

LJ2650DN/M7650DNF

网络术语表
Network Glossary

lenovo

Statement

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Definitions of notes

We use the following icon throughout this User's Guide:

 Note	Notes tell you how you should respond to a situation that may arise or give tips about how the operation works with other features.
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IMPORTANT NOTE

- Your product is approved for use in the country of purchase only. Do not use this product outside the country of purchase as it may violate the power regulations of that country.
- Windows[®] XP in this document represents Windows[®] XP Professional, Windows[®] XP Professional x64 Edition and Windows[®] XP Home Edition.
- Windows Server[®] 2003 in this document represents Windows Server[®] 2003 and Windows Server[®] 2003 x64 Edition.
- Windows Server[®] 2008 in this document represents Windows Server[®] 2008 and Windows Server[®] 2008 R2.
- Windows Vista[®] in this document represents all editions of Windows Vista[®].
- Windows[®] 7 in this document represents all editions of Windows[®] 7.

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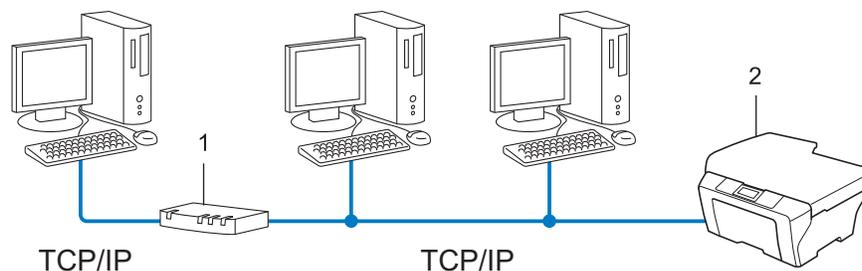
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Types of network connections

Wired network connection example

Peer-to-Peer printing using TCP/IP

In a Peer-to-Peer environment, each computer directly sends and receives data to each device. There is no central server controlling file access or machine sharing.



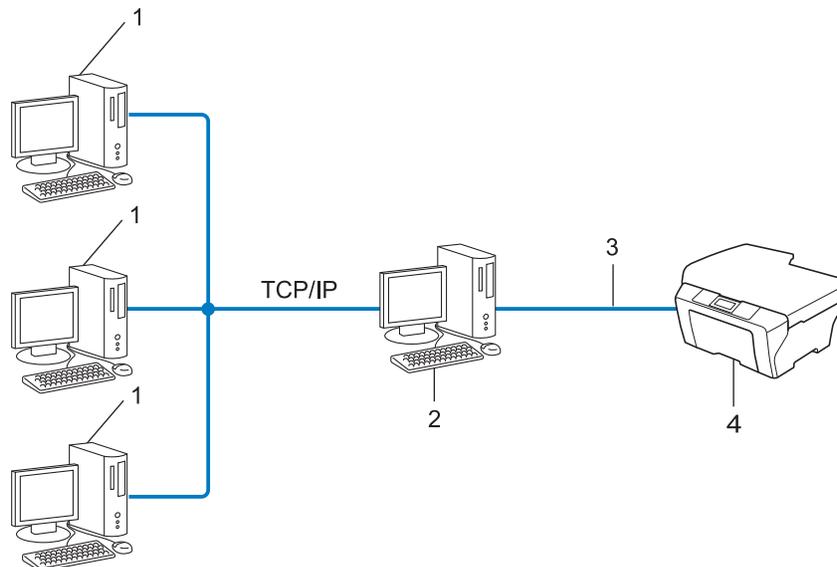
1 Router

2 Network machine (your machine)

- In a smaller network of 2 or 3 computers, we recommend the Peer-to-Peer printing method as it is easier to configure than the Network Shared printing method. See *Network Shared printing* on page 2.
- Each computer must use the TCP/IP Protocol.
- The Lenovo machine needs an appropriate IP address configuration.
- If you are using a router, the Gateway address must be configured on the computers and the Lenovo machine.

Network Shared printing

In a Network Shared environment, each computer sends data via a centrally controlled computer. This type of computer is often called a “Server” or a “Print Server”. Its job is to control the printing of all print jobs.



- 1 Client computer
- 2 Also known as “Server” or “Print server”
- 3 TCP/IP, USB or parallel (where available)
- 4 Network machine (your machine)

- In a larger network, we recommend a Network Shared printing environment.
- The “server” or the “print server” must use the TCP/IP print protocol.
- The Lenovo machine needs to have an appropriate IP address configuration unless the machine is connected via the USB or the parallel interface at the server.

Protocols

TCP/IP protocols and functions

Protocols are the standardized sets of rules for transmitting data on a network. Protocols allow users to gain access to network connected resources.

The print server used on the Lenovo machine supports the TCP/IP (Transmission Control Protocol/Internet Protocol) protocol.

TCP/IP is the most popular set of protocols used for communication such as Internet and E-mail. This protocol can be used in almost all operating systems such as Windows[®], Windows Server[®], Mac OS X and Linux[®]. The following TCP/IP protocols are available on the Lenovo machine.



Note

- You can configure the protocol settings by using the HTTP interface (web browser). (See the *Network User's Guide*.)
 - To find what protocols your Lenovo machine supports, see the *Network User's Guide*.
-

DHCP/BOOTP/RARP

By using the DHCP/BOOTP/RARP protocols, the IP address can be automatically configured.



Note

To use the DHCP/BOOTP/RARP protocols, please contact your network administrator.

APIPA

If you do not assign an IP address manually (using the control panel (for LCD models) of the machine or the BRAdmin Light) or automatically (using a DHCP/BOOTP/RARP server), the Automatic Private IP Addressing (APIPA) protocol will automatically assign an IP address from the range 169.254.1.0 to 169.254.254.255.

ARP

Address Resolution Protocol performs mapping of an IP address to MAC address in a TCP/IP network.

DNS client

The Lenovo print server supports the Domain Name System (DNS) client function. This function allows the print server to communicate with other devices by using its DNS name.

NetBIOS name resolution

Network Basic Input/Output System name resolution enables you to obtain the IP address of the other device using its NetBIOS name during the network connection.

WINS

Windows Internet Name Service is an information providing service for the NetBIOS name resolution by consolidating an IP address and a NetBIOS name that is in the local network.

LPR/LPD

Commonly used printing protocols on a TCP/IP network.

SMTP client

Simple Mail Transfer Protocol (SMTP) client is used to send E-mails via the Internet or Intranet.

Custom Raw Port (Default is Port 9100)

Another commonly used printing protocol on a TCP/IP network. It enables interactive data transmission.

IPP

The Internet Printing Protocol (IPP Version 1.0) allows you to print documents directly to any accessible machine via the internet.

mDNS

mDNS allows the Lenovo print server to automatically configure itself to work in a Mac OS X Simple Network Configured system.

SNMP

The Simple Network Management Protocol (SNMP) is used to manage network devices including computers, routers and Lenovo network ready machines. The Lenovo print server supports SNMPv1 and SNMPv2c.

LLMNR

The Link-Local Multicast Name Resolution protocol (LLMNR) resolves the names of neighboring computers, if the network does not have a Domain Name System (DNS) server. The LLMNR Responder function works in both the IPv4 or IPv6 environment when using a computer that has the LLMNR Sender function such as Windows Vista® and Windows® 7.

Web Services

The Web Services protocol enables Windows Vista® or Windows® 7 users to install the Lenovo printer driver by right-clicking the machine icon from the **Network** folder. (See *Network printing Installation when using Web Services (Windows Vista® and Windows® 7)* on page 8.) The Web Services also lets you check the current status of the machine from your computer.

HTTP

The HTTP protocol is used to transmit the data between a web server and a web browser.

FTP (For the Scan to FTP feature)

The File Transfer Protocol (FTP) allows the Lenovo machine to scan black and white or colour documents directly to an FTP server located locally on your network or on the internet.

IPv6

IPv6 is the next generation internet protocol.

Other protocol

LLTD

The Link Layer Topology Discovery protocol (LLTD) lets you locate the Lenovo machine easily on the Windows Vista®/Windows® 7 **Network Map**. Your Lenovo machine will be shown with a distinctive icon and the node name. The default setting for this protocol is Off. You can activate LLTD using Web Based Management (web browser) (See the *Network User's Guide*).

IP addresses, subnet masks and gateways

To use the machine in a networked TCP/IP environment, you need to configure its IP address and subnet mask. The IP address you assign to the print server must be on the same logical network as your host computers. If it is not, you must properly configure the subnet mask and the gateway address.

IP address

An IP address is a series of numbers that identifies each device connected to a network. An IP address consists of four numbers separated by dots. Each number is between 0 and 255.

■ Example: In a small network, you would normally change the final number.

- 192.168.1.1
- 192.168.1.2
- 192.168.1.3

How the IP address is assigned to your print server:

If you have a DHCP/BOOTP/RARP server in your network the print server will automatically obtain its IP address from that server.



Note

On smaller networks, the DHCP server may also be the Router.

For more information on DHCP, BOOTP and RARP, see:

Using DHCP to configure the IP address on page 11.

Using BOOTP to configure the IP address on page 13.

Using RARP to configure the IP address on page 12.

If you do not have a DHCP/BOOTP/RARP server, the Automatic Private IP Addressing (APIPA) protocol will automatically assign an IP address from the range 169.254.1.0 to 169.254.254.255. For more information on APIPA, see *Using APIPA to configure the IP address* on page 13.

Subnet mask

Subnet masks restrict network communication.

■ Example: Computer 1 can talk to Computer 2

- Computer 1

IP Address: 192.168. 1. 2

Subnet Mask: 255.255.255.000

- Computer 2

IP Address: 192.168. 1. 3

Subnet Mask: 255.255.255.000

Where the 0 is in the Subnet mask, there is no limit to communication at this part of the address. What this means in the above example is, we can communicate with any device that has an IP address that begins with 192.168.1.x. (where x. are numbers between 0 and 255).

Gateway (and router)

A gateway is a network point that acts as an entrance to another network and sends data transmitted via the network to an exact destination. The router knows where to direct data that arrives at the gateway. If a destination is located on an external network, the router transmits data to the external network. If your network communicates with other networks, you may need to configure the Gateway IP address. If you do not know the Gateway IP address then contact your Network Administrator.

Types of additional network settings

Following features are available to use if you want to configure additional network settings.

- Web Services (Windows Vista[®] and Windows[®] 7)



Note

Verify the host computer and the machine are either on the same subnet, or that the router is properly configured to pass data between the two devices.

Network printing Installation when using Web Services (Windows Vista[®] and Windows[®] 7)

The Web Services feature allows you to monitor its machine information which is connected to the network. This also enables the printer driver installation from the printer icon and the Web Services port (WSD port) will be made.



Note

- You must configure the IP address on your machine before you configure this setting.
- For Windows Server[®] 2008, you must install Print Services.
- Only printer support is installed with Web Services.

- 1 Insert the installation CD-ROM.
- 2 Choose your CD-ROM drive/**install/driver/gdi/32** or **64**.
- 3 Choose your language and then double-click **DPInst.exe**.



Note

If the **User Account Control** screen appears,

(Windows Vista[®]) Click **Allow**.

(Windows[®] 7) Click **Yes**.

4 (Windows Vista®)

Click , then choose **Network**.

(Windows® 7)

Click , **Control Panel, Network and Internet**, and then **View network computers and devices**.

- 5 The machine's Web Services Name will be shown with the printer icon. Right-click the machine you want to install.



Note

The Web Services Name for the Lenovo machine is your model name and the MAC Address (Ethernet Address) of your machine (e.g. Lenovo XXXX (model name) [XXXXXXXXXXXX] (MAC Address / Ethernet Address)).

- 6 From the pull down menu, click **Install**.

Security methods for E-mail Sending and Receiving

**Note**

You can configure the security methods settings using Web Based Management (web browser). For the details, see the *Network User's Guide*.

POP before SMTP (PbS)

The user authentication method for sending E-mail from a client. The client is given permission to use the SMTP server by accessing the POP3 server before sending the E-mail.

SMTP-AUTH (SMTP Authentication)

SMTP-AUTH expands SMTP (the Internet E-mail sending protocol) to include an authentication method that ensures the true identity of the sender is known.

APOP (Authenticated Post Office Protocol)

APOP expands POP3 (the Internet receiving protocol) to include an authentication method that encrypts the password when the client receives E-mail.

Using services

A service is a resource that can be accessed by computers that wish to print to the Lenovo print server. The Lenovo print server provides the following predefined services (do a `SHOW SERVICE` command in the Lenovo print server remote console to see a list of available services): Enter `HELP` at the command prompt for a list of supported commands.

Service (Example)	Definition
BINARY_P1	TCP/IP binary
TEXT_P1	TCP/IP text service (adds carriage return after each line feed)
PCL_P1	PCL service (switches PJL-compatible machine to PCL mode)
BRNxxxxxxxxxxxx	TCP/IP binary
BRNxxxxxxxxxxxx_AT	PostScript® service for Macintosh
POSTSCRIPT_P1	PostScript® service (switches PJL-compatible machine to PostScript® mode)

Where “xxxxxxxxxxxx” is your machine’s MAC Address (Ethernet Address).

Other ways to set the IP address (for advanced users and administrators)

Using DHCP to configure the IP address

The Dynamic Host Configuration Protocol (DHCP) is one of several automated mechanisms for IP address allocation. If you have a DHCP server in your network, the print server will automatically obtain its IP address from the DHCP server and register its name with any RFC 1001 and 1002-compliant dynamic name services.

Note

If you do not want your print server configured via DHCP, BOOTP or RARP, you must set the Boot Method to static so that the print server has a static IP address. This will prevent the print server from trying to obtain an IP address from any of these systems. To change the Boot Method, use the machine’s control panel Network menu (for LCD models), BRAdmin Light or Web Based Management (web browser).

Using RARP to configure the IP address

The Lenovo print server's IP address can be configured using the Reverse ARP (RARP) facility on your host computer. This is done by editing the `/etc/ethers` file (if this file does not exist, you can create it) with an entry similar to the following:

```
00:80:77:31:01:07    BRN008077310107
```

Where the first entry is the MAC Address (Ethernet Address) of the print server and the second entry is the name of the print server (the name must be the same as the one you put in the `/etc/hosts` file).

If the RARP daemon is not already running, start it (depending on the system the command can be `rarpd`, `rarpd -a`, `in.rarpd -a` or something else; type `man rarpd` or refer to your system documentation for additional information). To verify that the RARP daemon is running on a Berkeley UNIX based system, type the following command:

```
ps -ax | grep -v grep | grep rarpd
```

For AT&T UNIX-based systems, type:

```
ps -ef | grep -v grep | grep rarpd
```

The Lenovo print server will get the IP address from the RARP daemon when the machine is powered on.

Using BOOTP to configure the IP address

BOOTP is an alternative to RARP that has the advantage of allowing configuration of the subnet mask and gateway. In order to use BOOTP to configure the IP address make sure that BOOTP is installed and running on your host computer (it should appear in the `/etc/services` file on your host as a real service; type `man bootpd` or refer to your system documentation for information). BOOTP is usually started up via the `/etc/inetd.conf` file, so you may need to enable it by removing the “#” in front of the bootp entry in that file. For example, a typical bootp entry in the `/etc/inetd.conf` file would be:

```
#bootp dgram udp wait /usr/etc/bootpd bootpd -i
```

Depending on the system, this entry might be called “bootps” instead of “bootp”.



Note

In order to enable BOOTP, simply use an editor to delete the “#” (if there is no “#”, then BOOTP is already enabled). Then edit the BOOTP configuration file (usually `/etc/bootptab`) and enter the name, network type (1 for Ethernet), MAC Address (Ethernet Address) and the IP address, subnet mask and gateway of the print server. Unfortunately, the exact format for doing this is not standardized, so you will need to refer to your system documentation to determine how to enter this information (many UNIX systems also have template examples in the `bootptab` file that you can use for reference). Some examples of typical `/etc/bootptab` entries include:

```
BRN310107 1 00:80:77:31:01:07 192.168.1.2
```

and:

```
BRN310107:ht=ethernet:ha=008077310107:\ip=192.168.1.2:
```

Certain BOOTP host software implementations will not respond to BOOTP requests if you have not included a download filename in the configuration file. If this is the case, simply create a null file on the host and specify the name of this file and its path in the configuration file.

As with RARP, the print server will load its IP address from the BOOTP server when the machine is powered on.

Using APIPA to configure the IP address

The Lenovo print server supports the Automatic Private IP Addressing (APIPA) protocol. With APIPA, DHCP clients automatically configure an IP address and subnet mask when a DHCP server is not available. The device chooses its own IP address in the range 169.254.1.0 through to 169.254.254.255. The subnet mask is automatically set to 255.255.0.0 and the gateway address is set to 0.0.0.0.

By default, the APIPA protocol is enabled. If you want to disable the APIPA protocol, you can disable it using control panel of the machine (for LCD models), BRAdmin Light or Web Based Management (web browser).

Using ARP to configure the IP address

If you are unable to use the BRAdmin Light and your network does not use a DHCP server, you can also use the ARP command. The ARP command is available on Windows® systems that have TCP/IP installed as well as UNIX systems. To use ARP enter the following command at the command prompt:

```
arp -s ipaddress ethernetaddress  
ping ipaddress
```

Where `ethernetaddress` is the MAC Address (Ethernet Address) of the print server and `ipaddress` is the IP address of the print server. For example:

■ Windows® systems

Windows® systems require the dash “-” character between each digit of the MAC Address (Ethernet Address).

```
arp -s 192.168.1.2 00-80-77-31-01-07  
ping 192.168.1.2
```

■ UNIX/Linux systems

Typically, UNIX and Linux systems require the colon “:” character between each digit of the MAC Address (Ethernet Address).

```
arp -s 192.168.1.2 00:80:77:31:01:07  
ping 192.168.1.2
```



Note

You must be on the same Ethernet segment (that is, there cannot be a router between the print server and operating system) to use the `arp -s` command.

If there is a router, you may use BOOTP or other methods described in this chapter to enter the IP address. If your administrator has configured the system to deliver IP addresses using BOOTP, DHCP or RARP your Lenovo print server can receive an IP address from any one of these IP address allocation systems. In which case, you will not need to use the ARP command. The ARP command only works once. For security reasons, once you have successfully configured the IP address of a Lenovo print server using the ARP command, you cannot use the ARP command again to change the address. The print server will ignore any attempts to do this. If you wish to change the IP address again, use a Web Based Management (web browser), or factory reset the print server (which will then allow you to use the ARP command again).

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