ **New driver, named *IBMIPPDRV**

■ **New driver is implemented according to standard IPP v1.1**

With OS/400 V5R1, the iSeries could be configured as an IPP server, but not as an IPP client.

By creating a *LAN, 3812, Port 631, *IBMIPPDRV printer device description on a V5R2 iSeries, a user is then able to print from the iSeries over the internet, an intranet or LAN, to an IPP-enabled printer (or, to a printer which is configured on an IPP-enabled server, such as an iSeries).

Also new is, the IPP server on the iSeries can now support a secured connection on the well known IPP port (i.e. port 631).

# IPP Printing - The 'Complete' Picture With V5R2

**Internet, Intranet, or LAN**

Print Request ->

Print Request ->

IPP-Enabled Client
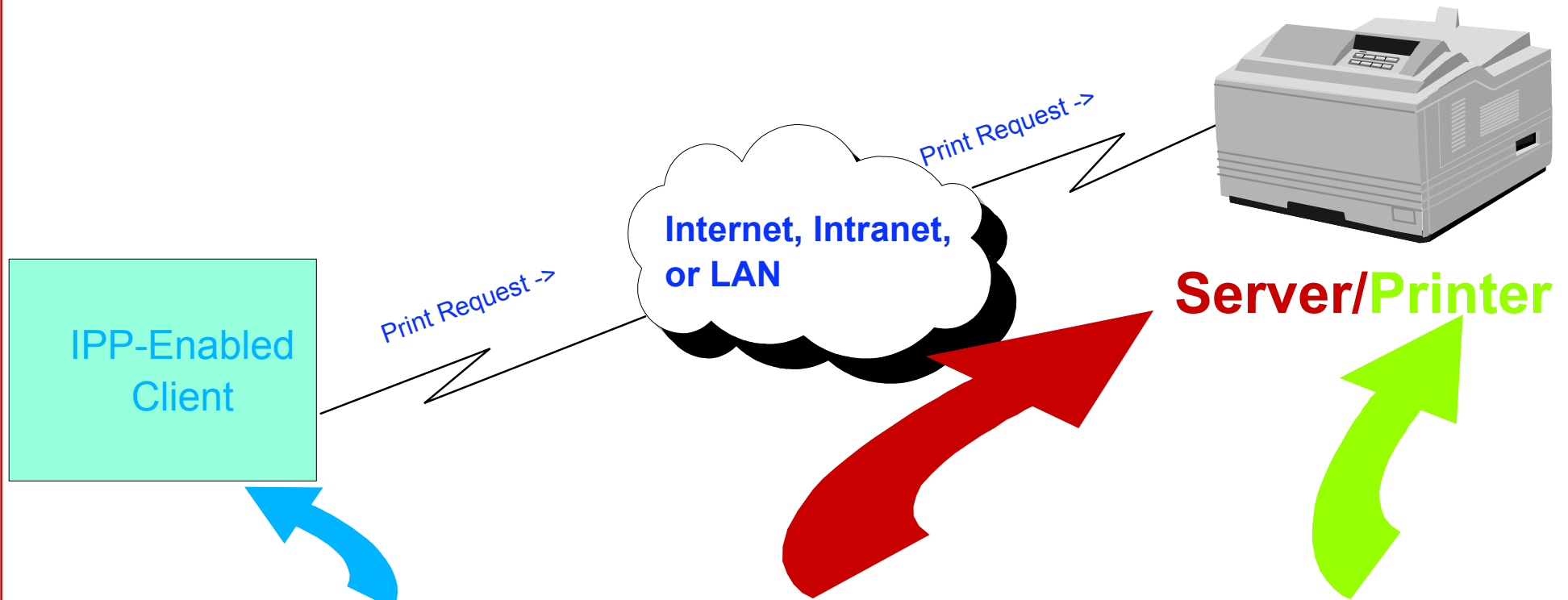
**Server/Printer**

◆ **The IPP Client Could Be:**

- **An iSeries with OS/400 V5R2**
- **A Windows client that supports IPP**

◆ **The IPP Server Could Be:**

- **An iSeries with OS/400 V5R2 or V5R1**
- **A LAN card in the printer**
- **An external LAN adapter**

◆ **The Printer Could Be:**

- **A printer configured on an IPP-enabled server, such as an iSeries, with V5R2 or, V5R1**
- **An IPP-enabled printer**

**With OS/400 V5R2, a user can print from an IPP-enabled client, such as an iSeries or Windows workstation, via the internet, an intranet, or a LAN, to an IPP-enabled printer or a printer configured on an IPP Server such as an iSeries.**

# *Using The New IPP Print Driver*

## ◆ OVERVIEW

- ◆ **Simply create a *LAN, 3812 printer device description**

- ◆ **Or, change an existing PJL or SNMP printer device description**

- ◆ **Vary the device on**

- ◆ **Start the writer (STRPRTWTR)**

- ◆ **And print**

In order to use the IPP print driver on the iSeries, a printer device description must be created
with the required parameter values to support the configuration.  Or, and existing PJL or SNMP printer
device description must be changed to have the required parameter values to support the configuration.
Among the key parameter values in the printer device description are PORT 631, SYSDRVPGM
*IBMIPPDRV. Once the printer device description is properly configured, the user simply varies the
device on, starts the print writer, and is ready to print.

# ◆ CONFIGURATION EXAMPLE

## ■ Prompt On CRTDEVPRT Or CHGDEVPRT, Then Specify:

**Device Class (DEVCLS) = \*LAN**

**Device Type (TYPE) = 3812**

**Device Model (MODEL) = 1**

**LAN Attachment (LANATTACH) = \*IP**

**Port (PORT) = 631**     ⟵ New Value

**Activation Timer (ACTTMR) = 170**

**Host Print Transform (TRANSFORM) = \*YES**

**Manufacturer Type And Model (MFRTYPMDL) = select value based on actual printer**

**Remote Location Name (RMTLOCNAME) = url or IP address of printer**     ⟵ New Value

**System Driver Program (SYSDRVPGM) = \*IBMIPPDRV**     ⟵ New Value

**Use Secure Connection (SECURECNN) = \*YES, or \*NO**     ⟵ New Parameter

**Validation List (VLDL) = \*NONE, or list name and library**     ⟵ New Parameter

Configuring a printer on the iSeries to use IPP is very similar to configuring a printer to use PJL or SNMP. However, there are five parameters in the printer device description that need to be paid particular attention to when creating a printer device description to use IPP, or when changing an existing PJL or SNMP configuration to use IPP. Those five parameters are:

◆ **PORT**

■ **If the device supports the Internet Printing Protocol (IPP), SYSDRVPGM(*IBMIPPDRV), the well known port number 631 is used for a non-secure connection. For a secured connection, this parameter value can still be 631, or 6310, or, any unused port specified by the user**

◆ **RMTLOCNAME**

■ **Specifies the remote location name, remote system name, or internet address.**

■ **The value for this parameter may be specified in either of two formats:**

  ► **http://hp8100.rchland.ibm.com   (i.e. URL format)**
  ► **Or, http://9.5.208.29                 (i.e. IP address format)**

◆ **SYSDRVPGM**

- ■ **The value, *IBMIPPDRV must be used here in order to support IPP**

◆ **SECURECNN**

- ■ **Specifies whether a secure connection is established with the printer.  A secure connection provides an encrypted communications session to ensure print data that passes over the connection remains private.**

- ■ **Note,  This parameter is only valid when  SYSDRVPGM(*IBMIPPDRV) is specified.**

- ■ **With a value of *NO, the connection with the device is not secured**

- ■ **With a value of *YES, the connection with the printer is secure. The printer must support SSL(Secure Sockets Layer) or TLS(Transport Layer Security) and must have a system digital certificate. More information about the secure connection can be found in the Printer Device Programming manual**

◆ **VLDL**

■ **Specifies a validation list that is used if the printer requests authentication**

■ **The validation list is checked for the name of the user who created the spool file, the name of the printer device, or the name of the system**

■ **Authentication information associated with the name is returned to the printer**

■ **Note, this parameter is only valid when SYSDRVPGM(*IBMIPPDRV) is specified**

■ **A value of *NONE, means that no validation list is specified**

■ **A value of validation-list-name, means a validation list containing authentication information is to be used**

```
                    Create Device Desc (Printer) (CRTDEVPRT)

 Type choices, press Enter.

 Device description . . . . . . . DEVD          > IPPPRT01
 Device class . . . . . . . . . . DEVCLS        > *LAN
 Device type  . . . . . . . . . . TYPE          > 3812
 Device model . . . . . . . . . . MODEL         > 1
 LAN attachment . . . . . . . . . LANATTACH     > *IP
 Switched line list . . . . . . . SWTLINLST
                          + for more values
 LAN remote adapter address . . . ADPTADR
 Adapter type . . . . . . . . . . ADPTTYPE        *INTERNAL
 Adapter connection type  . . . . ADPTCNNTYP      *PARALLEL
 Emulated twinaxial device  . . . EMLDEV
 Advanced function printing . . . AFP             *NO
 AFP attachment . . . . . . . . . AFPATTACH       *WSC
 Port number  . . . . . . . . . . PORT          > 631
 Switch setting . . . . . . . . . SWTSET
 Local location address . . . . . LOCADR
                                                             More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
```
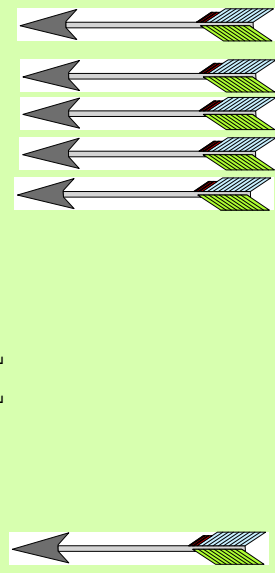
```
                    Create Device Desc (Printer) (CRTDEVPRT)

Type choices, press Enter.

Auxiliary printer  . . . . . . .  AUXPRT
Emulating ASCII device . . . . .  EMLASCII        *NO
Physical attachment  . . . . . .  ATTACH
Online at IPL  . . . . . . . . .  ONLINE          *YES
Attached controller  . . . . . .  CTL
Language type  . . . . . . . . .  LNGTYPE         *SYSVAL
Print quality  . . . . . . . . .  PRTQLTY         *STD
Font:                             FONT
  Identifier . . . . . . . . . .              > 11
  Point size . . . . . . . . . .                  *NONE
Form feed  . . . . . . . . . . .  FORMFEED      > *AUTOCUT
Separator drawer . . . . . . . .  SEPDRAWER       *FILE
Separator program  . . . . . . .  SEPPGM          *NONE
  Library  . . . . . . . . . . .
Number of drawers  . . . . . . .  NBRDRAWER
Printer error message  . . . . .  PRTERRMSG       *INQ
                                                         More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

```
               Create Device Desc (Printer) (CRTDEVPRT)

Type choices, press Enter.

Message queue  . . . . . . . . .   MSGQ            *CTLD
  Library  . . . . . . . . . . .
Maximum length of request unit     MAXLENRU        *CALC
Application type . . . . . . . .   APPTYPE         *NONE
Activation timer . . . . . . . .   ACTTMR          170
Inactivity timer . . . . . . . .   INACTTMR        *ATTACH
SNA pass-through device desc . .   SNPTDEV         *NONE
SNA pass-through group name  . .   SNPTGRP         *NONE
Host signon/logon command  . . .   LOGON           *NONE




Pacing . . . . . . . . . . . . .   PACING          7
Line speed . . . . . . . . . . .   LINESPEED       *TYPE
Word length  . . . . . . . . . .   WORDLEN         *TYPE
Type of parity . . . . . . . . .   PARITY          *NONE
                                                       More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```
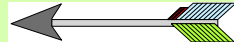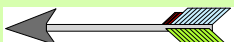
```
                    Create Device Desc (Printer) (CRTDEVPRT)

 Type choices, press Enter.

 Stop bits . . . . . . . . . . . .   STOPBITS        1
 Host print transform . . . . . .    TRANSFORM       *YES
 Manufacturer type and model  . .    MFRTYPMDL    >  *LEXOPTRA
 Paper source 1 . . . . . . . . .    PPRSRC1      >  *LETTER
 Paper source 2 . . . . . . . . .    PPRSRC2      >  *LETTER
 Envelope source . . . . . . . .     ENVELOPE        *MFRTYPMDL
 ASCII code page 899 support  . .    ASCII899        *NO
 Image configuration . . . . . .     IMGCFG          *NONE
 Maximum pending requests . . . .    MAXPNDRQS       6
 Print while converting . . . .      PRTCVT          *YES
 Print request timer  . . . . . .    PRTRQSTMR       *NOMAX
 Form definition . . . . . . . .     FORMDF          F1C10110
   Library . . . . . . . . . . .                        *LIBL
 Character identifier:               CHRID
   Graphic character set . . . .                     *SYSVAL
   Code page . . . . . . . . . .
                                                                More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

```
                    Create Device Desc (Printer) (CRTDEVPRT)

Type choices, press Enter.

Remote location:                    RMTLOCNAME
  Name or address  . . . . . . .                > 'http://9.5.208.29'  ⇐




Local location . . . . . . . . .   LCLLOCNAME    *NETATR
Mode . . . . . . . . . . . . . .   MODE          QSPWTR
User-defined options . . . . . .   USRDFNOPT     *NONE
                      + for more values
User-defined object:               USRDFNOBJ
  Object . . . . . . . . . . . .                 *NONE
    Library . . . . . . . . . .
  Object type  . . . . . . . . .
Data transform program . . . . .   USRDTATFM     *NONE
  Library  . . . . . . . . . .

                                                         More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```
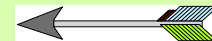
```
                    Create Device Desc (Printer) (CRTDEVPRT)

Type choices, press Enter.

User-defined driver program  . . USRDRVPGM        *NONE
  Library  . . . . . . . . . . .
System driver program  . . . . . SYSDRVPGM      > *IBMIPPDRV      <------
Secure connection  . . . . . . . SECURECNN        *NO            <------
Validation list  . . . . . . . . VLDL             *NONE          <------
  Library  . . . . . . . . . . .
Publishing information:           PUBLISHINF
  Support duplex . . . . . . . .                   *UNKNOWN
  Support color  . . . . . . . .                   *UNKNOWN
  Pages per minute black . . . .                   *UNKNOWN
  Pages per minute color . . . .                   *UNKNOWN
  Location . . . . . . . . . . .                   *BLANK

  Data streams supported . . . .                   *UNKNOWN
                        + for more values

                                                            More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```
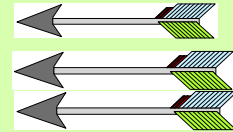
```
                    Create Device Desc (Printer) (CRTDEVPRT)

Type choices, press Enter.

Text 'description' . . . . . . . TEXT          > 'IPP Printer'

Dependent location name  . . . . DEPLOCNAME      *NONE

                          Additional Parameters

Remote network identifier  . . . RMTNETID        *NETATR
Workstation customizing object   WSCST           *NONE
  Library . . . . . . . . . . .
Authority . . . . . . . . . . . AUT             *LIBCRTAUT




                                                            Bottom
F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
F24=More keys
```

## ◆ RESTRICTIONS

■ **\*AFPDS, \*SCS and \*USERASCII type spool files are supported; all others are not**

■ **Direct printing (i.e. SPOOL \*NO) is not supported**

■ **Sharing printers through the direct print (ALWDRTPRT) parameter on the STRPRTWTR command is not supported.**

■ **Note, the PJL and SNMP drivers have these three restrictions as well.**

◆ **The IPP driver is functionally similar to the existing PJL and SNMP drivers. However, the IPP driver does have the following restrictions:**

■ Only spool files with device type attributes of *AFPDS, *SCS, or *USERASCII are supported. Spool files with other device types (e.g. *IPDS) will be held, and a spool file status message will be sent to the message queue which is specified in the printer device description.

■ Direct printing is not supported. (i.e. SPOOL parameter set to *NO on the CRTPRTF, CHGPRTF, or OVRPRTF command).

■ Sharing printers through the direct print (ALWDRTPRT) parameter on the STRPRTWTR command is not supported. Printer sharing means specifying the SPOOL parameter value = *NO on the CRTPRTF command and the ALWDRTPRT parameter value set to *YES on the STRPRTWTR command.

■ Note, the PJL and SNMP drivers have these restrictions as well.

# Troubleshooting The IPP Print Driver Configuration

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◆ **Troubleshooting the IPP print driver configuration is very similar to troubleshooting the PJL or SNMP configurations**

◆ **Some of the tools useful in troubleshooting the IPP print driver configuration are:**

- **The writer joblog**
- **The message queue for writer messages**
- **The communications trace**

◆ **Many of iSeries messages used for the PJL and SNMP configurations are also used for the IPP print driver configuration**

◆ **However, there are some iSeries messages that are unique to the IPP print driver configuration**

**Just as configuring an IPP printer device description on an iSeries is very similar to configuring a PJL or SNMP device description, troubleshooting is very similar as well. Among the commonly used iSeries tools and resources for troubleshooting lan printing issues are, the writer joblog, the writer message queue, and the communications trace. These can be essential in pinpointing IPP print driver printing problems.**

**Most of the iSeries messages used relative to the PJL and SNMP printer configurations are also used for the IPP print driver configuration. In addition, there are a number of new iSeries messages unique to the IPP print driver configuration. These new messages are listed and described later in this section.**

◆ **CPD6F83**

  ■ **Could not establish Internet Print Protocol (IPP) communications with device &1.**

◆ **CPD6F84**

  ■ **Could not establish secure connection with device &1.**

◆ **CPD6F85**

  ■ **Could not satisfy authentication request from device &1.**

◆ **CPD6F86**

　　■ **Port &2 was used to connect to device &1.**

◆ **CPD6F87**

　　■ **Spool file attribute is not supported on device &1.**

◆ **CPD6F88**

　　■ **Internet Printing Protocol (IPP) status message returned by device &1.**

◆ **CPD6F89**

■ **Internet Printing Protocol (IPP) job state message returned by device &1.**

```
                     Display Formatted Message Text
                                                System:    S10A8858
Message ID . . . . . . . . . . :    CPD6F83
Message file . . . . . . . . :    QCPFMSG
  Library  . . . . . . . . . :      QSYS


Message . . . . :   Could not establish Internet Print Protocol (IPP)
  communications with device &1.
Cause . . . . . :   Was not able to establish IPP communications with device
  &1. The reason code is &2.  The reason codes and their meanings are as
  follows:
    1 - A connection was established with the device, but the device did not
  respond with an IPP response.
    2 - A connection was established with the device, but the IPP request was
  not understood by the device.
Recovery  . . . :   The recovery for the reason codes are as follows:
    1 - Make sure that the device supports IPP and that the correct port and
  path are specified. Port 631 is the well known port for the Internet Print
  Protocol.
    2 - No recovery. Contact your service organization and report the problem.



Press Enter to continue.


F3=Exit   F11=Display unformatted message text   F12=Cancel
```

```
                    Display Formatted Message Text
                                              System:    S10A8858
Message ID . . . . . . . . . :     CPD6F84
Message file . . . . . . . . :     QCPFMSG
  Library  . . . . . . . . . :     QSYS

Message  . . . . :    Could not establish secure connection with device &1.
Recovery  . . . :    Verify that the device can support secure connections and
   that the device is configured to accept SSL connections.




                                                                  Bottom
Press Enter to continue.

F3=Exit    F11=Display unformatted message text    F12=Cancel
```

```
                       Display Formatted Message Text
                                               System:   S10A8858
Message ID . . . . . . . . . :     CPD6F85
Message file . . . . . . . . :     QCPFMSG
  Library  . . . . . . . . . :       QSYS


Message . . . . :    Could not satisfy authentication request from device &1.
Cause . . . . . :    Was not able to satisfy the authentication request from
  device &1. The reason code is &2.  The reason codes and their meanings are
  as follows:
    1 - Validation list was not configured in device description.
    2 - Device did not accept validation list authentication information.
    3 - Client certificate was not associated with user profile.
    4 - Device did not accept client certificate.
Recovery  . . . :    The recovery for the reason codes are as follows:
    1 - Specify a Validation list in the device description.
    2 - Verify that the Validation list contains a userid and password that
  the device will accept.
    3 - The device is configured for SSL. Verify that a client certificate is
         associated with the user profile of the user that owns the spooled file.
    4 - Verify that the device is configured to accept a client certificate
         from the user that owns the spooled file.




Press Enter to continue.

 F3=Exit    F11=Display unformatted message text    F12=Cancel
```

```
                    Display Formatted Message Text
                                              System:    S10A8858
Message ID . . . . . . . . . :    CPD6F86
Message file . . . . . . . . :    QCPFMSG
  Library  . . . . . . . . . :    QSYS

Message . . . . :    Port &2 was used to connect to device &1.
Cause . . . . . :    RMTLOCNAME contained a port number that was ignored. PORT
  contains the port number that was used.
Recovery  . . . :    Do not use RMTLOCNAME to specify the port number. Use PORT
  to specify the port number. The well known port for IPP is 631.




                                                            Bottom
Press Enter to continue.

F3=Exit    F11=Display unformatted message text    F12=Cancel
```

```
                         Display Formatted Message Text
                                                       System:    S10A8858
Message ID . . . . . . . . . . :      CPD6F87
Message file . . . . . . . . :        QCPFMSG
  Library  . . . . . . . . . :        QSYS

Message . . . . :      Spool file attribute is not supported on device &1.
Cause . . . . . :      Spool file attribute &2 with value &3 for file &4 number
  &5 job &8/&7/&6 created on system &10 on &9 is not supported on device &1.



                                                                   Bottom
Press Enter to continue.

F3=Exit    F11=Display unformatted message text    F12=Cancel
```

```
                    Display Formatted Message Text
                                             System:    S10A8858
Message ID . . . . . . . . . :      CPD6F88
Message file . . . . . . . . :      QCPFMSG
  Library . . . . . . . . . :        QSYS


Message . . . . :    Internet Printing Protocol (IPP) status message returned
  by device &1.
Cause . . . . . :    Device &1 has returned IPP status message - &2.




                                                          Bottom
Press Enter to continue.

F3=Exit    F11=Display unformatted message text    F12=Cancel
```

```
                    Display Formatted Message Text
                                                 System:    S10A8858
 Message ID . . . . . . . . . :     CPD6F89
 Message file . . . . . . . . :     QCPFMSG
   Library  . . . . . . . . . :       QSYS


 Message . . . . :     Internet Printing Protocol (IPP) job state message
   returned by device &1.
 Cause . . . . . :     Device &1 has returned IPP job state message - &2.
 Recovery  . . . :     Correct the problem described by the IPP job state
   message.




                                                              Bottom
 Press Enter to continue.

 F3=Exit    F11=Display unformatted message text    F12=Cancel
```

# *Miscellaneous*

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◆ **At the present time, the following IBM printers can be IPP-enabled, allowing an IPP client to print to them over the internet, an intranet, or LAN:**

■ **InfoPrint 21     (Type 4322)**

■ **InfoPrint 70     (Type 2770)**

■ **InfoPrint 2085 (Type 2785)**

■ **InfoPrint 2105 (Type 2705)**

◆ **Hewlett-Packard**

**Generally speaking, a printer with an internal HP Jetdirect card or a printer connected to an external Jetdirect box can be printed to from an IPP client, provided the Jetdirect device supports the IPP server, and IPP is enabled on the device.**

**According to the information on the website referenced below, there are two methods that may be used to determine if the HP Jetdirect print server is IPP enabled. They are:**

- **Print a Configuration or self-test page from the HP Jetdirect box or from the printer. If the version number listed on the Configuration page is revision G.07.15, H.07.15, or later, the HP Jetdirect print server is IPP enabled. Any firmware that is below that letter and/or number value does not support IPP. For further details, refer to the following HP website. http://www.hp.com/cposupport/networking/support_doc/bpj05549 .html**

- **Try browsing to the HP Jetdirect print server. From a browser, type the HP Jetdirect print server's URL. For example, if the Jetdirect has an IP address of 192.168.109.108, type: http://192.168.109.108 in the browser. After the Embedded Web page is loaded, look at the lower-left hand side of the page for a link to the Internet Printing Install Wizard. If this link is found, the HP Jetdirect print server is IPP enabled.**

# ◆ Lexmark

**The following information was taken from a Lexmark web page:**

- **"Web-enabled Printing**

  **The Lexmark MarkNet 2000 Series of internal and external print servers provide IPP (Internet Printing Protocol) capability which allows direct-to-URL printing with Lexmark network printers and multifunction products using the Windows 2000 IPP client implementation."**

- **The above information was found at:**

  **http://www.lexmark.com/US/press_releases_details/0,1233,MTU0fDE=,00.html**

- **Note, the above information is not intended to be a comprehensive statement regarding support for IPP by Lexmark's productline, but rather, simply an example of one Lexmark product series that supports IPP printing.**

- **For questions regarding a specific Lexmark printer or print server relative to whether or not it supports IPP printing, contact Lexmark Technical Support at 1-800-539-6375**

# IPP Printing - References

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◆ **"iSeries Printer Device Programming" (SC41-5713-05) http://submit.boulder.ibm.com/pubs/html/ws400/cur/v5r2/ ic2924/books/sm16/c4157135.pdf**

◆ **"iSeries Printing" http://submit.boulder.ibm.com/pubs/html/as400/cur/ v5r2/ic2924/index.htm**

◆ **Printing Documents Over The Internet Using The Internet Printing Protocol http://www.printers.ibm.com/R5PSC.NSF/Web/ipservwebipp**

◆ **"IBM eserver iSeries Printing VI", (SG24-6250-00), http://publib-b.boulder.ibm.com/Redbooks.nsf/9445fa5b4 16f6e32852569ae006bb65f/d7e842ba22f62bdd85256ac50057 d9d9?OpenDocument&Highlight=0,printing,VI**

◆ **Internet Printing Protocol Overview http://www.printers.ibm.com//R5PSC.NSF/Web/ ippoverview**

◆ **Internet Printing Protocol (IPP) At A Glance http://www.printers.ibm.com/R5PSC.NSF/Web/ ippspotlight**

◆ **Printer Working Group (PWG) website http://www.pwg.org**

◆ **Internet Printing Protocol, Sponsored By The PWG http://www.pwg.org/ipp/index.html**

◆ **Internet Printing Protocol, Maintained By The Internet Engineering Task Force (IETF) Secretariat http://www.ietf.org/html.charters/ipp-charter.html**

◆ **IPP Documents http://www.ietf.org/ids.by.wg/ipp.html**

◆ **HP Internet Printer Connect Software - Determining if IPP is Enabled http://www.hp.com/cposupport/networking/support_doc/ bpj05549 .html**

◆ **Lexmark announces Windows 2000 compatibility for hardware, software and management tools**

**http://www.lexmark.com/US/press_releases_details/0,1233, MTU0fDE=,00.html**

◆ **Lexmark Technical Support: 1-800-539-6375**

# Lab Exercise #1

## IPP Print Driver

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