

Configuring the IBM 7318 Terminal Server



By Eddie Ho and David Phipps

Users can connect to a RISC System/6000 (RS/6000) either through multiport adapters or a LAN. The Serial Communications Network Server (7318) allows LAN-based workgroups to access system resources. This article provides configuration tips for the Model P10.

The IBM 7318 Model P10 is a terminal server and the Model S20 is a communications server. Both provide a way to attach ASCII devices—such as terminals, modems, or printers—to AIX 3.2 systems using Ethernet™ wiring.

The 7318 Model S20 communications server is a stand-alone TCP/IP node that provides networking capabilities, such as Simple Network Management Protocol (SNMP), Kerberos security functions, and other serial protocols such as Serial Line Internet Protocol (SLIP), Compressed SLIP (CSLIP), and Point-to-Point Protocol (PPP) for remote TCP/IP communications.

The 7318 Model P10 terminal server off-loads terminal protocol processing from the RS/6000™. It provides the RS/6000 with TTY devices that behave like standard I/O serial ports, such as sa0 and sa1. These ports are functionally equivalent and interface compatible with the TTYs created with a multiport adapter. A high-performance protocol that is transparent to users is used over the SPX/IPX transport protocol between the AIX device driver and the server to provide the TTY devices.

Using SMIT

The 7318 P10 configuration panels can be accessed using System Management Interface

Tool (SMIT). If the `cns.p10.obj` package has been installed, you can fastpath from the AIX prompt using `smit ts7318_mnu` or make the following selections in SMIT (root user authority is required):

- ◆ Devices
- ◆ Communications
- ◆ Serial Communications Network Server (ComNetServer)

Figure 1 shows the structure of the configuration menus. The order of the selections in the main menu can be mapped to the sequence of steps to define all resources on the 7318. For example, a terminal server must be configured before adding any TTY or printer devices.

Figure 2 shows three hosts and three device nodes, how each is addressed, and the configuration file entries for the hosts. It also shows the network definition for the topology.

IPX Addressing

NetWare® IPX network addressing principles are different and often simpler than for IP. Each host on the network has a user-designated internal network number that is stored in the configuration file `/etc/netware/NPSCconfig`. This internal network number must be unique among all hosts on the network.

The administrator assigns a number to each Ethernet segment in the network. Hosts, attached to one or more Ethernet segments, can perform routing between these segments. A configuration file in the host lists the external network numbers to which it is attached, and associates the

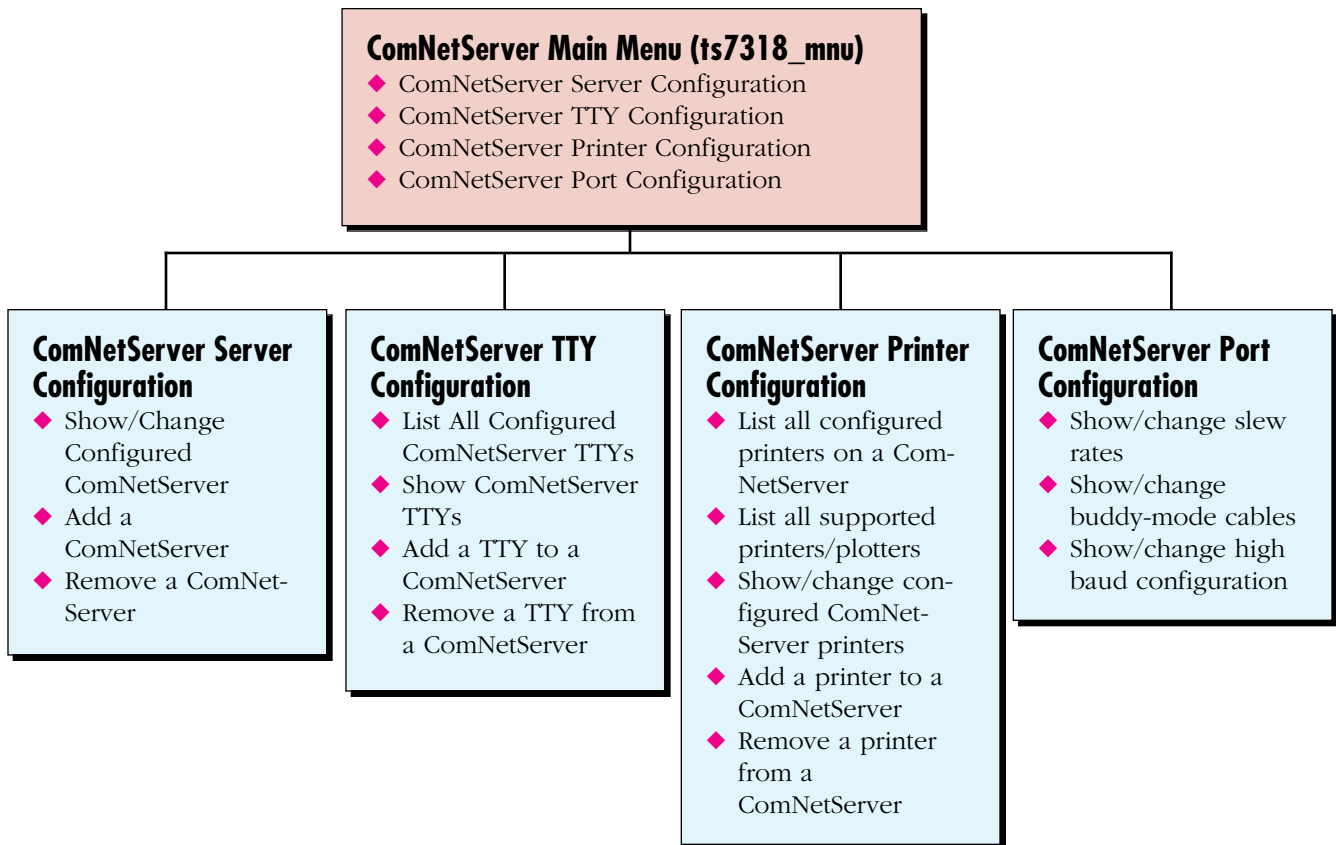


Figure 1. Configuration panels and navigation flows

numbers with the appropriate Ethernet adapter. The internal network numbers and the external Ethernet segment numbers must be unique. Both are logical network numbers—eight hexadecimal digits each.

A standard IPX address is represented by nnnnnnnn:dddddddddd. The nnnnnnnn is the 8-digit internal network number and the dddddddddd is the 12-digit Ethernet hardware address. Since hosts pretend to be a network by themselves, their Ethernet hardware address is not used as part of their node addressing. They are addressed by their internal network number with a fixed node address of 000000000001. All other devices on the network are addressed by the Ethernet segment number for the segment to which they are attached, followed by their Ethernet hardware address.

Configuring a 7318 Model P10

Figure 3 illustrates the two primary steps in configuring a terminal server. It includes two IPX nodes, the RS/6000, and a 7318-P10 connected by Ethernet. The 7318 has 16 IBM 3151 terminals

attached to 16 serials ports; an IBM 4029 printer is attached to parallel port 1. The Ethernet interface in the RS/6000 is en0.

Step 1: Update the Configuration File

The configuration worksheet from the *7318 Serial Communication Server Guide and Reference* (SA23-2542) should be used to gather all networking information. This information can help resolve network address conflicts and can make configuration easier. It is also a roadmap for debugging networking problems.

From the worksheet, verify the parameter settings below and change them if necessary in the `/etc/netware/NPSConfig` file. Use your favorite editor to input the changes. Any change in this file requires a system reboot before proceeding to step 2. The following key parameters are those most frequently used:

- ◆ **spx = active.** This parameter enables the SPX/IPX protocol on this host. Change this value from `inactive` to `active`.

Sample IPX Network

```

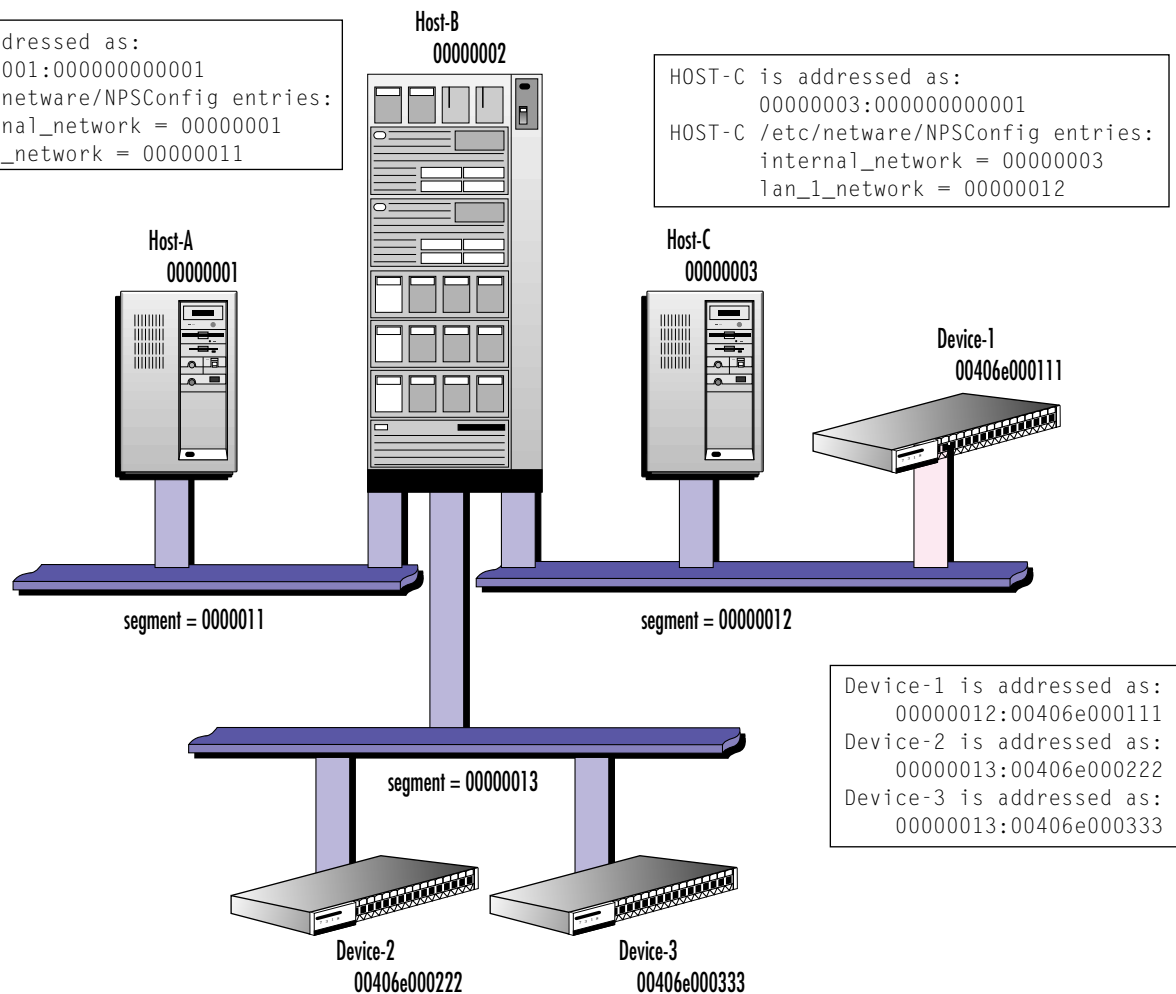
HOST-B is addressed as:
00000002:000000000001
HOST-B /etc/netware/NPSConfig entries:
internal_network = 00000002
lan_1_network = 00000011
lan_2_network = 00000013
lan_3_network = 00000012
    
```

```

HOST-A is addressed as:
00000001:000000000001
HOST-A /etc/netware/NPSConfig entries:
internal_network = 00000001
lan_1_network = 00000011
    
```

```

HOST-C is addressed as:
00000003:000000000001
HOST-C /etc/netware/NPSConfig entries:
internal_network = 00000003
lan_1_network = 00000012
    
```



```

Device-1 is addressed as:
00000012:00406e000111
Device-2 is addressed as:
00000013:00406e000222
Device-3 is addressed as:
00000013:00406e000333
    
```

Figure 2. Sample IPX network with three hosts on three different segments

- ◆ **internal_network = 00000001.** This is a unique number for this host. Since no other hosts are in this example, the value will not conflict with hosts. However, it must be different from the LAN network number and the internal network number of all other hosts on the network.
- ◆ **lan_1_ppa = 0 and lan_1_if_name = "en".** These two parameters contain the RS/6000 net-

work interface value. Concatenate the values from `lan_x_if_name` and `lan_x_ppa` to obtain the Ethernet interface being used for this segment. For this example, these are `en` and `0`, yielding interface `en0`.

The next step is to ensure that this interface is enabled. Since IP and IPX can share the same Ethernet adapter, this interface is usually up if TCP/IP is already active. The `smit chinnet`

Sample 7318 Topology

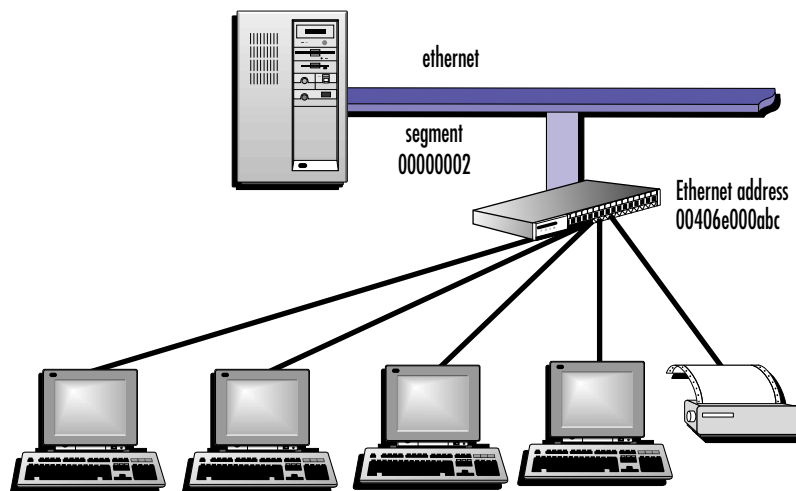


Figure 3. 7318 topology example

Parameter	Value
New ComNetServer Number	Contains the next available value.
ComNetServer Network Address	Contains the value set for <code>lan_1_network</code> in the <code>NPSConfig</code> file. This should be for the Ethernet segment on which the 7318 is attached.
ComNetServer Ethernet Address	The 12 hex digit Ethernet address. This address is located on the back of the 7318.

Figure 4. Values for panel parameters

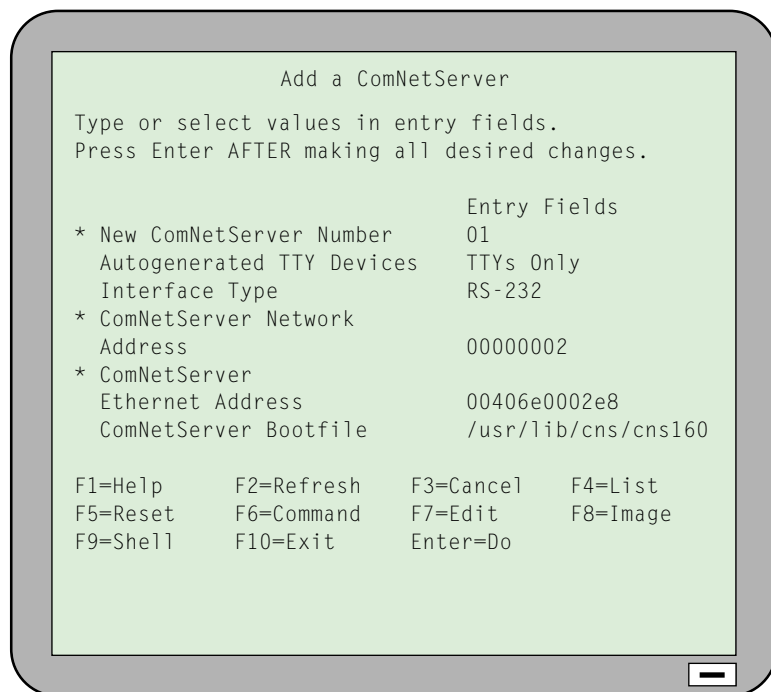


Figure 5. SMIT panel for adding a terminal server

fastpath will enable you to check this quickly, selecting the interface name you constructed above. Look in the Current STATE field for a value of UP. If the interface is not UP, then go ahead and start TCP/IP on this interface.

- ◆ **lan_1_network = 00000002.** This is a unique number for this host. This value defaults to 00000002. If IPX is running on the network, make sure that this value does not conflict with the internal network number of any other host, or the external network number of any of the Ethernet segments in the network.

Step 2: Use SMIT to Configure the Server and Its Attached Devices

Using the configuration worksheet, configure the 7318 unit. From the ComNet Server main menu, select the following:

```

ComNetServer Server Configuration
Add a ComNetServer
    
```

Use the values shown in Figure 4 to update the panel parameters shown in Figure 5.

This step configures the 7318 to AIX and automatically generates one RS-232 device session on each port of the 16 serial ports. If necessary, SPX/IPX will be started and the CNSVIEW daemon will be started or re-initialized with the new information.

The daemon monitors the network for the 7318 boot request and provides a command-line interface to perform administrative functions for the 7318. The 7318 can then boot from the system when it is powered up. This step takes about 2 minutes because of auto-TTY generations.

Configuring a Terminal

Configuring a terminal is usually not required for an ASCII terminal device. All 16 TTY devices were automatically created and configured to provide an AIX login prompt effective at the next system boot.

To enable them immediately, issue the penable command for each of these ports at the console (for example, enable tty15) after the TTY devices become available. The 7318 must finish booting before the configured devices are changed to the available state. You can check the state of each TTY device with a command such as `lsdev -C | grep tty15`.

Configuring a Parallel Printer

Printer definitions are not generated automatically—each port must be configured with a supported printer type. From the ComNet Server Printer Configuration menu in SMIT, select the “Add a Printer to a ComNetServer” option (shown in Figure 6) to define a printer device. Use the F4 key for a list of the printers supported by AIX. The Printer ComNetServer Number field must contain the appropriate number where the printer should be attached. The printer port number should be either p1 or p2. When completed, this step creates a special device file, such as

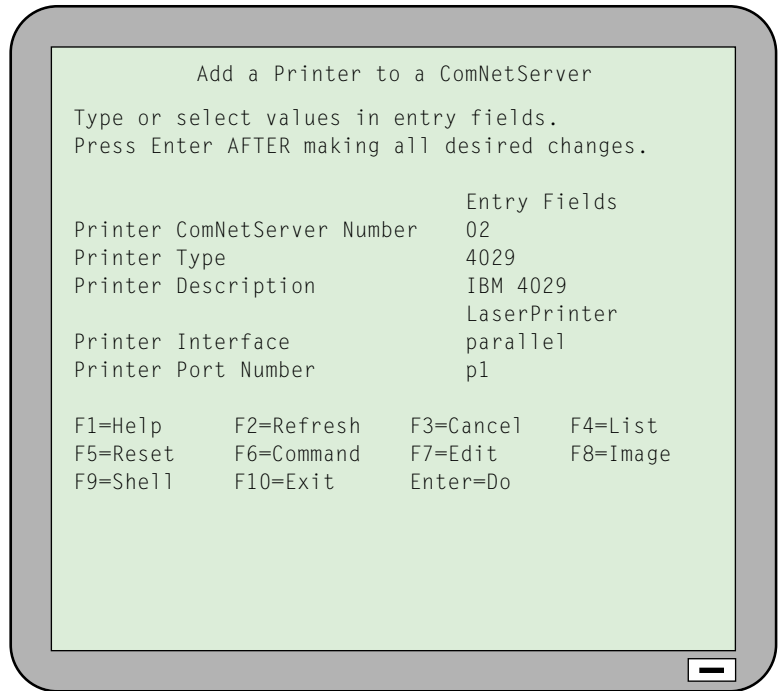


Figure 6. SMIT panel for adding a printer device to a terminal server

`/dev/lpx` for the printer, and can be used by the printer spooling subsystem.



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