

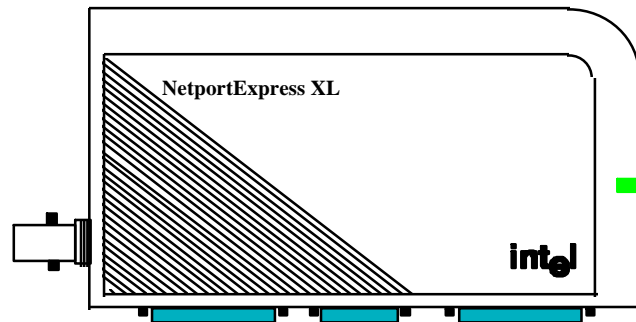
The Intel NetportExpress™ Print Server

A technical description of what the NetportExpress Print Server is and how it works with your network and your network users.

Intel's NetportExpress™ Print Server

The easiest way to take control of your network printing.

A small, self-contained unit, the NetportExpress (NPX) print server connects up to printers directly to the LAN wiring. It contains its own microprocessor, memory, LAN interface circuitry, and Flash memory to meet the sophisticated printing needs of today's heterogeneous networks.



The NetportExpress EL print server is designed with two high-speed parallel ports and supports NetWare* environments. The NetportExpress XL print server adds a serial port, higher performance, and simultaneously runs multiple protocols (NetWare, TCP/IP, LAN Manager*/LAN Server*, AppleTalk*). This report utilizes the NetWare environment for example purposes.

Main features/benefits of NetportExpress Print Server

Control - With the new Windows NPMgr software, a LAN Administrator can see, modify, and reset all NetPort print servers connected to their LAN. This includes XL, EL, NetPort II and the original NetPort print servers.

Performance - The EL prints up to 80 KBps while the XL prints up to 180KBps on a single port which is equivalent to or better than internal cards.

Flash Software Upgradeable - Using Intel's Flash memory, the NPX can easily be upgraded over the LAN wire to newer versions of software, including new protocols and higher performance.

Network Printing

When printing on a network, the workstation redirects the serial or parallel output to the file server for processing. In Novell, this is done through the CAPTURE command. CAPTURE monitors the workstation ports and redirects print jobs to the appropriate file server queue.

When a print job has been redirected to a Novell file server, the print job is spooled to the appropriate print queue. The job is then directed to a printer either through the file server's parallel or serial port, or over the LAN wiring and through a print server.

Printing with the NetportExpress Print Server

NetportExpress print servers are video cassette-sized devices which allows multiple printers to be connected directly to the LAN wiring, rather than to the file server or a PC print station. The EL supports two printers while the XL supports three. The network cable plugs directly into the NPX on one side, while the parallel and/or serial cables from the printer plug into the other side.

A print job travels from the initiating workstation to the file server queues. The NPX is defined in the file server bindery to pick up the job, bring it out on the wire and then through one of its ports to the appropriate printer. This path is shown in Figure 1.

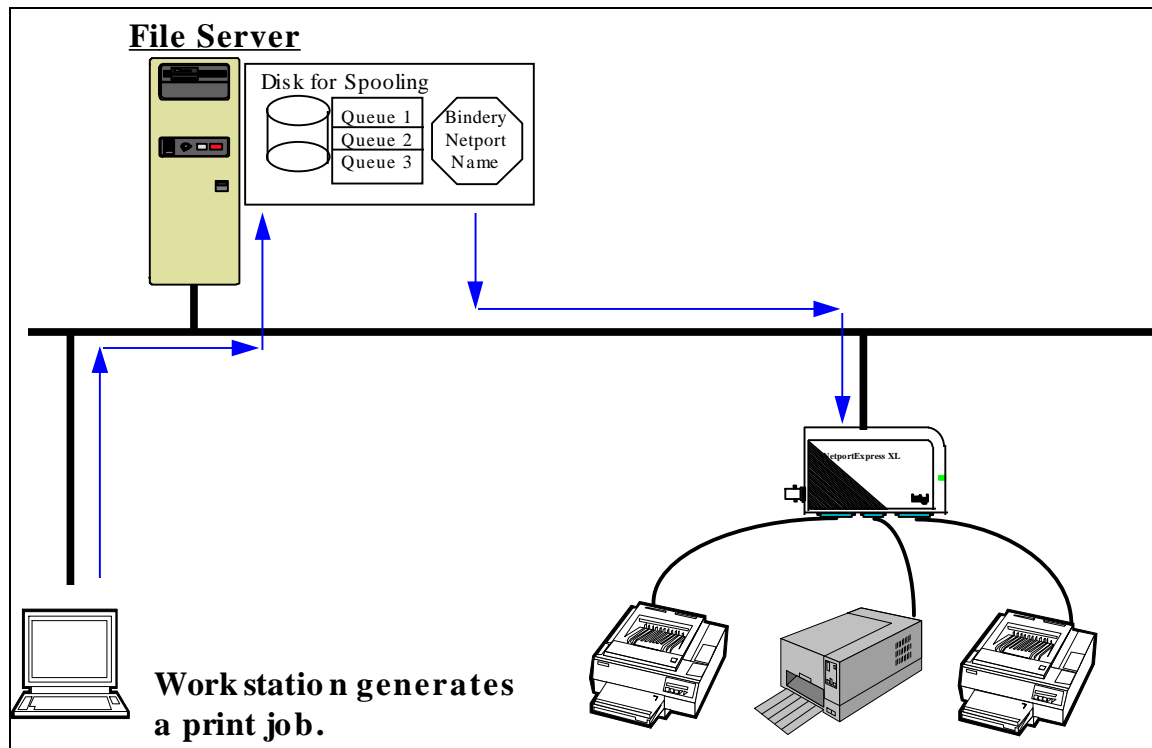


Figure 1: The path followed by the print job to the printer.

By connecting directly to the network wiring, the NPX easily allows printers to be installed anywhere on the network. With a few simple steps, it can be configured for the appropriate queues, and then centrally managed along with all Netport print servers on the network.

Once the NPX is installed, users redirect print jobs with the same NetWare commands they are familiar with: CAPTURE, NPRINT and ENDCAP. No special software or reconfiguration is required for users workstations.

The NetportExpress Print Server on the Wire

Power On Self Test (POST)

At the time of power-up, the NPX runs through a power on self test (POST). If it finds an error during POST, it will report the error through a simple flash sequence on the LED, as described in the installation guide. On successful completion of the POST, the LED indicator will stay solid green.

The Remote Boot Load Process

The application code for the NPX (basic runtime code, protocols, special setup information) is contained in a special file on the designated Remote Boot Load (RBL) file server (The file name is ENL.NPX or TNL.NPX for the EL ethernet and token ring versions respectively. For the XL the files names are EN.NPX and TN.NPX). After POST, the NPX retrieves its application code from the RBL Server, using its Flash memory to manage the task. During this time the LED is amber. The application code is stored in RAM, thereby improving performance and providing

dynamic resource allocation. The RBL server can be any server specified by the LAN Administrator and is not necessarily one that the NPX will be servicing queues from.

NetportExpress Modes

The NetportExpress print server can be configured in two modes: print server or remote printer. Each port can simultaneously be configured and run as a print server or remote printer. Print server mode is the most common because it provides the best performance and is simple to configure. Both modes can coexist with other printing solutions on the file server. Figure 2 compares the modes.

Print/Queue Server	Remote Printer
Highest Performance	Slower Performance
Easiest to install -- No additional software (VAP, NLM or EXE) required.	Must unload & reload PSERVER NLM. Must stop & restart Novell's Print Server VAP to set up any printer.
Takes up one user login slot. (# of NetPorts limited by available # of slots).	Does not use login slots.
Supports 8 file servers and 32 queues.	NetWare PServer limit of 16 printers per file server.
NetPort polls the file server for print jobs. PULL mode.	The VAP/NLM controls the job. When a print job is ready, the VAP/NLM sends it to the NetPort. PUSH mode.

Figure 2: Comparison of the two NPX set-up modes.

NetportExpress Print Server Installation

The NPX installation is quick and easy. The basic installation steps are:

Step 1. Physically connect the XL to the network and printer cables, and plug in the power cord.

Step 2. Install the NPMGR software

Step 3. Run NPMGR to configure the NPX.

The Token Ring NPX also provides the ability to set Early Token Release and Locally Administered Addresses.

Supervisors and Operators

The NPMgr software has three user classifications to provide maximum flexibility in assigning control over Netport print servers: supervisors, notification operators, and control operators.

Network supervisors can perform all NPX functions. Only a supervisor can assign or change NetPort's mode of operation (print server, remote printer or virtual circuit), serial port parameters, alias name, associated file server, or operators.

Notification operators are simply notified of job completions and need for form changes.

Control Operators can further help manage the NetPorts day-to-day by resetting them, canceling or retrying jobs, and issuing the New Form command.

In addition, you can assign a password to each NPX unit on your network. This allows LAN Administrators to increase security by segmenting the network..

Print Management Utilities

In addition to NPMgr, the NetportExpress print servers offer two utilities for registered users that give supervisors, operators and users the ability to view and control their printing environment from any workstation. These management tools become increasingly important as your network grows.

LANQView Utility. Intel's LANQView utility enables LAN administrators to view and control as many as three print queues at once to make the most productive use of print resources. Unique in the industry, LANQView allows print jobs to be moved within a queue or from one queue to another, even across file servers.

While keeping queue management in the hands of the network administrator, LANQView allows varying degrees of control to be delegated. Supervisors can grant different privileges to operators, individuals and groups. Even users without special privileges can use LANQView to check the backlog in the queue before sending a job, and to cancel their own jobs.

LANPrint Utility. Intel's LANPrint software is a pop-up utility that makes network printer selection easy for end users. The LANPrint utility, available in both DOS and Windows, displays a menu of available network printers and lets users switch from one printer to another - without having to worry about queues, jobs, Novell's CAPTURE commands or the inner workings of NetWare. The simple, menu-driven interface also allows network users to alter banner pages, type styles and number of copies printed.

The LANPrint utility lets the administrator configure the LANPrint menu to restrict access to a specified list of print job parameters — for example, printer selection only — while still allowing queue operators to retain their standard start, stop and delete queue privileges. LANPrint also provides a centralized PRINTCON database for all users, rather than a distinct one for each user.

What's Inside the NetportExpress print server?

Flash Memory - Flash memory is a read/write non-volatile memory developed by Intel which permanently stores the NPX's RBL Server access code as well as Token Ring MAC layer code.

The advantage of this is that when Intel develops software to provide added functionality, better performance or compatibility with new NOS versions (such as NetWare 4.0 or Windows NT), an EEPROM does *not* need to be physically replaced. Instead, Intel simply provides a diskette with the new software files. The LAN Administrator copies the new image file and the next time the NPX is reset or cycled off, it will automatically download the new functionality from the RBL server. This alleviates the exercise of updating each NPX individually.

Random Access Memory (RAM) - The NetportExpress print server's RAM is used to execute networking functions and store protocol information.

Network Adapter Interface - There are two NetportExpress units. The Ethernet version supports thin-wire (10Base2, BNC) and unshielded twisted pair (10Base-T, TPE) media connections, with automatic sensing to determine which connector is being used. The Token Ring version supports 4/16Mbps over *both* shielded (STP) and unshielded (UTP) twisted pair wiring.

The Ethernet interfaces support 802.2, 802.3, Ethernet Type II, and SNAP frame types using the hardware switch. The Token Ring interface supports 802.2 and SNAP and is switchable between 4 and 16 Mbps with the same type of hardware switch.

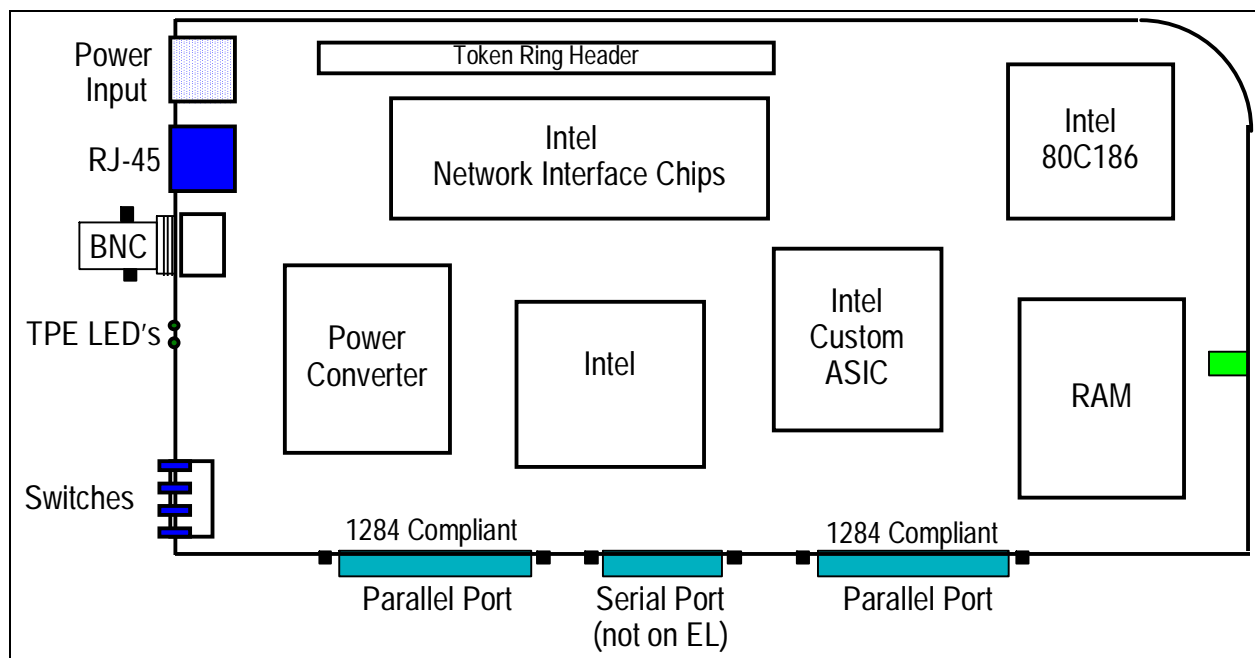


Figure 3: NetportExpress XL's print server's internal components.

Ports:

Parallel Ports - The NetportExpress print server has two IEEE standard high-speed, bi-directional parallel ports with 25 pin female connectors. Both ports operate at the same high speed.

Serial Port - The XL adds a standard 9-pin male RS-232C serial connection. It supports XON/XOFF, RTS/CTS and DTR protocols, as well as configurable baud rate, byte size, data bits and parity. The defaults are XON/XOFF, 9600bps, 8 data bits, 1 stop bit, and no parity. The serial port will support speeds up to 57.6 kbps.

Power Supply - The NPX has one switchable power supply. A different power cord is supplied depending on country of use: North America, Continental Europe, Hong Kong/UK, Australia/New Zealand, and Japan.

Intel NetportExpress Print Server

With its optimized LAN printing hardware and management utilities, the NetportExpress print server is an ideal solution for connecting printers directly to LAN wiring. Backed by a three year warranty and industry-leading technical support, NPX shows Intel's commitment to providing advanced technology for today's networking needs. Other FaxBACK documents of interest are:

The XL and LAN Manager/LAN Server Printing	6049
The XL and TCP/IP Printing	6126
The XL and AppleTalk Printing	6127
NPX Trade-In Order Form	9929

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