AXIS 5900

Network Print Servers

User's Manual

Regulatory Information

Safety Notices
Take some time to read through the safety notices before installing the print server. Please observe all safety markings and instructions when using this product.

Important:
Observe "Important:" in the text to avoid operational impairment. Do not proceed until you have fully understood the implications.

Electromagnetic Compatibility (EMC)

USA
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna

- increase the separation between the equipment and receiver

- connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- consult the dealer or an experienced radio/TV technician for help. Shielded (STP) network cables must be used with this unit to ensure compliance with the class B limits..

Europe
This digital equipment fulfils the requirements for radiated emission according to limit B of EN55022, and the requirements for immunity according to EN55024 residential, commercial, and light industry. Compliance is not valid for unshielded network cables.

Japan
This is a class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual. Compliance is not valid for unshielded network cables.

Australia
This electronic device meets the requirements of the Radio communications (Electromagnetic Compatibility) Standard 1998 AS/NZS 3548. Compliance is not valid for unshielded network cables.

Liability
Every care has been taken in the preparation of this manual; if you detect any inaccuracies or omissions, please inform your local Axis office, which can be found on the cover of this document. Axis Communications AB cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice. Axis Communications AB makes no warranty of any kind with regard to the material contained within this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Axis Communications AB shall not be liable nor responsible for incidental or consequential damages in connection with the furnishing, performance or use of this material.

Axis' Trademarks
AXIS ThinWizard, axinstall, AXIS Print Monitor, AXIS AddPrinter.

Other Trademark Acknowledgments
Adobe Acrobat Reader, Aix, Apple, Debian, Ethernet, EtherTalk, IBM, LAN Manager, LAN Server, Linux, Macintosh, Microsoft, Novell NetWare, OS/2, OS/400, AS/400, Red Hat, Solaris, SuSe, UNIX, Microsoft Windows, are registered trademarks of the respective holders.

Support Services
Should you require technical assistance, please contact your Axis dealer. If your questions cannot be answered immediately, your Axis dealer will forward your queries through the appropriate channels to ensure you a rapid response. On the Internet you can find online manuals, technical support, software updates, application software, corporate information, etc..

Patent information
Axis AB has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the patents listed at http://www.axis.com/patent.htm and one or more additional patents or pending patent applications in the US and other countries.

Software Acknowledgments
This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit.

Radio Transmission Regulatory Information

The channel must be set according to the radio frequency requirements in your country:

Country	Frequency	Available Channels	Default Channel
Europe	2.412–2.472 GHz	1–13	11
France	2.457–2.472 GHz	10–13 (indoor use) *	11
Japan	2.484 GHz	14	14
USA/Canada	2.412–2.462 GHz	1–11	11

* (France) outdoor use permitted on private property with prior authorization

Tested to comply with FCC Standards FOR HOME OR OFFICE USE.

This product must be installed and used in strict accordance with the instructions given in the user documentation. The Axis Network Print Server complies with the following radio frequency and safety standards:

Europe - EU Declaration of Conformity. This device complies with the requirements of the R&TTE Directive 1999/5/EC with essential test suites as per standards

- EN 60950 Safety of Information Technology equipment:
- ETS 300 328 Technical requirements for radio equipment
- ETS 300 826 General EMC requirements for radio equipment

CE

USA - Federal Communications Commission FCC

This device complies with Part 15 of FCC Rules. Operation of the device is subject to the following two conditions:

(1) This device may not cause harmful interference

(2) This device must accept any interference that may cause undesired operation.

Approvals The Axis Network Print Server is approved for use in the US, EU member states, Switzerland and Japan.

Table of Contents

Section 1 Introduction

Thank you for purchasing the AXIS 5900. This product has been developed to connect your printers anywhere in your network, allowing all network users access to shared printer resources.

The AXIS 5900 can be installed either as an IEEE 802.11b wireless print server or as an Ethernet attached print server.

About this Manual

This manual is applicable for the AXIS 5900 with firmware version 7.00 or higher, providing introductory information as well as detailed instructions on how to set up and manage the print server in various network environments. It is intended for everyone involved in installing and managing the print server. To fully benefit from this manual, you should be familiar with basic networking principles.

These instructions are based on the settings in a **new** and **unconfigured** print server. To reload the default parameters, you can perform a Factory Default, which will restore most of the settings. See *"Performing a Factory Default"* on page 134.

Supported Environments

- Windows
- NetWare
- Macintosh
- OS/2
- UNIX/Linux

About Axis

Axis increases the value of network solutions. The company is an innovative market leader in network video and print servers. Axis' products and solutions are focused on applications such as security, surveillance, remote monitoring and document management. The products are based on in-house developed chip technology, which is also sold to third parties.

Axis was founded in 1984 and is listed on the Stockholmsbörsen (XSSE:AXIS). Axis operates globally with offices in 14 countries and in cooperation with distributors, system integrators and OEM partners in 70 countries. Markets outside Sweden account for more than 95 % of sales. Information about Axis can be found at www.axis.com

Support Services

Should you require any technical assistance, please contact your Axis reseller. If your questions cannot be answered immediately, your Axis reseller will forward your queries through the appropriate channels to ensure a rapid response.

If you are connected to the Internet, you can:

• Download user documentation and firmware updates
• Find answers to previously resolved problems in the FAQ database. Search by product, category or phrase
• Report problems to Axis support staff by logging in to your private support area

Visit the Axis support Web at www.axis.com/techsup

Section 2 Product Overview

Package Contents

Verify that nothing is missing from the AXIS 5900 print server package by using the check list below. Please contact your dealer if anything is missing or damaged. All packing materials are recyclable.

Hardware	Model	Part Numbers
Axis Print Server	AXIS 5900	0158-001-01

Media	Title	Part Numbers
CD	AXIS Network Product CD	22965
Warranty Sheet	Warranty Axis Servers	21681
Printed Material	User's Guide AXIS 5900	19091

Power Adapter	Model	PS-H Part Number
	Australia	19111
	Europe	19108
PS-H	Korea	19112
	UK	19109
	USA / Japan	19110

Optional Accessories (not included in box)	Part Numbers
Parallel Printer Cable	13360
Self-adhesive velcro ribbons	13282 & 13283

Caution!

> Ensure that the print server's Power Adapter is marked with the correct voltage! Refer to the tables above for details.

AXIS Network Product CD

The AXIS Network Product CD provides an easy-to-use electronic catalog, that includes Axis software, firmware and user documentation. If your computer is set to French, German, Italian or Spanish, the information will automatically be presented in that language, otherwise you will see the English version.

To read the PDF documents you need an Acrobat Reader, which can be fetched at http://www.adobe.com/products/acrobat/readermain.html

Start-up procedures for Windows

If your computer is configured to autostart CDs, the AXIS Network Product CD will start automatically when inserted into a local CD drive on Windows 98, Me, NT, 2000 and XP platforms. You can also navigate to the CD root directory and start the *index.htm* file from within the Windows file manager.

Start-up procedures for UNIX, OS/2 and Mac OS Using your preferred file manager application, navigate to the CD root directory and click *index.htm*

Latest Versions

The latest version of Axis documentation, software and firmware is available on www.axis.com

Physical Description

AXIS 5900
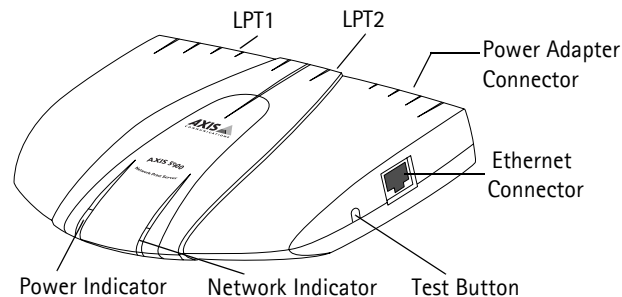
Underside label of print server
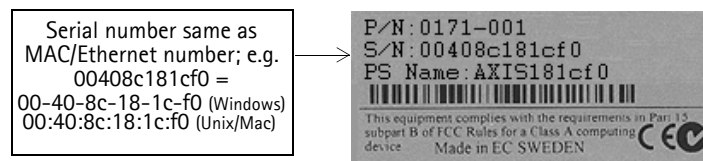
Note: "S/N" can also appear as "Ser. No." or "Serial no."

Network Connector The AXIS 5900 can be installed as an IEEE 802.11b wireless print server or as an Ethernet attached print server and connects to the network wirelessly or via a twisted pair category 5 cable (10baseT and 100baseTX) or better.

Printer Ports The Axis Network Print Server print server is equipped with two high-speed IEEE 1284 compatible parallel ports (LPT1, LPT2). Any standard printer can be connected to any of the ports for network printing. Print data can be directed to any of the two ports simultaneously, which means that two different printers can be used at the same time, regardless of protocol.

Test Button   The test button is used for:

- Printing a test page to check the connection to the printer.
- Printing the parameter list showing the print server settings.
- Performing a Factory Default of the print server, which will restore most of the parameters and settings to factory default values.

See *The Test Button*, on page 134 for details.

Network Indicator   The network indicator flashes to indicate network activity.

Power Indicator   The power indicator is lit while power is applied. If it is not lit, or it flashes, there is a problem with the Axis Network Print Server or its Power Adapter.

Antenna   The Axis Network Print Server is equipped with a built-in 802.11b PC-Card with an internal antenna.

Configuration and Management   The print server can be configured and managed from its internal Web pages, using HTTP as well as HTTPS in the secure mode. These Web pages offer you a platform independent management tool that is suitable for all supported network environments. See *Using a Web Browser for Print Server Management*, on page 92 for details.

Features and Benefits

Reliability The AXIS 5900 print server provides high performance and reliability combined with low power consumption. The electronic circuits are based on the AXIS ETRAX 100 LX chip, which comprises an integrated 32 bit RISC processor and associated network controllers.

Flexibility The AXIS 5900 print server supports printing over the WLAN or printing over the wired network. The print server supports printing in all major computer systems and environments, including five different print methods in the TCP/IP environment. It also allows you to print on two printers simultaneously.

The Axis Network Print Server works in both wired (LAN) and wireless (WLAN) networks in ad hoc (computer to computer) mode or infrastructure mode (AirPort network).

The integrated IPP (Internet Printing Protocol) function allows for printing from LAN to LAN via a WAN, such as the Internet.

Cable Speed The AXIS ETRAX 100 LX chip supports data transfer rates of up to 200 Mbit/s (100 Mbit Ethernet full duplex).

Wireless Speed The Axis Network Print Server supports the IEEE 802.11b wireless standard with a data rate of up to 11 Mbps over a WLAN.

Multi-language Support The print server's Web interface and Help pages are available in English, French, German, Italian, Japanese and Spanish. The default language is English. See *Language Setting*, on page 97.

Easy to Install Install the Axis Network Print Server for wired or wireless network printing in just a few minutes. AXIS 5900 installs, operates and is managed in the same reliable and easy way as other Axis network print servers.

Security You can assign passwords to restrict both login and printer access. It is also possible to disable protocols and to configure a secure mode (https). AXIS 5900 supports data encryption and access control using WEP (Wired Equivalent Privacy).

Monitoring   The internal Axis Network Print Server Web pages and the AXIS
ThinWizard software allow you to continuously monitor printer status.
The Web pages are used to monitor single Axis units and AXIS
ThinWizard can be used to monitor multiple Axis units.

The AXIS 5900 supports SNMP for remote monitoring.

Through e-mail notification, the printer administrator can be notified by
e-mail whenever an event that requires human intervention occurs in a
printer. The e-mail contains a short and concise description of the event.

Future proof   The firmware stored in the print server Flash memory can be upgraded
over the network. This allows you to quickly update and enhance its
operational features when new print server software becomes available.

NetWare Packet   AXIS 5900 supports NetWare Packet Signature Level 1, 2, 3, which
Signature   protects servers and clients using the NetWare Core Protocol services. NCP
packet signature prevents packet forgery by requiring the server and the
client to sign each NCP packet. See *"NetWare Packet Signature Levels"* on
page 121.

Section 3   Basic Installation (Wired & Wireless)

Connecting the Hardware

1. Make sure that your printer is switched <u>off</u> and that the Power Adapter external is <u>disconnected</u>.

2. Locate the serial number, found on the underside label of the print server, and write it down. You will need this number to set the IP address.

3. Connect the printer to the LPT1 or the LPT2 port on the Axis Network Print Server using an appropriate printer cable.

4. Connect the Axis Network Print Server to the wired network using a twisted pair category 5 cable, 10baseT and 100baseTX, or better.

Note:

> You can install this Axis Network Print Server without using a network cable, simply skip step 4 in these instructions.

5. Switch on the printer and connect the Power Adapter to the Axis Network Print Server. The Power indicator will light up. When the Network indicator starts to flash, the Axis Network Print Server is successfully connected to the network.

6. Wait 1 minute. Press the test button on the Axis Network Print Server to print a test page. The test page includes a list of the most important parameters, including the network speed, firmware version number and IP address of the print server.

Notes:

> The Axis Network Print Server uses high-speed Centronics Communication. For use with older printers not supporting high speed, this function can be disabled by using a standard Web browser. Please refer to *"Management and Configuration"* on page 92, for more information.

Installation Overview

Select the appropriate method to establish a connection between the workstation / laptop and the Axis Network Print Server. The following descriptions provide an overview of the installation procedures:

- *"Setting up Using the Ethernet Interface"* on page 14
- *"Setting up over the WLAN"* on page 15

Setting up Using the Ethernet Interface

- To establish communication with the network, an IP address must be assigned to your Axis Network Print Server. See *"Assigning an IP Address to the Print Server"* on page 16.

- Once the connection has been established, proceed with creating a certificate. See *Configuring the Axis Network Print Server for Wireless Printing*, on page 23.

- Next, enable https in the print server for secure Web services. See *Configuring the Axis Network Print Server for Wireless Printing*, on page 23.

- Set the **WLAN Network Mode** and enter the **SSID**, **WLAN channel** and **WEP keys** according to your network, see *"Configuring the Axis Network Print Server for Wireless Printing"* on page 23

- The Axis Network Print Server must be restarted for the WLAN settings to take effect. On power up, the Axis Network Print Server will automatically select WLAN communication if there is no Ethernet cable connected. Disconnect the network cable and disconnect and reconnect the Axis Network Print Server power supply.

Setting up over the WLAN

Before you begin, configure the WLAN settings on your **workstation / laptop** as described below (refer to the user documentation of your WLAN network interface for instructions):

- Select **ad hoc mode.**
- Set the **SSID** to **AXIS** followed by the last 6 digits of the serial number which is found on the underside label of the Axis Network Print Server (example: AXIS181636). The SSID is case sensitive and must be entered exactly as stated, i.e. in upper-case letters.
- Set the WLAN **channel** to **11** (channel **14** in Japan).
- Disable the **WEP** parameter.

Proceed with the following:

- To establish communication with the network, an IP address must be assigned to your Axis Network Print Server. See *"Assigning an IP Address to the Print Server"* on page 16.
- Once the connection has been established, proceed with creating a certificate. See *Configuring the Axis Network Print Server for Wireless Printing*, on page 23.
- Next, activate https in the print server for secure Web services, such as WEP. See *Configuring the Axis Network Print Server for Wireless Printing*, on page 23.
- Set the WLAN **Network Mode** and enter the **SSID**, WLAN **channel** and **WEP keys** according to your network. See *"Configuring the Axis Network Print Server for Wireless Printing"* on page 23.
- The Axis Network Print Server must be restarted for the WLAN settings to take effect. Disconnect and reconnect the Axis Network Print Server Power Adapter to restart the AXIS 5900.

Note:

> Once the print server's connection to the network has been established and verified, you can reset the workstation / laptop to its original settings i.e. the network mode, SSID, WLAN channel and WEP keys.

Assigning an IP Address to the Print Server

Before you Start If you have a DHCP server on your network, your print server will receive an IP address automatically. The IP address will then appear on the test page you printed earlier.

If you are <u>not</u> working in a DHCP network, you need to set the IP-address of the print server manually.

Follow these instructions in order to assign an IP address to your Axis Network Print Server.

System Privileges You need root privileges on your UNIX system, or administrator privileges on a Windows NT/2000/XP/2003 to:

- set the IP address using RARP, BOOTP, DHCP
- add an entry to the ARP table with the command 'arp -s'

Ethernet Address You need to know the Ethernet address of your Axis Network Print Server in order to assign an IP address to it. The Ethernet address is based upon the serial number of your Axis Network Print Server. This means, for example, that an Axis Network Print Server with the serial number of 00408C100086, will have the corresponding Ethernet address of 00 40 8C 10 00 86. The serial number is located on the underside label of the print server.

IP Address Unless you are downloading the IP address using DHCP or Auto-IP, you must obtain an unused IP address from your network administrator.

Important:

> DO NOT use the IP addresses used in the following examples when installing your Axis Network Print Server. Consult your network administrator before assigning an IP address to your Axis Network Print Server.

Methods for Setting the IP Address

You can set the IP address of your Axis Network Print Server using one of the following methods, depending on your network operating environment:

Method	Network environments	See ...
AXIS AddPrinter Wizard	Windows 2000, XP, 2003	*"Adding Printers in Windows 2000 / XP / 2003 using AXIS AddPrinter Wizard"* on page 28
DHCP*	Windows NT, Me 2000, XP, 2003, UNIX, NetWare	*"Setting the IP Address using DHCP"* on page 18
ARP	Windows 95, 98, NT Me, 2000, XP, 2003	*"Setting the IP Address using ARP/Ping in Windows 95, 98, NT, Me, 2000, XP, 2003"* on page 19
	UNIX, Mac OS X	*"Setting the IP Address using ARP in UNIX and Mac OS X"* on page 20
RARP*	UNIX	*"Setting the IP Address Using RARP in UNIX"* on page 21
BOOTP*	UNIX, NetWare	*"Using BOOTP in UNIX/Linux"* on page 22
Auto-IP*	Windows 98, ME, 2000, XP, 2003	*"Setting the IP Address using Auto-IP"* on page 18

* The IP address of the print server will be set automatically using these methods.

Notes:

- The ARP and RARP methods operate on single network segments only, that is they cannot be used over routers.
- The ability to set the IP address with ARP and PING will only be enabled the first 10 minutes after rebooting the print server
- Refer to *"Setting Parameters"* on page 47 for information about setting the IP address in the Macintosh environment.

Registering and Resolving Host Names

In order to register the host name of the Axis Network Print Server in networks with dynamic IP address settings, WINS (Windows Internet Name Service) and DDNS (Dynamic Domain Naming System) are supported. It is recommended that at least one of these methods should be used if you are setting the IP address of the Axis Network Print Server using DHCP.

The host name of the Axis Network Print Server is specified by the PS_NAME parameter. Refer to the *"The Parameter List"* on page 142.

WINS Host Name Rules

WINS only supports 15 character long host names. If your host name is longer than 15 characters, the Axis Network Print Server truncates the host name to 15 characters when registering with a WINS server. You can view the Axis Network Print Server host name that is registered at a WINS server, in the print server's Web interface. Refer to *"Management and Configuration"* on page 92.

DDNS Host Name Rules

DDNS supports 47 character long host names and can only consist of the characters 'A-Z', 'a-z', '0-9' and '-'. If your host name consists of any other characters, they are converted to '-', when registering with a DDNS server. You can view the Axis Network Print Server host name that is

registered at a DDNS server, in the print server's Web interface. Refer to *"Management and Configuration"* on page 92.

If the host name matches another entry in the DDNS data base, the Axis Network Print Server deletes that entry before registering.

Notes:

- The default host name of the Axis Network Print Server is 'AXIS' followed by the last 6 digits in the serial number. e.g. AXIS181636. The host name (Print server name) can be changed in the Print Server Name field on the **Admin** | **General Settings** page.

- The host name limitations conclude that if you want to register the same host name at a WINS server and a DDNS server, the host name should be no longer than 15 characters and it should only contain the characters 'A – Z', 'a–z', '0-9' and '-'.

- Refer to your system manuals or to your network administrator for instructions on how host name resolutions are performed on your system.

Setting the IP Address using DHCP

Follow the instructions below to download the IP address using DHCP:

1. Edit or create a scope in the DHCP manager of the DHCP daemon. The entries included in this scope should contain the following parameters:

- range of IP addresses
- subnet mask
- default router IP address
- WINS server IP address(es) or DDNS server IP address(es)
- lease duration

2. Activate the scope. The Axis Network Print Server automatically downloads the DHCP parameters. If you are using WINS or DDNS, you should include at least one WINS or DDNS server IP address in the DHCP scope. Immediately after the IP address has been received, the Axis Network Print Server registers its host name and IP address on the WINS alternatively DDNS server. Refer to *"Registering and Resolving Host Names"* on page 17 for more information. The Axis Network Print Server can automatically download a customized config file from a TFTP server. Just add the name of the config file and the TFTP server's IP address to your DHCP scope. The config file is downloaded immediately after the Axis Network Print Server receives its IP address.

3. You have now successfully set the IP address of your Axis Network Print Server. Continue to *"Configuring your Print Server"* on page 26.

Note:

You have to restart the Axis Network Print Server to download the IP address.

Setting the IP Address using Auto-IP

Auto-IP sets the IP address automatically in the absence of a DHCP server. If you have a DHCP server running on your network, the Axis Network Print Server will receive an IP address immediately after you have

connected it to the network. In the absence of a DHCP server, your Axis Network Print Server will automatically be assigned an IP address through integrated Auto-IP. The Auto-IP address structure is: **169.254.xxx.xxx.**

The Auto-IP function will only work when DHCP is enabled in your Axis print server. This function is enabled automatically upon installation of a brand new print server.

The easiest way to make sure DHCP and Auto-IP are enabled is to reset your print server (Factory Default). See *"The Test Button"* on page 134 for instruction on how to do this.

If you perform a Factory Default on the Axis Network Print Server and you do not have a DHCP server on your network, Auto-IP will automatically set the IP address of the print server.

Setting the IP Address using ARP/Ping in Windows 95, 98, NT, Me, 2000, XP, 2003

Start out with making sure that the IP address is available for use. The IP address **192.168.3.191** is used here as an example:

• Ping the IP address by opening a Command Prompt and writing:

```
ping 192.168.3.191
```

If the host returns Reply from 192.168.3.191 ... or a similar message, the IP address is already taken.
You can obtain a new and unused IP address from your system administrator.

• Check that the IP address you want to use is not already taken and stored in the host's cache memory.
Open a Command Prompt and write:

```
arp -a
```

If the host lists the IP Address followed by the Physical Address, then the IP address is in use.

You can remove the entry from the cache memory with the command:

```
arp -d 192.168.3.191
```

Follow the instructions below to set the IP address using arp/ping.

1. Open a Command Prompt and write:

```
arp -s <IP address> <Ethernet address>
ping -t<IP address>
```

```
arp -s 192.168.3.191 00-40-8c-10-00-86
ping -t 192.168.3.191
```

2. Without interrupting the "ping -t" loop, restart the print server by disconnecting and then re-connecting the Power Adapter.

3. If the host returns `Reply from 192.168.3.191` ... or a similar message, the IP address has been set successfully.
Interrupt the "ping -t" loop by pressing CTRL+C on your keyboard.

If the host returns `Request timed out` ...
you need to perform a Factory Default on the print server and perform steps 1-3 above again. See *Performing a Factory Default*, on page 134.

4. Log in to the print server's Web pages (see *Using a Web Browser for Print Server Management*, on page 92), select **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** and define the **Default Router** and **Subnet Mask**.

You have now set the IP address of the print server. Continue to *Configuring the Axis Network Print Server for Wireless Printing*, on page 23.

Important:

> • The ability to set the IP address with ARP and PING will only be enabled the first 10 minutes after restarting the print server.
>
> • When you execute the ping command for the first time, you will experience a significantly longer response time than usual.

Setting the IP Address using ARP in UNIX and Mac OS X

Start out with making sure that the IP address is available for use. The IP address **192.168.3.191** is used here as an example:

• Ping the IP address by opening a Terminal and writing:

```
ping 192.168.3.191
```

If the host returns Reply from `192.168.3.191` ... or a similar message, the IP address is already taken.
You can obtain a new and unused IP address from your system administrator.

• Check that the IP address you want to use is not already taken and stored in the host's cache memory.
Open a Terminal and write:

```
arp -a
```

If the host lists the IP Address followed by the Physical Address, then the IP address is in use.

You can remove the entry from the cache memory with the command:

```
arp -d 192.168.3.191
```

Follow the instructions below to set the IP address using arp/ping.

1. Open a Terminal and write:

```
arp -s <IP address> <Ethernet address>
ping -t<IP address>
```

```
arp -s 192.168.3.191 00:40:8c:10:00:86
ping -t 192.168.3.191
```

2. Without interrupting the "ping -t" loop, restart the print server by disconnecting and then re-connecting the power supply.

3. If the host returns Reply from `192.168.3.191` … or `psname is alive` … or a similar message, the IP address has been set successfully. Interrupt the "ping -t" loop by pressing CTRL+C on your keyboard.

   If the host returns Request timed out…
   you need to perform a factory default on the print server and perform steps 1-3 above again.
   See *Performing a Factory Default*, on page 134.

4. Log in to the print server's Web pages (see *Using a Web Browser for Print Server Management*, on page 92), select **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** and define the **Default Router** and **Subnet Mask**.

You have now set the IP address of the print server. Continue to *Configuring the Axis Network Print Server for Wireless Printing*, on page 23

Important:

- The ability to set the IP address with ARP and PING will only be enabled the first 10 minutes after restarting the print server.

- When you execute the ping command for the first time, you will experience a significantly longer response time than usual.

- If the host name has not been mapped to an IP address, simply replace the host name entry with the IP address.

- The ARP command varies between different UNIX/Linux systems. Some BSD type systems expect the host name and node address in reverse order. Furthermore IBM AIX systems will require the additional argument ether.

Setting the IP Address Using RARP in UNIX

Follow the instructions below to set the IP address using RARP.

1. Append the following line to your Ethernet Address table. This is typically located in the `/etc/ethers` file:

```
<Ethernet address> <host name>
```

Example:

```
00:40:8c:10:00:86 npsname
```

2. Update, if necessary, your host table and alias name databases, as required by your system.

3. If it is not already running, start the RARP daemon. This is typically performed using the `rarpd -a` command.

4. Restart the AXIS 5900 to download the IP address.

Using BOOTP in UNIX/Linux

Below is an example of how to set the IP address of the Axis Network Print Server using BOOTP:

1. Append the following entry to your boot table. This is typically performed by editing the file: `/etc/bootptab`

```
<host name>:ht=<hardware type>:vm=<vendor
magic>:\
:ha=<hardware address>:ip=<IP address>:\
:sm=<subnet mask>:gw=<gateway field>
```

Example:

```
npsname:ht=ether:vm=rfc1048:\
:ha=00408c100086:ip=192.168.3.191:\
:sm=255.255.255.0:gw=192.168.1.1
```

2. If necessary, update your host table and alias name databases, as required by your system.

3. If it is not already running, start the BOOTP daemon. This is typically performed using the `bootpd` command.

4. Restart the Axis Network Print Server to download the IP address, default router address, and subnet mask. The Axis Network Print Server can automatically download a customized config file from a TFTP server. Just add the name of the config file and the TFTP server's IP address to your boot table. The config file is downloaded immediately after the Axis Network Print Server receives its IP address.

5. You have now successfully set the IP address of the Axis Network Print Server. Proceed to *"Configuring your Print Server"* on page 26.

Configuring the Axis Network Print Server for Wireless Printing

1. **Start your Web browser.**

2. **In the Location/Address field, type the host name or the IP address of your AXIS 5900.**
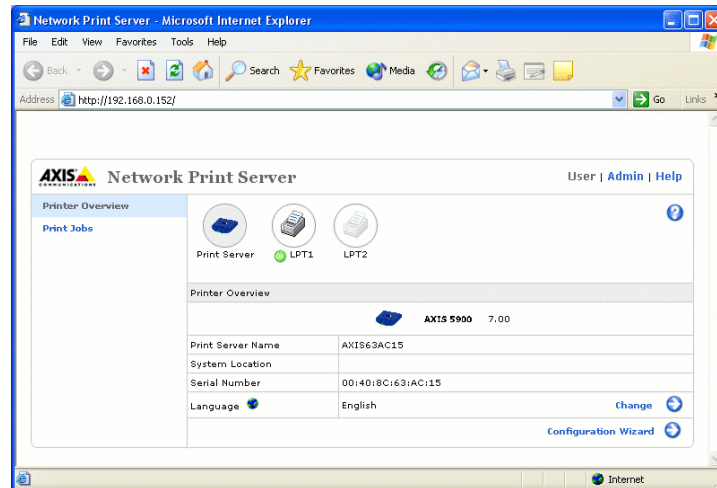
3. Click **Admin** to enter the administrator's pages.

Note:

> In a new and unconfigured you do not have to enter a User name/Password combination to enter Admin mode.
>
> It is highly recommended that the default password is changed to prevent unauthorized access to the print server's configuration pages. This is done from the **Admin** | **General Settings** | **General** tab in the **Root Password** field.

4. Create a certificate. See *Enabling Secure Web Services – SSL/TLS*, on page 115 for a detailed description on how to fill out the certificate.

5. Click **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network => HTTPS Enabled** | **Yes** and then **OK**.

6. Click **Admin** | **General Settings** and select **Auto Sense** or **WLAN** from the Network Mode drop down list to enable wireless communication (enabled by default).

7. To access the WLAN settings page, click **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** | **WLAN**
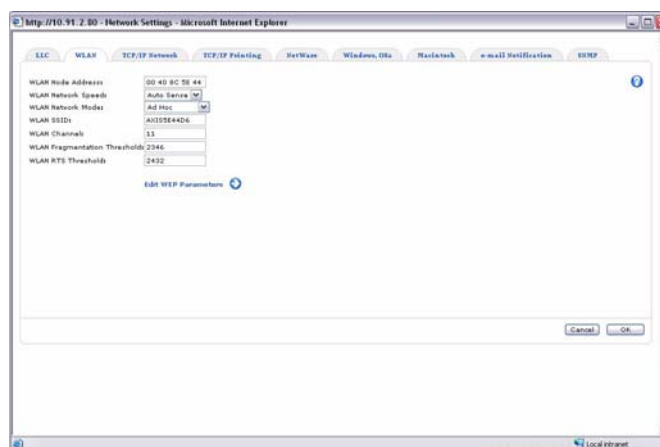
WLAN Parameters   Refer to the table below for a description of the WLAN parameter settings used to configure the Axis Network Print Server for wireless printing.

WLAN Parameters	Description
WLAN Node Address	The WLAN node address that is identical to the Axis Network Print Server serial number which is found on the underside label on the print server, e.g. Ser.No: 00:40:8C:10:00:86 WLAN Node Address: 00 40 8C 10 00 86
WLAN Network Speed	Select the appropriate network speed according to your network environment or select Auto Sense
WLAN Network Mode	Select Ad Hoc mode for peer to peer printing or Infrastructure mode for wireless communication via an access point. Note: The WLAN Network Mode must match the mode of the workstation / laptop. This is set using the computer's wireless configuration software.
WLAN SSID	The default SSID (service set identifier) in the Axis Network Print Server is 'AXIS' followed by the last six digits of the serial number, e.g. AXIS100086 Note: the SSID must match the SSID of the WLAN network interface. This is set using the computer's wireless configuration software.
WLAN Channel	The default setting is channel 11 (Japan = channel 14) See *"Technical Specifications"* on page 138 for more information
WLAN Fragmentation Threshold	These parameters are used to optimize the data transmission in accordance with the IEEE 802.11b standard.
WLAN RTS Threshold	

Edit WEP Parameters

Click the **Edit WEP Parameters** button. You will be prompted for the root password (default **pass**). Enter the WEP keys and click **OK** to save your settings.

WLAN Parameters	Description
Edit WEP Parameters	Click the button to access the WEP parameter settings
WEP Encryption Level	WEP security. The default setting is that WEP encryption is disabled. Select 64 Bit or 128 Bit security level. 128 Bit encryption level is the highest level of security but may reduce the performance level.
Active WEP key	Select the appropriate WEP key as specified by the network administrator
WEP key x	Enter the WEP keys (as ASCII or as hexadecimal values) specified by the network administrator
Enforce WEP	When enabled, the print server will not allow access to clients without a WEP key

Notes:

> Once you have clicked the **OK** button, the WEP parameter settings will be saved and cannot be cancelled by clicking **Cancel** on the WLAN page.

When you have entered the WLAN settings to match your network, click **OK** to save your settings.

Proceed to *"Configuring your Print Server"* on page 26 to set up your Axis Network Print Server and the connected printers for printing.

Configuring your Print Server

Configuration Methods   Once you have set the IP address of your Axis Network Print Server print server, it can be managed and configured over the LAN or WLAN using a number of different methods. The method that you choose should be dictated by your printing requirements and your supported network environments. Select the appropriate method from the table below:

Windows	TCP/IP	See *"Adding Printers in Windows"* on page 27
	NetBIOS/NetBEUI	See *"Adding Printers in Windows"* on page 27
	IPP	Proceed with *"IPP - Internet Printing Protocol"* on page 123
NetWare	IP/IPX in PSERVER mode	See *"Setup using NDPS"* on page 50 and then *"Queue-based Printing Methods"* on page 74
	IP/IPX in Remote Printer mode	See *"Setup using NDPS"* on page 50 and then *"Queue-based Printing Methods"* on page 74
Macintosh	AppleTalk	See *"Adding Printers in Macintosh"* on page 42
UNIX/Linux	TCP/IP	Proceed with *"Adding Printers in UNIX/Linux"* on page 76
	IPP	Proceed with *"IPP - Internet Printing Protocol"* on page 123

Section 4   Adding Printers in Windows

Overview of Installation Methods

This section describes how to add network printers to a computer in Windows. Refer to the table below to determine the most appropriate installation method according to your computer environment:

Windows Platform	Protocol	Method	See...
Windows 2000, XP, Server 2003	TCP/IP (LPR)	AXIS AddPrinter software	*"Adding Printers in Windows 2000/XP/ 2003 using AXIS AddPrinter Wizard"* on page 28
		Windows Add Printer Wizard	*"Adding Printers in Windows 2000/XP/ 2003 using Windows Add Printer Wizard"* on page 30
		Microsoft LPR Monitor	*"Adding Printers in Windows 2000/XP/ 2003 using the Microsoft LPR Monitor"* on page 33
Windows 2000	NetBIOS/NetBEUI	AXIS Print Monitor software	*Adding NetBIOS/NetBEUI Printers in Windows 2000 using AXIS Print Monitor*, on page 38
Windows NT	TCP/IP (LPR)	Windows Add Printer Wizard	*Adding Printers in Windows NT using the Microsoft LPR Monitor*, on page 34
	NetBIOS/NetBEUI	Windows Add Printer Wizard	*"Adding Printers over NetBIOS/NetBEUI in Windows NT using AXIS Print Monitor"* on page 39
Windows 98/Me	TCP/IP (LPR)	AXIS Print Monitor software	*"Adding Printers in Windows 98 and Me over TCP/IP using AXIS Print Monitor"* on page 40
	NetBIOS/NetBEUI		*"Adding Printers in Windows 98 and Me over NetBIOS/NetBEUI using AXIS Print Monitor"* on page 41

If you intend to use the print server in a multi-protocol environment, refer to the chapters pertaining to the respective operating systems in this manual.

Client/Server Network

For client/server printing, each computer sends print jobs through a network server computer.

The printer must first be installed on the server computer (from the Add Printer Wizard, AXIS Print Monitor) and then shared on the network, which makes it a network printer. It will then appear as a **Network Printer** (in Windows Add Printer Wizard and in AXIS Print Monitor) on the client computers. Each client computer must install the appropriate printer drivers in order to print properly.

> For Windows 98 and Me, it is only necessary to install AXIS Print Monitor on a **server** for client/server printing.

Peer-to-Peer Network

In Peer-to-Peer networks, each computer prints directly to the network printer. The network printer appears as a **Local Printer** (in Windows Add Printer Wizard and in AXIS Print Monitor), and needs to be added to each

client computer that wants to print. Each client computer must install the appropriate printer drivers in order to print properly.

> In Windows 98 and Me, AXIS Print Monitor must be installed on **all (printing) client computers** for Peer–to–Peer printing.

SNMP Device Index   When using the TCP/IP protocol (and if the printer driver permits), the print server can use **SNMP Status** to find out if the printer is ready to accept a new job. See *"SNMP Device Index"* on page 147.

Adding Printers in Windows 2000 / XP / 2003 using AXIS AddPrinter Wizard

AXIS AddPrinter is a Wizard that locates your network printers and helps you install them in your Windows environment. When you have completed the Wizard, the network printer is ready for use. To install a network printer you must be logged in as an Administrator or be a member of the Administrators' group.

1. Install AXIS AddPrinter Wizard on all Windows 2000 / XP / 2003 workstations that will print via the print server.

2. Before you continue, ensure that the print server is properly connected to the printer, network and power.

3. Start AXIS AddPrinter. Click **Next**. The Wizard will perform an automatic search for all Axis network printers, which is indicated by the progress bar at the bottom of the screen.
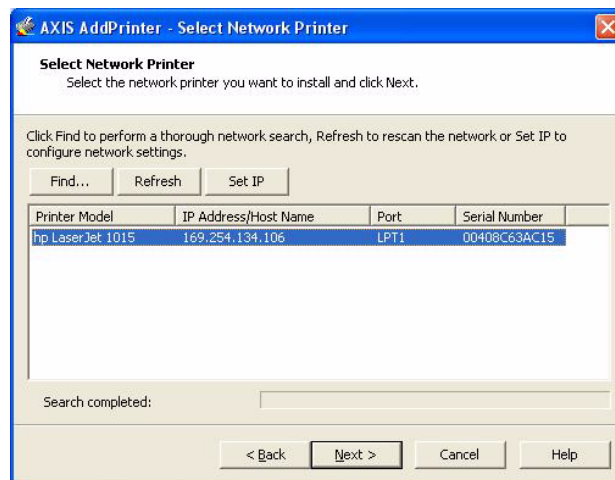

4. Select a printer from the **Select Network Printer list** and click **Next**. If the printer does not appear, see *Easy Access to All Network Printers*, below.

5. The Wizard searches for a suitable printer driver.

   If a suitable driver is not found, you will be asked to select a driver, otherwise the Wizard suggests which Printer Model and Printer Driver to use.

   Click **Change driver** to select another driver, or click **Finish** to accept and install the suggested driver.
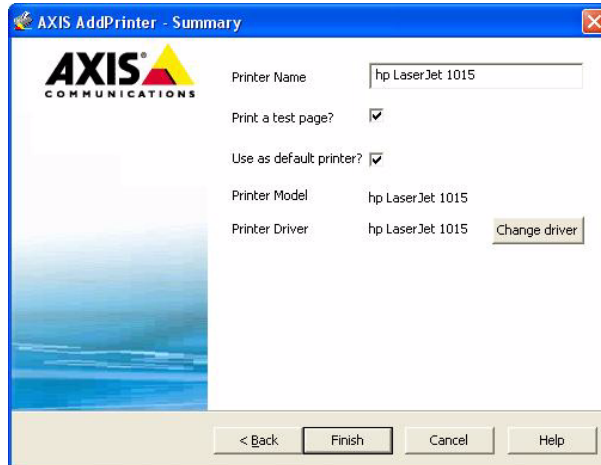
The installation is complete and you can start using the network printer.

Easy Access to All Network Printers
The Wizard's **Select Network Printer list** also provides quick and easy access to all connected and configured network printers.

Find...
If the print server is located outside your local subnet it will not appear in the list. This may be the case if your router blocks SLP traffic. Click **Find**. Enter the IP address or host name displayed on the print server's Test page and click **OK**. *Example: 192.168.3.191 or AXIS181cf0*

Refresh
If the print server has just been switched on, the printer has not had time to report its presence. This process can take a few minutes. In this case, **Printer Model** is stated as **No printer connected**. Click **Refresh** to rescan your local network segment for available print servers and update the status. If you still do not see the expected values, click **Help** and select **Troubleshooting**.

Set IP
To set or change the IP address, select the print server and click **Set IP**. Decide whether you want to configure the IP settings manually or want the Wizard to suggest a static IP address.

Example: Select **Suggest...** and click **OK**. Confirm – or modify – the Wizard's suggested IP settings. Click OK.

Note: The **Suggest...** option is only available when the computer has one network card.
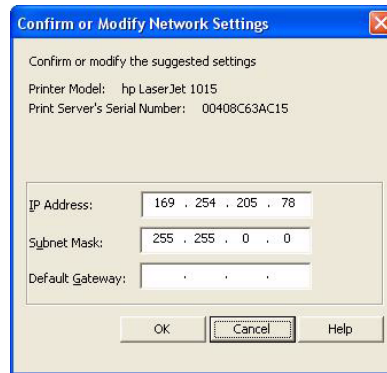
Go Straight to the Print Server's Web Interface

Right-click on a printer in the **Select Network Printer list** and select **Print server home page** to configure the print server from its embedded Web pages.

Adding Printers in Windows 2000 / XP / 2003 using Windows Add Printer Wizard

1. **Windows XP/Windows Server 2003:**
   Go to **Start | Printers and Faxes** and click the **Add a Printer** icon to start the Add Printer Wizard. Click **Next.**

   Windows 2000:
   Go to **Start | Settings | Printers** and click the **Add Printer** icon to start the Add Printer Wizard. Click **Next.**

2. In the Wizard, select **Local Printer attached to this computer.** Make sure the **Automatically detect and install my Plug and Play printer** check box is <u>not</u> checked. Click **Next.**
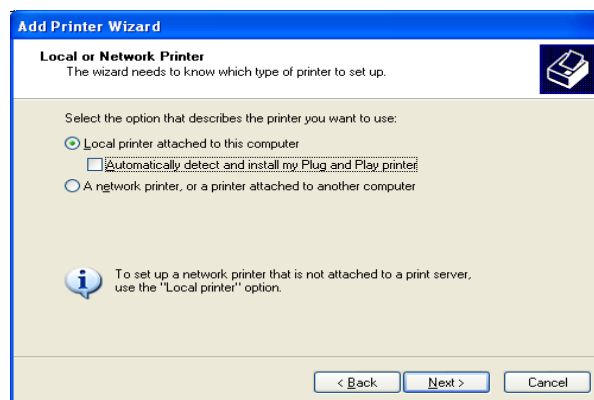
3. Click the **Create a new port** radio button and select **Standard TCP/IP Port** from the list.
   Click **Next** and the **Add Standard TCP/IP Printer Port Wizard** starts. Click **Next**.
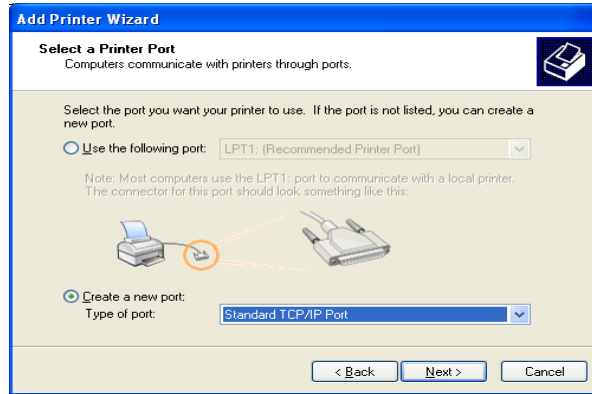
4. Enter the IP address of the print server in the Printer Name or IP Address field *(Example: 192.168.3.191)*

   The Port Name field will be filled in automatically when you enter the IP address. Optionally, add the port you want to use as a suffix (i.e. LPT1 or LPT2) *(Example: 192.168.3.191_LPT1)*

   Click Next.
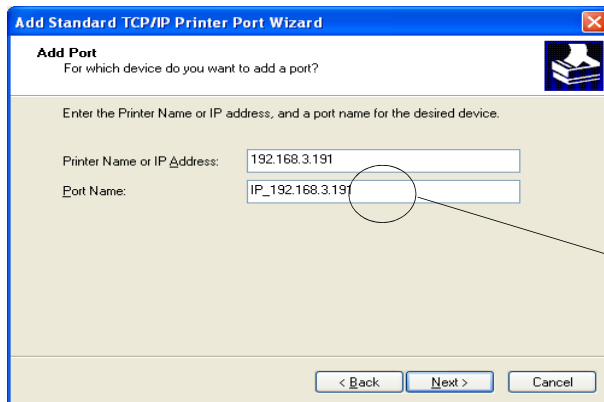
Optional:
Add _**Port**
as a suffix

5. In the **Additional Port Information Required** window, select the **Device Port** you want to use, i.e. LPT1 or LPT2.
   Click **Next** then **Finish.**
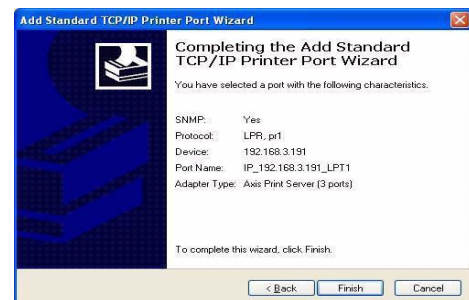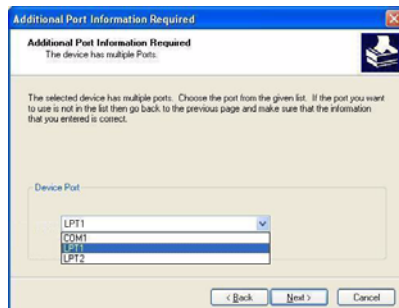
6. Select **Manufacturer and Printer** from the driver list or from a directory/file. Click **Next**. If you already have the printer's driver installed, you will be asked whether to keep it or replace it.

7. Click **Next**. Supply a name for the printer and choose whether you want to make it your default printer. Click **Next**.

8. Choose whether you want to share the printer with other network users, print a test page, etc. Select the appropriate radio button and click **Next** and **Finish**.

9. Print a test page to verify your installation.

You have now completed the installation.

Adding Printers in Windows 2000 / XP / 2003 using the Microsoft LPR Monitor

This section describes how to set up a Windows 2000/XP/2003 server for LPR printing over the TCP/IP protocol, using the built-in Microsoft LPR Monitor i.e. Print Services for UNIX.

Note:

See *"Alternative Method for LPR Printing"* on page 34 for instructions on how to set up printing over LPR without installing Print Services for Unix**.**

Basic Setup   If you have not already done so, you should perform the TCP/IP basic setup procedures prior to installing a printer for LPR printing.

Preparing for LPR Printing   Follow the following steps to prepare for LPR printing:

1. Open the **Control Panel**.

2. Click **Add/Remove Programs.**

3. Click **Add/Remove Windows Components.**

4. Check **Other Network File and Print Services** and click **Details.**

5. Check **Print Services for Unix** and click **OK.**

6. Click **Next** and **Finish**.

7. Close **Add/Remove Programs** and the **Control Panel**.

Installing an LPR printer   Follow the instructions below to use the standard Windows method for installing an LPR printer in Windows 2000/XP/2003:

Windows XP/2003:
1. Go to **Start** | **Printers and Faxes** and click the **Add a Printer** icon to start the **Add Printer Wizard**. Click **Next.**

Windows 2000:
1. Go to **Start** | **Settings** | **Printers** and click the **Add Printer** icon to start the **Add Printer Wizard**. Click **Next.**

2. Select the appropriate radio button: **Local Printer**. Click **Next.**

3. Click the **Create a new port** radio button and select **LPR Port** from the list. Click **Next.**

4. Enter IP address (or host name) of the print server in the field **Name and address of server providing lpr** *(Example: 192.168.3.191)* and enter the port you want to use in the field **Name of printer or print queue on that server**, i.e. LPT1 or LPT2. Click **OK.**

5. End the Wizard in the usual manner: select Manufacturer and Printer, keep/replace driver, name the printer, make it default or not, share it or not and finally decide whether you want to print a test page.

Client/Server Printing   Select **Network printer** instead of **Local Printer** in Step 2 above if your print server has already been installed by the administrator on another computer. Follow the instructions in the **Add Printer Wizard** to complete the installation.

Important!

- Make sure that the **Automatically detect and install my Plug and Play printer** checkbox is <u>not</u> checked
- Press **F1** to access the Windows online help system if you need additional help when installing a printer/print server using this method.

Alternative Method for LPR Printing   If you wish to print over LPR but do not wish to install **Print Services for Unix** you can do this by changing the printing protocol after having installed the printer using the Standard TCP/IP method, see *"Adding Printers in Windows 2000 / XP / 2003 using Windows Add Printer Wizard"* on page 30 for instructions.

Once the printer is installed, follow these instructions to change the printing protocol:

1. Go to **Start** | **Settings** | **Printers**.

2. Double-click the installed printer.

3. Select **Properties** from the **Printer** menu.

4. Click the **Ports** tab.

5. Click the **Configure Port** button.

6. Click the **LPR** radio button and enter the queue name (PR1, PR2...).

7. Click **OK** to finish.

Adding Printers in Windows NT using the Microsoft LPR Monitor

If you have not already done so, you should perform the TCP/IP basic setup procedures prior to installing a printer for LPR printing.

Preparing for LPR Printing   In the **Control Panel**, double-click the **Network** icon. Select the **Services** tab. If the TCP/IP Printing entry appears, then TCP/IP is already installed. Close the **Network** folder and go on to *Installing an LPR printer*, below.

First, prepare for LPR printing:

1. Open the **Control Panel** and double-click the **Network** icon.

2. Select **Protocols**.

3. Add **TCP\IP Protocol**.

4. Select **Services**.

5. Add **Microsoft TCP\IP Printing**.

Installing a Network
printer

1. Go to **Start** | **Settings** | **Printers** | **Add Printer**. Select **My Computer** and click **Next**.

2. From the **Available Ports** list, choose the appropriate printer port, which will appear as the IP address or host name of the print server. If it doesn't appear in the list, click **Add Port**.
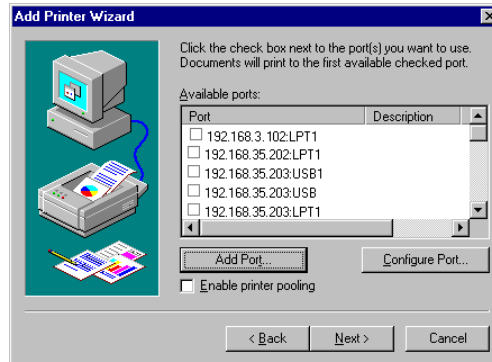
3. Choose **LPR Port** from **Available Printer Ports** and click **New Port**.
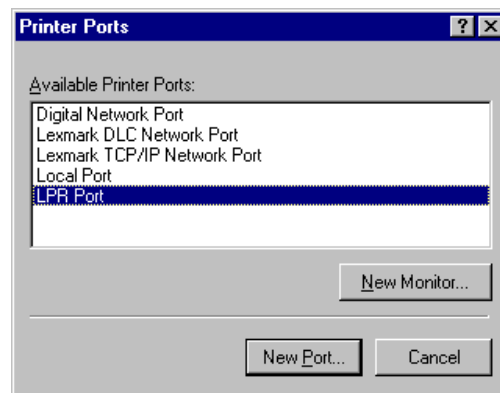
4. Type the print server's IP address (or host name) in the field **Name or address of server providing lpd** *(Example: 192.168.3.191)*. Enter which port to use in the field **Name of printer or print queue on that server (LPT1 or LPT2).** Click **OK** and then **Close**.
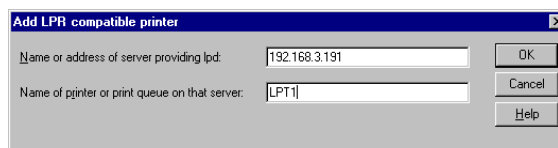
5. The added print server will now appear in the **Available Ports** list. Click **Next**, choose a driver and finish the installation as usual.

AXIS Print Monitor Software

AXIS Print Monitor is the recommended tool to use for network printing in Windows 98 and Me environments. AXIS Print Monitor is available free of charge on www.axis.com

AXIS Print Monitor Overview

AXIS Print Monitor allows the print server to be connected in the same simple fashion as connecting a local printer. Once installed, it is automatically initialized upon system startup. AXIS Print Monitor has been developed for peer-to-peer printing, allowing your print jobs to be sent directly to the print server.

Printing Environments

AXIS Print Monitor supports printing over TCP/IP (LPR and Raw TCP) and NetBIOS/NetBEUI. To enable printing in these environments, please ensure that the desired printing protocols are running on your client.

Peer-to-Peer Printing

The AXIS Print Monitor needs to be installed on each workstation to perform peer-to-peer printing. Once installed, the AXIS Print Monitor allows you to access all network printers, just as if they were connected directly to your workstation.

Client/Server Printing

AXIS Print Monitor needs only to be installed on one server to perform client/server printing. The installed printers must be configured to be shared to allow clients to use them. Pop-up messages should not be enabled on the server as they will not be displayed on the client platforms.

Note:

> AXIS Print Monitor can also be used for DOS printing. Please refer to the AXIS Print Monitor's Readme file for instructions. The Readme file is located in the same folder where AXIS Print Monitor is installed on your PC.

Adding Printers over TCP/IP in Windows NT using AXIS Print Monitor

1. Install AXIS Print Monitor on all workstations that will print via the print server. AXIS Print Monitor is available free of charge on www.axis.com

2. To start the Add Printer Wizard, select **Settings** | **Printers** from the **Start** menu and double-click the **Add Printer** icon.

3. The Wizard asks you to select **My Computer** or **Network printer server**. Select **My Computer**, click **Next**.

4. Click **Add Port...** In the Available Ports dialog, select **AXIS Port** and click **New Port...**

5. Select **LPR (TCP/IP)** as your choice of protocol and click **OK**.

6. Enter the IP address or the host name of your print server *(Example: enter an IP address: 192.168.3.191 or a host name: AXIS181636).*
   In the **Logical Printer Name** field, enter the port you wish to use; **LPT1 or LPT2**. Click **OK**, click **Close**.

7. Select Manufacturer, Printers, choose a printer name and if you want to use the printer as your default printer. Choose if you want to share the printer and print a test page. Click **Finish**.

8. You may now configure the port, as described below.

Configure the Port:

1. Select **Settings** | **Printers** from the **Start** menu and highlight the printer you wish to configure. Select **File** | **Properties** | **Ports** and click **Configure Port**.

2. Choose whether error condition pop-up messages are to be displayed by checking the box in the **Configure AXIS Ports** dialog. Define the frequency at which the error messages should be displayed after retry. Click **OK**.

> Even if the desired printer is available in the Manufacturers and Printers lists, you are advised to use the print driver provided with the printer. This assures you of the latest driver software.

Adding NetBIOS/NetBEUI Printers in Windows 2000 using AXIS Print Monitor

See to it that the NetBEUI protocol is installed on your client. Follow the procedure below to install Axis Printer Ports from a Windows 2000 workstation:

1. To start the Add Printer Wizard, select **Settings | Printers** from the **Start** menu and double-click the **Add Printer** icon. Start the installation by clicking **Next**.

2. The Wizard asks you to select **Local printer** or **Network printer**. Select **Local printer**. Click **Next**.

3. Click **Create a new port.** In the Available Ports dialog, select **AXIS Port** and click **Next**.

4. Select **NetBIOS/NetBEUI** as your choice of network protocol and click **OK**.

5. Select the AXIS Port you want to add from the list of available ports. The port appears as <name>.<port> (Example: AX100086.LP1). The <port> is LP1 for LPT1 or LP2 for LPT2.

6. Choose the appropriate printer driver for your printer. Click **Next** and proceed directly to step 9. It is only necessary to perform steps 7 - 8 if your printer does not appear in the list.

Note:

> Even if the desired printer is available in the **Manufacturers** and **Printers** lists, you are advised to use the printer driver provided with the printer. This assures you of the latest driver software.

7. Click the **Have Disk...** button. Insert the printer driver diskette/CD that was provided with your printer, select the appropriate diskette/CD drive and click **OK**.

8. Select the printer driver you want to install and click **Next**.

9. Enter an appropriate name for your printer and click **Next**.

10. Choose whether you want to share the printer with other network users and click **Next**.

11. Choose whether you want to print a test page, click **Next** and then **Finish**.

Adding Printers over NetBIOS/NetBEUI in Windows NT using AXIS Print Monitor

See to it that the NetBEUI protocol is installed on your client. Follow the procedure below to install Axis Printer Ports from a Windows NT workstation:

1. Install AXIS Print Monitor on all workstations that will print via the print server.

2. To start the Add Printer Wizard, select **Settings** | **Printers** from the **Start** menu and double-click the **Add Printer** icon.

3. The Wizard asks you to select **My Computer** or **Network printer server**. Select **My Computer**. Click **Next**.

4. Click **Add Port...** In the Available Ports dialog, select **AXIS Port** and click **New Port...**

5. Select **NetBIOS/NetBEUI** as your choice of network protocol and click **OK**.

6. Select the AXIS Port you want to add from the list of available ports. The port appears as <name>.<port> (Example: AX100086.LP1). The <port> is LP1 for LPT1 or LP2 for LPT2.

7. Close the Printer Ports window.

8. Click the **Configure Port...** button. Choose whether error condition pop-up messages are to be displayed by checking the box in the Configure Axis Ports dialog. Define the frequency at which the error messages should be displayed after retry. Click **OK**. Continue the installation by clicking **Next**.

9. Choose the appropriate printer driver for your printer. Click **Next** and proceed directly to step 12. It is only necessary to perform steps 10-11 if your printer does not appear in the list.

Note:

> Even if the desired printer is available in the **Manufacturers** and **Printers** lists, you are advised to use the printer driver provided with the printer. This assures you of the latest driver software.

10. Click the **Have Disk...** button. Insert the printer driver diskette/CD that was provided with your printer, select the appropriate diskette/CD drive and click **OK**.

11. Select the printer driver you want to install and click **Next**.

12. Enter an appropriate name for your printer and click **Next**.

13. Choose whether you want to share the printer with other network users and click **Next**.

14. Choose whether you want to print a test page and then click **Finish**.

Adding Printers in Windows 98 and Me over TCP/IP using AXIS Print Monitor

1. Install AXIS Print Monitor on all workstations that will print via the Axis print server.

2. Next, start the Windows Add Printer Wizard: select **Settings** | **Printers** from the **Start** menu and double-click the **Add Printer** icon.

3. After clicking **Next** in the first dialog, the Wizard asks you to select between **Local Printer** and **Network Printer**. You must select **Local Printer** as the print server emulates a local printer port. Click **Next**.

4. Choose the appropriate print driver for your printer. If the desired print driver already appears within the displayed **Manufacturers and printers** lists, highlight your selection, click **Next** and proceed directly to step 7. It is only necessary to perform steps 5- 6 if your printer does not feature in the model list.

5. Click the **Have Disk...** button. Insert the printer driver diskette/CD into the appropriate disk drive of your computer.

6. Select the type of printer you want to install from the diskette/CD and click **Next**. If you already have the printer's driver installed, you will be asked whether to keep it or to replace it.

7. Select the Printers@TCP/IP Port and click **Next**.

8. Enter an appropriate name for your printer and choose whether you want it to be the default printer. Click **Next**.

9. In the next window, do <u>not</u> order a Test Page to be written, just click **Finish**.

10. The printer you have defined will now be displayed in the Printers Folder. Right-click the printer object and select **Properties**.

11. Click the **Details** tab within the **Properties** page and then click **Add Port** to display the available monitors.

12. Click the radio button "other". Select **AXIS Port** and then click **OK**.

13. Select **LPR (TCP/IP)** as your choice of protocol and click **OK**.

14. Enter the IP address or the host name of your print server *(Example enter an IP address: 192.168.3.191 or a host name: AXIS181636).*
In the **Logical Printer Name** field, enter the port you wish to use; **LPT1 or LPT2.**

15. The TCP/IP port will then be added automatically to the list of available ports. Click **Apply** and **OK**.

16. You may now configure the port, as described below. The Axis Printer Port is now installed.

Configure the Port:

1. Select **Settings** | **Printers** from the **Start** menu and highlight the printer you wish to configure. Select **File** | **Properties** | **Details** and click **Port Settings**.

2. Choose whether error condition pop-up messages are to be displayed by checking the box in the **Configure AXIS Ports** dialog. Define the frequency at which the error messages should be displayed after retry. Click **OK**.

Note:

> Even if the desired printer is available in the Manufacturers and Printers lists, you are advised to use the print driver provided with the printer. This assures you of the latest driver software.

Adding Printers in Windows 98 and Me over NetBIOS/NetBEUI using AXIS Print Monitor

Follow the procedures below to install Axis NetBIOS/NetBEUI printer ports on a Windows 98 workstation, using AXIS Print Monitor:

1. To start the Add Printer Wizard, select **Settings** | **Printers** from the **Start** menu and double-click the **Add Printer** icon.

2. After clicking **Next** in the first dialog, the Wizard asks you to select Local printer or Network printer. Select **Local printer**. Click **Next**.

3. Choose the appropriate printer driver for your printer. If the desired printer driver appears in the displayed **Manufacturers** and **Printers** lists, highlight your selection, click **Next** and proceed directly to step 6. It is only necessary to perform steps 4 - 5 if your printer does not appear in the model list.

Note:

> Even if the desired printer is available in the **Manufacturers and Printers** lists, you are advised to use the printer driver provided with the printer. This assures you of the latest driver software.

4. Click the **Have Disk...** button. Insert the printer driver diskette/CD that was provided with your printer, select the appropriate diskette/CD drive and click **OK**.

5. Select the printer driver you want to install and click **Next**.

6. Select the AXIS Printer Port from the Available Ports list. The port names appears as <name>.<port>. Here, <name> is AX followed by the last six digits of the print server's serial number (e.g. AX100086) and <port> is LP1 for LPT1 or LP2 for LPT2. Click the Configure Port button. *Example: AX100086.LP1*

7. Choose whether error condition pop-up messages are to be displayed by checking the box in the **Configure AXIS Ports** dialog. Define the frequency at which the error messages should be displayed after retry. Click **OK** and **Next**.

8. Enter an appropriate name for your printer and click **Next**.

9. Choose whether you wish to print a test page and click **Finish**.

Section 5 Adding Printers in Macintosh

Having connected the AXIS 5900 to your network, this section now describes how to set up your print server for printing in Mac OS X and earlier Macintosh environments using AppleTalk.

If you intend to use the print server in a multi-protocol environment, refer to the chapters pertaining to the respective operating systems in this manual.

Bonjour Printing in Mac OS X

Bonjour is available from Mac OS X 10.2 and up. Bonjour is enabled by default in the print server. You can alter the Bonjour parameters from the print server's Web interface: select **Admin | Network Settings | Detailed View | TCP/IP Network**.

1. From the Apple menu, select **Go | Applications | Utilities** and start the **Print Center** or the **Printer Setup Utility**.

2. Click **Add** in the Printer List.

3. From the drop-down list, select **Bonjour**.

4. High-light the printer you want to install. The print server's default name is **AXISxxxxxx Network Print Server** (where the xs represent the last six digits of the print server's serial number) followed by the ports available, i.e. LPT1 and LPT2. *Example: AXIS610282 Network Print Server_LPT1.*
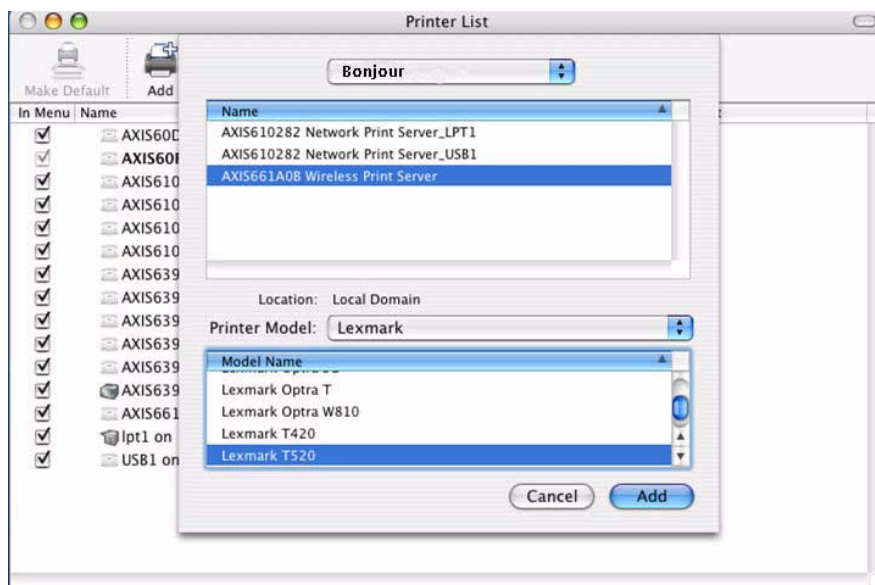
5. Select **printer manufacturer** and **model** from the drop-down list. (For some printer drivers, Printer Manufacturer and Model are selected automatically.)

6. Click **Add** to finish the installation. The print server has now been added to the Printer List.
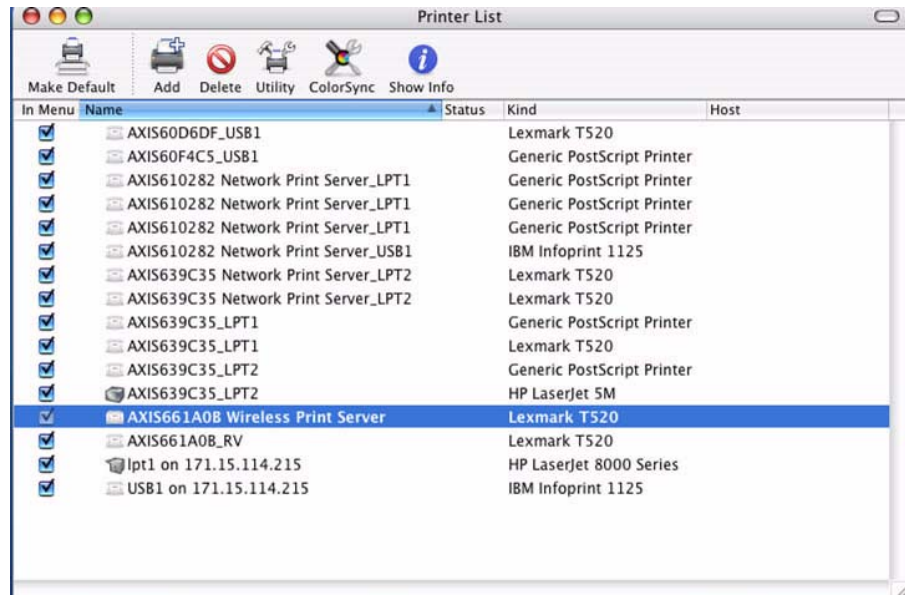
7. If you wish to configure printer settings, click **Printers** | **Configure Printer**.
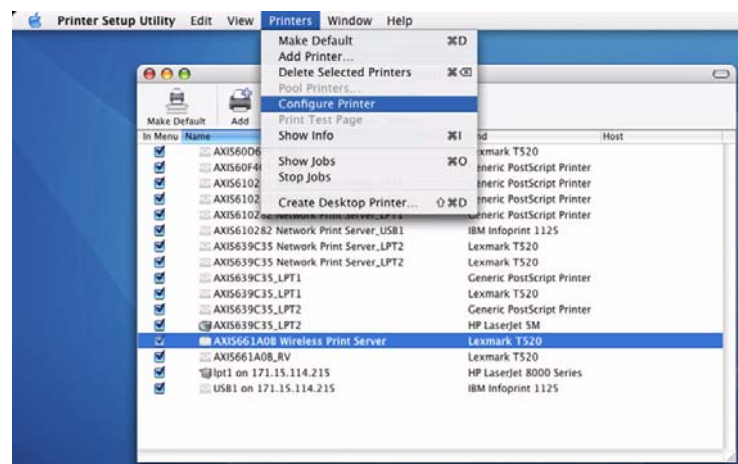
To Change the Bonjour Service Name   You can change the print server's Bonjour service name via the print server's Web interface: **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** => Bonjour Service Name.

If the print server using Bonjour is already installed and the print server name or service name is changed, the print server must be removed from the Printer List and then re-installed with the new Bonjour service name.

Installation in Mac OS X using AppleTalk

This section describes setting up your print server for printing in the Mac OS X.

1. Start **Print Center** (from **Go** | **Applications** | **Utilities => Print Center**) or the **Printer Setup Utility**.

2. Select **Printers** | **Add Printer...**

3. From the **Printer List** dialog, select **AppleTalk**.

4. Now, the port of your print server will appear in the list of available printers. The port is shown as <host name>_<port>. **Example**: AXIS100086_LPT1. Select the print server port you want to use. i.e. LPT1 or LPT2.

5. Select an appropriate printer driver for your printer from the **Printer Model** drop-down list. If the printer is not available in the list, select **Generic**. (Note: **Generic** is only used for postscript printers.)

   You can also browse for a printer driver on your computer or network by selecting **Other...** from the list.

6. Click **Add** to complete the installation.

Installation of LPR printing in Mac OS X

If you want to print using LPR, select:

1. **Printers | Add Printer...**

2. From the **Printer List** dialog, select **LPR printers using IP**.

3. Enter the IP address or host name of the print server in the **LPR printer's Address** field. You must uncheck the **Use Default Queue on Server** check box and enter a Queue Name:
   Physical ports: LPT1, LPT2
   Logical printer ports: PR1, PR2, PR, PR4, PR5, PR6, PR7, PR8

4. Choose a printer driver from the **Printer Model** list and click **Add** to finish.

Installation on Mac OS 9.1 or older, using AppleTalk

Basic Configuration

On Mac OS 9.1 or older, basic configuration in AppleTalk is performed simply by opening the Chooser window and selecting a printer.

You can change the default name of your print server or any of default parameters by editing the print server's *config* file. To access the *config* file from a Macintosh, you can use:

- any Web browser with Javascript enabled
- FTP using MacTCP, Fetch or Anarchie

In order to use any of these methods, you must assign an IP address to the print server as described in *"Setting Parameters"* on page 47.

Choosing a Printer

Selecting a Printer

The method for choosing a printer varies depending on which version of LaserWriter printer driver you are using.

- The LaserWriter 7.0 driver assumes that you use a standard PostScript driver, and cannot take advantage of any printer specific features.
- The LaserWriter 8.0 driver uses PPD files that contain printer descriptions. This gives you full control over any features your printer might have.

Autodetect Printer Type

The print server can automatically detect the type of printer you are using if you enable **Autodetect Printer Type**. The print server can then recognize Epson and Hewlett Packard InkJet printers. Most Epson and Hewlett Packard InkJet printers that have Mac OS printer drivers for network printing are supported. Without the Autodetect Printer Type function, the AppleTalk printer type has to be specified manually in the print server. For Epson InkJets it would be "EPSONLQ2" and for HP InkJets it would be "DeskWriter". If the print server does not recognize the connected printer, the default setting "LaserWriter" will be used as printer type. "LaserWriter" is the recommended setting to be used with all PostScript printers.

To enable **Autodetect Printer Type**, log in to your print server's Web interface and select **Admin** | **Network Settings** | **Detailed View** | **Macintosh** | **Auto Detect Printer Type** | **Yes.**

See the **Help** pages in the print server's Web interface for details.

LaserWriter 7.0 Printer Driver

Follow the instructions below to choose a printer:

1. Select **Chooser** from the **Apple** menu.

2. Click the **LaserWriter** icon.

3. If your network has more than one zone, click on the zone you want. (If your network does not have any zones, this box will not appear.)

---

4. Click the name of the printer you want — the ports are shown as <host name>_<port>. **Example**: AXIS100086_LPT1.

5. Click the **Close** box. This completes the configuration and closes the Chooser.

Repeat this procedure for each Macintosh computer on the network using the print server.

LaserWriter 8.0 Printer Driver

Follow the instructions below to choose a printer:

1. Select **Chooser** from the **Apple** menu.

2. Click the **LaserWriter 8.0** icon.

3. If your network has more than one zone click on the zone you want. (If your network does not have any zones, this box will not appear.)

4. Click the name of the printer you want — the ports are shown as <host name>_<port>. **Example**: AXIS100086_LPT1.

5. Click **Setup...** and then **Auto Setup**. If the selected printer supports bi-directional printing and the appropriate PPD file is available, the installation is performed automatically and you can therefore proceed directly to step 7 (if this is not the case, the PPD file must be selected manually, as described in step 6).

6. Choose the PPD file matching your printer, and click **OK**.
   If your printer does not appear in the PPD file list, please contact your printer vendor. Use the Generic PPD if you do not need any printer specific features.

7. Click **OK**, and then click the **Close** box. This completes the configuration and closes the Chooser.

Repeat this procedure for each Macintosh computer on the network using the print server.

Bi-directional Support

The AXIS 5900 allows the printer driver to communicate directly with the printer and consequently facilitates complete functional control over print jobs, e.g. automatic downloading of fonts not resident in the printer.

This functionality has backward compatibility with older printers and Macintosh computers, which means that the AXIS 5900 can generate appropriate responses to Macintosh printer queries when the connected printer does not support bi-directional communication.

Verifying the Setup

You simply need to print a document from the Macintosh computer to verify communication to the chosen printer. The basic installation can be considered complete if the print test is satisfactory. The AXIS 5900 is now ready for use.

BCP and TBCP You should specify if you want to enable or disable binary transfer of print data in the print server's Web interface **(Admin | Network Settings | Detailed View | Macintosh | Binary Protocol for Printer** *n*. By enabling binary transfer you reduce printing time, provided that the print job is sent as binary data to the print server. This is particular true when you are printing large bitmaps.

- **TBCP** enables the print server to use the TBCP (Tagged Binary Communication Protocol) to transfer print data to the printer. Select this alternative when using Postscript printers.
- **BCP** enables the print server to use the BCP (Binary Communications Protocol) to transfer print data to the printer. Select this alternative when using Postscript printers.
- **None** disables all binary transfers, select this alternative for all non-PostScript printers and for ASCII PostScript printing.

Notes:

> - If you have have set the Autodetect Printer Type parameter to YES, the text output format will be chosen automatically (Admin | Network Settings | Detailed View | Macintosh | Auto Detect Printer *n* Type | Yes).
> - Some printers, e.g. Epson InkJet printers, can not be used when TBCP is enabled.

Setting Parameters In AppleTalk, you can change a limited number of the parameters of the AXIS 5900, such as:

- enable and disable binary data transfers for your printing
- select the type of binary transfer protocol to use
- specify the AppleTalk printer type
- set the IP address

However, by assigning an IP address to your print server, you have access to all of the print server parameters via any standard Web browser or via FTP. Refer to *"Management and Configuration"* on page 92 for more information.

Follow the instructions below to set the print server parameters in AppleTalk:

Important:

> DO NOT use the parameter values from this example when configuring your print server. You should select values that are appropriate for your printers and network settings.

1. Open the **Chooser** from the Apple menu.

2. Select a network printer driver – any LaserWriter will do.

3. Select the printer port ending with **_CFG**.

4. Close the Chooser.

5. Open a text editor, e.g. SimpleText.

6. Write a text file containing the parameters you want to set:

BINARY_TYPE_1.	:BCP
INT_ADDR.	:192.168.3.191
ATYPE_1.	:EPSONLQ2

Note:

Parameters that you do not want to set should be excluded from the text file. Refer to the Parameter list in this manual for information about which values that are valid for each parameter.

7. Print the text file. The settings will be stored in the print server.

8. Open the Chooser and select the printer port you wish to use for printing documents.

9. Close the Chooser.

Note:

The _CFG port disappears 60 minutes after the AXIS 5900 has been powered on. If you want it to reappear, you must restart your print server.

Section 6   Adding Printers in NetWare

This section describes how to continue the installation of the AXIS 5900 in the NetWare environment. Identify which transport protocol you are running on your network and which installation method you should use. Continue the installation by selecting the appropriate installing instructions from the table below:

Installation method	Transport protocol	Action
NDPS	TCP/IP IPX/SPX	See *"Setup using NDPS"* on page 50 and *"Public Access Printers"* on page 51 *"Controlled Access Printers"* on page 54
iPrint	iPrint over LPR	See *"Setup using iPrint"* on page 66 and *"Install a Printer using AXIS LPR Gateway Configuration Snap-in"* on page 68
	iPrint over IPP	See *"Setup using iPrint"* on page 66 and *"Install a Printer with AXIS IPP Gateway Configuration Snap-in"* on page 67
Queue-based printing	IPX/SPX Basic Configuration	To install using the AXIS NetPilot Installation Wizard, see *"Basic Setup with AXIS NetPilot"* on page 70
	IPX/SPX Advanced configuration	If you need a more advanced installation that is not covered by the AXIS NetPilot Installation Wizard, see *"Advanced Installation using AXIS NetPilot"* on page 71

See *"NetWare Administration"* on page 75 for information on Novell's administration tools.

If you intend to operate your AXIS 5900 in a multi-protocol, mixed environment, you should also proceed to the other relevant sections in this manual.

Setup using NDPS

The AXIS 5900 supports Novell Distributed Print Services (NDPS). You can run NDPS over Pure IP (TCP/IP) or IPX/SPX.

Before the AXIS 5900 can be installed, make sure that NDPS is installed and a Broker is loaded on your NetWare file server.

Axis Network Print Server uses the AXIS NDPS Gateway for printing in networks using either IP or IPX as transport protocols. The printer gateways are included with the NDPS software (from version 5.1 and up) and are automatically installed together with NDPS.

Installing the Axis Network Print Server in the NDPS Environments

Having assigned an IP address to the AXIS 5900 as described in *Assigning an IP Address to the Print Server*, on page 16, you are now ready to install the Axis Network Print Server for NDPS printing. You can select to install the connected printers as public or controlled access printers. Follow the instructions below to install the Axis Network Print Server using NDPS:

Important:

- The NDPS Enabled parameter of the Axis Network Print Server is by default enabled. It must be set to Yes in order for the communication between the print server and the NDPS gateway to be enabled. To change this parameter, log in to the print server's Web pages and choose: Admin | Network Settings | Detailed View | NetWare => NDPS Enabled => Yes.

- If you do not have an NDPS Manager object available, start out with creating one in the NetWare Administrator.

Public Access Printers Follow these instructions to create a public access printer using the NDPS Manager object in your NetWare administrator utility:

1. Double-click on the NDPS Manager object you will be using to control the Printer Agents.

2. On the **Identification** page for the NDPS Manager, click the printer **Agent List** button. The **Printer Agent List** dialog will appear.

3. Click **New**. The **Create Printer Agent** dialog will appear.

4. Type a name of your choice in the **NDPS Printer Agent** field
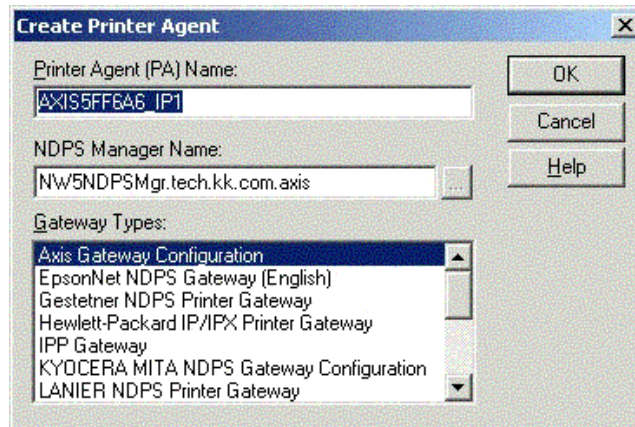
5. Select the **Axis Gateway configuration** in the **Gateway Type** window.

6. Click **OK**

7. In the **Select the printer's type** window, choose your printer. If you cannot find the printer, select an appropriate Generic one (PCL, PS, etc)
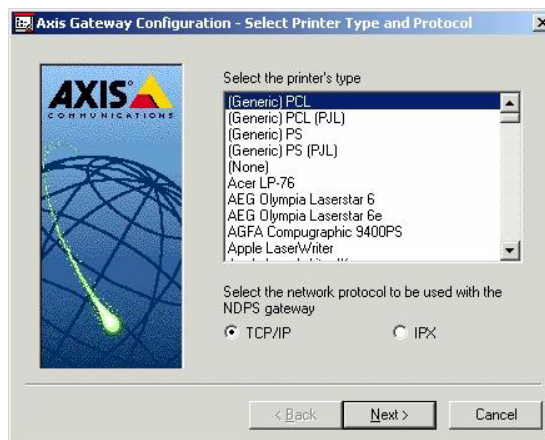
8. Select TCP/IP (**default**) or IPX as network protocol. Click **Next.**

9. You will find the print server in the next window with the printer attached on the connected port. Depending on the transport protocol you used when you start the installation, the print server should appear as following:

• **TCP/IP Network protocol:**
    IP Address and Port, e.g: *192.168.70.243* and *LPT1* (or *LPT2*).
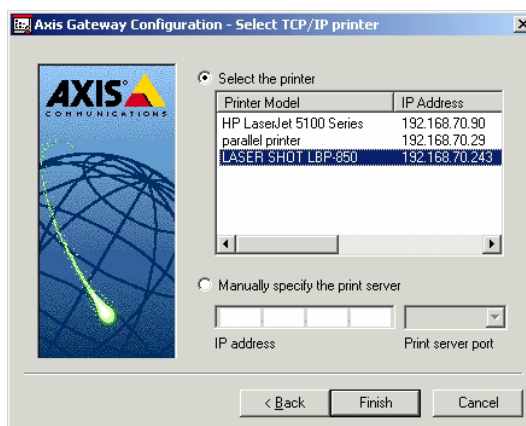
Only the ports with a connected printer show up in this window. If the printer is not in the displayed print list, click **Manually specify the print server** and do the following:

Enter the print server's IP address in the **IP Address** field and choose a port in the **Print server port** field: *e.g., 192.168.70.243* and *LPT1* (or *LPT2*).
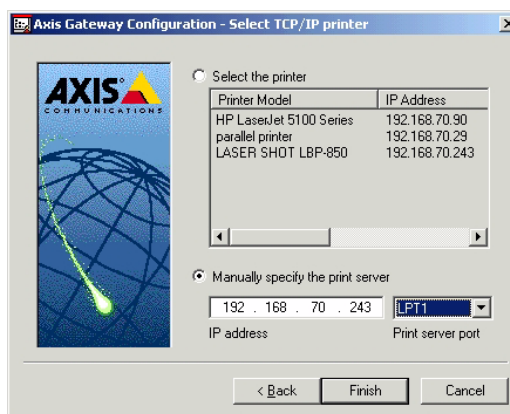
IPX Network protocol:
All the available ports will be presented, regardless if the printers are or not connected to those ports, e.g.

LPT1	AXIS5FF66A_P1
LPT2	AXIS5FF66A_P2

The IPX Addresses for the above printers will appear as:
<IPX External Network Number>:<Print server's HW address>:<Socket Number>

i.e.: **01d7e1c2:00408c5ff6a6:400c**
where 400c, 401c, and 402c are the socket numbers corresponding to the LPT1 and LPT2 physical ports:

LPT1	400c
LPT2	401c
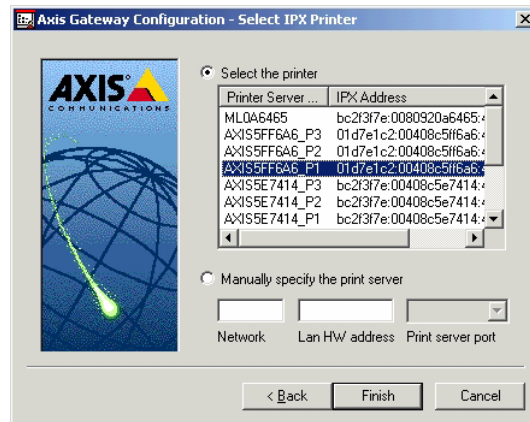
If the printer is not in the displayed print list, click **Manually specify the print server** and do the following:

1. Enter the <IPX External Network Number> in the **Network** field.

2. Enter the <Print server's HW address> in the **LAN HW address** field.

3. Choose a port in the **Print server port** field, e.g. *01d7e1c2:00408c5ff6a6* and *LPT1* (or *LPT2*).
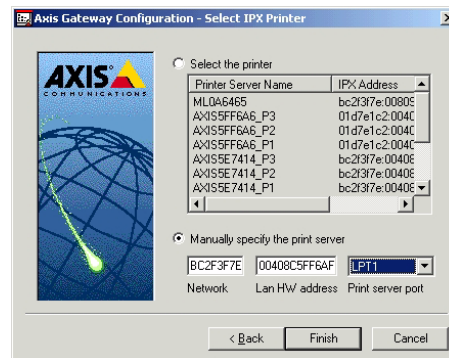
4. When done, select your printer and click **Finish**.

5. Next, select the printer drivers for each client operating system. (Windows 2000, Windows NT and Windows 95/98). These drivers will be automatically downloaded to users' workstations when they install this printer in the future.
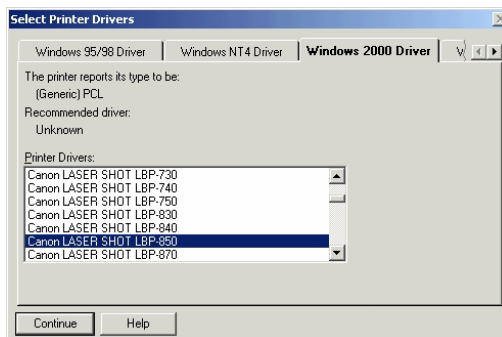
6. Click **Continue** and **OK** in the next NDPS window. The new Printer Agent appears in the Printer Agent List window.
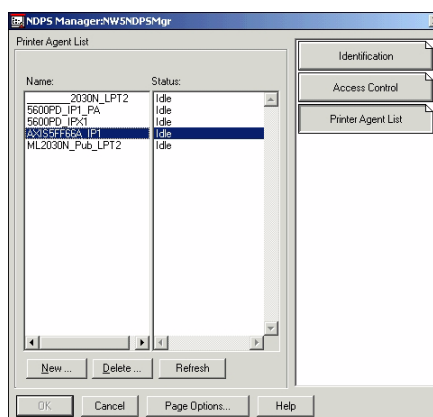
Check the Status: it should be **Idle.**

7. Press **Cancel** to close the NDPS Manager

To install the printer on the workstation, See "Installing an NDPS Printer on a Workstation" on page 61.

Controlled Access Printers

Follow these steps to create a controlled access printer as an object in the Directory Tree, using the NetWare administrator utility:

1. Log in as Admin.

2. Start the NW Admin utility on any Workstation (SYS:PUBLIC\WIN32\nwadmin32.exe).

3. Browse the context your NDPS Manager resides in.

4. From the **Object** menu, select **Create**. The New Object dialog appears.
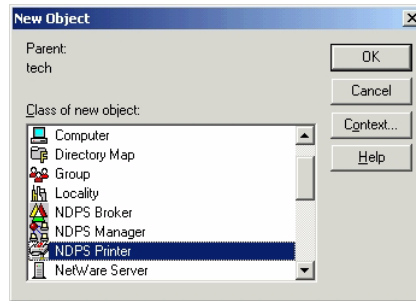
5. Select NDPS Printer. The Create NDPS Printer dialog appears.
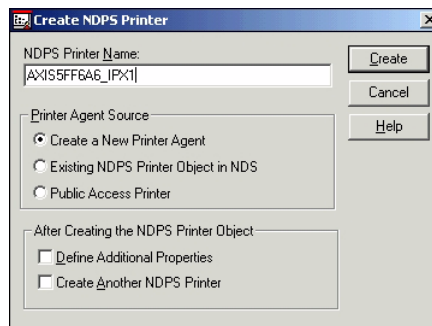
6. Type a name of your choice in the NDPS Printer Name field, e.g.
    AXIS5FF66A_IPX1
    In the Printer Agent Source field, select the source of the Printer Agent. The following options are available:

    – Create a New Printer Agent. If you select this option, you are asked to select either the Novell Gateway or a third party Gateway.

    – Printer Agent on Existing NDS Object. Use a Printer already configured as a controlled access printer (NDPS Printer Object).
    If you select this option, a list of current NDPS Printer Objects in this container will be displayed from which you can select the one you want to use.

    – Public Access Printer Agent. Use an existing Printer Agent representing a Public Access Printer.

7. Select **Create a New Printer Agent** and click **Create** to display the Create Printer Agent dialog.

8. Confirm the Printer Agent name (default is the name of the new printer you are creating) and browse to select the NDPS Manager to which you want to assign it
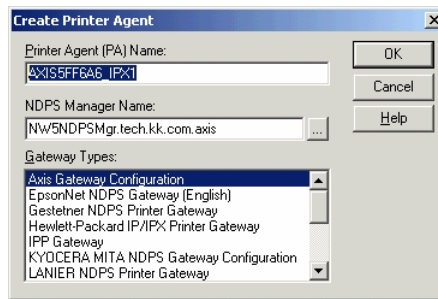
9. Select AXIS Gateway Configuration in the Gateway Type field.

10. Click **OK**.

11. In the **Select the printer's type** window choose your printer. If you cannot find the printer, select an appropriate Generic one (PCL, PS, etc)
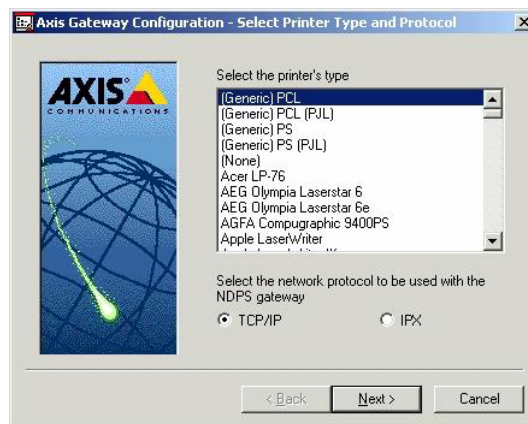
12. Select TCP/IP (**default**) or IPX as network protocol.

13. Click **Next.**

14. You will find the print server in the next window with the printer attached on the connected port.
Depending on the transport protocol you used when you start the installation, the print server will appear as:

- **TCP/IP Network protocol:**
IP Address and Port, e.g: *192.168.70.243* and *LPT1* (or *LPT2*)
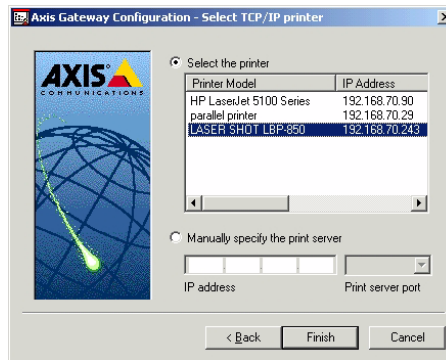
Only the ports with a connected printer will show up in this window.

If the printer is <u>not</u> in the displayed print list:

1. Click **Manually specify the print server** enter the print server's IP address in the **IP Address** field and choose a port in the **Print server port** field e.g., *192.168.70.243* and *LPT1* (or *LPT2).*
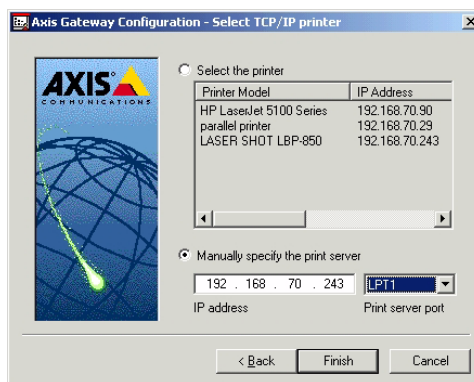
IPX Network protocol:
All the available ports will be presented, regardless if the printers are or not connected to those ports.

LPT1	AXIS5FF66A_P1
LPT2	AXIS5FF66A_P2

The IPX Addresses for the above printers will appear as:
<IPX External Network Number>:<Print server's HW address>:<Socket Number>

i.e.: **01d7e1c2:00408c5ff6a6:400c**
where 400c, 401c, and 402c are the socket numbers corresponding to the LPT1 and LPT2 physical ports:

LPT1	400c
LPT2	401c
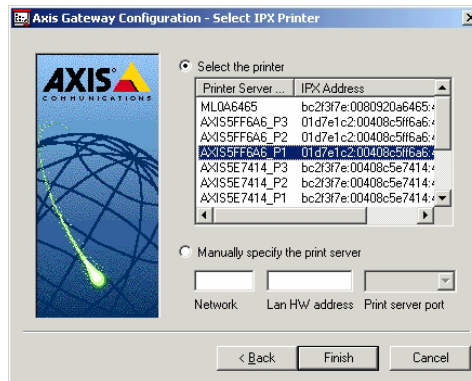
If the printer is <u>not</u> in the displayed print list:

1. Click **Manually specify the print server** and enter the <IPX External Network Number> in the **Network** field.

2. Enter the <Print server's HW address> in the **LAN HW address** field and choose a port in the **Print server port** field:
    e.g.: 01d7e1c2:00408c5ff6a6 and *LPT1* (or *LPT2*).
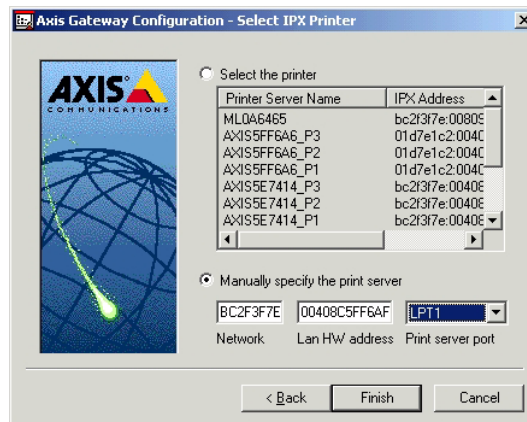
3. When done, select your printer and click **Finish**.

4. Next, select the printer drivers for each client operating system. (Windows 2000, Windows NT and Windows 95/98). These drivers will be automatically downloaded to users' workstations when they install this printer in the future.
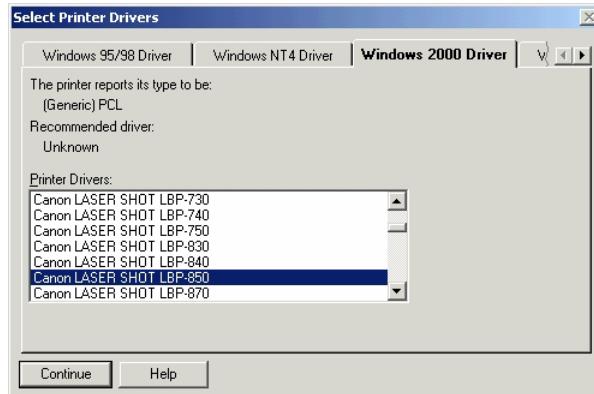
5. Click **Continue** and **OK** in the next NDPS window. Your printer will appear as an NDS object in the Directory Tree and will offer a full range of network security options
.

Installing an NDPS Printer on a Workstation

To install the printer on a workstation, use either Novell Printer Manager (NetWare 5.1 only) or the Add Printer Wizard on the local workstation.

Using Novell Printer Manager

1. Log in as Admin.

2. On the any workstation, browse to
   <NW 5.1 File Server>\SYS:PUBLIC\Win32
   and start Nwpmw32.exe (Novell Printer Manager).
   The Novell Printers dialog appears, displaying a list of installed Public or Controlled printers (if any printers have previously been installed on the workstation).
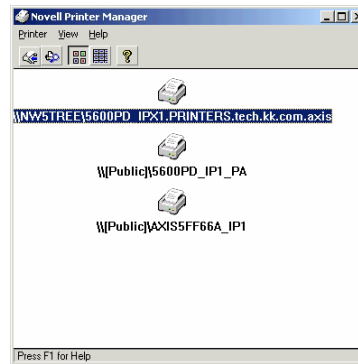
3. From the Printer Manager's Printer pull down menu, select **New**.

4. Click **Add**. A list of available printers appears.

---
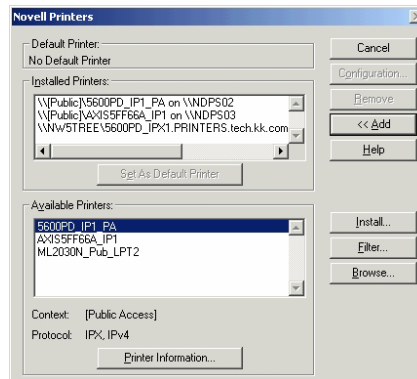
5.   The list of available printers shows the NDPS Public Access Printers on the network and the NDPS Controlled Access Printers in you current NDS context. To see the Controlled Access Printers in other context that you have rights to, click the **Browse** button and select your choice. Click **OK.**
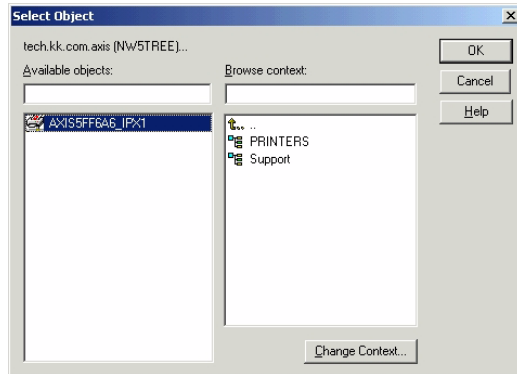
6.   Once selected, click **Install**. The Novell Printers – Install dialog appears.
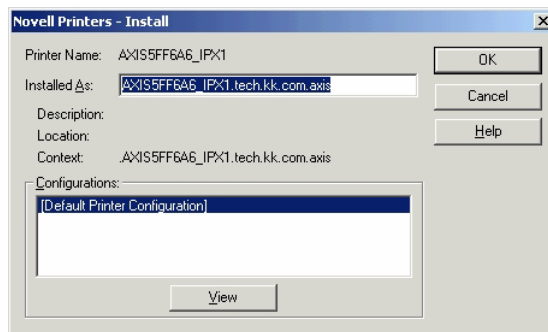
7. Click **OK**. The default driver for that printer is then automatically downloaded.
   If the printer object does not have a printer driver associated with it, or a driver was not found, you will be prompted to either to choose from a list of printer drivers provided by NDPS or to provide a disk with the appropriate driver.
   The Novell Printers dialog appears with the new printer, e.g. *AXIS5FF6A6_IPX1* in the installed list.
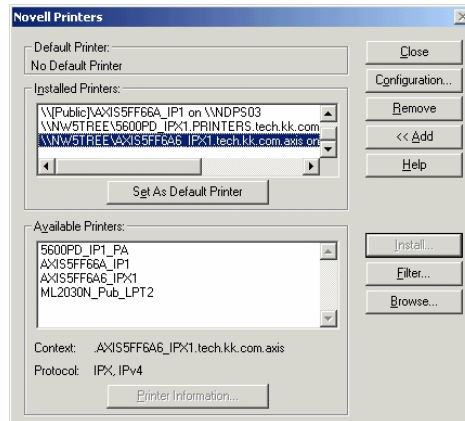
8. Click **Close**.
   In the Novell Printer Manager window the new installed NDPS printer appears with the name e.g. *AXIS5FF6A6_IPX1* and is available for print jobs.
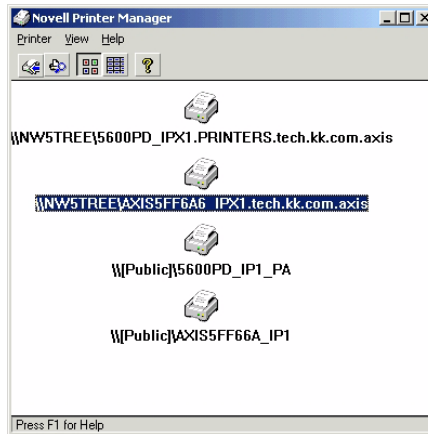
9. Verify by clicking **Start – Settings – Printers** on the workstation.
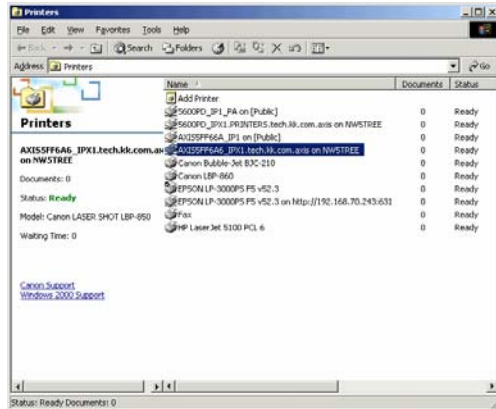
Using the Add Printer Wizard

1. Click **Start** on your workstation, select **Settings =>Printers**. There might be some differences regarding this menu depending of MS Operating System you are running.

2. Start the Add Printer Wizard on the workstation. The Add Printer Wizard dialog will appear. Click **Next**.

3. Select **Network printer** and click **Next**.
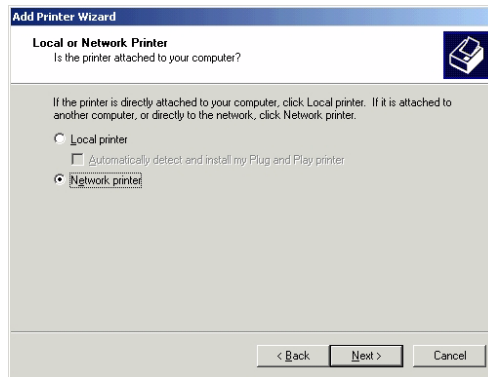
4. Click **Next** again in the **Locate Your Printer** dialog (Win2000/XP) or press the **Browse** button (Win9X)

5. Browse to the **NDPS Printers**. Expand either the **NDPS Controlled Access Printers** or the **NDPS Public Access Printers** folder, select your newly installed NDPS printer and follow the instructions.
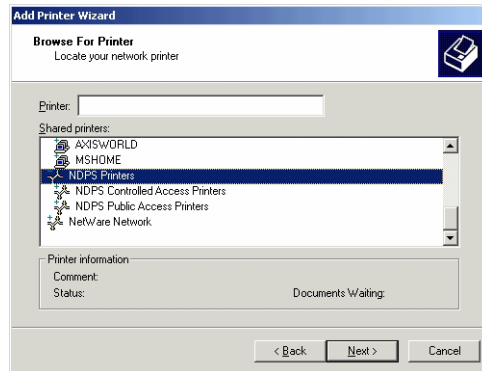
When you have completed these steps, you are ready to start printing.

Notes:

- The Public Access print servers are immediately available for everyone on the network

- The Axis Gateway Configuration Utility is an installation and configuration tool for NDPS printers in the NetWare environment. The Axis Gateway will appear in NetWare 5.1 and later releases. You can download the Axis Gateway Configuration Utility for use with earlier versions of NetWare from www.axis.com.

- To print using TCP/IP, Axis print server firmware 6.1 or later is required. In order to print using IPX/SPX, Axis print server firmware 5.51 or later is needed.

Setup using iPrint

iPrint is Novell's next generation of printing software that lets users print to and from all destinations.

A standard Web page displays available printers to the user. 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.

Before setting up iPrint printers, make sure that you meet all the iPrint Setup requirements. See the Novell iPrint Administration Guide for instructions on installing, configuring, and customizing iPrint.

AXIS Print servers can be installed as iPrint printers, either by using the Novell LPR gateway (LPR on IP) or the AXIS Gateway Configuration Snap-in for iPrint.

Axis provides two free Snap-ins for iPrint:

• **AXIS LPR Gateway Configuration**
• **AXIS IPP Gateway Configuration**

When you install Service Pack 6 (16 April 2003) for NetWare 5.1 or later and Service Pack 3 (16 April 2003) for NetWare 6.0 or later, the AXIS LPR Gateway Configuration will automatically be installed and configured on the NetWare Servers and ready for use.

The AXIS IPP Gateway Configuration Snap-in for NetWare 6.0 can be downloaded for free from www.axis.com. Follow the instructions below to install the AXIS IPP Gateway Configuration Snap-in for NetWare 6.0, if you want to add it in your iPrint environment.

Installing AXIS IPP Gateway Configuration Snap-in for NetWare 6.0

1. Download the free **axisIPP-snap-in.zip** file from www.axis.com and unzip it in a temporary directory.

2. Make sure the the NetWare Enterprise Web Server was previously installed on the server. Otherwise, install it.

3. Novell iPrint uses the NDPS infrastructure, so make sure that all the NDPS requirements have been met:

   • Make sure that the BROKER.NLM is loaded. If it isn't, type LOAD BROKER in the server console prompt and select the name of the Broker.

   • Make sure that the NDPS Manager object is created in the Novell Directory Services (NDS) tree. Refer to your Novell documentation for creating this object.

   • Make sure that the NDPSM.NLM is loaded. If it isn't, type LOAD NDPSM in the server console prompt and select the appropriate NDPS Manager.

4. Shutdown Tomcat and the NetWare Enterprise Web Server on the NetWare file server by executing the following commands:

   Type "NSWEBDN" <Enter>
   Type "TOMCAT33 -STOP" <Enter>
   Type "NVXADMDN" <Enter>

5. Map the next available drive (e.g. G:) to the root of volume SYS on your NetWare server.
   From the temporary directory where **axisIPP-snap-in.zip** has been unzipped, run the batch file **AxisIPP.bat** (default G:).
   If the drive G: is not available, you have to edit the batch file and change the drive to next available one.
   Check that each line in the batch file is executed without failure.

6. Restart Tomcat and the NetWare Enterprise Web Server on the file server by executing the following commands:
   Type "TOMCAT33" <Enter>
   Type "NVXADMUP" <Enter>
   Type "NSWEB" <Enter.

7. Access the iManager Web page on the NetWare server by opening the following URL:
   https://<IP address of NW server>:2200/eMFrame/iManager.html
   You have to authenticate.

8. Click on **iPrint Management** on the left pane and select **Create Printer.**

9. On the right pane, verify that the newly installed **AXIS IPP Gateway Configuration** is under the **Gateway type** drop-down menu.
   If not, it may be necessary to restart the NetWare server.

   Now you are ready to use the AXIS IPP Gateway Configuration for installing iPrint printers. You have to have **Administrator rights** to install the printers through iPrint.

Install a Printer with AXIS IPP Gateway Configuration Snap-in

1. Connect a printer to any port of the AXIS 5900.

2. Connect the print server to the network.

3. Connect the power adapter.

4. Start the printer and the print server.

5. Log in as Admin.

6. Use a Web browser and the local host URL to login into iManager on your NetWare server.

7. Open your browser to the following URL:
   https://<IP address of NW server>:2200/eMFrame/iManager.html
   You have to authenticate.

8. Click on **iPrint Management** on the left pane.

9. Click on **Create Printer.**

10. Choose a name of your choice for the printer

11. Choose the context where the printer will be installed.

12. Browse for the NDPS Manager and select it.

13. In the **Gateway Type** drop-down list, choose the **Axis IPP Gateway Configuration**. Press **Next**.

14. In the Printer URL, you may choose either the IPP version 1.0 format:
    http://<IP address of your print server>:631/lptx

    or the IPP version 1.1:

    ipp://<IP address of your print server>/lptx

    where x is the port number. Click **Next.**

15. Select default drivers for your printer. Click **Next** and **OK**.

Install a Printer using AXIS LPR Gateway Configuration Snap–in

1. Connect a printer to any port of the AXIS 5900.

2. Connect the print server to the network.

3. Connect the power adapter.

4. Start the printer and the print server.

5. Log in as Admin.

6. Use a Web browser and the local host URL to login into iManager on your NetWare server.

7. Open your browser to the following URL:
   https://<IP address of NW server>:2200/eMFrame/iManager.html You have to authenticate.

8. Click on **iPrint Management** on the left pane.

9. Click on **Create Printer.**

10. Choose a name for the printer.

11. Choose the context where the printer will be installed.

12. Browse for the NDPS Manager and select it.

13. In the **Gateway Type** drop-down list, choose the **Axis LPR Gateway Configuration**. Click **Next**.

14. Choose either the IP address or the DNS Name for your print server.

15. Under **Printer name**, select the physical printer port, e.g. LPT1 or LPT2, or logical printer port pr1-pr8 using the drop-down list. Click **Next**.

16. Select default drivers for your printer. Click **Next** and **OK**.

Installing the iPrint Printer on the Workstation

An iPrint printer can by locally installed on the workstation in two ways:

- Using the iPrint Client
- Using the MS Add Printer Wizard at the workstation.
  See "Using the Add Printer Wizard" on page 64.

Installing the iPrint Printer using the iPrint Client.

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.

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

- Windows 95/98/Me/NT/2000/XP/2003
- Web browser with JavaScript enabled:
  - Microsoft Internet Explorer 5.0 or later
  - Netscape 4.76 (iPrint is not supported on Netscape 6)

The user should use the following iPrint url:
http://<IP address of your NW server>:631/IPP

1. From a Netscape or Internet Explorer browser, enter the provided URL.
   A Web page displays a listing of available printers to install and a link to install the client software.

2. Select **Install iPrint client software** to locally install the iPrint printers. If you try to install a printer before installing the iPrint client software, you will be 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.

3. 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.

Basic Setup with AXIS NetPilot

Install the AXIS NetPilot software on your computer. AXIS NetPilot runs on Windows 98 and Windows NT.

Starting the Installation Follow the instructions below to install the AXIS 5900 with AXIS NetPilot:

1. Start AXIS NetPilot by double-clicking the NetPilot icon, which is located in the folder where you installed AXIS NetPilot.

2. Locate the Axis Network Print Server in the 'New Axis Units' folder. Select it and click the **Install** button on the AXIS NetPilot toolbar. If your network is large, it could take a few seconds before the print server appears in the folder.

3. Choose the **with Installation Wizard** option.

The AXIS NetPilot Installation Wizard guides you through the installation process. The following options are available:

Note:

> The number of options varies according to the number of environments you enable.

Print Server Name The default print server name consists of the characters 'AXIS' followed by the last six digits of the serial number. If you want to change the print server name, just type the new name in the available text field.

Environments Choose which networking environments you want to configure the Axis Network Print Server for, e.g. NetWare, TCP/IP, Windows & OS/2 or Macintosh. If your network comprises various different platforms, you can enable any combination of environments.

NetWare NDS Place NetWare Print Queues on a specific bindery server, or alternatively into an NDS Tree.

The IP Address Choose the method the Axis Network Print Server should employ for obtaining an IP address. DHCP, ARP, RARP, BOOTP and Auto-IP are supported. You can also select to set the IP address manually. Refer to *"Assigning an IP Address to the Print Server"* on page 16 for further information about setting the IP address.

Print Queues The Axis Network Print Server uses the print server name followed by the printer port as the default Print Queue names and print server port names. If you want to change the default printer queue names, just type the new names in the available text fields.

AXIS 5900

Environment	Default Names
NetWare	AXIS1A0003_LPT1_Q AXIS1A0003_LPT2_Q
Windows & OS/2	AX1A0003.LP1 AX1A0003.LP2
AppleTalk	AXIS1A0003_LPT1 AXIS1A0003_LPT2

Default Print Queue Names and Print Server Port Names
for each of the operating environments.

Test Page   The final user prompt in the Installation Wizard allows you to print a test page through NetWare. The test page displays the name of all the NetWare servers the Axis Network Print Server is connected to and shows the status of each connection.

Unless you want to connect or create additional printing queues, the installation for the NetWare environment is now completed.

Notes:

- The parameters entered during installation are not permanent; they can be altered at any time according to your network printing requirements.
- No serious or permanent damage will be caused if you make a mistake during installation. If you find, at any time, that printing is not satisfactory, the parameters can easily be changed to tune the system to your requirements.
- For information on advanced functions, please refer to the AXIS Network Print Server Technical Reference. You can download this or other technical information over the Internet by accessing www.axis.com

Advanced Installation using AXIS NetPilot

Having installed your Axis Network Print Server in accordance with the basic installation procedures described in *Basic Setup with AXIS NetPilot*, on page 70, your Axis Network Print Server should now feature in the *Network Print Servers folder* located in the AXIS NetPilot main window.

NetWare Network
Environment Window   The NetWare Network Environment window allows you to connect additional print queues to your Axis Network Print Server as well as create new ones.

Follow the steps below to gain access to the NetWare Network Environment window:

1. Select the required Network print server from the 'Network Print Server' folder.

2. Choose **Network** from the Setup menu or click on the **Network** icon on the AXIS NetPilot's toolbar.

3. If you are not logged on to your NetWare file server, a dialog box will ask you to log on.

The Axis Network Print Server periodically updates the configuration by scanning the NDS tree or, in the case of NetWare versions 3.x, the designated file servers.

Connecting Print Queues

Follow the steps below to connect a print queue to the print server port:

1. Open the NetWare **Network Environments** window.

2. Select the print server port you want to connect.

3. Click the **Connect...** button. The **Connect NetWare Print Queues** window appears.
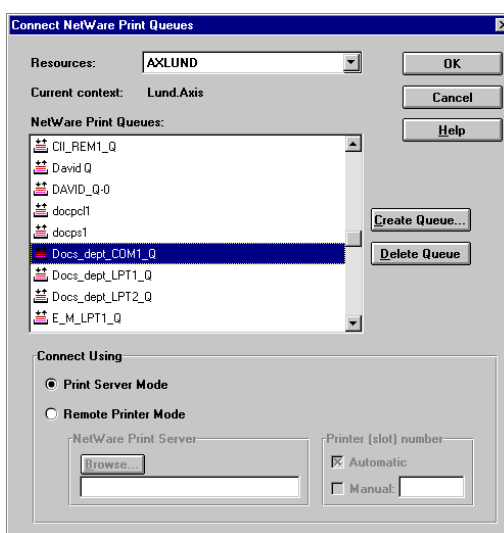
The AXIS NetPilot Connect NetWare Print Queues window

4. Select the tree or server location of the print queue from the **Resources** box.

5. Select an existing print queue to connect to the server port, or create a new print queue by clicking on **Create Queue...** If you have selected an existing queue, advance to step 8. Continue with step 6 only if you want to create a new queue.

6. Type the queue name in the **Create Queue** dialog window. If you want to create a queue in the NDS tree you must also enter the name of the volume where the queue will be located. Click **OK**.

7. Select the newly created queue from the queue list.

8. Select **Print Server Mode** or **Remote Printer Mode**. If you selected **Print Server Mode**, advance directly to step 11, otherwise continue with step 9.

9. Select an appropriate NetWare Print Server name, that will be associated with the Axis Network Print Server, by using the **Browse...** button.

Notes:

> - You cannot type or edit the name manually.
> - Make sure that you have PSERVER.NLM running if you selected Remote Printer Mode in step 8.

10. If you want to define a remote printer number slot manually, check the **Manual** box and type the desired number in the box.

11. Click the **OK** button to return to the Network Environments window.

Basic Queue–based Printing over IP

Axis print servers with software version 6.0 or later allow users to print in a Pure IP environment using traditional queue-based printing (which usually uses the IPX transport protocol). Note that only NDS queue-based printing is supported.

In the NetWare Pure IP environment, you must use the NetWare Administrator to create the printer, print server and queue objects.

Installing the Axis Network Print Server

Follow the instructions below to install the Axis Network Print Server in the NetWare Pure IP environment:

1. Start the Configuration Wizard from the **User mode** in the Axis Network Print Server Web interface.

2. Click your way through the Wizard until reaching the **NetWare** page.

3. Set the parameters on the NetWare page:

   - PSERVER NDS Tree (example: NW5TREE)
     or
     PSERVER NDS File Server: (example: FILESERVERNAME)
   - PSERVER NDS Distinguished Name:
     (example: AXISXXXXXX.<context>, where <context> is the container where you want to create your print server)
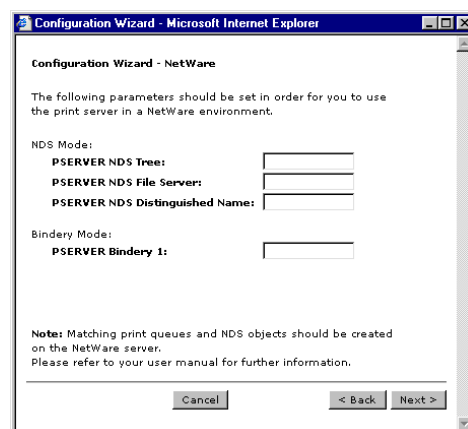
Setting the PSERVER parameters in the Axis Network Print Server Web interface.

4. Use the NetWare Administrator to create the printer, print server and queue objects in the NDS tree and then link them together. The **Print Services Quick Setup** (Non-NDPS) utility can be used for this. Go to **Tools** in the **NetWare Administrator**.

5. Use the Add Printer Wizard on your work station to install the printer on your client. Note that only NDS queue based PSERVER printing is supported. When installing, choose **Network Printer** and browse to the queue you have just created. Alternatively, choose **Local Printer** and select the queue you have just captured.

Any configuration and management of the Axis Network Print Server can be performed from any standard Web browser. Please refer to *"Using a Web Browser for Print Server Management"* on page 92.

If both the IPX and IP protocols are enabled in your network and the print server uses DUAL_STACK (enabled by default) as its network transport protocol, then IPX will be chosen. To force the print server to use the IP transport protocol, go to your print server's Web interface and choose **Admin | Detailed View | NetWare** and change the NetWare Transport Protocol from DUAL_STACK to IP_ONLY. Save and exit when finished.

Note:

Pure IP requires that you run NetWare 5 or higher.

Queue-based Printing Methods

The following overview explains the advantages and limitations of the two supported queue-based printing methods.

Print Server Mode

The Axis Network Print Server logs in to a file server(s) and repeatedly polls the print queues for print jobs. In this fashion, the Axis Network Print Server emulates a NetWare print server, which is a workstation running PSERVER. It provides high printing speed with low network load and is the recommended mode for medium to large sized networks. Each print server in PSERVER mode takes one NetWare user licence.

Advantages

- High performance: up to 1 Mbyte/s

Limitations

- In bindery mode, this printing method requires a NetWare user licence for each Axis Network Print Server to file server link.

Remote Printer Mode

The Axis Network Print Server acts as Remote Printer for PSERVER.NLM running on the NetWare file server, or to a dedicated workstation running PSERVER.EXE. In this fashion, the Axis Network Print Server emulates a workstation running the NetWare remote printer software RPRINTER, or NPRINTER. This mode is only recommended for small networks where the number of NetWare user licences is a major issue.

Advantages

- NetWare user licences are not required.

Limitations • Lower performance, typically 20 - 70 kbytes/s for NLM and higher network load.

Using Novell Utilities After installing the Axis Network Print Server into the NetWare environment, you can manage your Axis Network Print Server, using either Novell's NetWare Administrator, or PCONSOLE.

NetWare Administration Some useful features provided by the NetWare Administrator are described in more detail below:

Printer Status The Printer Status menu, detailed below, shows the status of an active print job serviced by an Axis Network Print Server. It displays detailed information concerning the active job including, Print Queue, print job description, size of print file, percentage of job completed, etc. You can also abort or pause the print job from this menu.

Notification You can use the NetWare Administrator to enable or disable status notification messages for printers connected to the AXIS 5900, e.g. Busy, Off-line, Out of paper, Paper jam, etc. You can also add or remove print job owners and administrators from the list of persons to be notified.

Print Layout You can view installed AXIS 5900 and their relative print queues for any NetWare Organizational Unit. You can also display summary information by right-clicking on the printer object you want to examine.

Section 7   Adding Printers in UNIX/Linux

Print Tools

For printer configuration, *printtool* and *printconfig* are the most common. How they are invoked depends on which distribution and window manager you use.

AIX   *SMIT* is the recommended printing tool. It contains an integrated printer driver list, but does not have printer detection functionality.

Instructions:

Type the command `smit` in a Terminal window, then click **Print Spooling**.

Debian   *printtool* is the recommended printing tool. The program contains an integrated printer driver list, but does not have printer detection functionality.

I*nstructions:*

Type the command `printtool` in a Terminal window to start the graphical version.

HP UX   *Sam* is the recommended printing tool. It doesn't provide an integrated printer driver list, nor printer detection functionality.

Instructions:

Type the command `sam` in a Terminal window, click **Printers and Plotters** and then click **Actions** and **Add_Remote Printer/Plotter.**

Mandrake   *printerdrake* is the recommended printing tool. It contains an integrated printer driver list, but does not have printer detection ability.

Red Hat   *printconf* is the recommended printing tool. The program contains an integrated printer driver list, but does not have printer detection functionality.

Instructions:

Type the command `printconf-gui` in a Terminal window to start the graphical version.

You can also run printconf as a text-based application if you do not have the X Window System installed, or if you prefer the text-based interface. Log in as **root** (or use the command `su` to temporarily change to the root user), and type the command `/usr/sbin/printconf-tui` from a shell prompt.

Solaris 9   The printing tool is called *Printer Administrator.* This operating environment has an integrated printer driver list, but does not have printer detection functionality.

Instructions:

Type the command `/usr/sadm/admin/bin/printmgr` in a Terminal window.

SuSE   *YaST2* is the recommended printing tool. It contains a printer driver list as well as printer detection capability.

Instructions:

To start the Printer Configuration tool, select this from the Desktop:

YaST2 menu button (on the panel) | **In Yast Control Center** | **Hardware** | **Edit Printers**

Notes:

> - A versatile IPP client for UNIX/Linux is CUPS. It can be downloaded from the Common Unix Printing System's Web site at www.cups.org
> - If you don't find your specific printer in your distribution, have a look at http://www.linuxprinting.org/database.html

Typical Invocation via a Windows Manager

Using the Mandrake 8.2 distribution (with CUPS installed) and the KDE windows manger as an example, a typical set-up begins with starting Mandrake Control Center.

1. Click **Hardware | Printer** and the *Printerdrake* application will be invoked.

2. Click **Expert Mode** to be able to add a network printer.

3. Click the **Add a new printer** button.

Print Queues   Five types of print queues can be configured in the Mandrake distribution:

- Local Printer
- Printer on remote lpd server
- Network printer (TCP/Socket)
- Printer on SMB/Windows 95/98/NT server
- A printer device URl

4. Select the **Network printer** radio button and click **Next**.

5. Enter the IP address or host name of the print server as well as the port you want to use. Port numbers available for TCP/IP are:

Port number	LPT1	LPT2
AXIS 5900	9900	9902

6. Click **Next**.

7. Fill in data to help users identify the printer, i.e. name, description and location. Click **Next**.

8. Select printer model and click **Next**.

9. Configure the printer and click **Next**. The printer is set up. Click **Finish** and the printer is accessible.

Typical Invocation from a Terminal Window

Still using Mandrake as an example, open a Terminal Window and type the command `printtool`. If you are in a terminal window, the graphic version will start (as described above). If you do not have the X Window System installed, the command will start a text based version. The same information as was described above will be needed.

Note: In Mandrake, even if you type `printtool` at a shell prompt, `printerdrake` will automatically start.

Debian 3.0

Debian offers a choice between plain LPD, LPRng and CUPS. There are several printer configuration tools in this distribution, e.g. the *apsfilter* (version 5 or later), which adds support for LPRng and Ghostscript's uniprint driver scheme. Red Hat's printtool is also supported, for those who prefer GUI administration tools.

For LPRng, LPD and CUPS use the **Printtool.**

Invocation

1. From the Gnome desktop, select Main Menu (on the panel) => Debian menus => Apps => System => Printtool.

2. On the KDE desktop, select the Main Menu (on the Panel) => System => Debian => Printtool.

3. Open a terminal window and type the command `printtool` (in XTERM or Gnome).

Print Queues

Five types of print queues can be configured with *printconf* in the Debian distribution:

- Local Printer
- Unix Printer (lpd Spool
- Windows Printer (SMB)
- Novell Printer (NCP Queue)
- JetDirect Printer

Adding a Remote Unix Printer

1. Start *printtool* and click **Add**.

2. Select **Remote Unix (lpd) Queue** from the **Printer Type** menu, and click **OK**. Text fields for the following options appears:

    - **Printer name** – Enter a unique name for the printer. (The name cannot contain spaces and must begin with a letter. Valid characters are a - z, A - Z, 0 - 9, -, and _.

    - **Remote Host** – The hostname or IP address of the remote machine to which the printer is attached.

    - **Remote Queue and input filter** – The remote printer queue and input filter.

3. Click **Next** to continue. Click **Select** to choose a printer driver and to set it up.

4. Click **OK**. Finally, click **Test** and print a test page.

Red Hat 7.3

Printtool has been replaced by **Printconf**. The utility maintains the /etc/printcap configuration file, print spool directories, and print filters.

Note: If you type `printtool` at a shell prompt, `printconf` will automatically start.

Invocation

1. On the Gnome desktop, select the Main Menu button (on the Panel) => Programs => System => Printer Configuration to start the graphical version.

2. On the KDE desktop, select the Main Menu button (on the Panel) => Red Hat => System => Printer Configuration to start the graphical version.

3. Type the command `printconf -gui` at a shell prompt (for example, in an XTerm or a Gnome terminal) to start the graphical version.

4. You can also run `printconf` as a text based application if you do not have the X Window System installed, or you just prefer the text based interface. To run it, log in as root (or use the command `su` to temporarily change to the root user), and type the command `/usr/sbin/printconf -tui` from a shell prompt.

Print Queues

Five types of print queues can be configured with `printconf` in the Red Hat distribution:

- Local Printer
- Unix Printer (lpd Spool)
- Windows Printer (SMB)
- Novell Printer (NCP Queue)
- JetDirect Printer

Important!

- Do not edit the /etc/printcap file. Each time the printer deamon (lpd) is started /restarted, a new /etc/printcap file is dynamically created.

- If you want to add a printer without using printconf, edit the /etc/printcap.local file. The entries in /etc/printcap.local are not displayed in printconf but are read by the printer daemon.

- If you upgrade your system from a previous version of Red Hat Linux, your existing configuration file is converted to the new format used by printconf. Each time a new configuration file is generated by printconf, the old file is saved as /etc/printcap.old.

- If you add a new print queue or modify an existing one, you need to restart the printer daemon (lpd) for the changes to take effect.

- Clicking the Apply button saves any changes that you have made and restarts the printer daemon. The changes are not written to the /etc/printcap configuration file until the printer daemon (lpd) is restarted. Alternatively, you can choose File => Save Changes and then choose File => Restart lpd to save your changes and then restart the printer daemon.

- If a printer appears in the main printer list with the Queue Type set to INVALID, the printer configuration is missing options that are required for the printer to function properly. To remove this printer from the list, select it from the list and click the Delete button.

Adding a Remote Unix Printer

1. To add a remote UNIX printer, such as one attached to a different UNIX/Linux system on the same network, click the **New button** in the main `printconf` window.

2. Select **Unix Printer** from the **Queue Type menu**, and click **Next**.

3. Enter a unique name for the printer in the **Queue Name** text field. The printer name cannot contain spaces and must begin with a letter a through z or A through Z. The valid characters are a through z, A through Z, 0 through 9, -, and _. Click **Next**.
   Text fields for the following options appear:

   Server – The hostname or IP address of the remote machine to which the printer is attached.

   Queue – The remote printer queue. The default printer queue is usually lp.

   By default, the Strict RFC1179 Compliance option is not chosen. If you are having problems printing to a non-Linux lpd queue, choose this option to disable enhanced LPRng printing features.

4. Click **Next** to continue. The next step is to select the type of printer that is connected to the remote system.

Important!

> The remote machine must be configured to allow the local machine to print on the desired queue. As root, create the file /etc/hosts.lpd on the remote machine to which the printer is attached. On separate lines in the file, add the IP address or hostname of each machine which should have printing privileges.

Selecting the Print Driver

If you are configuring a local printer, select the print driver from the list. The printers are divided by manufacturers. Click the arrow beside the manufacturer for your printer. Find your printer from the expanded list, and click the arrow beside the printer name. A list of drivers for your printer will appear. Select one. Then finish the Wizard in the usual manner.

SuSE 8.0

The printing system on SuSE Linux is based on an apsfilter, with some enhancements; SuSE's apsfilter will recognize all common file formats (including HTML, if html2ps is installed).

There are two ways to setup printers on SuSE systems:

- YaST2 will let you configure "PostScript", "DeskJet" and "Other printers", supported by Ghostscript drivers; it's also possible to setup HP's GDI printers (DeskJet 710/720, 820, 1000, via the "ppa" package). YaST2 will provide /etc/printcap entries for every printer ("raw", "ascii", "auto" and "color", if the printer to configure is a color printer). YaST2 will create spool directories and it will arrange apsfilterrc files, where you're able to fine tune some settings (Ghostscript preloads, paper size, paper orientation, resolution, printer escape sequences, etc.). With YaST2 it's also possible to setup network printers (TCP/IP, Samba, or Novell NetWare Printer).

- SuSE includes the regular SETUP program from the original apsfilter package (with some enhancements); run `lprsetup` to invoke this configuration script. Once you get accustomed to its GUI, you'll be able to configure local and network printers.

Invocation of YaST2   On the Gnome desktop select **YaST2 Menu Button (on the panel) => Yast Control Center => Hardware => Edit Printers** to start the Printer Configuration tool. On the KDE desktop select **YaST Menu Button (on the panel) => Yast2 modules => Hardware => Edit printers** to start the graphic version.

Print Queues   SuSE and YaST2 differ between these printer connections:

- Local printers (Parallel, Serial and Disk File)
- LPD protocol network printing (Forward queue to a remote LPD and Prefiltered queue for an LPD forwarding queue)
- Other network printing (Samba/Windows, Novell)

The SuSE installation manual explains the setup procedures in detail.

AXIS axinstall Script

Having performed the basic TCP/IP setup procedures as defined earlier in this manual, you are now able to print in interactive mode using PROS, LPR, FTP or Reverse Telnet protocols. However, if you want to integrate the AXIS 5900 with your host spooler, you can use the Axis automatic installation script *axinstall*. The *axinstall* script is available from ftp://ftp.axis.com/pub_soft/prt_srv/utility/axinstall/latest/

After executing this script, the printer connected to the print server will appear as though it is directly connected to the host printer spooler.

If you intend to use the print server in a multi-protocol environment, refer to the chapters pertaining to the respective operating systems in this manual.

When the *axinstall* script has been downloaded to your host, execute the script with this command:
`sh axinstall` or `sh ./axinstall` (depending on your system).

You will be guided through the installation by a step-by-step procedure. During the installation you will be asked to select a print method; we suggest you choose LPD or, for more functionality, use the PROS filter or named pipe methods. Please refer to the following pages if you need guidance on the choice of print methods.

> Note: NLPRng is not supported by axinstall.

The *axinstall* script will suggest one of the systems listed below when started. If you do not find the suggestion appropriate, then manually select any of the systems listed.

```
1....SunOS 4 (SUN BSD, Solaris 1.x)
2....SunOS 5 (SUN SYS V, Solaris 2.x)
3....AIX (IBM RS/6000, BULL DPX 20)
4....HP-UX (HP 9000)
5....BOS (BULL DPX 2)
6....DEC OSF/1 (Digital Equipment, Alpha)
7....ULTRIX (Digital Equipment, DEC)
8....IRIX (Silicon Graphics, SGI)
9....SCO UNIX (Santa Cruz Operation)
10...SCO UnixWare 2.x
11...SCO UnixWare 7
12...SCO OpenServer
13...FreeBSD (Berkeley UNIX)
14...Linux

15...Generic BSD (Berkeley UNIX)
16...Generic SYS V R3 (UNIX System V Release 3)
17...Generic SYS V R4 (UNIX System V Release 4)
```

Systems supported by axinstall

Print Methods on TCP/IP Networks

The AXIS 5900 supports several different print methods in the TCP/IP environment. *axinstall* will suggest a print method suitable for your particular UNIX/Linux system, but you might want to use another method depending on your printing requirements (banner pages, status logging, etc).

The diagram below shows the alternative data paths taken by some of the UNIX/Linux print methods. This illustrates some of the advantages and limitations of the different methods. Use the following information to determine which method to adopt.
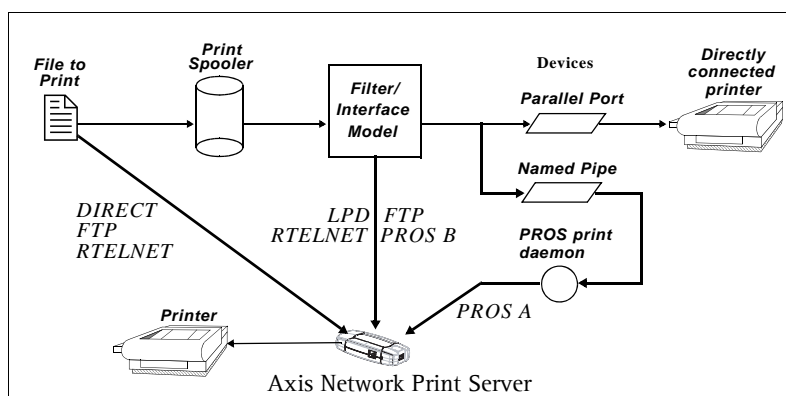
Illustration of different UNIX/Linux print methods

LPD   The Line Printer Daemon is a protocol for transferring print jobs between hosts. This is the recommended method for UNIX/Linux systems, but some System V versions do not support LPD.

> **Advantages:**
> Easy to set up — install the AXIS 5900 as a remote queue in System V, or add a remote printer to `/etc/printcap` using the `rm` and `rp` fields (BSD).

> **Limitations:**
> Spooler features, and `printcap` or `lpr` options (BSD) such as multiple copies, are not available.

FTP   The File Transfer Protocol is used for transferring files between hosts.

> **Advantages:**
> Uses industry standard network software on the host.

> **Limitations:**
> No printer status logging. In the case of BSD it may conflict with other input or output filters and does not allow both input and output filters. In System V no filters or interface programs can be used.

PROS	A protocol developed at Axis. Comes in two versions; *named pipe* (PROS A) and *filter* (PROS B).
PROS A Advantages	The AXIS 5900 appears as a device to the system. This makes all filter and model options available. It provides accounting and status logging. Supports bi-directional printing. The printer information read back can be viewed in a log file.
PROS A Limitations	A 'C' compiler is required to build the PROS A drivers.

Note:

> You can download a 'C' compiler from **http://www.gnu.org/**

PROS B Advantages	It provides accounting and status logging. Supports bi-directional printing. The printer information read back can be viewed in a log file.
PROS B Limitations	A 'C' compiler is required to build the PROS B drivers and in the case of BSD, it may conflict with other input or output filters. It does not allow both input and output filters. Interface programs can not be used in System V.
Reverse Telnet	Often used for printing via a terminal server printer port. Only recommended if you already have a Reverse Telnet driver installed.
Advantages:	Easy to set up with previously installed Reverse Telnet drivers.
Limitations:	No status logging. Drivers are not supplied with the print server. Existing drivers may be slow.
Other UNIX/Linux Systems	Most UNIX/Linux systems resemble either BSD or System V and so with some ingenuity, a solution can also be devised for other variants.

If the system has BSD socket type networking support, then `prosbsd` (in the `bsd` directory of the AXIS 5900) can be used as a starting point. It receives print data from `stdin`, and writes a log file to `stderr`. Nothing is written to `stdout`.

Alternatively, FTP may be used. It is a good idea to use `bsd/ftp_bsd` or `sysv/ftp_sysv` as a starting point.

IBM MVS Systems	A sample JCL script, `jclex`, is available in the `mvs` directory of the print server. It gives an example of how to print a file from an MVS mainframe to an AXIS 5900 using FTP.

Section 8   Adding Printers in OS/2

This section describes how to set up your print server for printing in the OS/2 environment.

Continue with the instructions presented in the table below:

Protocol	See ...
TCP/IP	*"TCP/IP Printing"* **on page 86**
NetBIOS/NetBEUI	*"NetBIOS/NetBEUI Printing in OS/2"* **on page 87**

TCP/IP Printing

Having assigned an IP address to the print server, you are now ready to install it for TCP/IP printing in the OS/2 environment. The print server supports LPR Printing using the lprportd service method.

Installing the Axis Network Print Server

Follow the instructions below to install the print server using the lprportd service method:

1. Open the **OS/2 System** window, select **TCP/IP** and **TCP/IP Configuration**.

2. Select **Printing**, type a number, e.g. 1, in the **Maximum number of LPD ports** field. The Remote print server and Remote print server's printer fields should remain empty.

3. Select **Autostart**, select **lprportd**, click the **Autostart** check box and select **Detached**.

4. Exit and Save.

5. Restart your OS/2 client.

Creating a Print Queue

Continue with the instructions below to create a print queue:

1. Open the **Template** group. Create an new printer from Templates by dragging the **Printer** icon to the desktop with the right mouse button.

2. Select a printer driver and double-click a free **Output port, for instance** \PIPE\LPD0.

3. Enter the host name or the IP address of the print server in the **LPD server** field.

4. Enter one of the print server's logical printer names, for example pr1, in the **LPD printer** field.

NetBIOS/NetBEUI Printing in OS/2

AXIS Print Utility for OS/2 is the tool to use for NetBIOS/NetBEUI printing in OS/2 environments. This tool can be fetched from **www.axis.com => Software => Discontinued products.** Install it if you have not already done so.

If you want to change the default name or any of the print server's default parameters, you can do so using any standard Web browser or WinOS/2 window under OS/2.

Refer to *"Management and Configuration"* on page 92, for more information.

The AXIS Print Utility for OS/2 is not needed on the client platforms when using a client-server configuration.

About AXIS Print Utility for OS/2

AXIS Print Utility for OS/2 is an application for NetBIOS/NetBEUI printing in the OS/2 environment. Its allows you to:

- Install and maintain the print server's printer port as an OS/2 printer port.
- Capture and monitor print jobs directed to the print server's ports.

Print jobs are directed through a spool directory located on your local hard disk (peer-to-peer mode), or on the file server (client-server mode). The printer port status of your print server can be monitored and pop-up notification messages can be generated, keeping you informed of completed print jobs or any problem condition.

Notes:

- The NetBEUI protocol must be active. If not, use MPTS/LAPS (LAN Server) or SETUP (LAN Manager) to activate it.
- If you are using OS/2 version 2.x and wish to print through TCP/IP, we recommend that you use the IBM TCP/IP for OS/2 product. It supports the LPD and interactive FTP print methods.

Installing the Axis Network Print Server

1. When AXIS Print Utility for OS/2 is running, click **Install** to install your Axis Network Print Server. The port appears in the list as <name>.LP1, where <name> is AX followed by the last six digits of your print server serial number. e.g. AX100086.LP1 or AX100086.LP2.

2. Select the LP1 port (or the LP2 port), then click **Install**.

Repeat this procedure for each server using the print server.

Note:

The AXIS Print Utility for OS/2 must be running in order to print through your Axis Network Print Server. It is strongly recommended that you modify the startup.cmd file, enabling AXIS Print Utility for OS/2 to automatically start when your client is re-booted. Instructions are available in the AXIS Print Utility for OS/2 Readme file.

**Creating
a Print Queue
(OS/2 version 2.x
and OS/2 Warp)**

1. Double-click the **Templates** folder, then drag the **Printer** icon out to the Workplace Shell (or into a folder) while holding the right mouse button down.

2. Type a name of your choice in the Name field.

3. Select \PIPE\<name>.LP1 (or LP2), from the Port list, and select a printer driver suitable for your printer from the Standard Printer list.

4. Click **OK** to confirm the printer definition.

**Sharing the
Print Queue**

A print queue must be made a shared resource before it can be accessed from other clients or servers. The following three examples show how you can share your printer resources:

Open an OS/2 window and issue the following command:

NET SHARE <queue_name> /PRINT

Where <queue_name> is the name of the queue created on the previous side.

To share a printer resource when using OS/2 Warp with IBM Peer service, follow the steps below:

1. Click the right mouse button on the printer object.

2. Select **Share** and then **Start sharing**. In the dialog box, enter a Description.

3. Select the check-box **Start sharing at LAN workstation start-up**.

4. Click **OK**.

To share a printer resource when using LAN server 4.0, follow the steps below:

1. Open **LAN Server Administration**.

2. Open your domain and then **Resource Definition**.

3. Drag and drop a printer from the template.

4. Enter the Alias name, select a Server name and the previously created Spooler Queue Name.

5. Click **OK**.

The setup is completed and you can now print through your print server.

Section 9 Updating the Firmware

Upgrading the Firmware

You can upgrade the AXIS 5900 firmware using one of the following methods:

- AXIS ThinWizard (TCP/IP)
- From the print server's internal Web pages (TCP/IP)
- FTP (TCP/IP)

Note:

Updating instructions are supplied with the firmware release notes.

Upgrading from the Print Server's Internal Web Pages

Follow these instructions to upgrade the firmware of your print server from its internal Web pages (flash loading over the Web):

1. Open your Web browser, enter the IP address of your print server and press **Enter**. (See *"Using a Web Browser for Print Server Management"* on page 92 for detailed instructions on accessing your Axis print server on the Web).

2. From the **Admin** mode, click the **Firmware Upgrade** button. From here you can upgrade your print server with the latest available firmware.

Upgrading using AXIS ThinWizard

AXIS ThinWizard 3.0 is a tool that enables batch upgrading of several print servers and can be used for upgrading the print server's firmware in TCP/IP networks.

Follow the instructions below to upgrade your print servers using AXIS ThinWizard:

1. Log in to AXIS ThinWizard.

2. Open the Network Group that contains the print server to be upgraded.

3. Click the **Firmware** button. The Firmware Wizard starts.

4. Browse through the upgrading tips and click **Next >** when you are done. Select **Latest Available Version**. Click **Next >**.

5. Select the servers you want to upgrade, by checking the correct upgrade boxes. Click **Next >**.

6. Enter the default User ID and Password of the servers you selected in the previous step. Select whether you want AXIS ThinWizard to verify the password immediately or when the upgrading job has started, by checking the appropriate box. Click **Next >**.

7. If you do not have a default password, just click **Next >**. If some of your servers use a different User ID or Password than the default entries, they will be displayed in the **Remaining servers** list. Enter the User ID and Password for each individual server. Click **Next >**.

8. Name the upgrade job. This is optional, so you can leave the field blank if you want. Click the **Start** button to start the upgrading job.
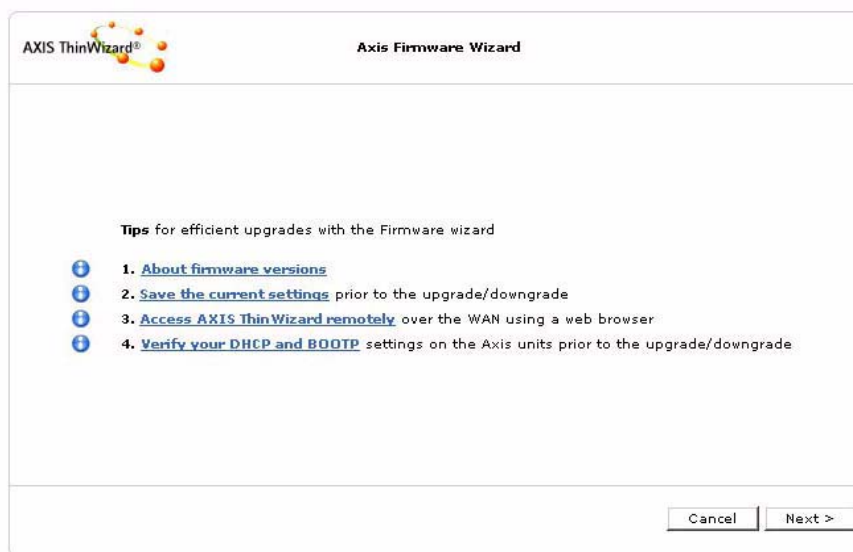
9. You can view the progress of the job in the Event Log.

Refer to *"Using AXIS ThinWizard for Print Server Management"* on page 107, for more information about AXIS ThinWizard.

Upgrading using FTP To upgrade over the network using FTP you will need a file with the new print server firmware. The name of this file is in the form `product_version.bin`.

Ensure that **FTP Enabled** is set to *yes*. To check this parameter, browse to the print server and select **Admin | Network Settings | Detailed View | TCP/IP Network.**

Caution!

> Be careful not to interrupt the file transfer. If the transfer is interrupted, the print server may have to be re-initialized by your dealer.

The objective of this example is to upgrade a print server to firmware version 7.00.

The description below from a typical Windows session uses the following *examples*:

- Print server model: AXIS 5900
- IP address of print server: 10.13.4.105
- New firmware version name: 5900p_v2_7_00.bin
- Location of firmware and upgrade procedure: c:\Axis

1. From www.axis.com, download the firmware and save it to a new directory on your computer, e.g. c:\Axis (if the directory does not exist, create it).

2. Open a command prompt from **Start => Run**. The Run window will appear. Type **cmd** and click **OK**. (Windows 98: Type **command** and click **OK**.) The DOS Command Prompt window will open.

3. Make sure you are working from the correct directory:
   type **cd c:\Axis** and press **Enter**.

4. Connect to the print server using ftp:
   type **ftp 10.13.4.105** followed by **Enter**.
   (Example using print server IP address 10.13.4.105)

5. Enter the user name, the default user is *root*. Press **Enter**. If the default password has been changed then it must also be entered. When you enter the password, it will not be echoed to the screen, nor will the cursor move.

6. Change to binary mode transfer.
   Type **bin hash** (or **binary hash**) and press **Enter**.

7. Use the **put** command to upload the upgrade file to the flash location:
   (Example using firmware named 5900p_v2_7_00.bin):
   Type **put 5900p_v2_7_00.bin FLASH** followed by **Enter**. (Note that FLASH is written in capital letters!) A stream of hash (#) marks will appear.

   Wait 30 seconds... You will receive a message stating *Transfer complete. Flash programming finished OK*. The print server will restart in five seconds running the new software.

   When you see a new **ftp prompt** the procedure has been completed successfully.

8. Type **bye** followed by **Enter** to end the ftp session.

Obtaining the Software

You can obtain all the print server firmware as well as the latest utility software from the following locations:

• http://www.axis.com
• your local dealer

Section 10   Management and Configuration

The management and configuration tools that are supported by the Axis Network Print Server allow you to:

- Change the print server parameters, i.e. editing the *config* file
- Receive extended information about the print jobs
- Receive printer port status
- Monitor your printers
- Reset the Axis Network Print Server to Factory Default

Configuration Overview

The method you should use to manage and configure your Axis Network Print Server depends on the operating system protocols of your network. The table below displays which method to use for each supported environment.

Operating System Protocols	Configuration/Management methods
WLAN, TCP/IP (UNIX, Windows, NetWare Pure IP, OS/2)	Web Browser - See page 92 AXIS ThinWizard - See page 107 FTP - See page 110 telnet - See page 112 SNMP - See page 114
IPX/SPX (NetWare)	Novell Utilities - See page 119
AppleTalk over TCP/IP	Web Browser - See page 92 AppleTalk_cfg method - See page 45 Mac-FTP - See page 110

Note:

> BOOTP and TFTP are powerful tools for configuring the Axis Network Print Server. Refer to the documentation for the BOOTP/TFTP server on your system for specific information.

Using a Web Browser for Print Server Management

Once you have established the Axis Network Print Server in the TCP/IP environment, as described in *"Assigning an IP Address to the Print Server"* on page 16, you are free to access the Axis Network Print Server Web pages from any standard Web browser.

The Web interface of the Axis Network Print Server is divided into two modes of operation, User mode and Admin mode:

User

In User mode you can change language, but you have no rights to change any other parameters. However, if you have access rights to the Admin mode, you can change some of the basic parameters from User mode via the Configuration Wizard. This mode is intended for regular users who are only interested in using the print server's interface for checking print jobs or viewing printer properties. If you want to change any other of the print server's settings, you must enter the Admin mode.

Admin   When in Admin mode, you have access to all the print server's parameters and you can change them to your liking. This mode is intended for network administrators and can be password protected to prevent unauthorized changing of the print server parameters.

Note:

> To protect the Admin pages from unauthorized use, it is highly recommended that you change the default password.
>
> This is done from the **Admin** | **General Settings** | **General** tab. Enter the password in the Root Password field.

Accessing the Web Pages   Follow the steps below to access the internal Web pages of the Axis Network Print Server:

1. Enter the print server's IP address (or host name) in the **Location/Address** field of your Web browser. Press **Enter**

2. The **Printer Overview** page will appear. Click Admin to access the Administration Web pages.

3. If you have changed the User/Password combination, you will be prompted for them. Click **OK**.

Note:

> • You can address the print server's Web interface via **https://** To do this you must enable the SSL/TLS protocols in the Web interface: **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** and set the **HTTPS Enabled** parameter to **Yes** (you must have a valid certificate loaded). If you do not have a valid certificate loaded, select **Admin** | **Security Settings** and click **Create.**

Available Services from the User Mode   The following services are available from the User mode. A link to the Axis home page is available from this mode.

Printer Overview   The Printer Overview page contains a section that allows you to view the general parameter setting of the Axis Network Print Server, including the print server name and the location of the print server in your organization, if defined.

By clicking the printer icon a printer page opens, allowing you to view the status and the supported capabilities of the connected printer. The extent of this information depends on the printer model. From the printer page, you can also print a test page to the printer.

Print Jobs   From the Print Jobs page you can view the status of the current print jobs, including the number of printed bytes and the origin of the print job. You can also view a log of the 20 latest print jobs that includes the user, the printing protocol and the file size. A log that displays the accumulated usage of the connected printers allows you to control the usage of the connected printers.

Help   The Help page presents you with basic information about the Axis Network Print Server and the Web user interface. A short description of the Axis installation tools you should use when installing a printer on your PC is also included.

Available Services from the Admin Mode   The following services are available from the Admin mode. An additional link to www.axis.com is available from this mode.

This Print Server   The **This Print Server** page contains a section that allows you to view and modify the general parameter setting of the Axis Network Print Server, including the print server name, the node address, the password and the base URL. You can also configure any of the eight logical printers of the Axis Network Print Server. Management operations, like restarting the Axis Network Print Server and resetting its parameters to the factory default settings, are also available.

Caution!

Any network configuration should involve the Network Administrator.

By clicking on the printer icon, a printer page opens, allowing you to view the status and the supported capabilities of connected printer. The extent of this information is depending on the printer model. From the printer page, you can also print a test page to the printer.

Print Jobs   From the **Print Jobs** page you can view the status of the current print jobs, including the number of printed bytes and the origin of the print job. You can also view a log of the 20 latest print jobs that includes the user, the printing protocol and the file size. A log that displays the

accumulated usage of the connected printers allows you to control the usage of the connected printers. To delete an ongoing print job, use the delete button next to the job.

Network Settings   From the **Network Settings** page you can set all parameters that control the network traffic to and from the Axis Network Print Server. You can enable or disable any of the supported network protocols and fine-tune the parameter settings. For additional information, see the Online Help pages.

Support   From the **Support** page you can receive help to resolve any installation or print problems that might occur. If your problems persist, the Support page allows you to produce a Server Report. The Server Report includes the settings of the Axis Network Print Server, information about your connected printers as well as the current network settings. The Server Report is of great value for support assistance, so please mail, email or fax it to your support channel together with a detailed problem description.

Statistics   The **Statistics** page displays information about the network traffic to and from the Axis Network Print Server as well as information about servers and services that are connected or associated with the Axis Network Print Server.

Help   The **Help** page displays a comprehensive description of the configuration and management activities that can be performed from the internal Web pages of the Axis Network Print Server. Theses activities include instructions on how to install the Axis Network Print Server in various environments and how to upgrade it with new firmware. A detailed index is also available.

Security Settings   On the **Security Settings** page you can enable or disable *SSL* (Secure Socket Layer - a protocol designed to provide secure communications on the Internet.) and *TLS* (Transport Layer Security, a protocol that guarantees privacy and data integrity between applications communicating over the Internet) You can also create secure certificates and disable/enable insecure protocols.

Whenever SSL/TLS is enabled, you have to address the print server's Web interface in the secure way, i.e. via **https://**

See *Enabling Secure Web Services − SSL/TLS*, on page 115 for a detailed description.

Parameter List   Shows all print server parameters and their current settings.

Restart   Restarts the print server.

Software Default
A Software Default will reset all print server parameters and settings to their default values **except:**

- Node address (NODE_ADDR.)
- IP Address (INT_ADDR.)
- DHCP enabled (DHCP_ENB)
- Installed certificate
- Private key

Also see *The Test Button*, on page 134 for instructions on performing a Factory Default.

Firmware Upgrade
Upgrades the print server's internal software.

Print Server Settings

Some useful settings that can be changed in the print server are described here. See the print server's **Help** pages for detailed information on all print server settings. For

Changing the Network Printer's 'Name'

From the print server's Web interface you can assign a user-friendly name to a network printer. This name will then show up under the 'Name' column in AXIS Print System and AXIS Wireless Printing Utility.

1. Log into the Axis Network Print Server internal Web pages and choose **Admin | This Print Server | General | Print Server Name**.

2. Enter the new name of the print server and click **OK**.

Changing the Network Printer's 'Location'

If you want to inform users about the physical location of a network printer, you can assign a descriptive location name to it. This name will then show up under the 'Location' column in AXIS Print System and AXIS Wireless Printing Utility.

1. Log into the Axis Network Print Server internal Web pages and select **Admin | This Print Server | General | System Location**.

2. Enter the location of the print server and click **OK**.

Language Setting

You can change the language of the print server's Web interface from the User mode. Available language options are English (default), French, German, Italian, Japanese and Spanish. Click **Language => Change** from the Web interface. Press F5 to refresh the view.

Character Setting

You can change the character settings from the User mode. Click **Language => Change** from the Web interface.

The available character sets are SHIFT_JIS, ISO-8859-1 and UTF-8. When choosing a character set, it is important that your Web browser uses the same character set as you print server. ISO-8859-1 is the default character set.

- For Japanese, SHIFT_JIS or UTF-8 should be used. SHIFT_JIS is default for Japanese.
- For other languages, use UTF-8 or ISO-8859-1.

Setting the e-mail Notification Parameters

In order to set the e-mail addresses of the people to whom the trouble-reports will be sent:

1. From your print server's internal Web page, go to: **Admin | Network Settings | Detailed View | e-mail Notification.** The following options will appear:

Options	E-mail recipient
Administrator e-mail Address	This address will be used as "Reply to"-address in the e-mails
PAPER JAM	The person responsible for handling paper jams in the printer
OUT OF PAPER	The person responsible for filling the printer with paper
TONER LOW	The person responsible for filling up the toner in the printer
NO TONER	The person responsible for changing the toner in the printer
PRINTER OFFLINE	The person responsible for the overall maintenance of printer

2. Enter the respective e-mail addresses of the trouble-report recipients in the blank fields as follows:
   name@company.com

3. Click **OK** and exit when done.

Important:

> The **SMTP Server** parameter in the print server's internal Web pages must be set so that it corresponds to the SMTP server used in your network! This is set in: **Admin | Network Settings | Detailed View | TCP/IP Network | SMTP Server.**

Network Speed

With the Network Speed parameter you can manually specify the speed at which you will send and receive network packages.

Ethernet Network

To change the Network Speed, log in to the print server's internal Web pages and click **Admin | General Settings | General**. From here you have the option of setting the network speed to:

Network Speed	
AUTO_SENSE (default value)	The print server detects which speed is optimal for each network package you transfer.
10_HALF__DX	10 Half Duplex
10_FULL_DX	10 Full Duplex
100_HALF_DX	100 Half Duplex
100_FULL_DX	100 Full Duplex

WLAN

To change the Network Speed, log in to the print server's internal Web page and click **Admin | Network Settings | Detailed View | WLAN**. From here you have the option of setting the network speed to:

Network Speed	
AUTO_SENSE (default value)	The print server detects which speed is optimal for each network package you transfer.
1 Mbps	
2 Mbps	
5.5 Mbps	
11 Mbps	

Note:

> The default Network Speed value is AUTO_SENSE. This option is the correct option for the majority of users. If you choose the incorrect network speed option for your network, you may lose contact with the print server. In order to reset the Network Speed parameter to AUTO_SENSE, you will have to perform a factory default on the print server.

Wireless Printing Check-list

Check the following before printing wirelessly. Click **Admin | Network Settings | Detailed View | WLAN** to check the print server settings.

- The Network Mode parameter must be set to Auto Sense or WLAN. This parameter is set on the Admin | General Settings page.

- To increase security, enable HTTPS before you set the WEP keys. HTTPS enabled requires that you install a certificate. See *Configuring the Axis Network Print Server for Wireless Printing*, on page 23

- Check that the WLAN network interface is properly configured in the workstation/laptop trying to access the Axis Network Print Server print server.

- All communicating clients must be in the same operating mode, i.e. ad hoc or infrastructure mode.

Note:

> In Macintosh environments, the **ad hoc mode** is referred to as **computer to computer mode** and the **infrastructure mode** is referred to as **Airport network.**

- Check that the SSID and the WEP keys are set according to your WLAN network settings. See *"WLAN Parameters"* on page 24 for more information.

- Check that the radio frequency channel setting is the same on all communicating clients and that the channel is set according to the requirements in your country.

Frequency Bands and Channels

Country	Frequency	Available Channels	Default Channel
Europe	2.412–2.472 GHz	1–13	11
France	2.457–2.472 GHz	10–13 (indoor use*)	11
Japan	2.484 GHz	14	14
USA/Canada	2.412–2.462 GHz	1–11	11

* (France) outdoor use permitted on private property with prior authorization

Using Logical Printers to Customize your Printing

The Axis Network Print Server has a powerful facility for altering the print data. This means that your desired print format can be realized on any type of printer. The following actions can be invoked from the Axis

Network Print Server:

- The character set can be changed to suit the printer
- Strings can be added before and after the print data
- Strings within the print data can be substituted
- ASCII to PostScript conversion
- Redirection of print data to another printer if the printer is busy
- Hex Dump mode to assist with printing problems

If any of these actions are required, a Logical Printer is used to change the print data before being sent to the printer port. There are eight logical printers (PR1-PR8) that can be set up to filter the print data.

The default logical printers settings are such that PR1-PR4 cause no change to the flow of print data, while PR5-PR8 add CR to LF control characters:

Logical Printer	Changes to data
PR1	no change
PR2	no change
PR3	no change
PR4	no change
PR5	add CR to LF
PR6	add CR to LF
PR7	add CR to LF
PR8	add CR to LF

Each logical printer can be set via the print servers' internal Web pages: Open a Web browser, enter the IP address of the print server in the Location/Address field and choose **Admin │ Logical Printer Settings**.

The logical printers can also be set up by editing the *config* file.

Notes:

- The examples in this section describe how you can configure the available logical printers using a standard Web browser. If you want to set them directly by editing the *config* file, just enter the values for the corresponding parameters.
- The examples should only be viewed as suggestions how to configure the logical printers. You should, off course, configure them according to the needs of your network.
- In the *The Parameter List*, on page 142, you can find a complete list of the Axis Network Print Server parameters.
- Refer to *"Management and Configuration"* on page 92, for more information about the available management tools.

Character Set Conversion

A common problem in a multiple host environment is that different hosts use different ASCII character sets. As a result of this, language specific characters (such as å ü ô ñ) are sometimes printed incorrectly.

The Axis Network Print Server solution to this problem is to assign a character set conversion filter to a logical printer, and then link that logical printer to the host causing the problem.

You select your desired conversion filter by setting the **Character Set Conversion** (PRx_CSET) parameter. The output from the conversion filter is always IBM PC Set 2 (Code Page 437), and this is the character set the printer must be set up for.

Example:

> Your network contains a host using the character set ISO 8859-2 and a host using the character set DEC. In order to direct their print jobs to the printer connected to the Axis Network Print Server, you should assign each host to a separate logical printer, and install a character set conversion filter.

Your network contains a host using the character set ISO 8859-2. In order to direct its print jobs to the printer connected to the Axis Network Print Server, you should assign the host to a separate logical printer, and install a character set conversion filter.

Follow the instructions below to change the conversion filter:

1. From the print server's internal Web page, select **Admin | Logical Printer Settings.**
2. Select the **PR1** tab.
3. Set the parameter **Physical Port** to **LPT1**.
4. Set the parameter **Character Set Conversion** to **ISO>IBM**.
5. Click the **OK** button.
6. Select the **Printer2** tab.
7. Set the parameter **Physical Port** to **LPT1**.
8. Set the parameter **Character Set Conversion** to **DEC>IBM**.
9. Click the **OK** button.

The ISO 8859-2 printer data that is sent to logical printer PR1 converts to IBM PC Set 2 and is printed on LPT1. Similarly, the DEC printer data that is sent to logical printer PR2 converts to IBM PC Set 2 and is printed on LPT1.

Adding Strings Before and After Print Jobs

These string functions provide a way to send printer control commands before and after each print job. They may be specified individually for each logical printer.

All strings are entered as hexadecimal byte values.

Example:

> Assume that the logical printer PR5 is configured as a PostScript printer and that you want to append the PostScript End of File character (hex 04) after each print job.

Follow the instructions below to add a string after the print job:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **Printer5** tab.

3. Enter the string **04** in the **String After Print Job** text field.

4. Click the **OK** button.

Example:

> You have an HP LaserJet printer with dual input bins, and want to print on pre-printed forms when using the logical printer PR4. The standard forms are taken from bin 1, and the pre-printed forms are taken from bin 2. The string before print job should contain the command to select bin 2, ^E_C14H (hex `1B 26 6C 34 48`), and the string after print job should contain the command to select bin 1, ^E_C11H (hex `1B 26 6C 31 48`).

Follow the instructions below to add strings before and after the print job:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **Printer4** tab.

3. Enter the string **1B 26 6C 34 48** in the **String Before Print Job** text field.

4. Enter the string **1B 26 6C 31 48** in the **String After Print Job** text field.

5. Click the **OK** button.

String Substitutions   The string substitution function performs search and replace operations on the print data. The primary application is to replace printer control commands. Up to twenty string substitutions may be specified individually for each logical printer.

All strings must be entered as hexadecimal byte values, and each match and substitute string must be preceded by a count byte.

You substitute command strings by editing the String Substitutions (PRx_STR) parameter.

Example:

> Assume that you want to replace the UNIX New Line (hex `0A`) with an ASCII NewLine (hex `0D 0A`) for logical printer PR1.

Follow the instructions below to substitute command strings:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **PR1** Webeb page.

3. Enter the string **01 0A 02 0D 0A** in the **String Substitutions** text field.

Hex Code	Explanation
01	length of the string you want to replace
0A	the string you want to replace
02	length of the substitute string
0D 0A	the substitute string

4. Click the **OK** button.

This is the default setting for logical printers PR5 through PR8.

Example:

> Assume that you want to replace the UNIX New Line (hex 0A) with an ASCII NewLine (hex 0D 0A), and the printer command $^{E}_{C}$G1 (hex 1B 47 31) with $^{E}_{C}$Y (hex 1B 59) for logical printer PR2.

Follow the instructions below to substitute command strings:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **Printer2** tab.

3. Enter the string **01 0A 02 0D 0A 03 1B 47 31 02 1B 59** in the **String Substitutions** text field.

Hex code	Explanation
01	length of the UNIX New Line command
0A	the UNIX New Line command
02	length of the ASCII New Line command
0D 0A	the ASCII New Line command
03	length of the replaced printer command
1B 47 31	the replaced printer command
02	length of the new printer command
1B 59	the new printer command

4. Click the **OK** button.

Note:

> Extensive use of string substitutions will naturally decrease the throughput rate of the Axis Network Print Server.

ASCII to Postscript Conversion

The Axis Network Print Server logical printers can translate ASCII print data into PostScript format. This makes it possible to print with a PostScript printer from a host that does not support PostScript. The conversion is selected by activating a filter that converts ASCII data into Postscript. This filter can be activated individually for each logical printer.

Activate your desired filter by setting the Printing Language Translation (PRx_FILT) parameter.

Example: Follow the instructions below to convert ASCII print data to PostScript for logical printer PR2:

1. From the print server's internal Web page, select **Admin | Logical Printer Settings.**

2. Select the **Printer2** tab.

3. Set the **Printer Language Translation** parameter to **POSTSCR.**

4. Click the **OK** button.

If you select the parameter value **AUTO_PS,** the print data for every print job is searched and if any ASCII data is found, it is translated into PostScript. This setting is recommended if you are not sure if the print data is ASCII or PostScript.

PostScript Settings   When a logical printer is set for PostScript conversion, you must specify the following:

- page size
- page orientation
- page formats
- which font is to be used

The default page size is A4 and the default page orientation is Portrait, while the page format parameters are as follows:

Page Format Parameter	Default Value	
Lines per page	66	
Characters per line	0	0=disable line wrap
Characters per inch	10.0	
Lines per inch	60	60 = 60 lines per inch
Left margin	30	30 = 3.0 mm
Top margin	50	50 = 5.0 mm

The PostScript font can be any font that is installed in the printer; if no font is specified, Courier will be used.

Example: Follow the instructions below to set the PostScript parameters for logical printer PR2:

1. From the print server's internal Web page, select **Admin | Logical Printer Settings.**

2. Select the **Printer2** tab.

3. Set the **Printer Language Translation** parameter to **POSTSCR.**

4. Set the **PostScript Page Size** parameter to **LETTER.**

5. Set the **PostScript Page Orientation** parameter to **LANDS.**

6. Enter the string **48 0 120 60 30 50** in the **PostScript Page Format** text field.

Hex code	Explanation
48	48 lines per page
0	disable line wrap
120	12 characters per inch
60	6 lines per inch
30	3 mm left margin
50	5 mm top margin

7. Enter the string **Helvetica** in the **PostScript Font** text field.

8. Click the **OK** button.

Redirecting Print Jobs when a Printer is Busy

If print data is received for a printer that is already busy, the host must wait. However, it is possible to use a logical printer to redirect the print data to another logical printer when the target printer is busy. If the second printer is also busy, the host must wait until the target printer is ready.

Example: Follow the instructions below to redirect PR1 print jobs to PR3, when the printer assigned to PR1 is busy:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **Printer1** tab.

3. Set the **Physical Port** parameter to **LPT1**.

4. Set the **Secondary Printer** parameter to **PR3**.

5. Set the **Wait On Busy** parameter to **NO**.

6. Click the **OK** button.

7. Select the **Printer3** Web page.

8. Set the **Physical Port** parameter to **LPT2**.

9. Click the **OK** button.

Notes:

- The two printers must use the same printer driver.
- Logical Printer redirection cannot be nested. If PR3 is redirected to another logical printer, the print job will not be redirected if PR3 is busy.
- If both printers are busy, the print job will be printed on the printer that first finishes its active print job.

Read-back of Information

The Axis Network Print Server supports bi-directional printing. The information from the printer is read back on the parallel port when the parameter Read Back Port (PRx_IN) has the default setting of AUTO. However, it is required that the printer also supports bi-directional printing.

Please refer to your printer documentation for further details regarding bi-directional printing support.

Example:

Follow the instructions below to disable the bi-directional communication for logical printer PR1:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **PR1** tab.

3. Set the **Read Back Port** parameter to **NONE**.

4. Click the **OK** button.

Debugging using the Hex Dump Mode

When hex dump mode is activated, the print data is printed as hexadecimal byte values rather than characters; printer control commands are also printed as hex values. This allows you to inspect what control and print characters are being sent to the printer, which is a useful debugging facility for the more difficult printing problems.

Example:

Follow the instructions below to activate the hex dump mode for PR3:

1. From the print server's internal Web page, select **Admin** | **Logical Printer Settings.**

2. Select the **Printer3** tab.

3. Set the **Hex Dump Mode Enabled** radio button to **YES**.

4. Click the **OK** button.

Note:

The page length for hex dump printouts is determined by the lines per page value of the PostScript page format parameter.

Using AXIS ThinWizard for Print Server Management

AXIS ThinWizard software allows you to manage and upgrade **multiple** Axis products. Using a standard Web browser, you can find, install, monitor, configure and upgrade your Axis print servers remotely in any TCP/IP network (WLAN or LAN). AXIS Thin Wizard 3.0 is Windows 2000 / XP / 2003 compatible.

Installing AXIS ThinWizard

AXIS ThinWizard software is available on www.axis.com
You should only install AXIS ThinWizard on a designated computer on your network.

To install, follow the instructions given by the Installation Wizard. During the installation, you will be asked to enter a user id and a password – these will be used when logging in to AXIS ThinWizard, so please take a note of them.

Starting AXIS ThinWizard

If AXIS ThinWizard is installed on the workstation you can access its Web interface via **Start** | **All Programs** (using Windows XP; on Windows 2000: **Start** | **Programs**). If it is installed on another computer, follow the instructions below:

1. Make sure that the computer where you installed the AXIS ThinWizard is up and running on your network.

2. Start a Web browser on a client in your network.

3. Enter the IP address or the host name of the computer where you installed AXIS ThinWizard. (If the server is installed on another port than 80, you must enter the port name after the host name or the IP address).

4. The AXIS ThinWizard start page now appears in the Web browser. Enter the user id and password you specified during installation and click **Log in**.

5. The AXIS ThinWizard interface appears:
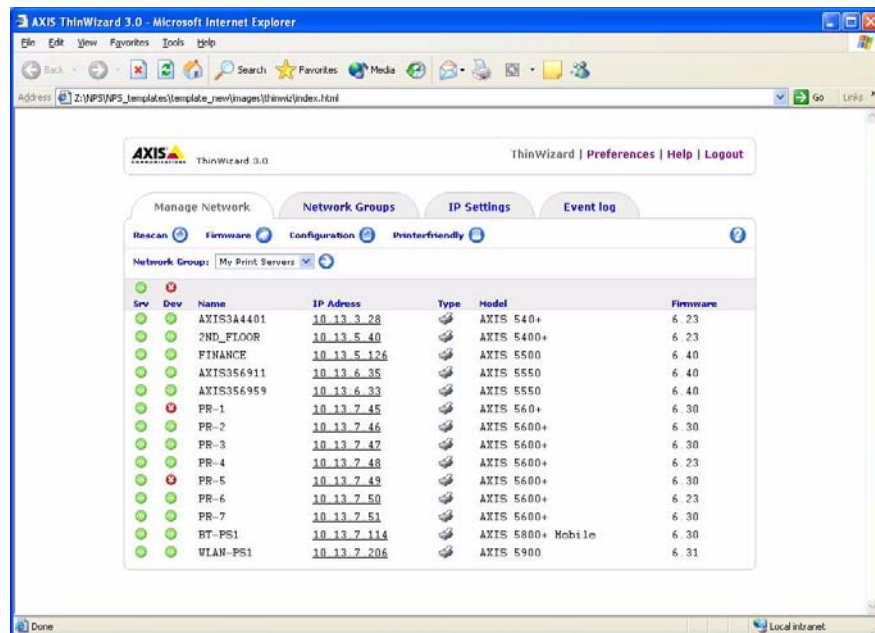
Important!

> These parameters must be enabled in the print server's Web interface for AXIS ThinWizard to function properly:
>
> • FTP_ENB (FTP enabled): click **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** | **FTP Enabled => Yes.**
>
> • SNMP_ENB (SNMP Enabled): click **Admin** | **Network Settings** | **Detailed View** | **SNMP** | **SNMPv1 Enabled => Yes**
>
> These parameters are enabled by default in the print server.

The first time you use AXIS ThinWizard, set the **Preferences** to reflect your network environment:

Select a network group from the list on the **Manage Network** page. If the list is empty, you must first create a group. Click the **Network Groups** tab and follow the instructions.

Creating a Network Group in AXIS ThinWizard

The network group concept is the corner stone of AXIS ThinWizard. By dividing your network into network groups, you can monitor your print servers more efficiently. The scope of each network group is determined by the Axis server types and IP address ranges that are included. You can create as many network groups as you want.

Follow the instructions below to create a network group:

1. Click **Network Groups** in the AXIS ThinWizard main menu.

2. Click **Create**.

3. The Create Network Group page opens. Type the name of the network group, enter the IP address ranges and Axis server types that should be included. If you are only interested in managing print servers, deselect all options but the **print server** option.

4. Click **OK** to create the network group.

You can edit the properties of each network group from the Network Groups page. Simply select the network group from the list and use one of the **Edit, Copy** or **Remove** commands.

Managing Print Servers

Follow the instructions below to access the print server using AXIS ThinWizard:

1. Click **Manage Network** in the main menu.

2. Select the network group, including the, from the drop-down list. All AXIS servers included in the network group appear in the window.

3. Click the link of the AXIS 5900 to access its internal Web page.

4. The 'Srv' and 'Dev' columns show the status of your print servers and printers.

Changing the IP Settings

Using AXIS ThinWizard you can also set or change each print server's IP parameters.

1. Click **IP Settings** in the main menu.

2. Select print server in the list.

3. Enter your data: IP address, Subnet mask, Default gateway and the print server's password (default password is **pass**).

4. Click **Set** to save your settings.

5. Click **Rescan** to update AXIS ThinWizard and see the changes.

If Your Print Server is not Shown in the List

If your print server is not shown in the list, click "**Click here…**". By entering the serial number of the print server (found on the underside label) you will be able to set the print server's IP parameters. Example: *00408c181cf0*

Upgrading Axis Servers

Refer to *"Using AXIS ThinWizard for Print Server Management"* on page 107 for more information about upgrading Axis servers using AXIS ThinWizard.

Multiple Configuration and Installation

Using AXIS ThinWizard it possible to change the settings of several Axis servers simultaneously. It is also possible to copy the configuration from one server to another. This is a convenient way to install a new server, based on the settings of an already existing server.

For additional information, please refer to the AXIS ThinWizard online help.

Using FTP for Print Server Management

Having assigned an IP address to your Axis Network Print Server, as described in *"Assigning an IP Address to the Print Server"* on page 16, you can change the Axis Network Print Server parameter settings using the File Transport Protocol (FTP).

Ensure that **FTP Enabled** is set to *yes*. To check this parameter, browse to the print server and select **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network**.

Editing the *config* **file**   Follow the instructions below to edit the *config* file using FTP:

1. Log in to the Axis Network Print Server by typing:
    ```
    ftp <host name>
    ```
    - or -
    ```
    ftp <IP address>
    ```
    in a Command window (Windows and OS/2) or in a Mac/UNIX/Linux Terminal.

2. Enter the user id and the password. (The default entries are `root` and `pass`.)

3. Download the *config* file to your host by typing:
    ```
    get config
    ```

4. Edit the file using your preferred text editor.

5. Save the *config* file to the Axis Network Print Server by typing:
    ```
    put config CONFIG
    ```

Notes:

> • It is important that the destination file is specified in capital letters. Otherwise the edits are temporary and will be lost once the Axis Network Print Server has been powered down.
>
> • To edit the *config* file from a Macintosh you will need FTP support such as MacTCP, Fetch or Anarchie. The procedure for editing the file is the same as described above.

The example on the next page shows how to upload and download the *config* file using FTP from a DOS window.

Example:

```
> ftp npserver
connected to npserver.
220 Axis Network Print Server FTP Print Server v7.00
Sep 06 2004 ready.
Name (npserver:(none)): root
331 User name ok, need password
Password: pass        (not visible)
230 User logged in
ftp> get config
200 PORT command successful.
150 Opening data connection for config
(192,36,253,4,13,223), (mode ascii).
226 Transfer complete.
8588 bytes received in 0.24 seconds (35.63 kbytes/s)
ftp> put config CONFIG
200 PORT command successful.
150 Opening data connection for CONFIG
(192,36,253,4,13,223), (mode ascii).
226 Transfer complete.
8588 bytes received in 0.45 seconds (19.04 kbytes/s)
ftp> bye
221 Goodbye.
>
```

Viewing the *Status* File

The status command shows which printer port the logical printers are assigned to, and their current status.

Follow the instructions below to view the *status* file using FTP:

1. Log in to the Axis Network Print Server by typing:
   ftp <host name> or ftp <IP address> in a DOS window (Windows and OS/2) or in a UNIX shell window.

2. Enter the user id and the password. (The default entries are root and pass.)

3. Download the *status* file to your host by typing:
   get status

4. View the status file using your preferred text editor.

Viewing the *Account* File

The *account* file contains data concerning the ten last print jobs. It specifies an internal job number, the user that initiated the job, the protocol and logical printer that was used, current status (Completed, Off-line, or Printing), number of bytes printed, elapsed time and off- line time.

Follow the instructions below to view the *account* file using FTP:

1. Log in to the Axis Network Print Server by typing:
   `ftp <host name>` or `ftp <IP address>` in a DOS windows (Windows and OS/2) or in a UNIX shell window.

2. Enter the user id and the password. (The default entries are `root` and `pass`.)

3. Download the *account* file to your host by typing:
   `get account`

4. View the *account* file using your preferred text editor.

FTP Help   By typing `help` in step 3 in the FTP instruction sets above, a list of all available files and commands will be displayed.

Using Telnet for Print Server Management

Having assigned an IP address to your Axis Network Print Server, as described in *"Assigning an IP Address to the Print Server"* on page 16, you can manage your Axis Network Print Server using the telnet protocol.

Viewing the *Account* File   The *account* file contains data concerning the last ten print jobs. It specifies an internal job number, the user that initiated the job, the protocol and logical printer that was used, current status (Completed or Printing), number of bytes printed and elapsed time.

Follow the instructions below to view the *account* file using telnet:

1. Log in to the Axis Network Print Server by typing:
   `telnet <host name>` or `telnet <IP address>` in a DOS window (Windows and OS/2) or in a UNIX shell window.

2. Enter the user id and the password. (The default entries are `root` and `pass`.)

3. View the *account* file by typing:
   `account`

The following example shows how to view the *account* file using Telnet from a UNIX shell.

Example:

```
> telnet npserver
Trying 192.36.253.96...
Connected to npserver.
Escape character is '^]'.


Axis Network Print Server TELNET Print Server v7.00 Sep 06 2004


Axis Network Print Server network login: root
Password: pass                (not visible)


Axis Network Print Server TELNET Print Server v7.00 Sep 06 2004


Root> account
Current account file:
JOB            USER         PROT        LPR S BYTES      ETIME


1              Thomas       FTP         pr2 C 1885       2
2              Lisa         LPT         pr1 C 23074      4
3              RICHARD      PSERVER     pr2 C 43044      5
4              MacUser      APPLE       pr1 C 6717       2
5              LSLM_user    NetBIOS     pr2 C 36995      3
6              patrick      PROS        pr5 P 83208      9
Root>
```

Typical Telnet session to view the *Account* File

Viewing the *Status* file The status command shows which printer port the logical printers are assigned to, and their current status.

Follow the instructions below to view the *status* file using telnet:

1. Log in to the Axis Network Print Server by typing:
    `telnet <host name>` or `telnet <IP address>` in a DOS windows (Windows and OS/2) or in a UNIX shell window.

2. Enter the user id and the password. (The default entries are `root` and `pass`.)

3. View the *status* file by typing:
    `status`

Performing Resets Three types of reset commands allow you to perform soft resets, to perform hard resets, and to reset the print server's parameters to its factory default settings.

Follow the instructions below to perform a soft reset using telnet:

1. Log in to the Axis Network Print Server by typing:
    `telnet <host name>` or `telnet <IP address>` in a DOS windows (Windows and OS/2) or in a UNIX shell window.

2. Enter the user id and the password. (The default entries are `root` and `pass`.)

3. Restart the print server's protocols by typing:
   `softreset`

   Replace the command in step 3 above with `hardreset` or `default` to perform the other two reset operations.

Telnet Help By typing `help` in step 3 in any of the Telnet instruction sets above, a list of all available commands will be displayed.

Using SNMP for Print Server Management

You can use SNMP (Simple Network Management Protocol) for remotely monitoring and configuring of the Axis Network Print Server. All major functions for print servers are supported.

General Information SNMP refers to a set of standards for network management, including a protocol, a database structure specification, and a set of data objects. The Axis Network Print Server SNMP implementation runs in the TCP/IP environment.

The management is handled by NMS (Network Management System) software running on a host on your network. The NMS software communicates with network devices by the means of messages, which are references to one or more objects.

A message can be a question or an instruction to a device, or an alarm triggered by a specific event in a device. Objects are contained in data bases called MIBs (Management Information Base), where MIB-II is a standard database.

The Axis Network Print Server supports all relevant parts of MIB-II and also includes a private enterprise MIB. Refer to *The AXIS MIB,* on page 115.

System Requirements for SNMP The following requirements must be fulfilled in order to make full use of the Axis Network Print Server SNMP support:

- NMS software that allows you to install private enterprise MIBs
- A host, supporting FTP, on which to run the NMS software

Follow these steps to add the AXIS MIB to your NMS software:

1. Log in to the Axis Network Print Server using FTP.

2. Download the MIB file */snmp/axis.mib* to the NMS host.

3. Install the AXIS MIB according to instructions in your NMS software documentation.

The AXIS MIB The AXIS MIB contains a large number of objects which may be categorized as follows:

- Menu objects - used for viewing and changing the Axis Network Print Server configuration from the NMS program. Refer to *The Parameter List*, on page 142.
- Printer status and unit administration objects - used for monitoring Axis Network Print Server print jobs and storing parameter changes permanently.
- Trap objects - used for alarms at various error conditions.

For technical details, you can view the MIB file (*axis.mib*) with any text editor.

SNMP Device Index When using the TCP/IP protocol (and if the printer driver permits), the print server can use **SNMP Status** to find out if the printer is ready to accept a new job. See *"SNMP Device Index"* on page 147.

Enabling Secure Web Services — SSL/TLS

In a new and unconfigured Axis Network Print Server, SSL/TLS is disabled.

Certificates To use SSL/TLS you have to create or obtain a digital certificate. There are two kinds of certificates: self-signed certificates and third party certificates.

- Self-signed certificates are less secure but normally they are sufficiently secure for small networks with no public access. You generate such a certificate yourself and there are no fees to pay.
- For large networks and for networks with public access, third party certificates from a trusted source are normally used. You obtain them for a yearly fee from a Certificate Authority (CA).

Among other things, a certificate gives information about which domain it is issued for, its validity and the name of issuer. With SSL/TLS enabled, the installed certificate authenticates the print server to the client and all information exchanged between them will be encrypted.

Enabling SSL via the Web Interface You enable the print server's secure Web services through its internal Web pages. If you have a valid certificate loaded, select **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** and set the **HTTPS Enabled** parameter to **Yes**.

If you do not have a valid certificate loaded, select **Admin** | **Security Settings** and click **Create**.

Decide whether you want to generate a self-signed certificate or if you want to generate a certificate request.

Generating a Self-Signed Certificate

1. Select the **Generate Self-Signed Certificate** radio button and click **Next**.

2. Enter the data asked for:

- Country Name: *Example*: US
- State or Province Name: *Example*: California
- Locality Name: *Example*: Los Angeles
- Organization Name: *Example:* Printers Inc
- Organizational Unit Name: *Example:* Sales Dept
- Common Name*: *Example:* printserver2@company.com
- Current Date (yyyy/mm/dd): *Example:* 2004/09/28
- Validity Duration (in days): *Example:* 365
    * Common Name denotes the name given to the print server in the network. If you do not have a DNS server on your network, you must include the domain name, e. g. xxx@company.com

3. Click **Finish** and the print server will generate a public/private key pair as well as the self-signed certificate itself (this process will take a few minutes) and store these data in the print server. When the certificate is generated, the print server automatically loads it into your present browser session. The browser reports the new state by changing into https mode.

4. In the browser's Security Alert box, select **View Certificate** and **Install Certificate**. Follow the instructions of the Install Certificate Wizard.

Generating a Certificate Request

1. Select the **Generate Certificate Request** radio button and click **Next**.

2. Enter the data asked for:

- Country Name: *Example:* US
- State or Province Name: *Example:* California
- Locality Name: *Example:* Los Angeles
- Organization Name: *Example:* Printers Inc
- Organizational Unit Name: *Example:* Sales Dept
- Common Name*: *Example:* printserver2@company.com
- Current Date (yyyy/mm/dd): *Example:* 2004/09/28
- Validity Duration (in days): *Example:* 365
    * Common Name denotes the name given to the print server in the network. If you do not have a DNS server on your network, you must include the domain name, e. g. xxx@company.com

3. Click **Finish**.

4. Now the print server will generate a public/private key pair and a PEM-encoded Certificate Request, called *cert.pem*. Click **Save**, **Save this file to disk** and **Save**.

5. Send this Certificate Request to your Certificate Authority for their signature.

Importing a Certificate

When you receive the PEM-encoded certificate from your Certificate Authority, open the print server's Web interface and select **Admin | Security Settings**. Click **Import** and follow the instructions on the screen.

Accessing the Print Server's Web Pages over https://	Whenever SSL/TLS is enabled, you can only reach the print server's Web interface through the secure services. The unsecure way via http:// is closed and now you have to address the print server's Web interface in the secure way, i.e. via https://.

Disabling Insecure Protocols	To further increase security, you <u>must</u> disable protocols that are considered insecure;

- FTP (used by AXIS ThinWizard. If FTP is disabled, AXIS ThinWizard can not function properly.)
- Telnet
- Auto-IP
- DHCP
- BOOTP
- Remote Config (used by AXIS NetPilot)
- SNMP Configuration (also used by AXIS ThinWizard. Note that if SNMP is disabled, AXIS ThinWizard can not function properly.)

To disable these protocols, go to **Admin │ Security Settings │ Protocol Settings │ Detailed View** and mark the check boxes. Click **OK** to finish. *Only enabled protocols will be visible from this view!*

To enable these protocols, select **Admin │ Network Settings │ Detailed View │ TCP/IP Network** for FTP, Telnet, AutoIP, DHCP and BOOTP. Remote Config is enabled via **Admin │ General Settings │ RConfig Support**.

Important:	To ensure maximum security, it is highly recommended that you change your Administrator password after generating a certificate and disabling insecure protocols! This is done from **Admin │ General Settings │ Change => │ General │ Root Password**.

Checking SSL/TLS Status	To check SSL/TLS status, open the print server's Web interface and select **Admin │ Network Settings │ Detailed View │ TCP/IP Network** to see if the **HTTPS Enabled** parameter is set to Yes or No.

To View a Certificate	To view a Certificate, open the print server's Web interface, select **Admin │ Security Settings** and click **View** next to the Certificate.

|	
To Delete a Certificate	To delete a Certificate, open the print server's Web interface, select **Admin │ Security Settings** and click **Delete** next to the Certificate.

Enabling the SNMPv3 Protocol

Invoke the print server's Web interface to enable the SNMPv3 protocol.

1. Select **Admin** | **Network Settings** | **Detailed View** | **TCP/IP Network** and ensure that **HTTPS Enabled** is set to **yes** to guarantee a secure configuration.
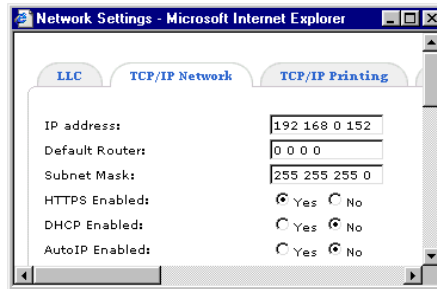
Note: You must have a valid certificate loaded to be able to enable HTTPS. See *"Enabling Secure Web Services – SSL/TLS"* on page 115.

2. Select **Admin** | **Network Settings** | **Detailed View** | **SNMP** and set **SNMPv3 Enabled** to **yes**.
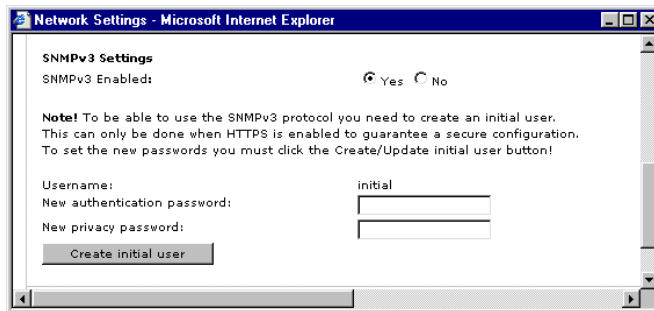
3. Create an **initial user** by entering two new passwords: one authentication password and one privacy password. Each password must consist of at least 8 characters.

4. Click the **Create initial user** button.

Now your print server is ready to accept communication according to the SNMPv3 protocol. For further management you will need an SNMPv3 management application; you use this application to configure the print server, to create new user accounts and to control access to it. Also see *"Using SNMP for Print Server Management"* on page 114.

To Update the Initial User

To update the initial user, select **Admin** | **Network Settings** | **Detailed View** | **SNMP**, enter the two passwords (one for authentication and one for privacy) and click the **Update initial user** button.

Using Novell Utilities for Print Server Management

After installing the Axis Network Print Server into the NetWare environment, you can manage your Axis Network Print Server, using either Novell's NetWare Administrator, or PCONSOLE (Not available in NetWare version 5.x or higher).

NetWare Administration Some useful features provided by the NetWare Administrator are described in more detail below:

Printer Status The Printer Status menu, detailed below, shows the status of an active print job serviced by an Axis Network Print Server network print server. It displays detailed information concerning the active job including, Print Queue, print job description, size of print file, percentage of job completed, etc. You can also abort or pause the print job from this menu.
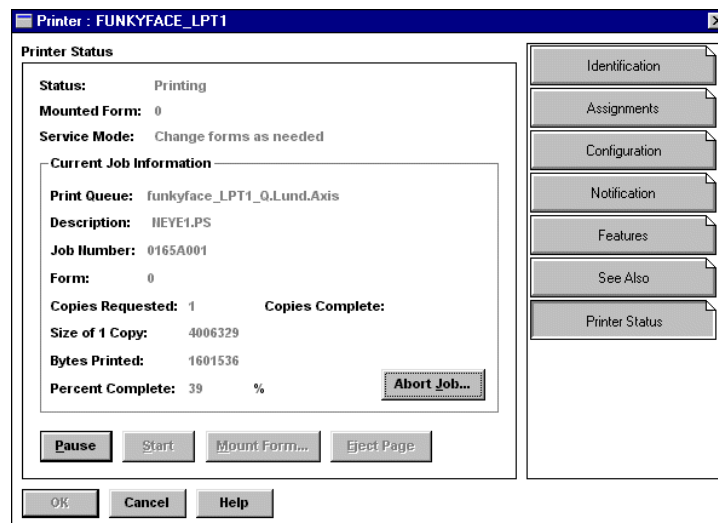
NetWare Administrator Printer Status Menu

Notification You can use the NetWare Administrator to enable or disable status notification messages for printers connected to the Axis Network Print Server, e.g. Busy, Off-line, Out of paper, Paper jam, etc. You can also add or remove print job owners and administrators from the list of persons to be notified.

Print Layout   You can view installed Axis Network Print Server Network Print Servers and their relative print queues for any NetWare Organizational Unit. You can also display summary information by right-clicking on the printer object you want to examine.
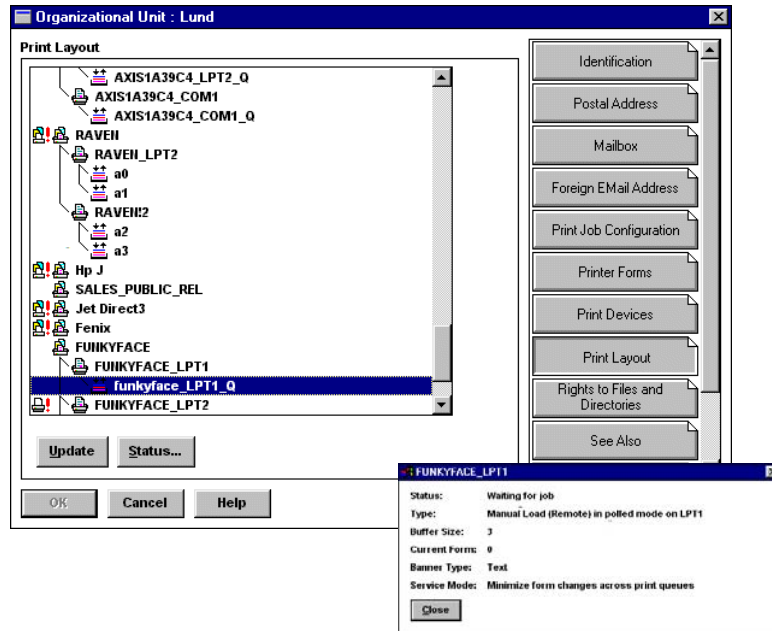
NetWare Print Layout with corresponding information summary

NetWare Packet Signature Levels

NetWare Packet Signatures protect servers and clients using the NCP (NetWare Core Protocol) services and prevent packet forgery by requiring the server and the client to sign each NCP packet.

There are two levels of NCP Packet Signature: the Server Level and the AXIS Print Server Level (also know as the Workstation Level).

Server Levels Server packet signature levels are assigned by a new SET parameter:
SET NCP PACKET SIGNATURE OPTION = n

Key to Server Levels	Explanation
0	Server does not sign packets (regardless of the print server level)
1 (default)	Server signs packets only if the print server requests it (print server level is 2 or higher)
2	Server signs packets if the print server is capable of signing (print server level is 1 or higher)
3	Server signs packets and requires the print server to sign packets (or logging in will fail)

Print Server Levels Print server signature levels are assigned by a new NET.CFG parameter
SIGNATURE LEVEL = n

Key to Print Server Levels	Explanation
0	Print server does not sign packets
1 (default)	Print server signs packets only if the server requests it (server option is 2 or higher)
2	Print server signs packets if the server is capable of signing (server option is 1 or higher)
3	Print server signs packets and requires the server to sign packets (or logging in will fail)

Regardless of server level, the AXIS print server has the capability to log in in Print Server Mode since it supports NCP Packet Level 3 (which is the most restrictive).

These procedures are taken care of automatically. There are no configurable parameters in the Print Server for choosing the NCP Packet Signature Level. The AXIS print server adapts itself to the Server Level.

TCP/IP Restrictions

In a new and unconfigured Axis Network Print Server any user is allowed to send TCP/IP print jobs. Using a restriction list you can reject TCP/IP printing from specified IP addresses.

Enabling TCP/IP Restrictions In the print server's Web interface, select **Admin | Network Settings | Detailed View | TCP/IP Printing**.
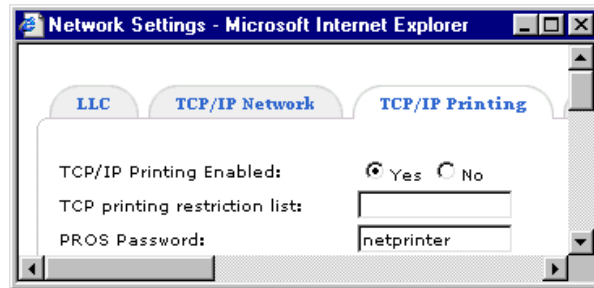
Print jobs from IP addresses specified in the **TCP printing restriction list** will be rejected. Comma delimited IP addresses as well as ranges of IP addresses can be entered.

Examples:
192.168.0.10 will reject print jobs from IP address 192.168.0.10.

192.168.0.12, 192.168.0.32 will reject print jobs from IP addresses 192.168.0.12 and 192.168.0.32.

192.168.0.40-192.168.0.79 will reject print jobs from IP addresses within the range 192.168.0.40 − 192.168.0.79.

Disabling TCP/IP Restrictions Empty the **TCP printing restriction list** to remove the restrictions. This is the default setting.

Section 11 IPP – Internet Printing Protocol

The Axis Network Print Server enables printing over the Internet with IPP (Internet Printing Protocol), an industry standard that allows users to print to remote printers across the Internet.

With IPP, a user with an Internet connection can send a document to any printer which is connected to the Internet. IPP is platform independent and can be used to print over any LAN or WAN that supports TCP/IP.

In practical terms, this means that you can send documents to a remote printer as an addition to or replacement of fax and e-mail, with the same quality and color options of traditional network printing.

IPP clients An *IPP client* needs to be installed on your computer together with an appropriate printer driver for proper IPP functionality. The IPP client is a tool that adds destination printers to your printer list.

The Axis Network Print Server with integrated IPP is compatible with any 1.0 and 1.1 compliant IPP client.

The Axis Network Print Server presents IPP printer objects to the client, one for each printer port. Some of the most common IPP client printing methods are described below. Please refer to your IPP client documentation for more specific information.

Currently Available IPP Clients on the Market:

- **For Windows 2000/XP/2003:** the Microsoft IPP Client (automatically installed with the Operating System).
- **For Windows 98/NT:** IPP clients can be downloaded from the Microsoft Web site.
- **For UNIX/Linux:** CUPS (can be downloaded from the Common Unix Printing System Web site at www.cups.org).
- If you wish to print using iPrint over IPP, use AXIS IPP Gateway Configuration Snap-in for iPrint in NetWare 5.x. It is available on www.axis.com (Support | Select Software). See its read-me file for installation instructions.
- **For Windows NT/2000:** the Internet Printer Connection software from Hewlett Packard (can be downloaded from the Hewlett Packard Web site).

IPP Printing Requirements

Before you print to an IPP printer you need to know:

- **the address** of the print server.
- **the brand and model of the printer** in order to install the appropriate printer driver.

Address Schemes for IPP Printers

When using IPP printing, you need to know the IP address or host name of your Axis print server. IPP is a client/server type protocol which comprises two industry standards:

- the 1.0 standard, which uses an http:// address scheme
- the 1.1 standard, which uses an ipp:// address scheme

Example using a Host Name in the 1.0 Standard

If "axisps" is the host name of the print server, "631" is the port number and "LPT1" is the local printer port name, then the syntax of the address scheme will be **http://axisps:631/LPT1** in the 1.0 standard.

Example using an IP Address in the 1.1 Standard

If "171.16.5.218" is the IP address of the print server and "LPT1" is the local printer port name, then the syntax of the address scheme will be **ipp://171.16.5.218/LPT1** in the 1.1 standard.

IPP User Requirements

The IPP protocol does not require any special configuration of the Axis Network Print Server, the IPP function is automatically activated when you install your print server.

IPP is platform independent and functional in Windows (NT/98/Me and 2000/XP/2003), Macintosh, NetWare and UNIX/Linux.

Firewall Considerations with IPP

If there are one or more firewalls between the IPP client and the server, you may have to make some changes to the firewall configuration. IPP uses TCP Port 631 for printing, so any firewalls between client and server must be configured to allow bi-directional traffic on that port. Please consult your network administrator if you think any configuration changes are necessary.

How to Print from Windows 98

Before you print to an IPP printer you will need to know:

- **the address of the print server.** The address contains the **IP address** or **host name** of the print server and the **printer port name.**
- **the brand and type of the printer** in order to install the appropriate printer driver.

If your destination printer does not exist in your **Printer name** list, you need to add it. Adding an IPP printer to your printer list is described below.

1. Select the IPP printer to which you want to send your document. Choose the destination printer from the **Printer name** field (in **File | Print**).

2. When you press **Print**, the print job is sent over the Internet to the Axis Network Print Server, which then forwards the print job to the destination printer.

3. The recipient of the print job can collect the print job at the destination printer.

Adding an IPP Printer to your Printer List in Windows 98

1. Install the IPP client for Windows 98 on your computer. This IPP client can be downloaded from the Microsoft Web site.

2. Open **Start** | **Settings** | **Printers.**

3. Choose **Add Printer**, then **Network Printer**.

4. In the **Printer** field in the **Connect to Printers** window, write the address of the destination printer.
(*Example: http://171.16.5.218:631/LPT1*)

5. Select the appropriate printer driver corresponding to the destination printer.

6. Specify a name for the printer you wish to add to your printer list. Click **Finish.** The destination printer will be added to your printer list and you are ready to print using IPP.

How to Print from Windows NT

Before you print to an IPP printer you will need to know:

- **the address of the print server.** The address contains the **IP address** or **host name** of the print server and the **printer port name.**
- **the brand and type of the printer** in order to install the appropriate printer driver.

1. Select the IPP printer to which you want to send your document. Select the destination printer from your **Printer Name** list (in **File** | **Print** | **Printer Setup**).

    The printer name will begin with a URL: **http://...**

    If your destination printer does not exist in your **Printer Name** list, you need to add it. Adding an IPP printer to your printer list is described below.

2. Press **Print.** The print job is sent over the Internet/WAN to the Axis Network Print Server, which then forwards the print job to the destination printer.

3. The recipient of the print job can collect the print job at the destination printer.

Adding an IPP Printer to your Printer List in Windows NT

1. Install the **Internet Printer Connection** software from HP (can be downloaded from www.hp.com) on your computer.

2. Open **Start** | **Settings** | **Printers.**

3. Choose **Add Printer.** The Add Printer Wizard will start.

4. Next, the Wizard will ask you if you want to install on **My Computer** or on a **Network print server**. Choose **My Computer** and click **Next.**
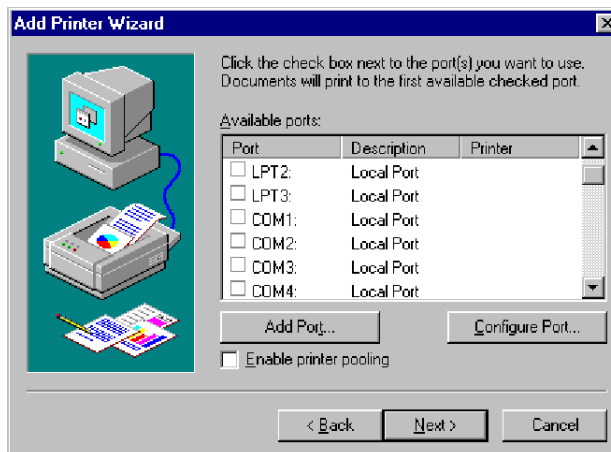
5. In the **Available Ports** window, click **Add Port**:
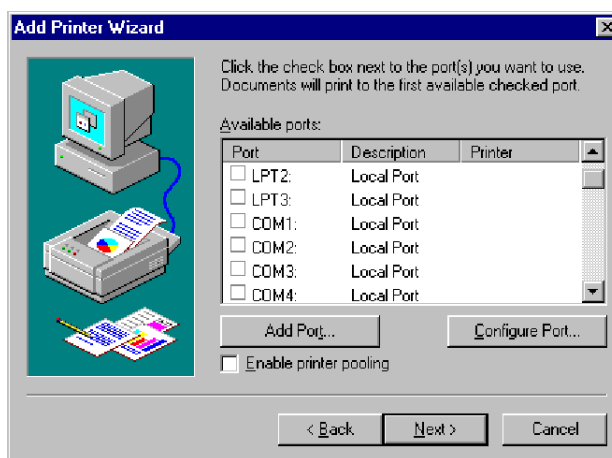
6. The **Printer Ports** dialog will appear, showing a list of **Available Printer Ports**.
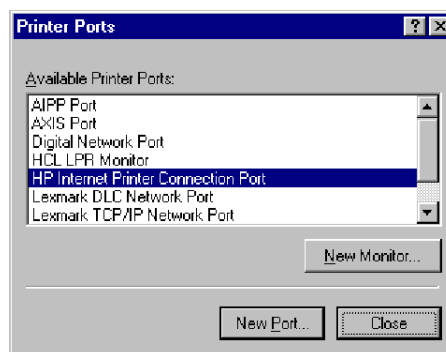
7. Choose **The HP Internet Printer Connection Port** and click **New Port.**

8. The HP Internet Printer Connection will start. Click **Next**.

9. In the **IP Address, Host Name or URL** field, type the address of the Axis Network Print Server to which the destination printer is connected. The URL will automatically appear in the **Port Name** field as well:
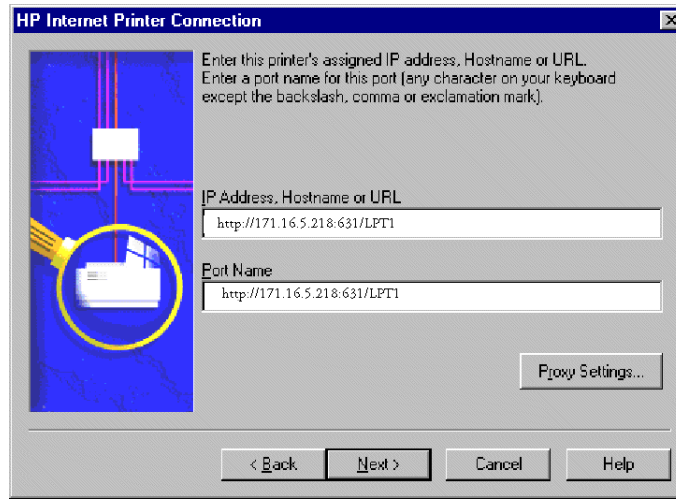

(*Example: http://171.16.5.218:631/LPT1* or *LPT2*). Click **Next**.

10. The Wizard will confirm the information you have entered. Click **Finish** to complete the installation and go back to the **Available Ports** list.

11. The IPP printer port list is now available in the **Available Ports** list. Click **Next.**

12. Next, choose a suitable driver for the destination printer and install it. Click **Next**.
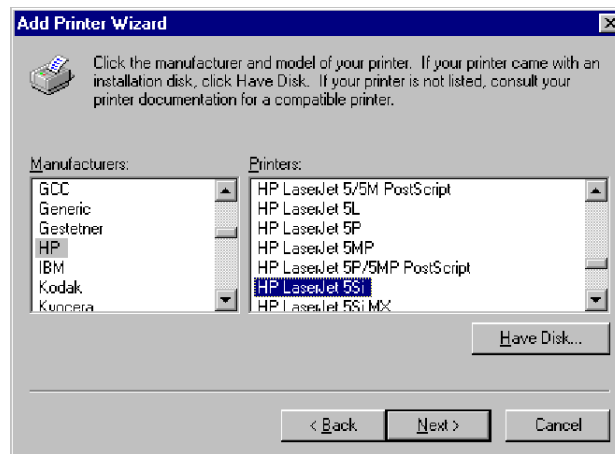
13. You will be asked if you want the newly added printer to be your default printer and if you want to share the printer on your network with other users. Choose the alternatives that suit your printing needs and click **Finish** to complete the installation.

14. The new printer will appear in your **Printer** window. You are now ready to start printing using IPP.
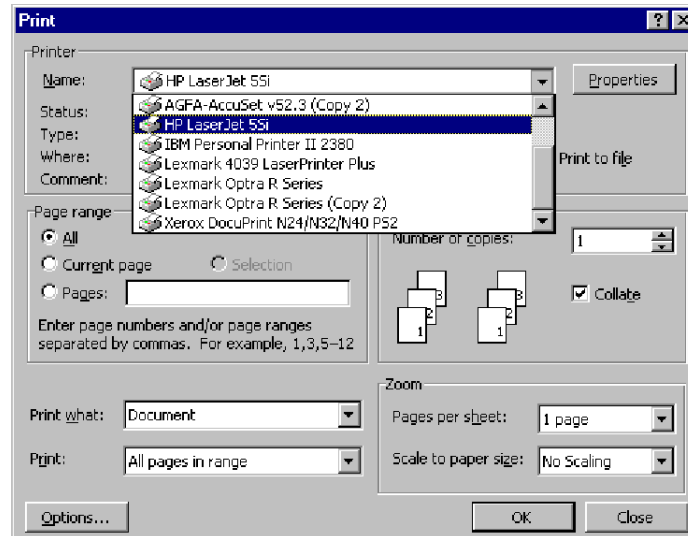
How to Print from Windows 2000/XP/2003

Before you print to an IPP printer you will need to know:

• **the address of the print server.** The address contains the **IP address** or **host name** of the print server and the **printer port name.**

• **the brand and type of the printer** in order to install the appropriate printer driver.

1. Select the IPP printer to which you want to send your document. Choose the destination printer from the **Select Printer** field (in **File | Print**).

   If your destination printer does not exist in your **Select Printer** list, you need to add it. Adding an IPP printer to your printer list is described below.

2. When you press **Print**, the print job is sent over the Internet to the Axis Network Print Server, which then forwards the print job to the destination printer.

3. The recipient of the print job can collect the print job at the destination printer.

Adding an IPP Printer to your Printer List in Windows 2000/XP/2003

1. Choose **File | Print** from the document you wish to print.

2. In the **Select Printer** field, click the **Add Printer** icon. The **Add Printer Wizard** will start. Click **Next**.

3. The Wizard will ask you if you want to install a local printer or a network printer. Choose **Network Printer** and click **Next**.

4. Enter the printer address in the **URL** field.
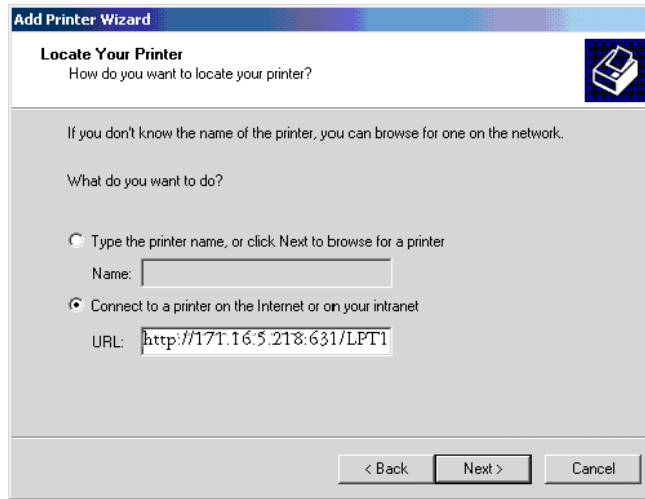
(*Example: http://171.16.5.218:631/LPT1* or *LPT2*)
Click **Next**.

5. If you do not have a driver corresponding to the destination printer installed on your computer, the Wizard will prompt you to install one. Click **OK**.

6. The Installation Wizard will ask you to select a printer driver corresponding to the destination printer. Select the printer driver from the list and click **OK**.
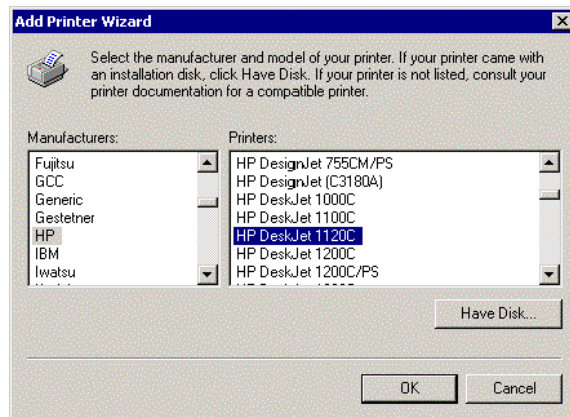
7. The Wizard will ask you if you want the printer to be your default destination printer. Make your choice and click **Next** to complete the Add Printer Wizard installation.

8. The new printer is added to your **Select Printer** window.

9. You are now ready to print using IPP: specify your new destination printer from the printer list and click **Print**.

Section 12   IP Addressing

IP Address and Subnet Mask   The print server must be correctly configured with the following information to function properly:

- an IP address
- a subnet mask
- a default gateway (or router)

IP Address   Each device on your network must have a unique IP address to operate correctly. An IP address identifies the address of the device to which data is being sent and the address of the destination network. IP addresses have the format n.n.n.x where n is a decimal number between 0 and 255 and x is a number between 1 and 254 inclusive.

Subnet Mask   In addition to the IP address, you need to set a subnet mask. All networks are divided into smaller sub-networks and a subnet mask is a number that enables a device to identify the sub-network to which it is connected. For your network to work correctly, all devices on the subnet must have:

- The same sub-network address
- The same subnet mask

The only value that will be different is the specific host device number. This value must always be unique. The size of the network determines the structure of the IP addresses in it.

Default Gateway   In a network using subnets, the **router** that forwards traffic to a destination outside of the subnet of the transmitting device. If there is a server or a router which functions as a gateway, enter the IP address of the server or the router.

IP Address and Subnet Mask Structures   Two of the most common types of IP address and subnet mask structures are described here:

Type One

In a small (Class C) network, the IP address example '192.168.3.191' is split into two parts:

- Part one ('192.168.3') identifies the network on which the device resides.
- Part two ('.191') identifies the device within the network.

This type of IP address generally operates on a subnet mask of '255.255.255.0'.

Type Two

In larger (Class B) networks, where there are more devices, the IP address of '162.168.3.191' is split into two parts but is structured differently:

- Part one ('162.168') identifies the network on which the device resides.
- Part two ('.3.191') identifies the device within the network.

This type of IP Address operates on a subnet mask of '255.255.0.0'.

Default Gateway Examples

1. This example shows a network with:

- one computer
- one networked printer
- no router

Device	IP address	Subnet Mask	Default Gateway
print server	192.168.3.191	255.255.255.0	*
pc1	192.168.3.192	255.255.255.0	*

* When no router is present on the network, the default gateway can be left undefined.

2. This example shows a network with:

- one computer
- one networked printer
- a router with IP value: 192.168.3.**1**

Device	IP address	Subnet Mask	Default Gateway
print server	192.168.3.191	255.255.255.0	192.168.3.1
pc1	192.168.3.192	255.255.255.0	192.168.3.1

Obtaining an IP Address and Subnet Mask

There are three different ways to obtain an IP address and subnet mask. These are:

- Dynamic Host Configuration Protocol (DHCP) Addressing
- Static Addressing
- Automatic Addressing (Auto-IP Addressing)

DHCP Addressing

If your network contains a DHCP server, print servers on your network will obtain an IP address and subnet mask automatically. DHCP assigns a temporary IP address and subnet mask which gets reallocated once you disconnect from the network. DHCP will work on any client Operating System such as Windows 95, 98 or NT. Also, using DHCP means that the same IP address and subnet mask will never be duplicated for devices on the network. DHCP is particularly useful for networks with large numbers of users on them.

Static Addressing

With this method you must enter an IP Address and the subnet mask manually on every device. Using a static IP and subnet mask means the address is permanently fixed.

Auto-IP Addressing   Network devices use automatic IP addressing if they are configured to acquire an address using DHCP but are unable to contact a DHCP server. Automatic IP addressing is a scheme where devices allocate themselves an IP address at random from the industry standard subnet of 169.254.x.x (with a subnet mask of 255.255.0.0). If two devices allocate themselves the same address, the conflict is detected and one of the devices allocates itself a new address.

Automatic IP addressing support was introduced by Microsoft in the Windows 98 operating system and is also supported in Windows 2000/XP/2003.

Registering and Resolving Host Names   In order to register the host name of the print server in networks with dynamic IP address settings, WINS (Windows Internet Name Service) and DDNS (Dynamic Domain Name System) are supported. It is recommended that at least one of these methods should be used if you are setting the IP address of the print server using DHCP.

The host name of the print server is specified by the PS_NAME. parameter. Refer to the *"The Parameter List"* on page 142.

WINS Host Name Rules   WINS only supports 15 character long host names. If your host name is longer than 15 characters, the print server truncates the host name to 15 characters when registering with a WINS server. You can view the print server's host name that is registered at a WINS server in the print server's Web interface. Refer to *"Using a Web Browser for Print Server Management"* on page 92.

DDNS Host Name Rules   DDNS supports 47 character long host names and can only consist of the characters 'A-Z', 'a-z', '0-9' and '-'. If your host name consists of any other characters, they are converted to '-' when registering with a DDNS server. You can view which host name that is registered at a DDNS server in the print server's Web interface. Refer to *"Using a Web Browser for Print Server Management"* on page 92.

If the host name matches another entry in the DDNS data base, the print server deletes that entry before registering.

Notes:

- The default host name of the print server is 'AXIS' followed by the last 6 digits in the serial number. e.g. AXIS181636. The host name (Print server name) can be changed in the PS_NAME. field on the **Admin** | **General Settings** page.

- The host name limitations conclude that if you want to register the same host name at a WINS server and a DDNS server, the host name should be no longer than 15 characters and it should only contain the characters 'A-Z', 'a-z', '0-9' and '-'.

- Refer to your system manuals or to your network administrator for instructions on how host name resolutions are performed on your system.

Setting the IP Address using DHCP

Follow the instructions below to download the IP address using DHCP:

1. Edit or create a scope in the DHCP manager of the DHCP daemon. The entries included in this scope should contain the following parameters:

   - range of IP addresses
   - subnet mask
   - default router IP address
   - WINS server IP address(es) or DDNS server IP address(es)
   - lease duration

2. Activate the scope. The print server automatically downloads the DHCP parameters. If you are using WINS or DNS, you should include at least one WINS or DNS server IP address in the DHCP scope. Immediately after the IP address has been received, the print server registers its host name and IP address on the WINS alternatively DNS server. Refer to *"Registering and Resolving Host Names"* on page 132 for more information. The print server can automatically download a customized *config* file from a TFTP server. Just add the name of the config file and the TFTP server's IP address to your DHCP scope. The *config* file is downloaded immediately after the print server receives its IP address.

3. You have now successfully set the IP address of your print server.

Note:

You have to restart the print server to download the IP address.

Section 13   The Test Button

The test button is located on the front right hand side of the AXIS 5900 and is used for:

- Printing a test page to check the connection to the printer.
- Printing a parameter list to see the print server's current settings.
- Performing a Factory Default of the print server.

If you want to change any of the parameters, use one of the methods described in *"Management and Configuration"* on page 92.

Printing a Test Page   Press the test button **once** to print a test page. The test page contains basic information about the AXIS 5900. It is recommended that you print a test page every time you connect the print server to a printer.

Note:

> The test page is printed on LPT1 by default. If you want to print the test page on LPT2, you should set the **Internal Printout Destination** parameter to LPT2 from the internal Web pages under **Admin** | **General Settings** | **General**.

Printing a Parameter List   Press the test button **twice** to print a parameter list showing the current AXIS 5900 settings. This list provides comprehensive details of all the parameters and their current status. Refer to *"The Parameter List"* on page 142.

Performing a Factory Default

1. Remove the external power supply to switch off the print server.

2. Press and hold down the test button while you reconnect the external power supply.

3. Continue to hold down the test button until the Network indicator remains constantly lit. This should take about 20 seconds.

4. Restart the print server by disconnecting and reconnecting the external power supply.

The Axis Network Print Server is now reset to factory default settings.

Note:

> A Factory Default will reset all AXIS 5900 parameters and settings to their default values, except:
> - Installed certificate
> - Private key

Section 14   Troubleshooting

This section provides useful information to help you resolve difficulties you might have with your AXIS 5900. Fault symptoms, possible causes and remedial actions are provided within a quick reference table.

Please visit the Axis Web site for latest troubleshooting tips, more support and additional help through the FAQ database or to fill in and submit a Support question.

LED Indicators

Indicator	Color/Behavior	Explanation
Power	Green	OK
	Not lit	No power/Error
Network	Orange	OK - network connected
	Orange flashing	Activity on network
	Not lit	No physical connection to the network

Web Interface

Symptoms	Possible causes	Remedial actions
The AXIS 5900 Web interface cannot be accessed from a Web browser.	The AXIS 5900 is not connected properly.	1. Check Power and Network indicator. 2. Check that assignment of IP addresses for the AXIS 5900 is correct. 3. To further check the IP addresses, run the Ping command from another computer as described in "IP address check" at the end of this chapter. Follow the appropriate recommendations.
	Problem with your proxy server.	Verify the proxy server settings in your Web browser.
	Other networking problems.	1. Verify that your network is accessible through your network socket. 2. Verify that your network cable is functional.

| IP Address Check with Ping | By sending a data packet to a specific IP address and waiting for a reply, Ping can determine whether that IP address is accessible. Ping can also help you to determine IP address conflicts with your AXIS 5900 and troubleshoot TCP/IP problems on the network. Follow the instructions below to diagnose your problem. |

Windows: Open a Command Prompt and enter the following commands:

Syntax	Example
ping <IP address>	ping 192.168.3.191

The host will return reply from 192.168.3.191, or a similar message. This indicates that the address has been set and that communication is established

UNIX/Linux and Mac OS X

Open a Terminal and enter the following commands:

Syntax	Example
ping <IP address>	ping 192.168.3.191

The host will return psname is alive, or a similar message. This indicates that the address has been set and that communication is established.

Replies: Subsequent replies will provide an explanation of the cause of the problem. Replies from DOS can be interpreted as defined in the table below (for UNIX/Linux replies please refer to the UNIX/Linux chapter of this manual):

Ping Reply	Interpretation and recommendation	
	Axis Network Print Server connected	Axis Network Print Server disconnected
bytes = 32 time = 2 ms...... - or something similar	The AXIS 5900 is responding correctly. There are probably no conflicts with the IP address - disconnect the AXIS 5900 and ping again to verify.	The IP address is already in use and cannot be used again. You must obtain a new IP address for your AXIS 5900.
destination host unreachable	The AXIS 5900 is not accessible. Check your network settings.	–
request timed out	The IP address is not in use. You are either pinging the wrong IP address or your AXIS 5900 does not have the correct IP address.	This IP address is not used by anyone and is available for use for your AXIS 5900. Set the IP address again, power on the AXIS 5900 and then try accessing the unit.
no response from ping command	The AXIS 5900 is not accessible. Check your network settings.	–

SNMP Device Index

If you are using the TCP/IP protocol, check that the SNMP Device Index is correct. See *"SNMP Device Index"* on page 147.

Axis Support
Server Report

In order to obtain optimal support from Axis support technicians, please follow these instructions when filling in and submitting a Support question.

1. Go to the print server's Web pages by typing the print server's IP address in the **Address/Location** field of your Web browser.

2. Go to **Admin** | **Support**. Click the **Server Report** link. A new window will open.

3. Save the Server report as an HTML file (with an .html file extension) and go to the Axis Web site.

4. Choose **Support** and report your case, attaching the Server Report.

Section 15 Technical Specifications

Supported Printers All parallel printers except host-based printers and copiers, e.g. CAPT, GDI, PPA

Supported Systems

Microsoft Windows 95, 98, Me, NT, 2000, XP and 2003

Novell NetWare 3.X, 4.X, 5.X, 6.X. Supports bindery and NDS mode. Supports user messages and printer status. NDPS supported over IP and IPX. Support for iPrint using both LPR and IPP protocols. PSERVER (IP/IPX), RPRINTER/NPRINTER supported

Apple Mac OS 7, 8, 9, Mac OS X version 10.X

Unix/Linux All Unix systems supporting TCP/IP (Linux, BSD, System V, Solaris, HP-UX, IBM AIX, Silicon Graphics IRIX, etc.)

Additional Systems Other systems supporting TCP/IP:

IBM (MVS, VM, VSE, OS/400), DEC, VMS

Microsoft LAN Manager

IBM LAN Server

LANtastic

Supported Web Browsers Any standard Web browser (Netscape 6.x and higher and MS Internet Explorer 5.x and higher)

Supported Protocols NetBIOS/NetBEUI

TCP/IP ARP, DHCP, BOOTP, RARP, DNS, DDNS, Telnet, TFTP, FTP, LPR, Reverse Telnet, PROS, IPP, IP, TCP, UDP, HTTP, HTTPS, SSL/TLS, SNMP, SLP v1/v2, ICMP, IGMP, Bonjour

NetWare IPX, SPX, SAP, NCP (extended with NDS), NDPS, NLSP, LIP, RIP, RIP-II, OSPF

Apple EtherTalk AAPR, ATP, DDP, NBP, PAP, RTMP, ZIP

Logical Printers	Logical printer ports can be programmed to perform auto ASCII to PostScript conversion, add string before and after job, string substitution, alternative output and character set conversion
RF Specifications	Unlicenced 2.4 GHz frequency band, RX sensitivity - 70 dBm, TX power 0 dBm (class 2)
Frequency bands and channels	Europe: 2.412–2.472 GHz, channels 1–13 France: 2.457–2.472 GHz, channels 10–13 (indoor use only) Japan: 2.484 GHz, channel 14 USA/Canada: 2.412–2.462 GHz, channels 1–11
Security	Password protected configuration SSL/TLS support for HTTPS security NetWare: Encrypted passwords, NetWare Packet Signature Level 1, 2, 3 Option to disable protocols
Wireless	64 or 128 bit WEP encryption
Print Server Management	AXIS ThinWizard for installation, configuration, monitoring and firmware upgrading of multiple units Bonjour support for quick and easy installation in Mac OS X evironments AXIS AddPrinter for easy and automated installation in Windows environments Internal Web pages or FTP for installation, configuration, monitoring and firmware upgrading SNMP-MIB II compliant (RFC 1213), Axis private enterprise MIB included Netware: Full PCONSOLE, NWAdmin, ConsoleOne and iPrint-iManager support
Supported Languages	English, French, German, Italian, Japanese and Spanish
Firmware Upgrade	Firmware upgrade using AXIS ThinWizard, the print server's Web pages or FTP
Supported Languages	English, French, German, Italian, Japanese and Spanish

Network Connection	Supports: IEEE802.2, IEEE802.3, SNAP and Ethernet II frame types simultaneously
	NWay for autodetection of network speed
WLAN	SNAP/802.2/802.3 for 802.11b
Ethernet	All standard Ethernet and Fast Ethernet networks: RJ-45 connector (Category 5 or 6, shielded twisted pair cable) for 10baseT or 100baseTX Ethernet with full duplex
Wireless Interface	IEEE 802.11b compliant with data rates up to 11 megabits per second Output Power 15 dBm Sensitivity 11Mbps 10-5 BER @ -81 dBm, minimum
Parallel Ports	Two 25-pin DSUB parallel ports, high-speed IEEE 1284 compliant with ECP support and throughput of 1 MB/sec
Hardware	
Processor	AXIS Etrax 100LX 32-bit 100 MHz RISC
Memory	2 MB Flash, 8 MB RAM
Front Panel	2 LED indicators: Power and Network
	Test button for information printouts
Power Consumption	Power provided by external supply. Maximum 5.6W (Type PS-H, 5.1 VDC 2000mA)
Dimensions	Height: 2.9 cm/1.2 in Width: 16.0 cm/6.3 in Depth: 12.9 cm/5.1 in Weight: 0.6 kg/0.27 lb
Environmental	
Temperature	Temperature: 40-105 °F (5-40 °C) Humidity: 10-90% non-condensing

Approvals

EMC	EN 55 022:1998 (CISPR 22:1997), Class B
	EN 55 024:1998
	EN61000-3-2:1995+A1+A2+Corrig.+A14
	EN 61000-3-3:1995+A1
	ETS 300 826
	FCC 47 CFR part 15
Other	ETS 300 328
	ARIB T-66
Safety	EN 60950:2000, approved power supplies for all countries

Included Accessories   AXIS Network Product CD with software for installation, management and printing, including AXIS ThinWizard (the recommended Axis management software for large enterprise networks) and AXIS AddPrinter (for easy and quick installation)

User documentation

Quick Installation Guide

Power adapter

> All specifications are subject to change without prior notice.

Section 16   The Parameter List

These are the default parameters in a new, unconfigured print server. A complete list of all Axis print server parameters can be found on www.axis.com

AXIS 5900

```
(AXIS 5900 Network Print Server V7.00 Oct 01 2004. S/N:
00408C5E44D6)

Parameter settings:

--- General Menu
NODE_ADDR.   : 00 40 8C 5E 44 D6
NETWORK_MODE. : AUTO_SENSE  (AUTO_SENSE, ETHERNET, WLAN)
NETWORK_SPEED. : AUTO_SENSE  (AUTO_SENSE, 10_HALF_DX,
10_FULL_DX, 100_HALF_DX, 100_FULL_DX)
PS_NAME.     : AXIS5E44D6
ROOT_PWD.    : pass
USERS.       :
BASE_URL.    : www.axis.com
CHARSET.     : ISO-8859-1  (SHIFT_JIS, ISO-8859-1, UTF-8)
LANG.        : English  (English, French, German, Spanish,
Italian, Japanese)
AXIS_PRINT_SYSTEM. : YES
RCONFIG_ENB. : YES
DEF_OUT.     : PR1  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
SYS_LOC.     :
SYS_CONT.    :

--- LLC Menu
LLC_RESPONSE. : 1300
LLC_REC_ACK. : 20
LLC_INACTIVITY. : 15

--- TCP/IP Network Menu
INT_ADDR.    : 10 91 2 40
DEF_ROUT.    : 10 91 0 1
NET_MASK.    : 255 255 0 0
HTTPS_ENB.   : NO
DHCP_ENB.    : YES
AUTOIP_ENB.  : YES
BOOTP_ENB.   : YES
RARP_ENB.    : YES
WINS_ENB.    : YES
WINS_ADDR1.  : 10 0 5 50
WINS_ADDR2.  : 0 0 0 0
NBT_SCOPE_ID. :
DNS_ENB.     : YES
DNS_ADDR1.   : 193 13 178 7
DNS_ADDR2.   : 193 13 178 2
DOMAIN_NAME. : se.axis.com
SLP_ENB.     : YES
SLP_SCOPE_LIST. : DEFAULT
RENDEZVOUS_ENB. : YES
RENDEZVOUS_SRVNAME_LPT1. :
RENDEZVOUS_SRVNAME_LPT2. :
SMTP_SERVER. :
FTP_ENB.     : YES
TELNET_ENB.  : YES
DEF_IP_FRAME_TYPE. : EthernetII  (EthernetII, SNAP)

--- TCP/IP Printing Menu
```

```
                    TCP_ENB.      : YES
                    PAR_TCP_RESTRICT_LIST. :
                    PROS_PWD.    : netprinter
                    PROS_PRT.    : 35
                    LPD_BANN.    : OFF  (OFF, AUTO, LAST)
                    DEFAULT_RAW_TCP. : 9100-9101  (9100-9101, CLOSED)
                    RTN_OPT.     : NO
                    RTEL_PR1.    : 0
                    RTEL_PR2.    : 0
                    RTEL_PR3.    : 0
                    RTEL_PR4.    : 0
                    RTEL_PR5.    : 0
                    RTEL_PR6.    : 0
                    RTEL_PR7.    : 0
                    RTEL_PR8.    : 0

                    --- SNMP Menu
                    SNMP_V1_ENB. : YES
                    SNMP_V2_ENB. : YES
                    READ_COM.    : public
                    WRT_COM.     : pass
                    TRAPADDR.    : 0 0 0 0
                    TRAP_COM.    : public
                    SYS_NAME.    :
                    SNMP_AUT.    : DISABLE  (DISABLE, ENABLE)
                    TRAP_PRT.    : DISABLE  (DISABLE, ENABLE)

                    --- SNMPv3 Menu
                    SNMP_V3_ENB. : NO

                    --- NetWare Menu
                    NETW_ENB.    : YES
                    NETW_TRANSPORT_PROTOCOL. : DUAL_STACK  (IPX_ONLY, IP_ONLY,
                    DUAL_STACK)
                    NDPS.        : TCP_AND_SPX  (TCP_AND_SPX, TCP_ONLY, SPX_ONLY,
                    DISABLED)
                    JOB_CHECK_DELAY. : 5
                    CONF_CHECK_DELAY. : 300
                    FR_802_3.    : YES
                    FR_ETH_2.    : YES
                    FR_802_2.    : YES
                    FR_SNAP.     : YES
                    NCP_BURST_MODE. : YES
                    PSERVER_NDS_TREE. :
                    PSERVER_NDS_FILESERVER. :
                    PSERVER_NDS_DISTINGUISHED_NAME. :
                    PSERVER_BINDERY1. :
                    PSERVER_BINDERY2. :
                    PSERVER_BINDERY3. :
                    PSERVER_BINDERY4. :
                    PSERVER_BINDERY5. :
                    PSERVER_BINDERY6. :
                    PSERVER_BINDERY7. :
                    PSERVER_BINDERY8. :
                    PSERVER_BINDERY9. :
                    PSERVER_BINDERY10. :
                    PSERVER_BINDERY11. :
                    PSERVER_BINDERY12. :
                    PSERVER_BINDERY13. :
                    PSERVER_BINDERY14. :
                    PSERVER_BINDERY15. :
                    PSERVER_BINDERY16. :
                    NPRINTER1.   :
                    NPRINTER2.   :
                    NPRINTER3.   :
                    NPRINTER4.   :
                    NPRINTER5.   :
```

```
NPRINTER6.    :
NPRINTER7.    :
NPRINTER8.    :

--- NetBIOS/NetBEUI Menu
LSLM_ENB.     : YES
NB_FR_TYPE.   : FR_802_2  (FR_AUTO, FR_802_2, FR_DIX)
LPRINT_1.     : AX5E44D6.LP1
LLOGIC_1.     : PR1  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_2.     : AX5E44D6.LP2
LLOGIC_2.     : PR2  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_3.     :
LLOGIC_3.     : PR3  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_4.     :
LLOGIC_4.     : PR4  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_5.     :
LLOGIC_5.     : PR5  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_6.     :
LLOGIC_6.     : PR6  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_7.     :
LLOGIC_7.     : PR7  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
LPRINT_8.     :
LLOGIC_8.     : PR8  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)

--- AppleTalk Menu
ATLK_ENB.     : YES
ATK_ZONE.     :
ZONER_EN.     : YES
ATK_FONT.     : DEFAULT  (DEFAULT, 35N, ALL)
AUTO_DT_PRIN1. : YES
APRINT_1.     : AXIS5E44D6_LPT1
ATYPE_1.      : LaserWriter
ALOGIC_1.     : PR1  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
BINARY_TYPE_1. : TBCP  (TBCP, BCP, NONE)
AUTO_DT_PRIN2. : YES
APRINT_2.     : AXIS5E44D6_LPT2
ATYPE_2.      : LaserWriter
ALOGIC_2.     : PR2  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8,
LPT1, LPT2)
BINARY_TYPE_2. : TBCP  (TBCP, BCP, NONE)

--- Printer1 Menu
PR1_OUT.      : LPT1  (NONE, LPT1, LPT2)
PR1_NAME.     :
PR1_SCND.     : PR1  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
PR1_WAIT.     : YES
PR1_IN.       : AUTO  (AUTO, NONE)
PR1_BEF.      :
PR1_STR.      :
PR1_CSET.     : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
7FR>IBM, 7ND>IBM, DEC>IBM)
PR1_FILT.     : NONE  (NONE, POSTSCR, AUTO_PS)
PR1_AFT.      :
PR1_DUMP.     : NO
PR1_SIZE.     : A4  (A4, LETTER, LEGAL, EXECUT)
PR1_ORNT.     : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
PR1_FORM.     : 66 0 100 60 30 50
PR1_FONT.     :
```

```
--- Printer2 Menu
PR2_OUT.      : LPT2  (NONE, LPT1, LPT2)
PR2_NAME.     :
PR2_SCND.     : PR2  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
PR2_WAIT.     : YES
PR2_IN.       : AUTO  (AUTO, NONE)
PR2_BEF.      :
PR2_STR.      :
PR2_CSET.     : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
7FR>IBM, 7ND>IBM, DEC>IBM)
PR2_FILT.     : NONE  (NONE, POSTSCR, AUTO_PS)
PR2_AFT.      :
PR2_DUMP.     : NO
PR2_SIZE.     : A4  (A4, LETTER, LEGAL, EXECUT)
PR2_ORNT.     : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
PR2_FORM.     : 66 0 100 60 30 50
PR2_FONT.     :

--- Printer3 Menu
PR3_OUT.      : LPT1  (NONE, LPT1, LPT2)
PR3_NAME.     :
PR3_SCND.     : PR3  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
PR3_WAIT.     : YES
PR3_IN.       : AUTO  (AUTO, NONE)
PR3_BEF.      :
PR3_STR.      :
PR3_CSET.     : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
7FR>IBM, 7ND>IBM, DEC>IBM)
PR3_FILT.     : NONE  (NONE, POSTSCR, AUTO_PS)
PR3_AFT.      :
PR3_DUMP.     : NO
PR3_SIZE.     : A4  (A4, LETTER, LEGAL, EXECUT)
PR3_ORNT.     : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
PR3_FORM.     : 66 0 100 60 30 50
PR3_FONT.     :

--- Printer4 Menu
PR4_OUT.      : LPT2  (NONE, LPT1, LPT2)
PR4_NAME.     :
PR4_SCND.     : PR4  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
PR4_WAIT.     : YES
PR4_IN.       : AUTO  (AUTO, NONE)
PR4_BEF.      :
PR4_STR.      :
PR4_CSET.     : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
7FR>IBM, 7ND>IBM, DEC>IBM)
PR4_FILT.     : NONE  (NONE, POSTSCR, AUTO_PS)
PR4_AFT.      :
PR4_DUMP.     : NO
PR4_SIZE.     : A4  (A4, LETTER, LEGAL, EXECUT)
PR4_ORNT.     : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
PR4_FORM.     : 66 0 100 60 30 50
PR4_FONT.     :

--- Printer5 Menu
PR5_OUT.      : LPT1  (NONE, LPT1, LPT2)
PR5_NAME.     :
PR5_SCND.     : PR5  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
PR5_WAIT.     : YES
PR5_IN.       : AUTO  (AUTO, NONE)
PR5_BEF.      :
PR5_STR.      : 01 0A 02 0D 0A
PR5_CSET.     : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
7FR>IBM, 7ND>IBM, DEC>IBM)
PR5_FILT.     : NONE  (NONE, POSTSCR, AUTO_PS)
PR5_AFT.      :
```

```
                    PR5_DUMP.    : NO
                    PR5_SIZE.    : A4  (A4, LETTER, LEGAL, EXECUT)
                    PR5_ORNT.    : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
                    PR5_FORM.    : 66 0 100 60 30 50
                    PR5_FONT.    :

                    --- Printer6 Menu
                    PR6_OUT.     : LPT2  (NONE, LPT1, LPT2)
                    PR6_NAME.    :
                    PR6_SCND.    : PR6  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
                    PR6_WAIT.    : YES
                    PR6_IN.      : AUTO  (AUTO, NONE)
                    PR6_BEF.     :
                    PR6_STR.     : 01 0A 02 0D 0A
                    PR6_CSET.    : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
                    7FR>IBM, 7ND>IBM, DEC>IBM)
                    PR6_FILT.    : NONE  (NONE, POSTSCR, AUTO_PS)
                    PR6_AFT.     :
                    PR6_DUMP.    : NO
                    PR6_SIZE.    : A4  (A4, LETTER, LEGAL, EXECUT)
                    PR6_ORNT.    : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
                    PR6_FORM.    : 66 0 100 60 30 50
                    PR6_FONT.    :

                    --- Printer7 Menu
                    PR7_OUT.     : LPT1  (NONE, LPT1, LPT2)
                    PR7_NAME.    :
                    PR7_SCND.    : PR7  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
                    PR7_WAIT.    : YES
                    PR7_IN.      : AUTO  (AUTO, NONE)
                    PR7_BEF.     :
                    PR7_STR.     : 01 0A 02 0D 0A
                    PR7_CSET.    : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
                    7FR>IBM, 7ND>IBM, DEC>IBM)
                    PR7_FILT.    : NONE  (NONE, POSTSCR, AUTO_PS)
                    PR7_AFT.     :
                    PR7_DUMP.    : NO
                    PR7_SIZE.    : A4  (A4, LETTER, LEGAL, EXECUT)
                    PR7_ORNT.    : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
                    PR7_FORM.    : 66 0 100 60 30 50
                    PR7_FONT.    :

                    --- Printer8 Menu
                    PR8_OUT.     : LPT2  (NONE, LPT1, LPT2)
                    PR8_NAME.    :
                    PR8_SCND.    : PR8  (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
                    PR8_WAIT.    : YES
                    PR8_IN.      : AUTO  (AUTO, NONE)
                    PR8_BEF.     :
                    PR8_STR.     : 01 0A 02 0D 0A
                    PR8_CSET.    : NONE  (NONE, ISO>IBM, 7UK>IBM, 7SW>IBM, 7GE>IBM,
                    7FR>IBM, 7ND>IBM, DEC>IBM)
                    PR8_FILT.    : NONE  (NONE, POSTSCR, AUTO_PS)
                    PR8_AFT.     :
                    PR8_DUMP.    : NO
                    PR8_SIZE.    : A4  (A4, LETTER, LEGAL, EXECUT)
                    PR8_ORNT.    : PORTR  (PORTR, LANDS, R_PORTR, R_LANDS)
                    PR8_FORM.    : 66 0 100 60 30 50
                    PR8_FONT.    :

                    --- LPT1 Menu
                    L1_CENTR.    : HISPEED  (IBM_PC, STNDRD, FAST, HISPEED, HINOACK)
                    L1_BSYTM.    : 60
                    L1_MGM_INFO. : AUTO  (DISABLE, AUTO)
                    L1_COMMENT.  :
                    L1_BIDIR.    : AUTO  (DISABLE, AUTO)
                    L1_READT.    : 3
```

```
--- LPT2 Menu
L2_CENTR.    : HISPEED  (IBM_PC, STNDRD, FAST, HISPEED, HINOACK)
L2_BSYTM.    : 60
L2_MGM_INFO. : AUTO  (DISABLE, AUTO)
L2_COMMENT.  :
L2_BIDIR.    : AUTO  (DISABLE, AUTO)
L2_READT.    : 3

--- Email Menu
EMAIL_NOTIFICATION. : NO
REPLY_ADDRESS. :
PAPER_JAM_ADDRESS. :
OUT_OF_PAPER_ADDRESS. :
TONER_LOW_ADDRESS. :
NO_TONER_ADDRESS. :
PRINTER_OFFLINE_ADDRESS. :

--- WLAN Menu
WLAN_NODE_ADDR. : 00 40 8C 5E 44 D6
WLAN_NETWORK_SPEED. : AUTO_SENSE  (1_MBPS, 2_MBPS, 5.5_MBPS,
11_MBPS, AUTO_SENSE)
WLAN_NETWORK_MODE. : AD_HOC  (INFRASTRUCTURE, AD_HOC)
WLAN_SSID.    : AXIS5E44D6
WLAN_CHANNEL. : 11
WLAN_FRAG_THRESHOLD. : 2346
WLAN_RTS_THRESHOLD. : 2432
```

SNMP Device Index

When using the TCP/IP protocol (and if the printer driver permits), the print server can use **SNMP Status** to find out if the printer is ready to accept a new job.

By default, Windows uses the value "1" when addressing an SNMP device, which is correct for single port print servers. For a multiport print server, obtain the SNMP Device Index from the table below.

Print Server	LPR Queue Name	Raw Port Number	SNMP Device Index
Single Port: Parallel	LPT1	9100	1
Single Port: USB	USB1	9100	1
Dual Port: Parallel USB	LPT1 USB1	9100 9101	1 2
Dual Port: Parallel Parallel	LPT1 LPT2	9100 9101	1 2

Print Server	LPR Queue Name	Raw Port Number	SNMP Device Index
Three Port: Parallel Parallel Serial	LPT1 LPT2 COM1	9100 9101 9102	1 3 2

Enable SNMP Status SNMP Status is enabled through Windows' printer port settings.

Example You have a three port print server and want to enable SNMP Status for LPT2. The table above tells you to set the SNMP Device Index to 3.

Using Windows XP as an example:

1. Go to **Start | Printers and Faxes**.

2. Select **Printer** and then **Properties**.

3. Select **Port** and mark the **Port** you would like to change.

4. Click **Configure Port...**
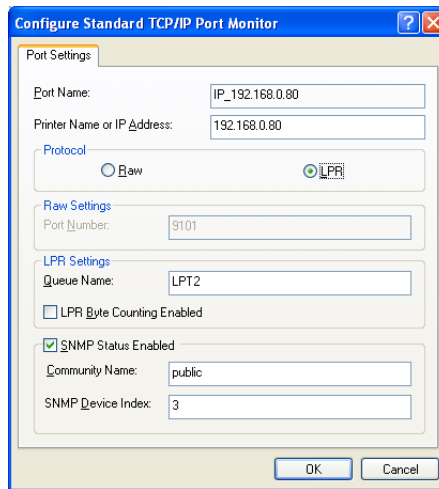
5. Ensure that **SNMP Status Enabled** is ticked and enter the correct index number in **SNMP Device Index**, taken from the table above (3 in this example).

6. Click **OK** and **Close**.

Section 17   Glossary

802.11b   A standard for wireless LAN communications operating within the 2.4 GHz ISM band.

Access Point   A network attached device that acts as a bridge between the wireless LAN and the wired LAN and interconnects wireless clients.

AIX   Advanced Interactive eXecutive. A version of the UNIX operating system from IBM that runs on various IBM computers including Mainframe systems.

AppleTalk   A local area network protocol for communication between Apple Computer products and other computers and peripherals.

ARP   Address Resolution Protocol. A protocol within the TCP/IP suite of network protocols that allows a host to find the physical address of a node on the same network. ARP cannot be used across routers.

Authentication   Verification of identity, for instance by use of digital signatures.

Auto-IP   A method to automatically set an IP address in the absence of a DHCP server.

Bonjour   Bonjour enables automatic discovery of computers, devices, and services on IP networks without the need to enter IP addresses or configure DNS servers.

BOOTP   BOOT Protocol. A TCP/IP protocol, used for downloading start-up information such as the IP address to hosts on the network. BOOTP requires a BOOTP daemon on your system. A request made to an active BOOTP daemon initiates a search of the Boot Table for an entry matching the print server's Ethernet address. If a matching entry is found, the daemon downloads the IP address to the print server.

BSD   Berkeley Software Distribution. The University of California, Berkeley additions to the UNIX operating system.

Certificate Authority, CA   An organization or company that issues digital certificates.

config **File**	This is a file that resides in the print server's memory and contains all the parameters that determine the print server's functionality. By editing the *config* file (changing the parameter settings), you can configure the print server to meet the printing needs of your network.
Client/server Printing	Means that print jobs are sent to a file server, with different clients attached to the print queue, rather than directly to the print server (Peer-to-Peer printing).
DHCP	Dynamic Host Configuration Protocol. Enables e.g. a print server to automatically obtain an unused IP address from the DHCP server.
	To fully benefit from this method, the print server also supports DDNS, which is available in Windows 2000 networks.
Digital Certificate	Used to create digital signatures and public/private key pairs for secure Web services.
DNS	Domain Name System. Resolves host names into IP addresses.
Dynamic DNS	Dynamic Domain Name System. Allows hosts to dynamically change the IP address in DNS, e.g. when the host is given a new IP address by DHCP.
Firmware	Firmware is the print server's internal software.
Flash Memory	The print server firmware is stored in Flash memory.
FTP	File Transfer Protocol. A TCP/IP protocol used for logging in to network servers and for transferring files.
HTML	Hypertext Markup Language. A standard hypertext language used for creating World Wide Web pages and other hypertext documents.
HTTP	Hypertext Transfer Protocol. The TCP/IP protocol for Web based communication.
HTTPS	HyperText Transmission Protocol, Secure, i.e. HTTP for secure transactions.
IP	Internet Protocol. The TCP/IP network-layer protocol that regulates packet forwarding by tracking IP addresses, routing outgoing messages and recognizing incoming messages.

IPP	Internet Printing Protocol. A developing industry standard that allows users to print to remote printers across the Internet. With IPP, a user with an Internet connection can send a document to any printer connected to the Internet. IPP is platform independent and can be used to print over any LAN or WAN that supports TCP/IP.
IPX	Internetwork Packet Exchange, a networking protocol used by NetWare.
LAN	Local Area Network.
LED	Light Emitting Diode.
Linux	An open source implementation of UNIX.
LLC	Logical Link Control. An additional data link layer protocol which operates on top of the MAC protocol defined in the original Ethernet standard (the "Blue Book").
LPD	The Line Printer Daemon is a protocol for transferring print jobs between hosts. This is the recommended method for UNIX/Linux systems, but some System V versions do not support LPD.
Logical Printer	A logical printer acts as a filter between the network and the physical printer. It appears to the user as a normal printer with additional characteristics. For example a UNIX/Linux workstation may only send a line feed (LF) to a shared printer that needs carriage return (CR) and LF. The logical printer can solve this problem by adding a CR whenever a line feed is detected.
MIB	Management Information Base. A database of network configuration information used by SNMP and CMIP to monitor or change network settings.
NCP	NetWare Core Protocol. Network clients use the NCP to request services of servers, and servers use NCP to provide services, such as file and print services.
NDPS	Novell's Distributed Printing Services.
NDS	NetWare Directory Services. A hierarchical data base that manages NetWare network resources such as servers and volumes.
NetBIOS/NetBEUI	Network Basic Input Output System, a network protocol with special functions for local area networks. NetBIOS Enhanced User Interface is an enhanced version of NetBIOS.

NetWare	An operating system for local area networks.
PCL	Printer Control Language — a set of command codes used when printing. A PCL driver is a small program that works between the operating system and the printer.
Peer-to-Peer Printing	When selecting Peer-to-peer printing, all print jobs are sent directly to the print server, rather than through a file server (client/server).
PEM	Privacy Enhanced Mail.
RARP	Reverse Address Resolution Protocol. A TCP/IP protocol used for downloading IP addresses in UNIX/Linux networks. It requires a RARP daemon on your system, and only operates within a single network segment. A request made to an active RARP daemon initiates a search of the Ethernet Address Table for an entry matching the print server's Ethernet address. If a matching entry is found, the daemon downloads the IP address to the print server.
RISC	Reduced Instruction Set Computing. A processor designed to increase performance, using a limited set of of assembly language instructions.
SAP	Service Advertising Protocol. A NetWare network name advertising service that e.g. file servers can use for advertising their existence to network clients.
SNMP	Simple Network Management Protocol. Standard management protocol for network attached devices.
SSL	Secure Sockets Layer, a protocol designed to provide secure communications on the Internet.
SPX	Sequenced Packet Exchange, a NetWare communications protocol used to transmit messages reliably over a network.
TCP	Transmission Control Protocol. The connection-oriented, transport-level protocol used in the TCP/IP suite of protocols.
Telnet	A terminal emulation program for networks, often used to remotely control Web servers.

TFTP   Trivial File Transfer Protocol (TFTP) is an Internet software utility for transferring files that is simpler to use than the File Transfer Protocol (FTP) but less capable. It is used where user authentication and directory visibility are not required. TFTP uses the User Datagram Protocol (UDP) rather than the Transmission Control Protocol (TCP).

TLS   Transport Layer Security, a protocol that guarantees privacy and data integrity between applications communicating over the Internet.

UNIX   A 32-bit multi-tasking, multi-user operating system originally developed by AT&T.

URL   Uniform Resource Locator. A way of specifying the location of information on the Internet.

USB   Universal Serial Bus.

WAN   Wide Area Network.

WEP   Wired Equivalent Privacy - a protocol that provides security and privacy by encrypting data transmitted over the WLAN.

WINS   Windows Internet Name Service. A NetBIOS Name Server that maps NetBIOS names to dynamically assigned IP addresses.

Wizard   A special form of user assistance that automates a task through a dialog with the user. Wizards help the user to accomplish tasks that are complex and require experience, and even for the experienced user can help to speed up an operation.

WLAN   Wireless Local Area Network - A local area network (LAN) to which a mobile user can connect wirelessly.

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