Console Management Implementation Guide

Preface

This document is written to assist the user in the configuration of a Computone RAS 2000 PowerRack for Out-of-Band and In-Band Console Management. This document will also provide standard cabling pinouts for network hardware and configuration information for standard UNIX operating systems. If you have any questions or comments on this manual, please e-mail 'support@computone.com' or call 800-241-3946 x2002. More information on Out-of-Band Console Management (OBM) can be found at 'http://www.computone.com/console_mgmt/console_mgmt_index.html.'

How to Use This Document

Three different fonts will be used to distinguish between the process of configuration, actual commands, and the output of commands:

1). Text used to describe the process of configuration and comments:

Times New Roman, font size 12 or greater.

2). Text used to represent commands:

```
Courier, font size 10.
```

3). Text used to represent output of commands:

```
Courier(NEW), font size 10, Bold.
```

NOTE: Examples of IP addresses throughout the document are to be used as examples only. Consult the Computone IntelliServer Software Configuration Guide for a thorough understanding of Networking and IP addressing. It is available on CD or our web site. Design an IP addressing scheme that works with your solution. We use the 192.168.0.0 addresses, which is consistent with Industry standards for Private Networks.

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What is Console Management?

There are two methods of managing your network devices. One is In-Band Management (IBM) and the other is Out-of-Band Management (OBM).

- In-Band Management is the management of network devices through the normal band of communication. This band is known as the Ethernet network. Several software packages have the ability to manage in this band. Examples are SNMP, Telnet, Web management interfaces, and remote control software. In-Band Management access via the network has one inherent weakness: communication is subject to the same problems that your network is experiencing at that time. When the network goes down or is severely disrupted, network traffic has no way to get between the managed node and the management console. Quite often when a network element goes down, it loses its network connection, which renders In-Band Management useless.

- Out-of-Band Management allows the administrator to gain direct access to the remote device regardless of network issues. If the network goes down an administrator can then dial into an OBM or remote console management device such as the RAS 2004/8 and connect directly up to the network element that has failed or is causing the network to fail. That managed device can then be restarted, reconfigured, or taken offline enabling your network to function with minimum downtime.

Remote Console Management (RCM)

The following reasons are why administrators choose Remote Console Management:

Access to Network Devices Regardless of Network Issues

If your router at a remote location is down or is unable to communicate through the WAN or the LAN, access can be gained by dialing into the OBM device. After dialing into the OBM device, connection to the console of the router can be made.

Short Diagnostic and Recovery Time

If the network failure is due to a configuration issue and requires a reboot, driving to the remote location to fix the problem is not required. Console Management devices give the ability to control, reboot, and configure devices remotely. Less downtime = More profit!

Secure In-Band Access to Network Devices

The password on a router or other device can be changed using telnet. Would-be hackers can see telnet packets and then access the router later. With an OBM device that has SSH, all passwords are encrypted with 128-bit encryption over the network. Administration access can be locked to the console port on your network devices. This will force administrators to use SSH and be an authorized user before they can gain administrative access to the network device.

Ease of Use for Administrators

Some networks use KVM switches or serial switches at the rack for console level access. This forces the administrator to go to each rack to gain access to the network devices. It also permits almost any user to gain access to those devices. If administrators need access to many devices, an OBM device will allow access without requiring them to leave their desk. They can also gain that access, if permitted, from home. It is faster to access 64 servers sequentially through the use of the RAS 2004/8 rather than pushing a cart with a serial terminal or monitor, keyboard, and mouse around on the floor. And when the cart does get to its destination, power must be found to turn it on. Greater productivity = More profit.

Great Insurance Investment

The question is why so many IT concentric organizations build their network without “insurance policies”. The expertise to recover is available, but not the ability to recover inexpensively and quickly. Paying a small premium in the beginning reduces down-time and expenditures. The RAS and RCM are “insurance policies” for your network. If the products are never used for recovery, then consider yourself among the lucky few in this world. However, if they are used, it is nice to know that recovery will be quick and inexpensive. Recover remote networks without ever sending some-one on-site.

Installing the RAS 2004/8 on Your Network

Upon receiving the RAS 2004/8, install it on your network. This section will discuss the following topics:

- Unpacking the RAS 2004/8
- Installing Hyper Terminal
- Assigning an IP Address
- Setting up Secure Shell for Secure Console Access
- Setting up Tipmenu for Console Management
- Using Tipmenu and tip

Unpacking the RAS 2004/8

The RAS 2004/8 box contains the following components:

Table 1 RAS 2004/8 Components

Quantity	Part Number	Description
1	RAS2000/16	Computone RAS 2004/8 PowerRack 16 port
1	DB9 PATCH PAK	RJ45 female to DB9 male. This allows a PC with a DB9 serial port to connect to the RAS for configuration.
1	DB25 PATCH PAK	RJ45 female to DB25 male. This allows a PC with a DB25 serial port to connect to the RAS for configuration.
1	2-20119	7” CAT5 cable for attaching the RAS 2004/8 to a network or using between the RAS 2004/8 and the DB9 or DB25 cables.
1	VP-RJ-DB/M 2-20122	RJ45 male to DB25 male. This allows a modem with a DB25 serial port to connect to the RAS 2004/8 for dial-in connections.
1	RAS2004/8 CD	RAS 2004/8 CD with drivers, software, and manuals
1	Power Cable	Power Cable
1	Manual	IntelliServer Software Manual

Contact ***Computone*** to replace any product using the part numbers listed above.

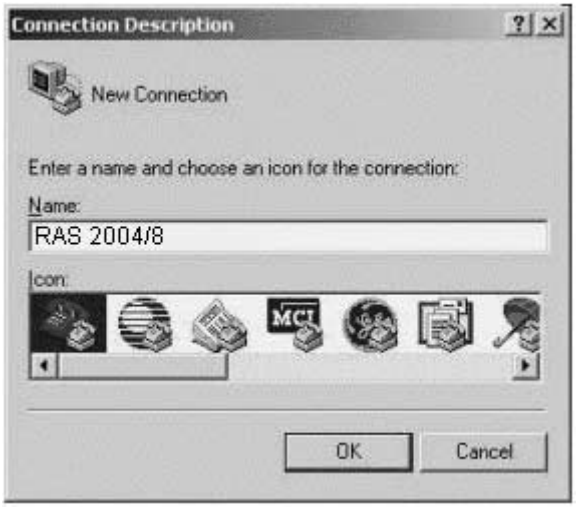
Installing Hyper Terminal

To setup the RAS 2004/8 on the network, access it using the console port. The console port is port ‘0’. If using a laptop or PC with a DB9 serial port, use the DB9 patch cable and the CAT5 cable that was included in the accessories package. Next, attach the DB9 patch cable to the COM port on the back of the PC. Connect one end of the RJ45 CAT5 cable into the RJ45 socket of the DB9 patch cable. Then connect the remaining end of the CAT5 cable into port 0 of the RAS 2004/8. The PC is now connected to the RAS 2004/8. ***Do not turn on the RAS 2004/8 yet***.

Plug the power cable into an UPS or power strip and then into the back of the RAS 2004/8. If the PC is running Windows, use the Hyper Terminal to configure the RAS 2004/8.

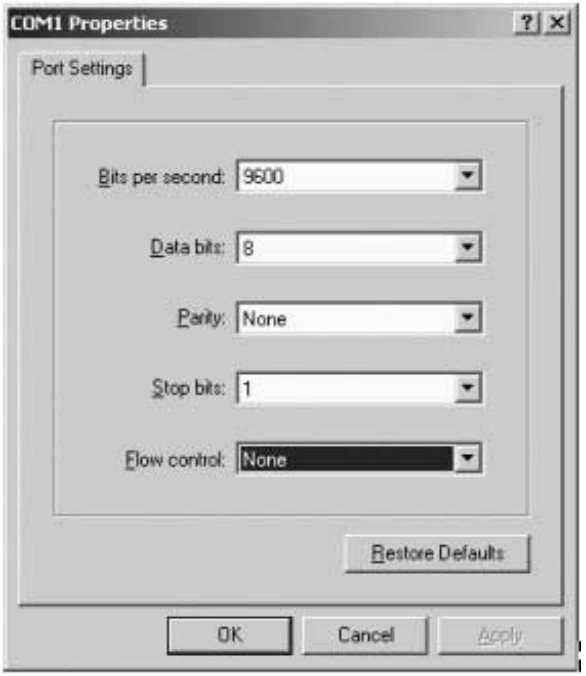
To start Hyper Terminal, perform the following steps:

1. To access Hyper Terminal, press the **Start** button, then select **Programs** > **Accessories** > **Communications** > **Hyper Terminal**.
2. In the Connection Description dialog box, type **RAS2004/8** in the **Name** field. Click **OK**.



3. In the **Connect To** dialog box, select the COM port that is connected to the RAS 2004/8 in the **Connect using** field. Click ***OK***.

4. From the **Properties** dialog box, set the Bits per second to **9600**, Data bits to **8**, Parity to **None** and Flow control to **None**. Click **OK**.



5. Turn on the RAS 2004/8 using the gray power button located on the back. The unit will boot and the following Hyper Terminal communications window appears.

```
Boot Loader, Release 1.1
CPU Speed  = 30 MHz
I/D Cache  = 8k/2k
Memory     = 8192k
Switches   = 0000
Fast Reset = Y (DRAM tests omitted)
Disabled   = Self tests:
Image Size = 626k/1573k
```

```
**************************************************
          Computone RAS 2004/8 PowerRack
Release 3.0.8c (us) of Thu Sep 14 11:45:13 EDT 2000
    Kernel Text/Data/Heap     = 347k/1233k/934k
    Directory                 = 1057k
    Memory Size/Available     = 8192k/4564k
    Flash Kernel/Config/Table = 1024k/32k/128k
    Internet Address          = 0.0.0.0
    Ethernet Address          = 00:80:69:81:0e:40
    Serial Ports              = 32
**************************************************
Copyright (c) 1999-2000 Computone Corp. All rights
Reserved.
Portions Copyright (c) 1998-1999 The OpenSSL Project
Portions   Copyright   (c)   1995-1999   Eric   Young
(eay@cryptsoft.com)
Sending bootp...
Sending bootp...
Sending dhcp...
Sending DHCP DISCOVER ....
Bootp reply from 192.168.2.1
Sending DHCP REQUEST ....
Bootp reply from 192.168.2.10
Starting network
netconf: added route 0.0.0.0 192.168.2.1
pppconf:  0 inbound  interfaces
pppconf:  0 outbound interfaces
pppconf: removing pppfsm, pppd, ppp
routed: disabled
httpd: starting server
sshd is either inactive or disabled.
4364 KB available memory
#
```

Assigning an IP Address

If a Dynamic Host Configuration Protocol (DHCP) server is on the network, the unit will automatically receive an IP Address. This will not be acceptable for a console management server.

Assign an address that is in your name server or one easily remembered so a connection from remote locations can always be made. If DHCP is used, the IP Address can change. Refer to the DHCP logs to find the new assigned address. If DHCP is not used, assign an IP Address to the RAS 2004/8.

Use the following commands to setup the network configuration:

```
# set server address 192.168.2.1
# set server subnet 255.255.255.0
```
(This assigns the netmask of the network.)
```
# set server broadcast 192.168.2.255
# set server domain mydomain.com
# set server name myname
# show server
```
(This will show the settings just entered.)

The output of the “show server” command should look like this:

```
Server configuration:
  Name                : myname
  IP Address          : 192.168.2.1
  Subnet Mask         : 255.255.255.0
  Broadcast Address   : 192.168.2.255
  Domain Name         : mydomain.com
  Syslog Host         :
  Syslog Facility     : LOG_USER
  Syslog Priority     : LOG_VERBOSE
  Console Port Number: 0
  Ethernet Address    : 00:80:69:81:0e:40
  Force AUI Port      : No
  IP Filter           :
  RIP                 : both
  Login Prompt        :
  User Prompt         :
  Password Prompt     :
  Telnet uses RADIUS : No
myname#
```

Use the version command to verify that the RAS 2004/8 is loaded with version 3.0.6 or greater:

```
# version

Computone RAS 2004/8 PowerRack
Release 3.0.8c (us) of Thu Sep 14 11:45:13 EDT 2000
```

If version 3.0.8c is not installed, it can be downloaded from:

‘ftp://ftp.computone.com/pub/Products/ras2000/R3.08/beta’.
For support on upgrading, call 800-241-3946 x2002.

To save and activate configuration, issue the following commands:

```
# save
# shutdown now
```

The RAS 2004/8 will reboot with the new IP settings.

Configuring Secure Shell for Secure Console Access

Secure Shell (SSH) allows administrators to securely log into another computer over a network and execute commands. It provides strong authentication and secure communications over insecure channels. It replaces telnet, rlogin, rsh, and rcp. By default, Secure Shell is disabled. If SSH is used, it must be enabled. This is very easy and should be done for secure access to network device consoles.

If the choice is not to enable SSH, telnet can be used. Telnet is a clear text solution that does not use any form of security across the network. Others can view passwords entered to gain access to mission-critical systems.

If a UNIX SSH client is needed, browse to 'http://www.OpenSSH.com.' If a Windows SSH client is needed, download putty from Computone's FTP site at 'ftp://www.computone.com/.' Instructions on downloading and using this program can be found in Appendix B of this manual.

Use the following command to enable Secure Shell:

```
# apps set sshd enable
```

Generate a host key by using the command:

```
# sshd gen   (This will take a few minutes to complete.)
 A 1024-bit host key has been generated and saved
```

To generate a new host key, issue the following commands:

```
# sshd erase
# sshd gen   (This will take a few minutes to complete.)
 A 1024-bit host key has been generated and saved
```

The configuration must be saved and the box restarted to enable Secure Shell.

Use the following commands:

```
# save
# shutdown now
```

Secure Shell should be running and operational.

NOTE: After enabling SSH, boot time variances of up to 60 seconds may occur. At boot up, the RAS 2004/8 checks itself for SSH keys and generates keys as needed, perhaps causing a delay in boot up. This is normal and should not exceed 60 seconds.

Tipmenu for Console Management

Configuring Tipmenu for Console Management

The ports on the RAS 2004/8 must now be configured for Console Management. The Tipmenu command makes it very easy to enable a port to manage a network device console. The Tipmenu also provides the administrator with a text-based menu that will display all ports and the symbolic names given for each port. It is much easier to remember a name than it is to remember the port number for each attached device.

Configuring Ports on the RAS 2004/8 for Console Management

In this example, we are going to enable ports 1 through 5 for Console Management. Port 6 will be enabled for dial-in so an administrator can gain access to the RAS 2004/8 from a remote location using Hyper Terminal and a modem.

To enable the ports use the following commands:

Set Tipmenu settings to **default**: (***This must be done on a new unit!)***

```
# tipmenu -x
```

Enable the ports:

```
# tipmenu -E 1
# tipmenu -E 2
# tipmenu -E 3
# tipmenu -E 4
# tipmenu -E 5
```

Name the ports symbolic names:

```
# tipmenu -n 1 Server1
# tipmenu -n 2 Server2
# tipmenu -n 3 Server3
# tipmenu -n 4 Server4
# tipmenu -n 5 Server5
```

To verify that settings have taken effect, issue the following command:

```
# tipmenu
```

```
 0:  n/a    16:disabled  32:disabled  48:disabled
 1:Server1  17:disabled  33:disabled  49:disabled
 2:Server2  18:disabled  34:disabled  50:disabled
 3:Server3  19:disabled  35:disabled  51:disabled
 4:Server4  20:disabled  36:disabled  52:disabled
 5:Server5  21:disabled  37:disabled  53:disabled
 6:n/a      22:disabled  38:disabled  54:disabled
 7:disabled 23:disabled  39:disabled  55:disabled
 8:disabled 24:disabled  40:disabled  56:disabled
 9:disabled 25:disabled  41:disabled  57:disabled
10:disabled 26:disabled  42:disabled  58:disabled
11:disabled 27:disabled  43:disabled  59:disabled
12:disabled 28:disabled  44:disabled  60:disabled
13:disabled 29:disabled  45:disabled  61:disabled
14:disabled 30:disabled  46:disabled  62:disabled
15:disabled 31:disabled  47:disabled  63:disabled

tip to port:
```

To exit Tipmenu use the following command:

```
tip to port: quit
```

Tipmenu assumes that all ports enabled for Console Management have a full-wired connector attached. Computone cables, enabled hardware flow control, and Carrier Detect on your network node are needed.

Otherwise, when trying to connect to the network node, the tip program will terminate without a connection. Tip terminates because it expects to receive Carrier Detect from the network node. This provides a mechanism to detect faults in the connection to the managed node.

If using software or no flow control, and using a minimal pinout configuration (this is true in most cases) this feature will need to be turned off. If this feature is not turned off, a connection to the device will not be made even if a cable is plugged into it.

Use the following commands to turn this feature off on ports 1 through 5:

```
# set port 1 modem disabled
# set port 2 modem disabled
# set port 3 modem disabled
# set port 4 modem disabled
# set port 5 modem disabled
```

Verify port configuration with the following command:

```
# show port 1
----
Port Number:   1    Port Type: Disabled
Comment:

Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None

Modem: No    Await Input: No    Dial Script:
Modem Init:

Speed: 9600      Size: 8    Parity: None    Stop Bits:
1
Inflow: XOFF   Outflow: XON  Auto PPP: Yes

Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal

IntelliView :
IntelliPrint:                          IntelliSet:

Current screen settings:
```

If this completes your configuration of the ports, issue the following command:

```
# save
# shutdown now
```

Configuring a Modem for Console Management

For Out-of-Band Remote Management, a modem must be installed and configured for use on the RAS 2004/8. To configure port 6 or any port for a modem, use the following commands:

Configure the port for a modem

Enable login:

```
# set port 6 login byport
```

Enable serial speed of 115,200 bps. supported by most modems. Use the correct value for your model:

```
# set port 6 speed 115200
```

Enable flow control:

```
# set port 6 inflow rts
# set port 6 outflow cts
```

Enable modem on port:

```
# set port 6 modem enabled
```

Connecting the modem

Attach the DB25 connector of the 2-20122 cable provided to your modem.

Connect the RJ45 male connector to port 6 on the RAS 2004/8.

Turn the modem on.

Reset the port:

```
# kill port 6
```

Verify port configuration with the following command:

```
# show port 6

----
Port Number:   6    Port Type: Login by port, wait
Comment:

Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None

Modem: Yes    Await Input: No    Dial Script:
Modem Init:

Speed: 115200    Size: 8    Parity: None    Stop Bits:
1
Inflow: RTS    Outflow: CTS  Auto PPP: Yes

Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal

IntelliView :
IntelliPrint:                        IntelliSet:

Current screen settings:
```

Attach to the modem and enable auto answer:

```
# tip 6

Tip will exit on loss of carrier
Waiting for carrier...
Escape sequence is '~.'
Use '~%b' to send a break.

ATZ

Ok

ATS0=1

Ok

AT&W

Ok

~. (Use ~. to escape from the tip session.)
```

Save current settings:

```
# save
# shutdown
```

Using Tipmenu and Tip

Tipmenu is an application on the RAS 2004/8 that will allow an administrator to access a network device by symbolic names rather than port numbers. To connect directly to a port, the administrator can simply use the tip command. For large installations, it is easier to use the Tipmenu command.

To run Tipmenu, use the following command:

```
# tipmenu
```

```
 0:  n/a    16:disabled  32:disabled  48:disabled
 1:Server1  17:disabled  33:disabled  49:disabled
 2:Server2  18:disabled  34:disabled  50:disabled
 3:Server3  19:disabled  35:disabled  51:disabled
 4:Server4  20:disabled  36:disabled  52:disabled
 5:Server5  21:disabled  37:disabled  53:disabled
 6:n/a      22:disabled  38:disabled  54:disabled
 7:disabled 23:disabled  39:disabled  55:disabled
 8:disabled 24:disabled  40:disabled  56:disabled
 9:disabled 25:disabled  41:disabled  57:disabled
10:disabled 26:disabled  42:disabled  58:disabled
11:disabled 27:disabled  43:disabled  59:disabled
12:disabled 28:disabled  44:disabled  60:disabled
13:disabled 29:disabled  45:disabled  61:disabled
14:disabled 30:disabled  46:disabled  62:disabled
15:disabled 31:disabled  47:disabled  63:disabled

tip to port:
```

To connect to port 1, just enter the port number:

```
# tip to port:1

Executing tip to port 1
Disregarding carrier detect
Escape sequence is '~.'
Use '~%b' to send a break.
```

To exit tip, use the following command:

```
~.
```

To send a break signal to device, use the following command:

```
~%b
```

To view the menu options again:

```
tip to port: refresh
```

To exit the tipmenu application, use the following command:

```
tip to port: quit
```

Use the same commands for each port.

Creating Cables for Connection to Network Devices and Servers

To manage the serial console of a network device or server, a serial cable must be created. Cables with proper pinouts for your device can be made or purchased from *Computone*. This chapter will go over major types of pinouts and provide part numbers for those who want to purchase cables.

RJ45 10-Pin (RJ69) RAS 2004/8 Connector

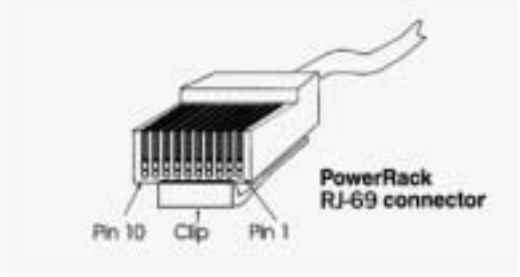
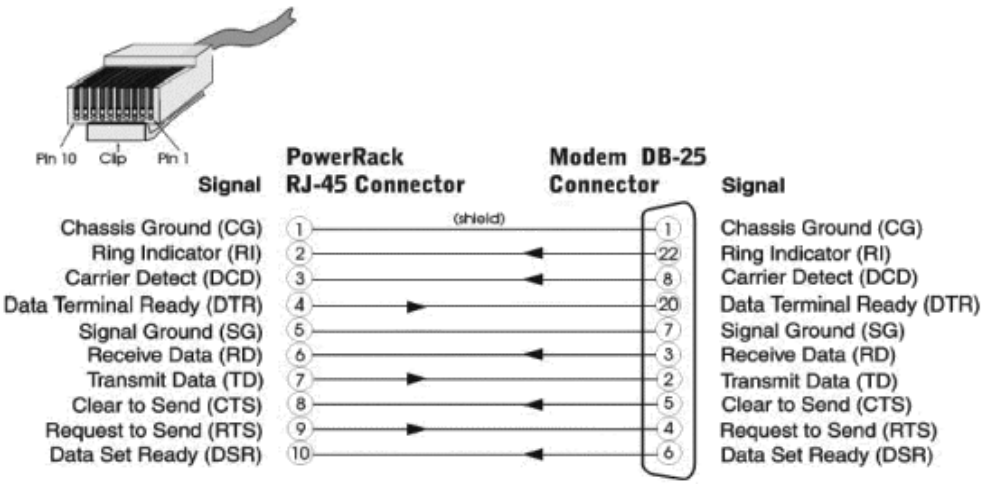


Table 2 RJ45 Signals and Descriptions

Pin	Direction	Signal Name	Description
1		Chassis Ground (CG)	Connected to the RAS 2004/8's metal case.
2	Input	Ring Indicator (RI)	Modem reports an incoming call
3	Input	Carrier Detect (CD)	Modem reports it is connected and ready to exchange data with the modem on the other end.
4	Output	Data Terminal Ready (DTR)	RAS 2004/8 indicates that the port is enabled.
5		Signal Ground (SG)	Reference point for all signals. Must always be present in your cable.
6	Input	Receive Data (RD)	Data coming to the RAS 2004/8 from the attached device.
7	Output	Transmit Data (TD)	Data sent from the RAS 2004/8 to the attached device.
8	Input	Clear to Send (CTS)	Device indicates to RAS 2004/8 that it has room for more data
9	Output	Request to Send (RTS)	RAS 2004/8 indicates to devices it has room for more data.
10	Input	Data Set Ready (DSR)	Indicates modem is ready to accept input from the RAS 2004/8.

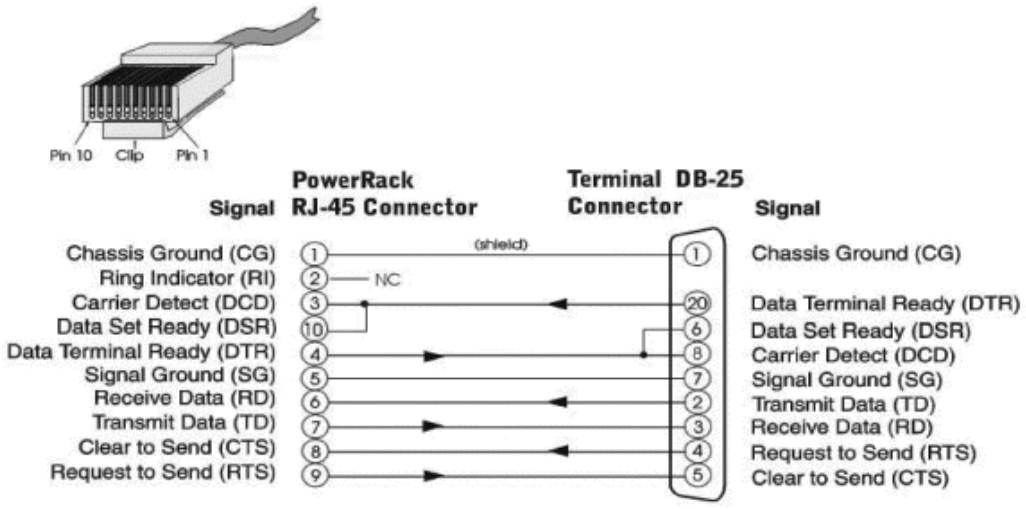
RJ45 to DB25 Modem or DCE Device

Part Number: VP-RJ-DB/M (2-20122)



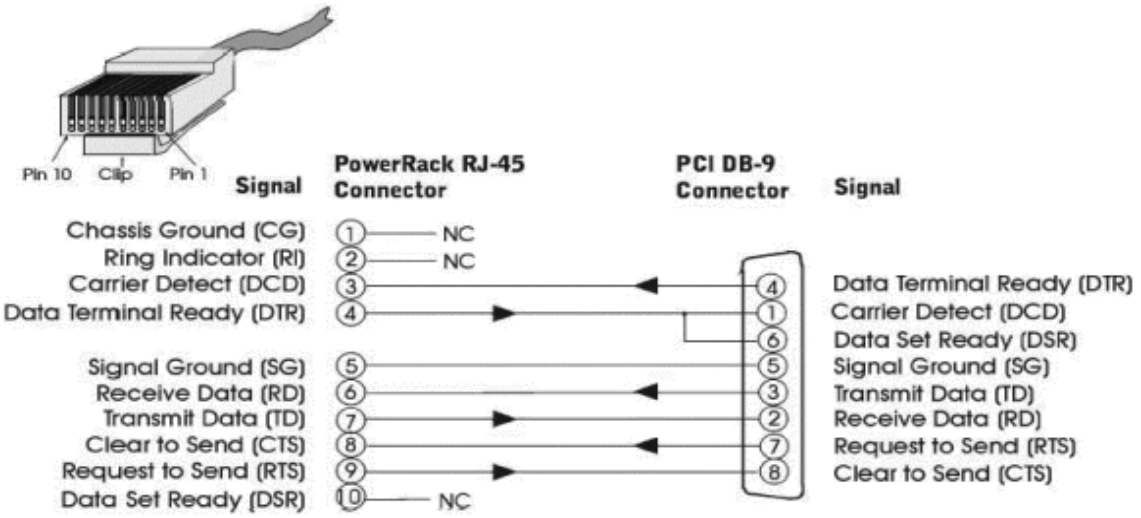
RJ45 to DB25 Terminal or DTE Device

Part Number: VP-RJ-DB/2 (2-20121)
Also as a patch cable: DB25 Patch Pak



RJ45 to DB9 on a PC or Other DTE Device such as a Router, Switch, etc.

Part Number: DB9 Patch



RJ45 to RJ45 on Cisco® Router

Table 3 Pin and Signal

Computone		Cisco	
Pin	Signal	Pin	Signal
4	SG	5	SG
5	RxD	3	TxD
6	TxD	6	RxD

Operating System Configuration for Serial Console Support

All network devices such as routers, switches, hubs, PBXs, etc. have a serial console port. For all Intel®-based operating systems, the serial port must be configured for console in the operating system. This will allow a pure headless solution without the use of keyboard, video or mouse. Many proprietary hardware operating systems such as Irix®, AIX®, and HP-UX® use serial console on their server systems. In those cases, all that is needed to do is to attach the appropriate cable between the consoles of those units and the RAS 2004/8. This chapter will give instructions for enabling console on the serial port for the following operating systems:

- Linux®
- FreeBSD®
- Sun® Solaris® Sparc/x86
- SCO® OpenServer® 5

Enabling Serial Console on Linux

Most Linux distributions include a kernel that is enabled for serial console support. This is true for Caldera®, Red Hat®, and others. The Debian® distribution is an exception. If using Debian, the kernel must be recompiled for serial console support. For this example, the assumption will be made that we are configuring a serial console on Red Hat 7.0. Serial console support will be enabled for COM1 or ttyS0 on the server.

Log into the Linux server as root.

Edit the /etc/lilo.conf file with the following command:

```
[root@linux.com]# vi /etc/lilo.conf
```

```
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
message=/boot/message
linear
default=linux

image=/boot/vmlinuz-2.2.16-22
        label=linux
        read-only
        root=/dev/hda3
~
~
~
"/etc/lilo.conf" 13L, 181C
```

Add the following line after ‘default=linux’:

```
serial=0,9600n8
```

Syntax:

0: COM1or ttyS0 on the server

9600: Port Speed

n: No Parity

8: 8 bits

Add the following statement after ‘root=/dev/hda3’ in the linux section:

```
append=”console=ttyS0,9600”
```

Syntax:

console: kernel parameter to set

ttyS0: COM1 or ttyS0 on the server

9600: Port Speed

The file should look like this or similar:

```
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
message=/boot/message
linear
default=linux
```

```
serial=0,9600n8

image=/boot/vmlinuz-2.2.16-22
        label=linux
        read-only
        root=/dev/hda3
        append="console=ttyS0,9600"
~
~
~
~
~
~
"/etc/lilo.conf" 15L, 226C written
```

Write the file and exit out of vi. To write the new information to the boot sector, use the following command:

```
[root@linux.com]# /sbin/lilo  -v

LILO version 21.4-4, Copyright (C) 1992-1998 Werner Almesberger
'lba32' extensions Copyright (C) 1999,2000 John Coffman

Reading boot sector from /dev/hda
Merging with /boot/boot.b
Mapping message file /boot/message
Boot image: /boot/vmlinuz-2.2.16-22
Added linux *
/boot/boot.0300 exists - no backup copy made.
Writing boot sector.
```

Add a login to the console by adding the following line to /etc/inittab. Without the login, the machine can be booted, but not login:

```
S1:2345:respawn:/sbin/mingetty ttyS0
```

Add the following line to /etc/security to allow root logins on the serial console:

```
ttyS0
```

Attach the DB9 Patch cable to COM1 on server and use CAT5 cable between the DB9 patch cable and the RAS 2004/8 to connect the server to the RAS 2004/8.

Reboot the server and tip to the port connected to the server on the RAS 2004/8. The server should boot and be able to login as root to do maintenance.

Reboot the server to enable the use of the serial console:

```
[root@linux.com]# init 6
```

Enabling Serial Console on FreeBSD 4.0

This section will outline steps needed to enable the serial console on FreeBSD. To enable the serial console, three things need to be configured: boot block code, boot loader code, and the kernel. In this example, COM1 or sio0 for console will be setup.

Edit your kernel configuration file to verify the correct setting for COM1:

```
freebsd# vi /usr/src/sys/i386/conf/GERNRIC
```

The correct line should be:

```
device sio0 at isa? Port “IO_COM” tty flags 0x10 irq 4
```

If the flags were not set, set the flags and recompile the FreeBSD kernel.

Create a boot.config file in the root directory:

```
freebsd# touch /boot.config
```

Edit the file and add the following line to turn on serial console:

```
-h
```

The boot.config file configures the boot blocks of the system.

To setup serial console for the boot loader edit the loader.rc file:

```
freebsd# vi /boot/loader.rc
```

```
\ Loader.rc
\ $FreeBSD: src/sys/boot/forth/loader.rc,v 1.2 1999/
11/24 17:59:37 dcs Exp $
\
\ Includes additional commands
include /boot/loader.4th

\ Reads and processes loader.rc
start

\ Tests for password -- executes autoboot first if a
password was defined
check-password

\ Unless set otherwise, autoboot is automatic at this
point
~
~
~
loader.rc: unmodified, readonly: line 1
```

Add the following line as the ***FIRST*** line:

```
set console=comconsole
```

Save the file and then edit the loader.conf file:

```
freebsd# vi /boot/loader.conf
```

Add the following line to the end of the file:

```
console=comconsole
```

To enable a login prompt on the serial port change the line in /etc/ttys:

```
freebsd# vi /etc/ttys
```

From:

```
ttyd0 “/usr/libexec/getty std.9600” unknown off secure
```

To:

```
ttyd0 “/usr/libexec/getty std.9600” unknown on secure
```

The FreeBSD configuration is now complete.

Attach the DB9 Patch cable to COM1 on the server. Use CAT5 cable between the DB9 patch cable and the RAS 2004/8 to connect the server to the RAS 2004/8.

Reboot the server and tip to the port the server is connected to on the RAS 2004/8. The server should boot and be able to login as root to do maintenance.

Reboot the server to enable use the serial console:

```
freebsd# init 6
```

Enabling Serial Console on Solaris x86

This section will outline the process for enabling serial console support under Solaris 7 Intel Edition. These steps are fairly simple and only one file needs to be modified for serial support.

Edit the bootenv.rc file:

```
# vi /boot/solaris/bootenv.rc
```

Change the following lines:

From:

```
input-device = keyboard
output-device = screen
```

To:

```
input-device = ttya
output-device = ttya
```

After saving the file, the Solaris configuration will be complete. A login will automatically run on the console at boot up.

Attach the DB9 Patch cable to COM1 on server and use a piece of CAT5 cable between the DB9 patch cable and the RAS 2004/8 to connect the server to the RAS 2004/8.

Reboot the server and tip to the port the server is connected to on the RAS 2004/8. The server should boot and be able to login as root to do maintenance.

Reboot the server to activate the serial console:

```
# init 6
```

Enabling Serial Console on Solaris Sparc

This section will outline the process of enabling a serial port on a Solaris Sparc Server for Console Management. These instructions are for Solaris 7 Sparc Edition.

Warning!:

Sun Sparc servers detect the presence of a break signal on the serial console line and will automatically run the OpenBoot monitor. This will temporarily halt all processes on the server until an administrator issues the continue command at the OpenBoot prompt. A break will happen anytime the cable is unplugged and plugged back in. It will also happen anytime the RAS 2004/8 is turned off, then back on. There are two options to fix this problem:

1. **Purchase the 16- port RAS 2004/8 "break-free" card. Part Number: REX-16-RJ/RCM.**

This card is an expansion card for the RAS 2004/8 that will not send breaks on power up of the unit. It will also allow the administrator to issue breaks when they need to run the OpenBoot monitor. This is the easiest and safest step for the eliminating this break issue.

2. **Install Solaris 7 Patch: 107589-02.**

This will allow the administrator to setup an alternate break command for OpenBoot that will allow the normal break signal to be ignored.

Download the patch from Sunsolve website located at http://sunsolve.sun.com.

Modify keyboard file and change a line:

```
# vi /etc/default/kbd
```

From:

```
#KEYBOARD_ABORT=enable
```

To:

```
KEYBOARD_ABORT=alternate
```

Now the alternate break signal #<CR> #~^b will be recognized as the abort sequence.

The following is a commentary on the issue from Sun:

The solution is quite straightforward and simple. When the customer wants BREAK compatibility and still wants protection against "false" BREAKs, a BREAK will be initiated by a character sequence CR ~ ^b which is similar to a familiar pattern used on Sun servers by the Remote Console. The Aux Break Sequence will be controlled by a /etc/system set variable and this could be easily disabled. When Aux Break is enabled, the standard BREAK signal will be ignored for console input. It will be handled in the normal way for a serial port driver. The Aux Break Sequence is recognized only when entered from a true console device.

By default when the keyboard of a Sparc Server is unplugged, the console will be on the first serial port called ttya. To enable a serial port on the Sparc System for console, just reboot and after shutdown, unplug the keyboard. Console will now be on the serial port.

Attach the DB9 patch cable to COM1 on the server and use a CAT5 cable between the DB9 patch cable and the RAS 2004/8 to connect the server to the RAS 2004/8.

Reboot the server and tip to the port the server is connected to on the RAS 2004/8. The server should boot and be able to login as root to do maintenance.

Reboot the server to activate the serial console:

```
# init 6
```

Enabling Serial Console on SCO OpenServer 5

This section will outline the process for enabling console on a serial port for SCO OpenServer 5.X. This will setup console on COM1 of the server.

Enable (COM1) for login:

```
# enable /dev/tty1a
```

Edit the default login file /etc/default/login and change a line:

From:

```
OVERIDE=tty01
```

To:

```
OVERIDE=tty1a
```

Save the file and ext vi.

Edit the default boot file /etc/default/boot and add the following line to the end:

```
SYSTTY=1
```

Save the file and exit vi.

NOTE: The "1" is for COM 1. "0" would be for the video console, which is the default setting. No other values of SYSTTY are allowed. However, it is still possible to specify a COM port other than COM 1 for use as a serial console. In order to do this, add "systty=sio(MINOR)" to the default bootstring. Here, MINOR is the minor number of the lower-case (non-modem-control) port device name. For example, if a line in /etc/default/boot reads "DEFBOOT-STR=hd(40)unix", and to configure COM 2 as the console, modify this line so that it reads "DEFBOOTSTR=hd(40)unix systty=sio(8)", where 8 is the minor number of /dev/tty2a. This value may vary, so it is important to verify the minor number with "ls -l /dev/tty2a".

Verify that a login is running on the serial port before continuing. If it is not running on the serial port, check all connections and cables and make sure the serial port is functioning and enabled in the BIOS. If rebooting without the serial port working, there will be no access to the system!

Attach the DB9 Patch cable to COM1 on the server and use CAT5 cable between the DB9 patch cable and the RAS 2004/8 to connect the server to the RAS 2004/8.

Reboot the server and tip to the port the server is connected to on the RAS 2004/8. The server should boot and be able to login as root to do maintenance.

Reboot the server to enable use of the serial console:

```
# init 6
```

Using Out-of-Band Management with Windows 2000 Advanced Server

Many server installations use Windows® 2000 as the server operating system. Windows requires that a keyboard, mouse, and monitor be attached for an administrator to gain access to the console. Administrators can use products such as PC Anywhere® and Virtual Network Computing (VNC) to take control of a Windows machine remotely through the network. This method will not work during network failure or when the system will not respond to network requests. The administrator then has to use the "crash cart" method to gain access to the system. A "crash cart" consists of a cart with wheels that has a keyboard, mouse, and monitor. This cart will allow the user to gain console access to the server, but the administrator has to be physically in the server room.

Remote control products will work over a point-to-point protocol (PPP) connection, allowing the administrator to connect multiple Windows servers to a RAS 2004/8 and gain access to the servers during network failure by either remotely dialing into the RAS 2004/8 or establishing a PPP connection using a "null-modem" or DTE cable.

It is suggested that a separate subnet be used that is private rather than the subnet that is on your Ethernet. The separate subnet will insure proper routing of the client and server protocols. If the RAS 2004/8 is not setup to communicate on your network, please go to page 5 and do that now. A connection to the unit is needed for configuration by either using Hyper Terminal or telnet. This chapter will explain the steps required to complete the following topics:

Configure the RAS 2004/8 for Inbound and Outbound Connections

Configure Windows 2000 Professional for Outbound Connections

Configure a serial connection from the client to the RAS 2004/8
Configure a dial-up connection from the client to the RAS 2004/8

Configure Windows 2000 Advance Server for Inbound Connections

Configure a serial connection from the server to the RAS 2004/8
Configure the network connection between the Server and RAS 2004/8
Configure the Server Routing and Remote Access Service
Configure a Static Route to the RAS 2004/8

Please follow each step closely and take your time. Making a mistake on one step could cause problems for the entire configuration.

Configure the RAS 2004/8 for Inbound and Outbound Connections

The first thing that is needed is programming the RAS 2004/8 for the inbound and outbound PPP connections. These connections will be used by the client and the server to communicate with each other when using PC Anywhere or VNC. Logging on to the RAS 2004/8 as an administrator is required to take the following steps:

Create a login script for the RAS 2004/8 to use when negotiating a PPP connection with the Windows 2000 Advanced Server.

Create a login script as follows:

```
# login add outbound1 line 1 “%s CLIENTCLIENT”
# login set outbound1 line 2 “%w CLIENTSERVER”
```

To see the additions, use the show login command:

```
# show login outbound1

 Script Name outbound1

  Line 1 [%s "CLIENTCLIENT"                          ]
  Line 2 [%w "CLIENTSERVER"                          ]
  Line 3 [                                           ]
  Line 4 [                                           ]
  Line 5 [                                           ]
  Line 6 [                                           ]
```

Configure the ports for inbound and outbound connections. In this example, we will use port 1 for outbound and port 2 for inbound.

Set port 1 for inbound connection:

```
# set port 1 login outbound
# set port 1 modem enabled
# Set port 1 speed 115200
# set port 1 inflow rts
# set port 1 outflow cts
```

To verify the settings, use the show port command:

```
# show port 1
```

```
Port Number:   1    Port Type: Outbound ppp or slip
Comment:
Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None
Modem: Yes    Await Input: No    Dial Script:
Modem Init:
Speed: 115200    Size: 8    Parity: None    Stop Bits:
1
Inflow: RTS    Outflow: CTS  Auto PPP: Yes
Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal
IntelliView :
IntelliPrint:                          IntelliSet:
 Current screen settings:
 modem; ospeed 115.2k; ispeed 115.2k; no parity; size
8; stop bits 1
  inflow rts ; outflow cts ; rows 24; cols 80; MSR =
DTR RTS cd cts dsr ri  ixlat CR to NL; oxlat NL to CR/
NL; Intr: ^c; Erase: ^h; Kill: ^u;
```

Set port 2 for inbound connection:

```
# set port 2 login byport
# set port 2 modem enabled
# set port 2 speed 115200
# set port 2 inflow rts
# set port 2 outflow cts
```

To verify the settings, use the show port command:

```
# show port 1

----
Port Number:  2    Port Type: Login by port, wait
Comment:

Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None

Modem: Yes    Await Input: No    Dial Script:
Modem Init:

Speed: 115200    Size: 8    Parity: None    Stop Bits:
1
Inflow: RTS    Outflow: CTS  Auto PPP: Yes

Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal

IntelliView :
IntelliPrint:                        IntelliSet:
```

Now, create a user for the inbound PPP connection.

Create user “testppp”:

```
# user add testppp
# user set testppp connect ppp
# user set testppp password testppp
```

To verify the settings, use the show user command:

```
# show user testppp

----
User Name: testppp
Comment:

Connection option:          Inbound PPP
Initial number of Sessions: 1
Administration Privileges:  No

Sess Lock  GC#  Command   Arguments/Description
  0   Yes    0  Disabled
  1   Yes    0  Disabled
  2   Yes    0  Disabled
  3   Yes    0  Disabled
  4   Yes    0  Disabled
  5   Yes    0  Disabled
  6   Yes    0  Disabled
  7   Yes    0  Disabled
```

Make modifications to the pppoption profile named default on the RAS 2004/8. These changes need to be made so the RAS 2004/8 can communicate efficiently with Windows computers.

Set options to pppoption file named default:

```
# pppoption set default size 1500
# pppoption set default vjmode enabled
```

To verify the settings, use the show pppoption command:

```
# show pppoption default
```

```
Profile Name                    default
Use Passive Mode                No
Address/Control Compression     Yes
Protocol Field Compression      Yes
Address Negotiation Mode        Enabled
Async Map Negotiation           Yes
Magic Number Negotiation        Yes
Maximum Receive Negotiation     Yes
Maximum Receive Size            1500
Van Jacobson Compression Mode   Enabled
Enable Proxy ARP                Yes
Bring up slip link immediately  No
Prompt slip login for address   No
```

Create an inbound and outbound remote profile (notice port differences).

Create outbound profile name OBPPP1:

```
# add remote OBPPP1
# set remote OBPPP1 address 192.168.1.2
# set remote OBPPP1 ifaddr 192.168.1.64
# set remote OBPPP1 netmask 255.255.255.0
# set remote OBPPP1 type outbound
# set remote OBPPP1 port 1
# set remote OBPPP1 mtu 1500
# set remote OBPPP1 rip both
# set remote OBPPP1 login outbound1
# set remote OBPPP1 protocol ppp
# set remote OBPPP1 authority pap
# set remote OBPPP1 secret testppp
```

To verify the settings, use the show remote command:

```
# show remote OBPPP1

Remote Name......: OBPPP1
Remote Address...: 192.168.1.2
Interface Address: 192.168.1.64      Interface Name:
ppp00
Interface Netmask: 255.255.255.0  Interface Type: Out-
bound
Serial Port: 1    Group: None   MTU: 1500   Async Map:
0x000a0000
Failed Call Wait: 0  Inactivity Timeout: 0  Rip: both
Dial-in User:             Phone Number:
Login Script: outbound1       Options Profile: default
Protocol:     PPP         IP Filter:
Authentication Protocol:  PAP
CHAP Name/PAP User ID:    testppp
CHAP Secret/PAP Password: testppp
```

Create inbound profile name IBPPP1:

```
# add remote IBPPP1
# set remote IBPPP1 address 192.168.1.1
# set remote IBPPP1 ifaddr 192.168.1.64
# set remote IBPPP1 netmask 255.255.255.0
# set remote IBPPP1 type inbound
# set remote IBPPP1 port 2
# set remote IBPPP1 mtu 1500
```

To verify the settings, use the show remote command:

```
# show remote IBPPP1

Remote Name......: IBPPP1
Remote Address...: 192.168.1.1
Interface Address: 192.168.1.64      Interface Name:
ppp01
Interface Netmask: 255.255.255.0  Interface Type:
Inbound
Serial Port: 2  Group: None  MTU: 1500  Async Map:
0x000a0000
Failed Call Wait: 0  Inactivity Timeout: 0  Rip: both
Dial-in User:             Phone Number:
Login Script:             Options Profile: default
Protocol:     PPP         IP Filter:
Authentication Protocol:  None
```

Check all of your settings and then save and shutdown:

```
# save
# Shutdown now
```

Configuration of the RAS 2004/8 for inbound and outbound connections is complete.

Configure Windows 2000 Professional for Outbound Connections

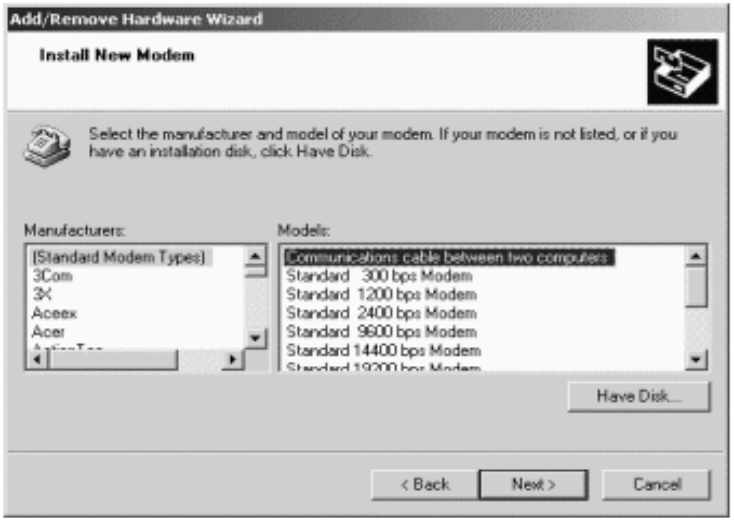
Configure a Serial Connection from the Client to the RAS 2004/8.

To configure a direct communications cable link from the serial port of the client to a serial port of the RAS 2004/8, follow these steps:

1. From the Control Panel, select **Phone and Modem Options**. Select **Modems** tab. Click on the **Add** button.

2. Make sure to check the box labeled **Don't detect my modem; I will select it from a list.** Click **Next >**.

3. When the **Add/Remove Hardware Wizard** dialog box appears, highlight **Communications cable between two computers**. Click **Next >**.

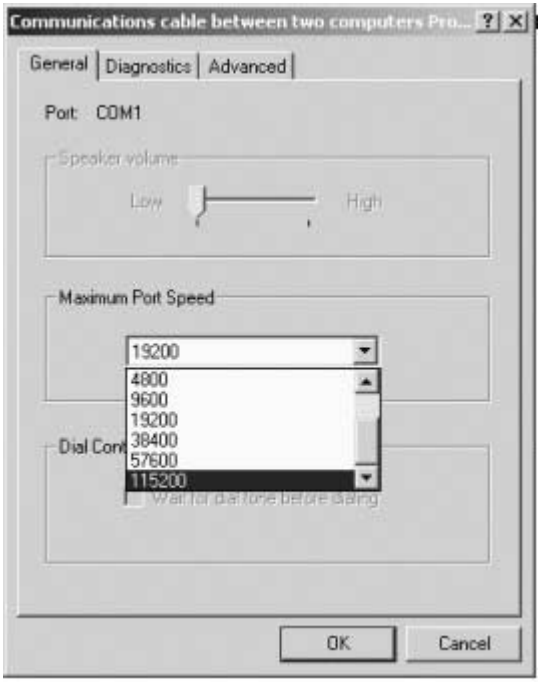


4. Select the Comport (**COM1** or **COM2**) that is attached to the serial cable. Click **Next >**.

5. The modem is now successfully installed if this screen appears. Click **Finish**.

6. The **Phone and Modems Options** dialog box appears. Click **Properties**.

7. In the **Properties** box under the **General** tab, select the **Maximum Port Speed**, **115200**. Click **OK**.

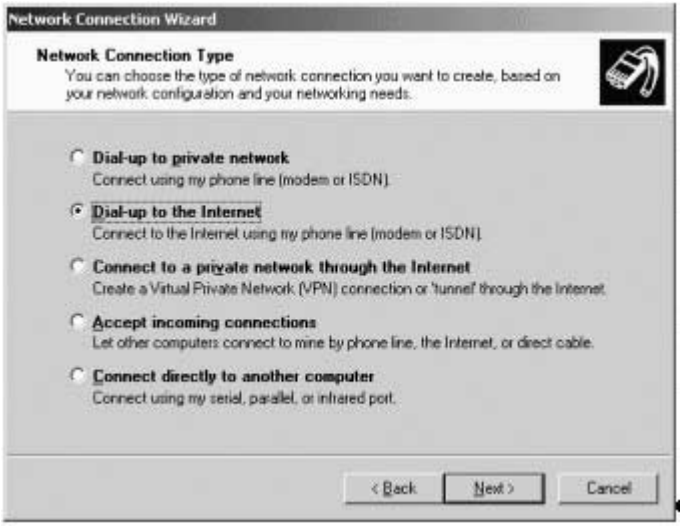


8. In the **Phone and Modem Options** dialog box, click **OK** to finish.

Configure a Dial-up Connection from the Client to the RAS 2004/8

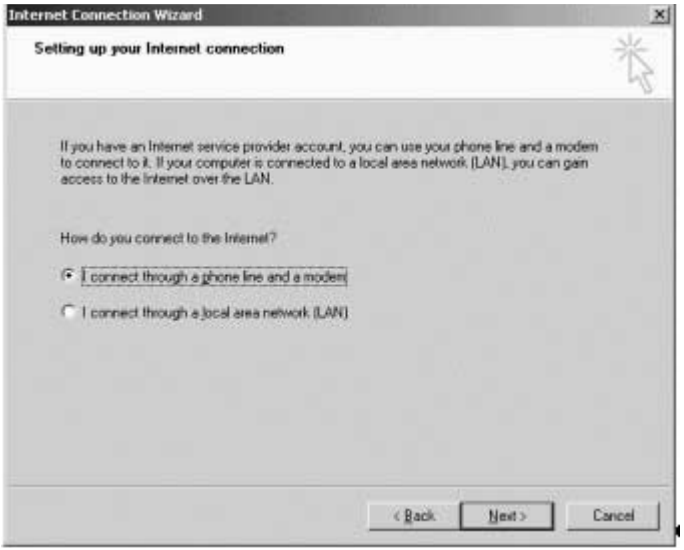
1. In Control Panel, select **Network and Dial-up Connections**. Select icon **Make New Connection**. When the **Network Connection Wizard** appears, select **Next >**.

2. Select **Dial–up to the Internet** option. Click **Next >**.

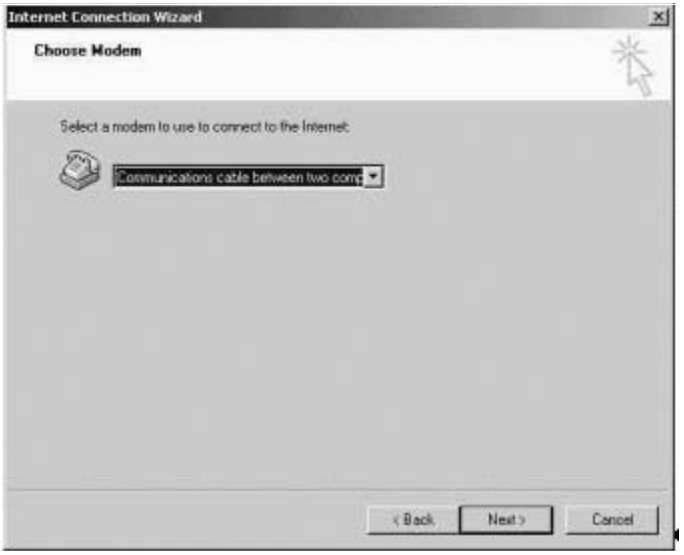


3. Select **I want to set up my Internet connection manually, or I want to connect through a local area network (LAN).** Select **Next >**.

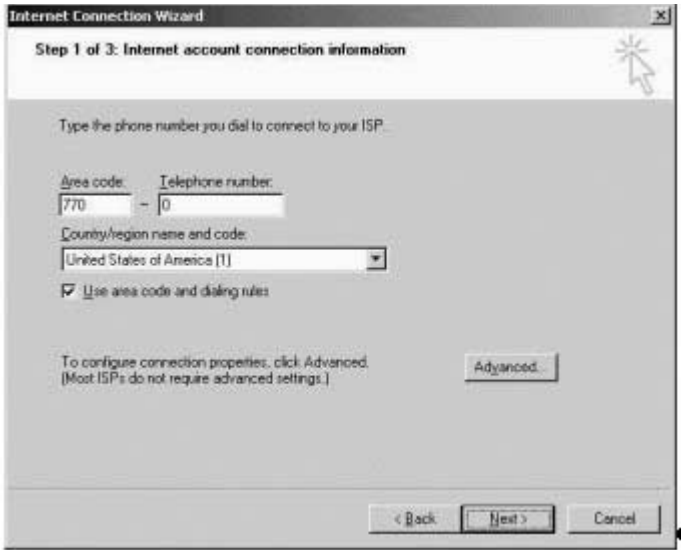
4. To set up your Internet connection, select **I connect through a phone line and a modem.** Click **Next >**.



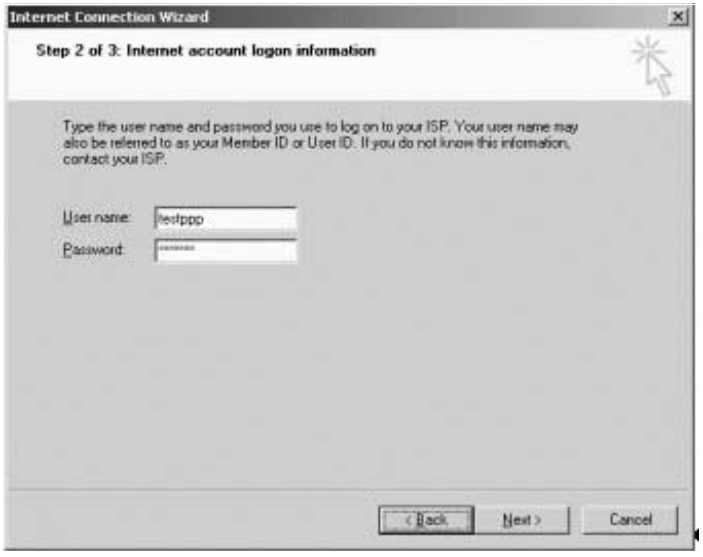
5. From the **Choose Modem** dialog box, select **Communications cable between two computers**. Click **Next >**.



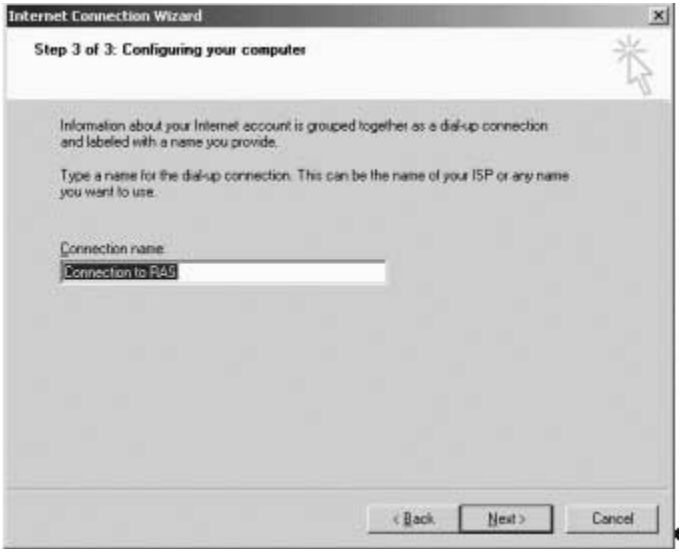
6. To complete the Internet account connection information dialog box, type **0** in the **Telephone number** box. Click **Next >**.



7. Complete your Internet account logon information. Enter your user name and password. Click **Next >**.



8. To configure your computer, enter a name for your connection. Click **Next >**.



9. In the **Set Up Your Internet Mail Account** dialog box, select the **No** option. Click **Next >**.

10. In the **Internet Connection Wizard** dialog box, remove check **To connect to the Internet immediately…**, and click **Finish >**.

11. From the **Network and Dial-up Connections** window, right click on **Connection to RAS** option and select **Properties**.

12. From the **Connection to RAS Properties** dialog box **General** tab, click **Configure…**.

13. In the **Modem Configuration** dialog box, select appropriate speed for connection **115200**. Click the **Enable hardware flow control** box. Click **OK**.

14. In the **Connection to RAS Properties** box, click **OK** to finish.

Configure Windows 2000 Advanced Server for Inbound Connections

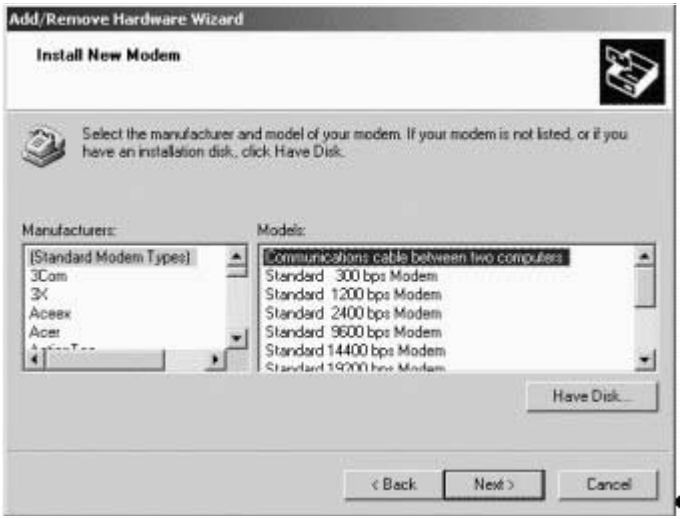
Configure a Serial Connection from the Server to the RAS 2004/8

To configure a serial connection, perform the following steps:

1. In **Control Panel**, select **Phone and Modem Options** > **Modems** tab. Click **Add…**.

2. Select **Don't detect my modem; I will select it from a list**. Click **Next >**.

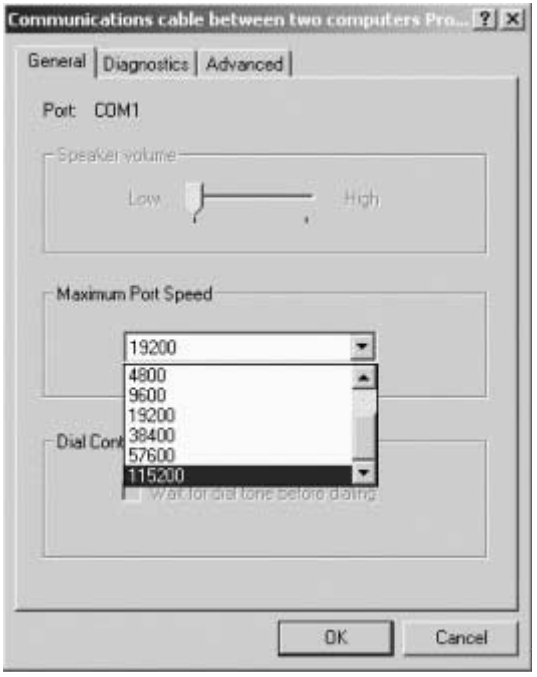
3. Highlight **Communications cable between two computers**. Click **Next >**.



4. Select the COM port (**COM1 or COM2**) that is attached to the serial cable. Click **Next >**.

5. Click **Finish** to close the box.

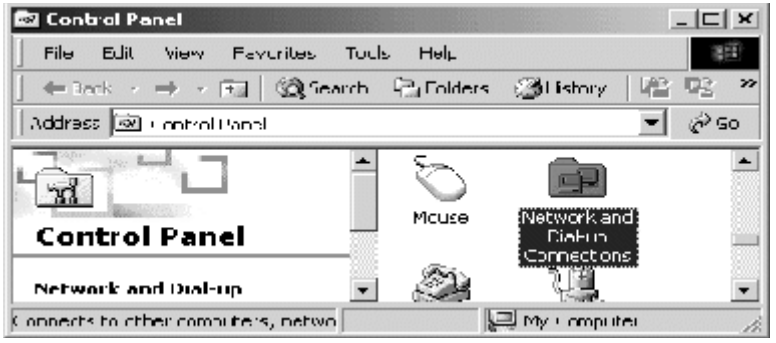
6. Select **Properties** from the modem window and under the **General** tab change the appropriate speed (**115200)** for your computer. Click **OK** to continue.



7. Click **OK** to close.

Configure the Network Connection Between the Server and RAS 2004/8

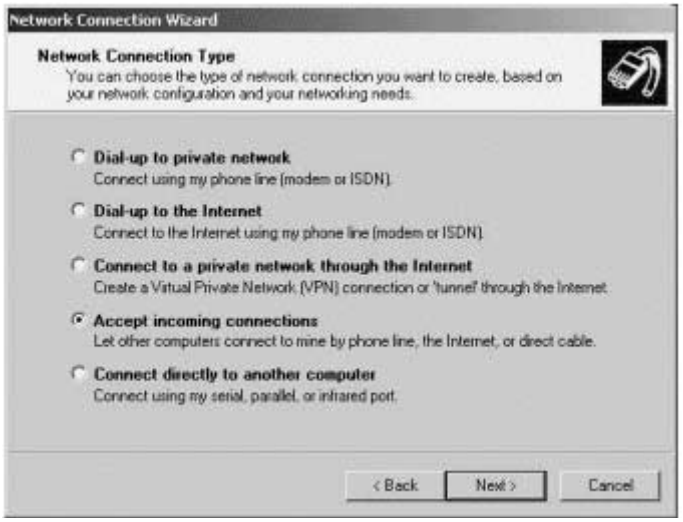
1. From **Control Panel**, select **Network and Dial-up Connections**.



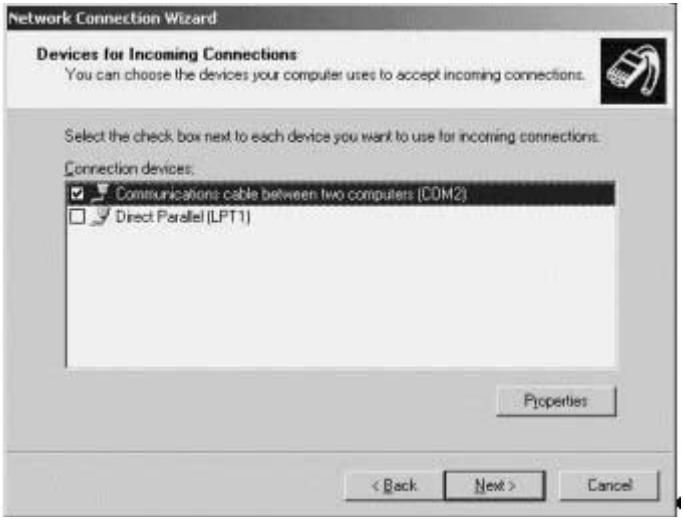
2. Select **Make New Connection**.

3. Enter the **Network Connection Wizard**, click **Next >** to continue.

4. In **Network Connection Wizard**, select your **Network Connection Type** > **Accept incoming Connections**. Click **Next >**.

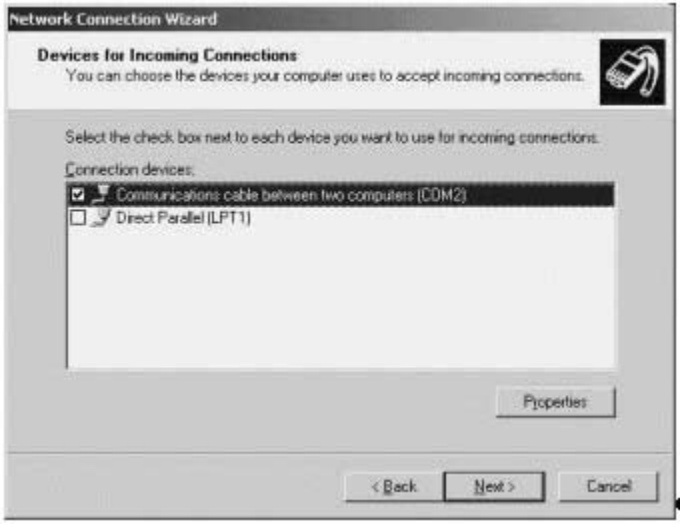


5. Select **Communications cable between two computers (COM2)**. Click **Properties** to adjust speed and flow control.

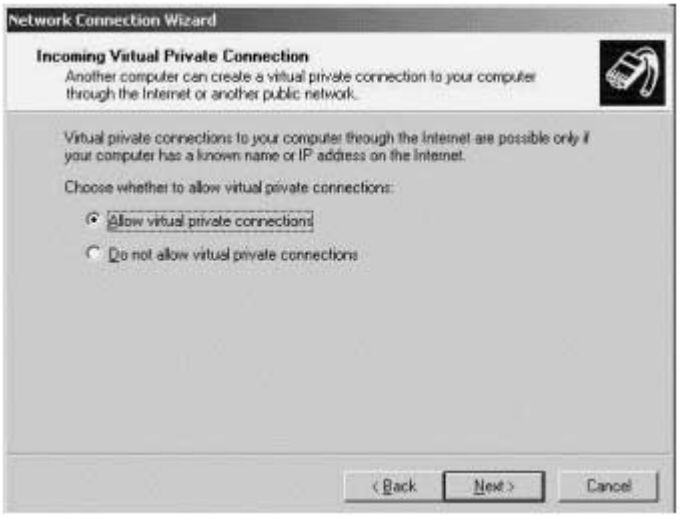


6. Select the appropriate port speed, **115200**. Under the **Data Connection Preferences,** select **Hardware** from the **Flow control** drop down list. Click **OK** to close the dialog box and return to the **Network Connection Wizard**.

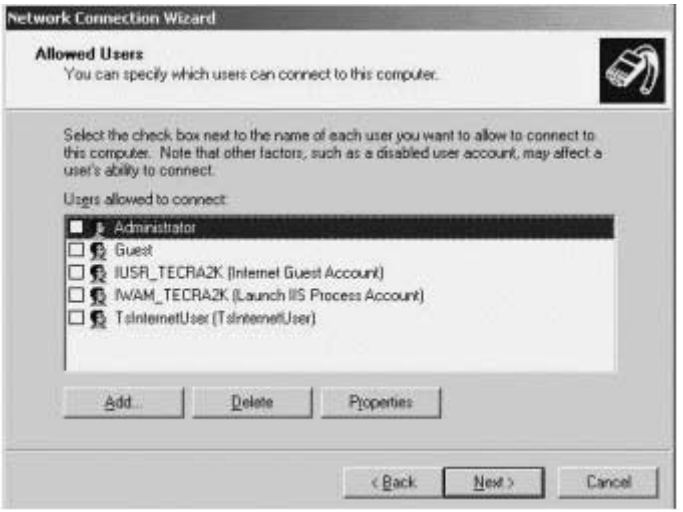
7. Click **Next >** to continue.



8. From the **Incoming Virtual Private Connection** screen, select **Allow virtual private connections**. Click **Next >**.



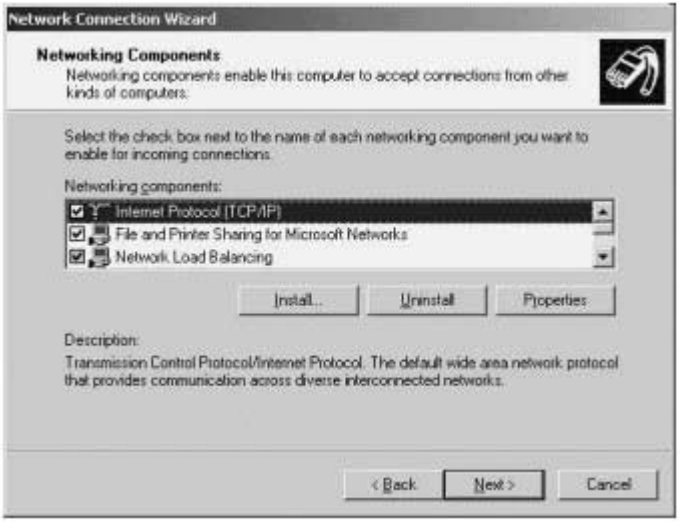
9. From the **Allowed Users** window, click **Add** to add your new users.



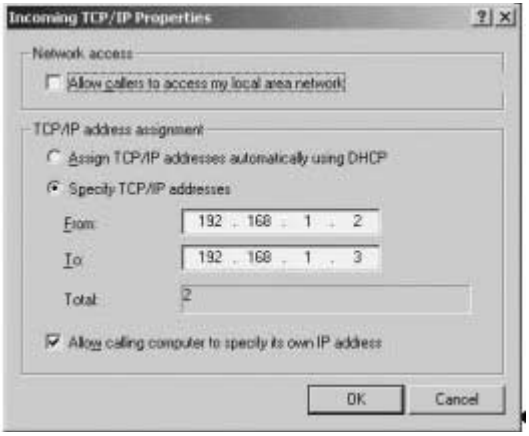
The New User dialog box will appear to create a test user.

10. Type in `testppp` for the username and password. Click **OK** to close window. Click **Next >** to proceed.

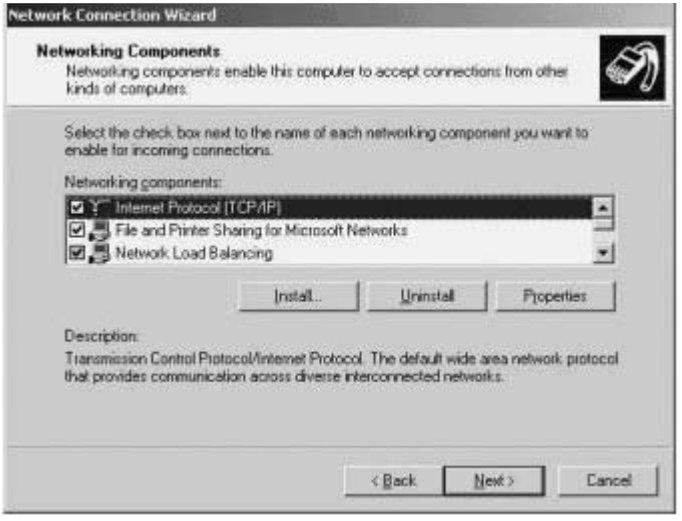
11. From the **Networking Components** window, select **Internet Protocol (TCP/IP)**. Click **Properties**.



12. Select **Specify TCP/IP addresses** and add appropriate IP Range for the RAS 2004/8 connection. The Network Administrator will determine the IP Range. Select **Allow calling computer to specify its own address**. Click **OK**.



13. Click **Next >** to finish the Network Connection.



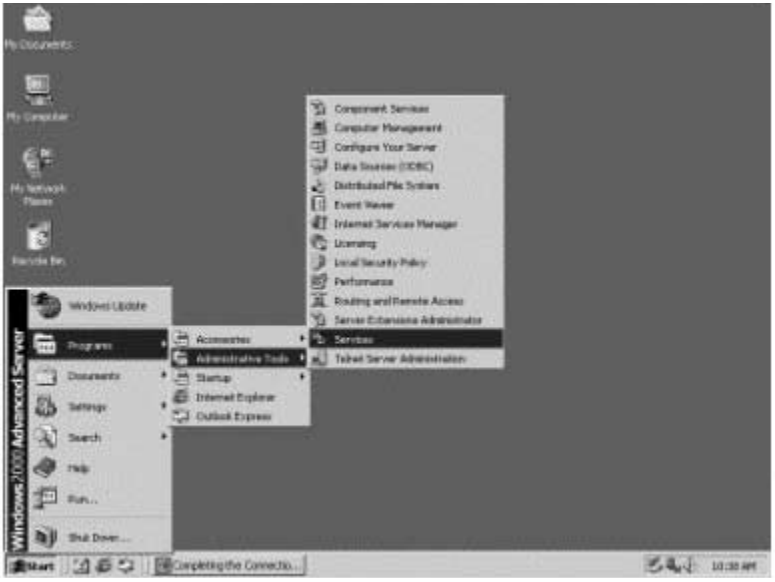
14. Click **Finish** to complete the **Networking Connection Wizard**.

NOTE: The name of the connection can not be changed.

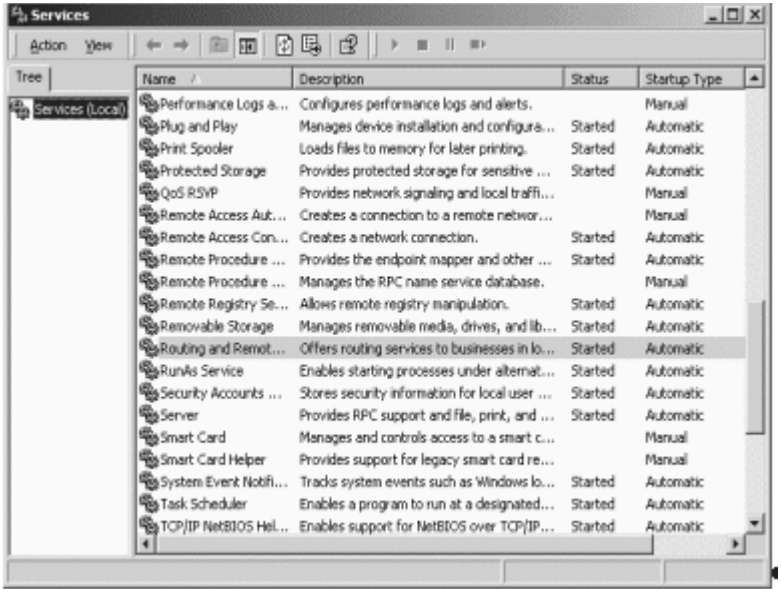
The **Networking Connection Wizard** is now completed.

Configure the Server Routing and Remote Access Service

1. Click **Start** > **Programs** > **Administrative Tools** > **Services** in the main window.



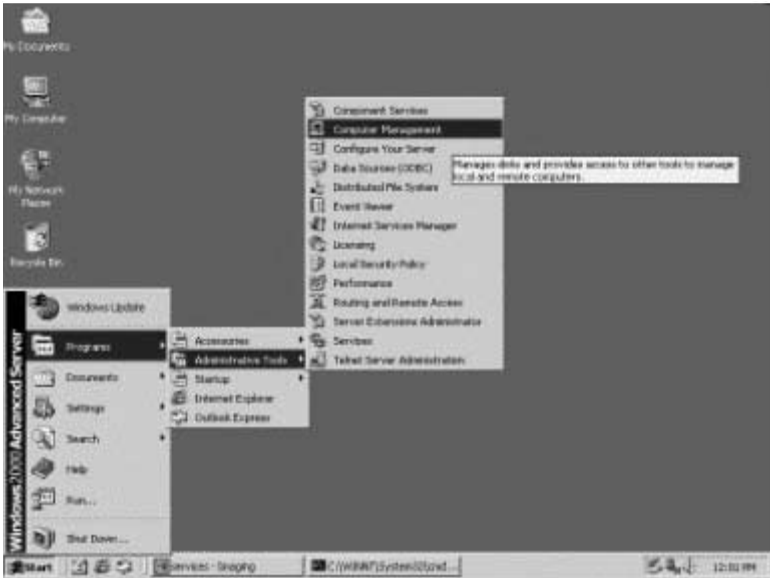
2. Ensure the **Routing and Remote Access Services** are started and enabled to run automatically. Close the window to continue.



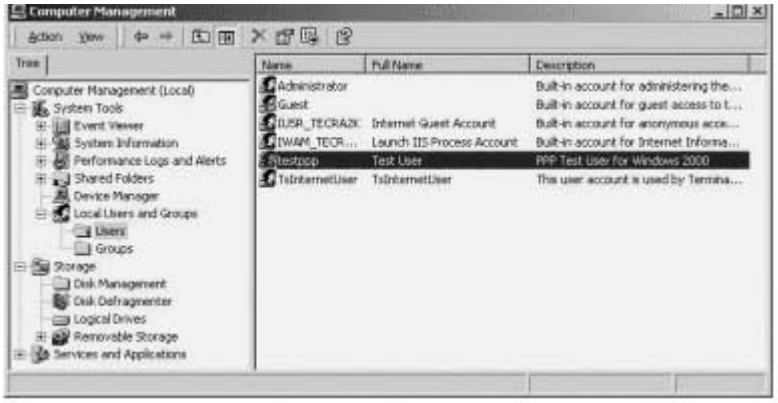
Configure a Static Route to the RAS 2004/8.

Next, configure a route on the Server. This is required in order for network traffic to pass through the Server to the RAS 2004/8.

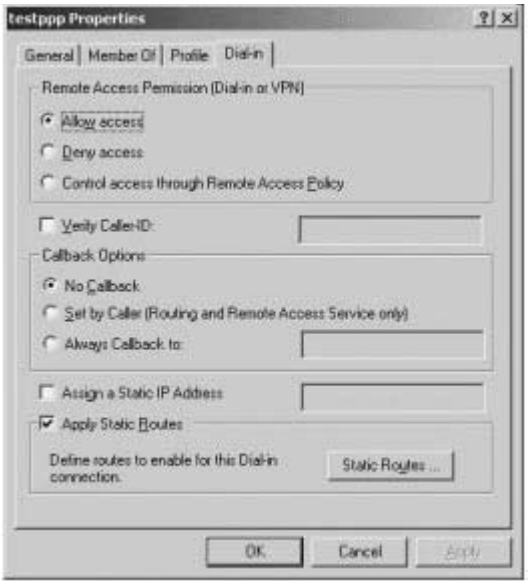
1. Click **Start** > **Programs** > **Administrative Tools** >**Computer Management** in the main window.



2. From the **Computer Management** screen, open the **Users** folder under the **Local Users and Groups** folder. Double click on the **`testppp`** user to open up the properties dialog box for your **`testppp`** user.

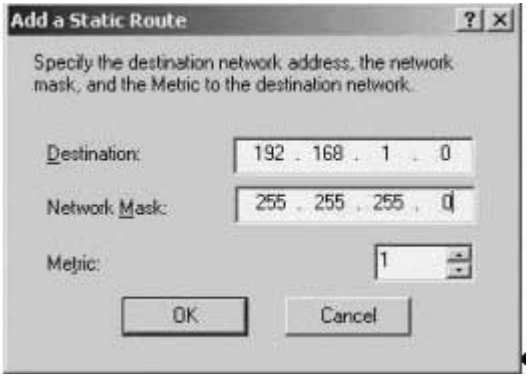


3. Select the **Dial-in** tab, and select **Allow access** > **No Callback** > **Apply Static Routes** and click **Static Routes…**.



4. In the **Static Routes** dialog box, click **Add Route…**.

5. Fill in the **Destination, 192.168.1.0,** and the **Network Mask 255.255.255.0**. Click **OK**.



6. The route will now appear in the **Static Routes** dialog box. Click **OK** to close.

The **testppp Properties** dialog box can now be closed for your **testppp** user.

7. To bring up the link, issue the ping command on the RAS 2004/8:

```
# ping 192.168.1.3
```

Using Out-of-Band Management with Windows NT 4.0 Server

Remote control products will work over a point-to-point protocol (PPP) connection, allowing the administrator to connect multiple Windows servers to a RAS 2004/8 and gain access to the servers during network failure by either remotely dialing into the RAS 2004/8 or establishing a PPP connection using a “null-modem” or DTE cable.

It is suggested that a separate subnet that is private, rather than the subnet that is on your Ethernet, be used. The separate subnet will insure proper routing of the client and server protocols. If the RAS 2004/8 has not been setup to communicate on your network, refer to the heading - **Assigning an IP Address -** on page 9. A connection to the unit is needed for configuration by either using Hyper Terminal or telnet. This chapter will explain the steps required to complete the following topics:

Configure the RAS 2004/8 for Inbound and Outbound Connections

Configure Windows 2000 Professional for Outbound Connections

- Configure a serial connection from the client to the RAS 2004/8
- Configure a dial-up connection from the client to the RAS 2004/8

Configure Windows NT 4.0 Server for Inbound Connections

- Configure a serial connection from the server to the RAS 2004/8
- Configure the network connection between the Server and RAS 2004/8
- Configure the Server Routing and Remote Access Service
- Configure a Static Route to the RAS 2004/8

Please follow each step closely and take your time. Making a mistake on one step could cause problems for the entire configuration.

Configure the RAS 2004/8 for Inbound and Outbound Connections

The first thing that must be done is programming the RAS 2004/8 for the inbound and outbound PPP connections. These connections will be used by the client and the server to communicate with each other when using PC Anywhere or VNC. Logging on to the RAS 2004/8 as an administrator is required to take the following steps.

Create a login script for the RAS 2004/8 to use when negotiating a PPP connection with the Windows NT 4.0 Server.

Create a login script as follows:

```
# login add outbound1 line 1 “%s CLIENTCLIENT”
# login set outbound1 line 2 “%w CLIENTSERVER”

To see the additions, use the show login command:
# show login outbound1

  Script Name  outbound1

  Line 1 [%s "CLIENTCLIENT"                          ]
  Line 2 [%w "CLIENTSERVER"                          ]
  Line 3 [                                           ]
  Line 4 [                                           ]
  Line 5 [                                           ]
  Line 6 [                                           ]
```

Configure the ports for inbound and outbound connections. In this example, we’ll use port 1 for outbound and port 2 for inbound.

Set port 1 for inbound connection:

```
# set port 1 login outbound
# set port 1 modem enabled
# Set port 1 speed 115200
# set port 1 inflow rts
# set port 1 outflow cts
```

To verify the settings, use the show port command:

```
# show port 1
```

```
Port Number:   1    Port Type: Outbound ppp or slip
Comment:
Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None
Modem: Yes    Await Input: No    Dial Script:
Modem Init:
Speed: 115200    Size: 8    Parity: None    Stop Bits:
1
Inflow: RTS    Outflow: CTS  Auto PPP: Yes
Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal
IntelliView :
IntelliPrint:                          IntelliSet:
 Current screen settings:
  modem; ospeed 115.2k; ispeed 115.2k; no parity; size
8; stop bits 1
   inflow rts ; outflow cts ; rows 24; cols 80; MSR =
DTR RTS cd cts dsr ri  ixlat CR to NL; oxlat NL to CR/
NL; Intr: ^c; Erase: ^h; Kill: ^u;
```

Set port 2 for inbound connection:

```
# set port 2 login byport
# set port 2 modem enabled
# set port 2 speed 115200
# set port 2 inflow rts
# set port 2 outflow cts
```

To verify the settings, use the show port command:

```
# show port 1

----
Port Number:  2    Port Type: Login by port, wait
Comment:

Local  Term Type: unknown        User Name: root
Remote Term Type:                Group    : None

Modem: Yes    Await Input: No    Dial Script:
Modem Init:

Speed: 115200    Size: 8    Parity: None    Stop Bits:
1
Inflow: RTS    Outflow: CTS  Auto PPP: Yes

Xlate Input: CR to NL     Xlate Output: NL to CR+NL
Xpand Tabs: No
Intr Char: ^c    Erase Char: ^h    Kill Char: ^u   TCP:
Normal

IntelliView :
IntelliPrint:                        IntelliSet:
```

Now, create a user for the inbound PPP connection.

Create user “testppp”:

```
# user add testppp
# user set testppp connect ppp
# user set testppp password testppp
```

To verify the settings, use the show user command:

```
# show user testppp

----
User Name: testppp
Comment:

Connection option:          Inbound PPP
Initial number of Sessions: 1
Administration Privileges:  No

Sess Lock  GC#  Command   Arguments/Description
  0   Yes    0  Disabled
  1   Yes    0  Disabled
  2   Yes    0  Disabled
  3   Yes    0  Disabled
  4   Yes    0  Disabled
  5   Yes    0  Disabled
  6   Yes    0  Disabled
  7   Yes    0  Disabled
```

Make modifications to the pppoption profile named default on the RAS 2004/8. These changes need to be made so the RAS 2004/8 can communicate efficiently with Windows computers.

Set options to pppoption file named default:

```
# pppoption set default size 1500
# pppoption set default vjmode enabled
```

To verify the settings, use the show pppoption command:

```
# show pppoption default

  Profile Name                    default
  Use Passive Mode                No
  Address/Control Compression     Yes
  Protocol Field Compression      Yes
  Address Negotiation Mode        Enabled
  Async Map Negotiation           Yes
  Magic Number Negotiation        Yes
  Maximum Receive Negotiation     Yes
  Maximum Receive Size            1500
  Van Jacobson Compression Mode   Enabled
  Enable Proxy ARP                Yes
  Bring up slip link immediately  No
  Prompt slip login for address   No
```

Create an inbound and outbound remote profile (notice port differences).

Create outbound profile name OBPPP1:

```
# add remote OBPPP1
# set remote OBPPP1 address 192.168.1.2
# set remote OBPPP1 ifaddr 192.168.1.64
# set remote OBPPP1 netmask 255.255.255.0
# set remote OBPPP1 type outbound
# set remote OBPPP1 port 1
# set remote OBPPP1 mtu 1500
# set remote OBPPP1 rip both
# set remote OBPPP1 login outbound1
# set remote OBPPP1 protocol ppp
# set remote OBPPP1 authority pap
# set remote OBPPP1 secret testppp
```

To verify the settings, use the show remote command:

```
# show remote OBPPP1

Remote Name......: OBPPP1
Remote Address...: 192.168.1.2
Interface Address: 192.168.1.64      Interface Name:
ppp00
Interface Netmask: 255.255.255.0  Interface Type: Out-
bound
Serial Port: 1    Group: None   MTU: 1500   Async Map:
0x000a0000
Failed Call Wait: 0  Inactivity Timeout: 0  Rip: both
Dial-in User:             Phone Number:
Login Script: outbound1       Options Profile: default
Protocol:     PPP         IP Filter:
Authentication Protocol:  PAP
CHAP Name/PAP User ID:    testppp
CHAP Secret/PAP Password: testppp
```

Create inbound profile name IBPPP1:

```
# add remote IBPPP1
# set remote IBPPP1 address 192.168.1.1
# set remote IBPPP1 ifaddr 192.168.1.64
# set remote IBPPP1 netmask 255.255.255.0
# set remote IBPPP1 type inbound
# set remote IBPPP1 port 2
# set remote IBPPP1 mtu 1500
```

To verify the settings, use the show remote command:

```
# show remote IBPPP1

Remote Name......: IBPPP1
Remote Address...: 192.168.1.1
Interface Address: 192.168.1.64      Interface Name:
ppp01
Interface Netmask: 255.255.255.0  Interface Type:
Inbound
Serial Port: 2  Group: None  MTU: 1500  Async Map:
0x000a0000
Failed Call Wait: 0  Inactivity Timeout: 0  Rip: both
Dial-in User:             Phone Number:
Login Script:             Options Profile: default
Protocol:     PPP         IP Filter:
Authentication Protocol:  None
```

Check all of your settings and then save and shutdown:

```
# save
# Shutdown now
```

Configuration of the RAS 2004/8 for inbound and outbound connections is complete.

Configure Windows 2000 Professional for Outbound Connections

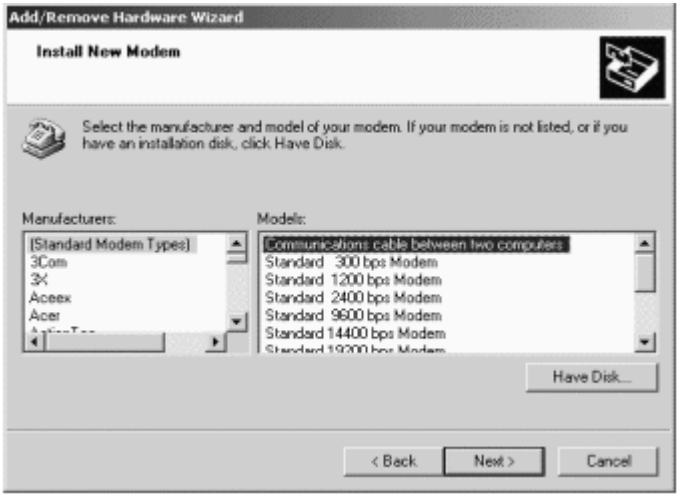
Configure a Serial Connection from the Client to the RAS 2004/8.

To configure a direct communications cable link from the serial port of the client to a serial port of the RAS 2004/8, follow these steps:

1. From the Control Panel, select **Phone and Modem Options**. Select **Modems** tab. Click **Add**.

2. Check the box labeled **Don't detect my modem; I will select it from a list**. Click **Next >**.

3. When the **Add/Remove Hardware Wizard** dialog box appears, highlight **Communications cable between two computers**. Click **Next >**.

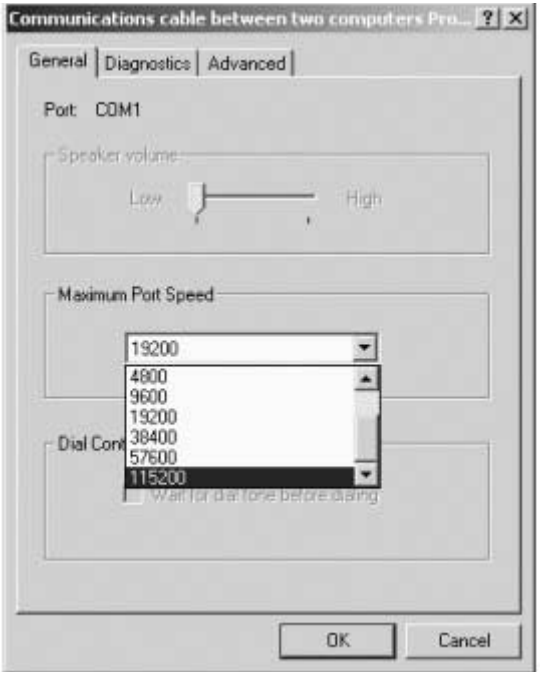


4. Select the Comport **(COM1 or COM2)** that is attached to the serial cable. Click **Next >**.

5. The modem is now successfully installed if the following screen appears. Click **Finish**.

6. The **Phone and Modems Options** dialog box appears. Click **Properties**.

7. Under the **General** tab, select the **Maximum Port Speed**, **115200**. Click **OK**.

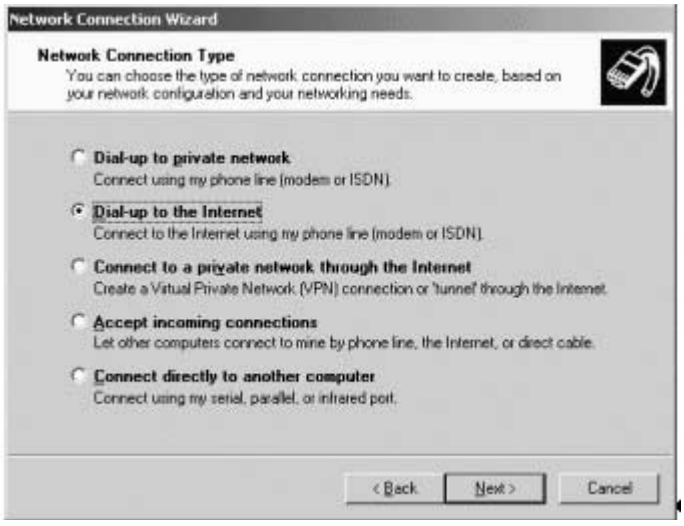


8. The **Phone and Modem Options** dialog box appears, click **OK** to finish.

Configure a Dial-up Connection from the Client to the RAS 2004/8

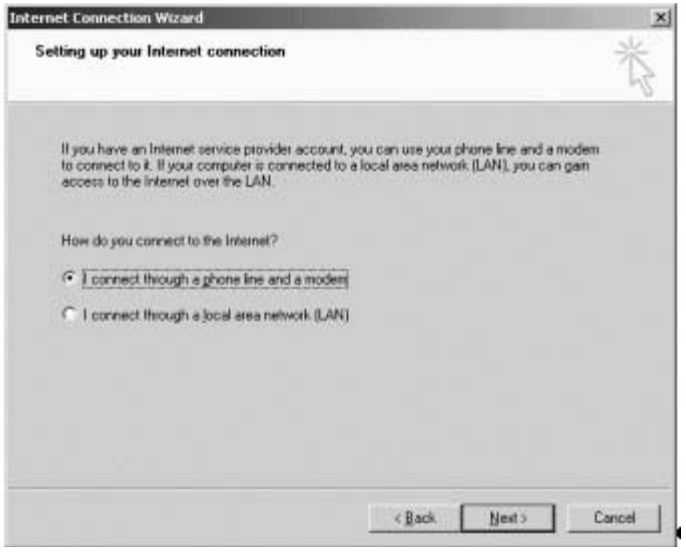
1. In **Control Panel**, select **Network and Dial-up Connections**. Select the icon **Make New Connection**. When the **Network Connection Wizard** appears, click **Next >**.

2. Select **Dial–up to the Internet** option. Click **Next >**.

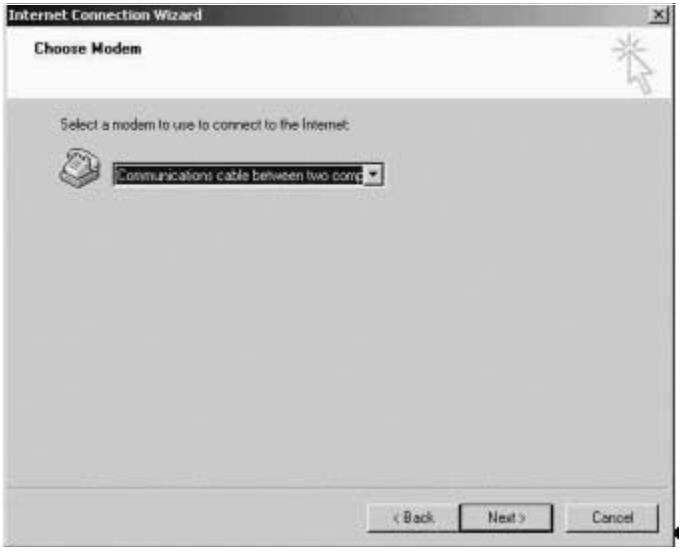


3. Select **I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)**. Click **Next >**.

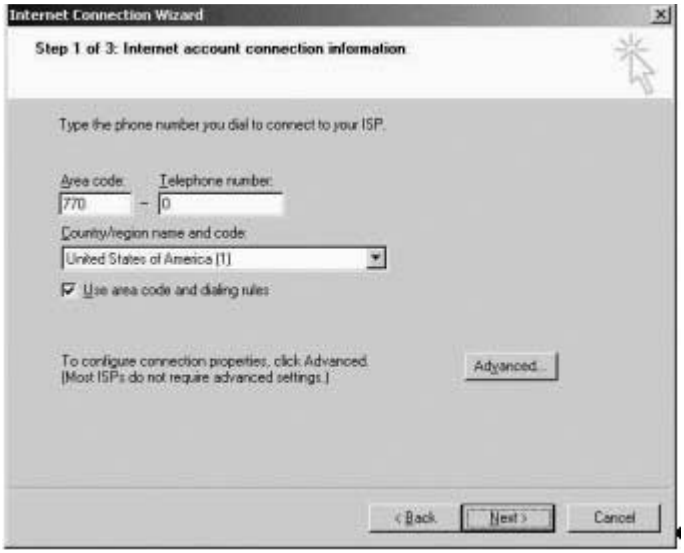
4. To set up your **Internet** connection, select **I connect through a phone line and a modem**. Click **Next >**.



5. From the **Choose Modem** dialog box, select **Communications cable between two computers**. Click **Next >**.



6. To complete the **Internet account connection information** dialog box, type **0** in the **Telephone number** box. Click **Next >**.

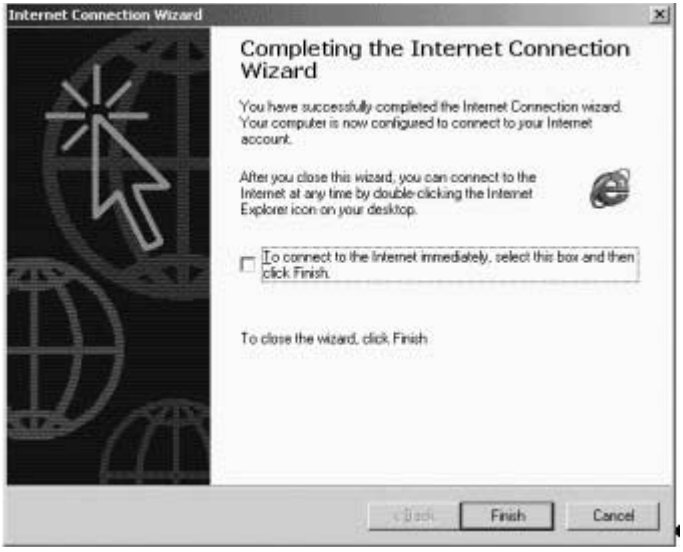


7. Complete your **Internet** account logon information. Enter your user name and password. Click **Next >**.

8. To configure your computer, enter a name for your connection. Click **Next >**.

9. In the **Set Up Your Internet Mail Account** dialog box, select the **No** option. Click **Next >**.

10. In the **Internet Connection Wizard** dialog box, remove the check **To connect to the Internet immediately…**, and click **Finish >**.



11. From the **Network and Dial-up Connections** window, right click on **Connection to RAS** option and select **Properties**.

12. From the **Connection to RAS Properties** dialog box, click **Configure…**under the **General** tab.

13. In the **Modem Configuration** dialog box, select the appropriate speed for connection, **115200**. Check the **Enable hardware flow control** box. Click **OK**.

14. The **Connection to RAS Properties** dialog box appears. Click **OK** to finish.

Configure Windows NT for Inbound Connections

Configure a Serial Connection from the Client to the RAS 2004/8.

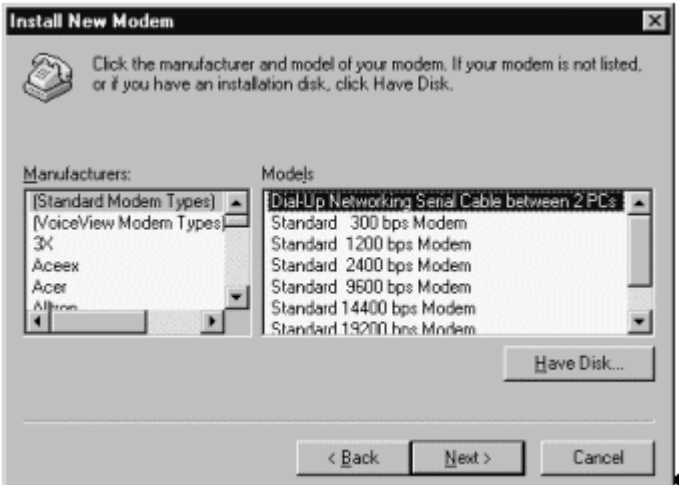
To configure a serial connection, perform the following steps:

1. Select **Start >Settings > Control Panel**. From the **Control Panel**, double click on the **Modems** icon.

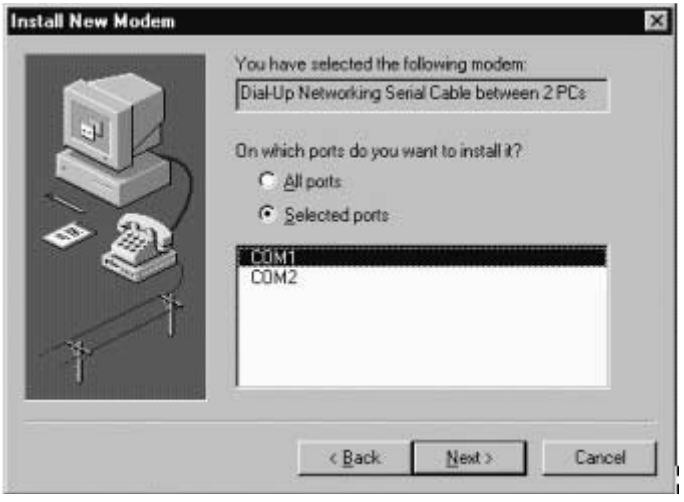
2. In the **Modems Properties** dialog box, Click **Add…**.

3. Check the box labeled **Don't detect my modem; I will select it from a list**. Click **Next >**.

4. When the **Add/Remove Hardware Wizard** dialog box appears, highlight **Communications cable between two computers**. Click **Next >**.



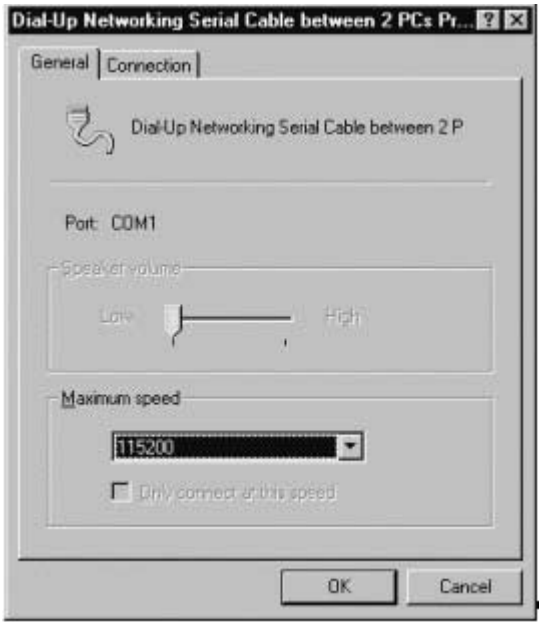
5. Select the Comport **(COM1 or COM2)** that is attached to the serial cable. Click **Next >**.



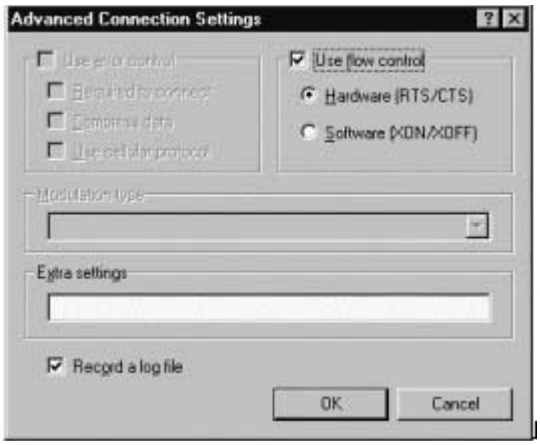
6. The modem is now successfully installed if the following screen appears. Click **Finish**.

7. The **Modems Properties** dialog box reappears. Click **Properties**.

8. While in the **Dial-up Networking Serial Cable between 2 PCs Properties** box, select the **Maximum speed**, **115200**. Then, click the **Connection** tab and choose the **Advanced** option.



9. In the **Advanced Connection Settings** dialog box, check the box **Record a log file**. Make sure the **Use flow control** option and **Hardware (RTS/CTS)** is selected. Click **OK** to close.

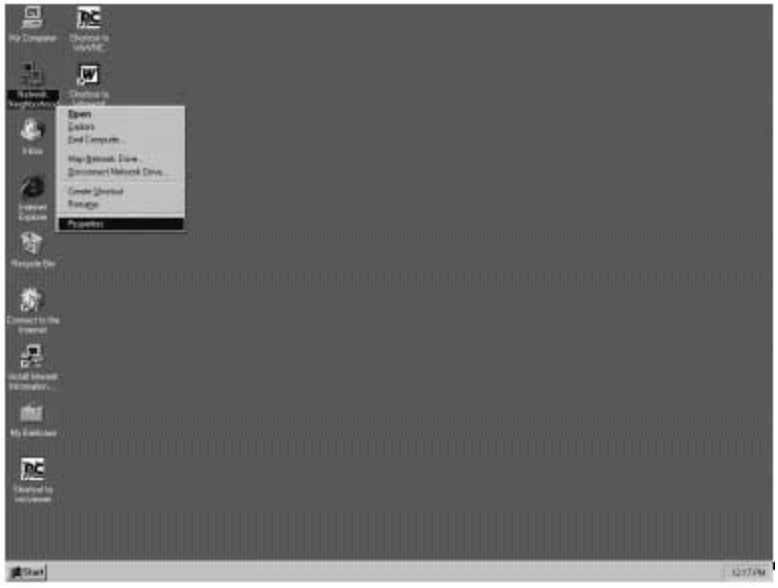


10. Upon returning to the **Modems Properties** dialog box, select **Close** to finish installing the modem.

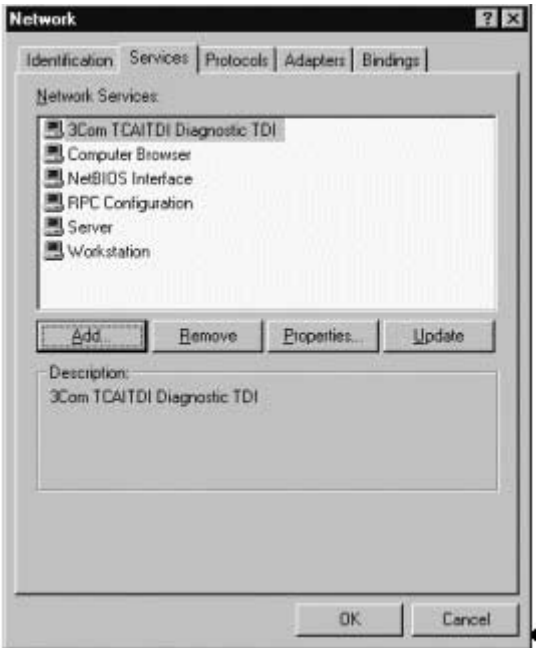
Installing Remote Access Service on Windows NT 4.0.

To install the Remote Access Service, follow these steps:

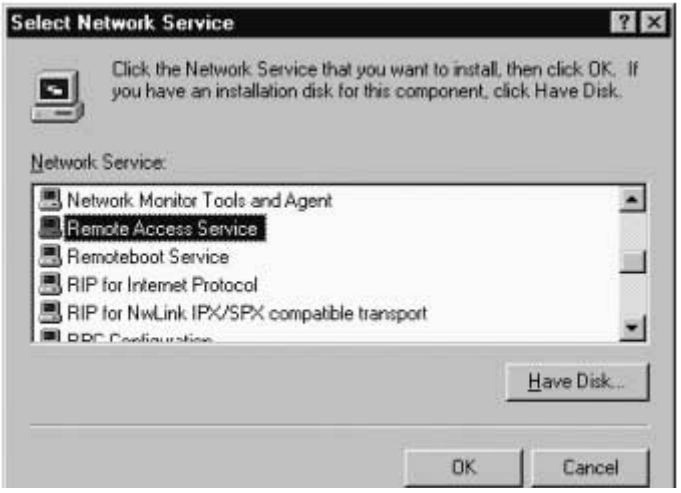
1. Right click on **Network Neighborhood.** Select **Properties**.



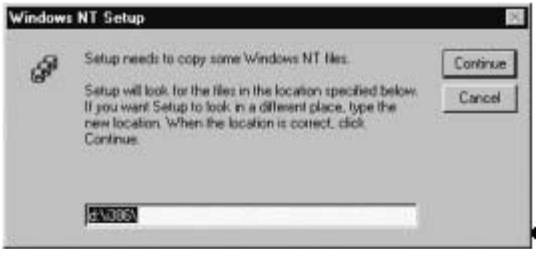
2. In the **Network** dialog box, select **Services** tab. Click **Add…**.



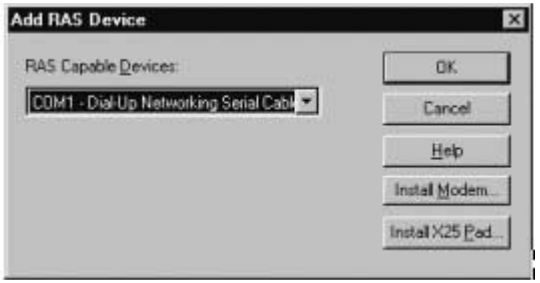
3. In the **Select Network Services** dialog box, choose **Remote Access Service**. Click **OK**.



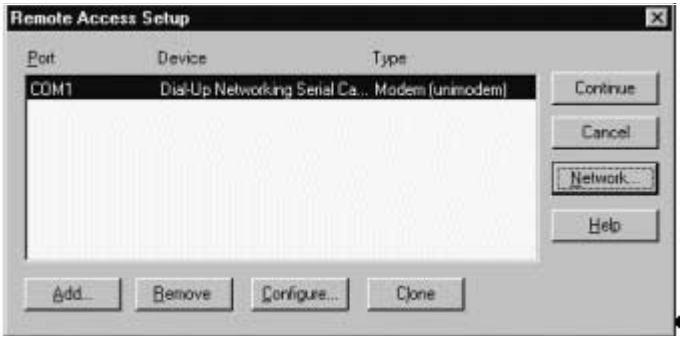
4. Setup will need to copy Windows NT 4.0 files. Insert CD and click **Continue**.



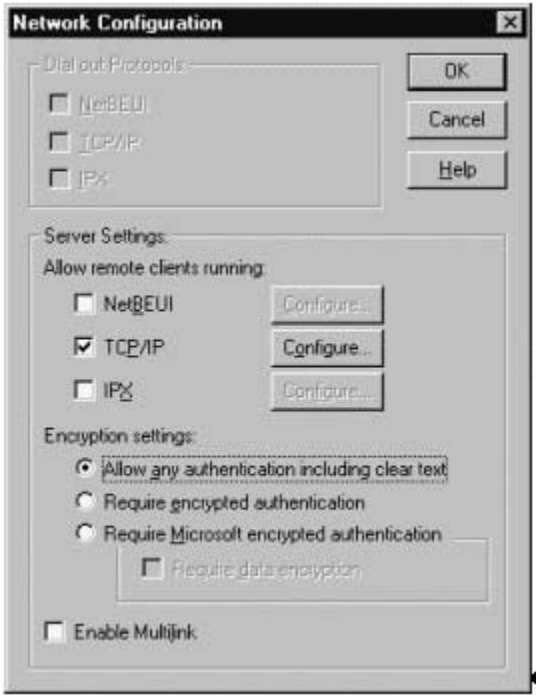
5. In the **Add RAS Device** dialog box, select **COM1-Dial-Up Networking Serial Cable**. Click **OK**.



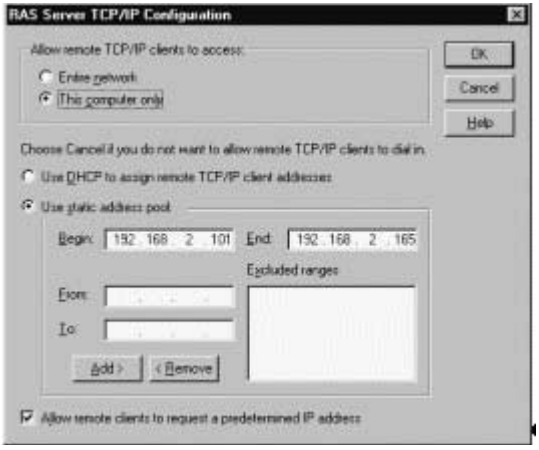
6. In the **Remote Access Setup** dialog box, click **Network…**.



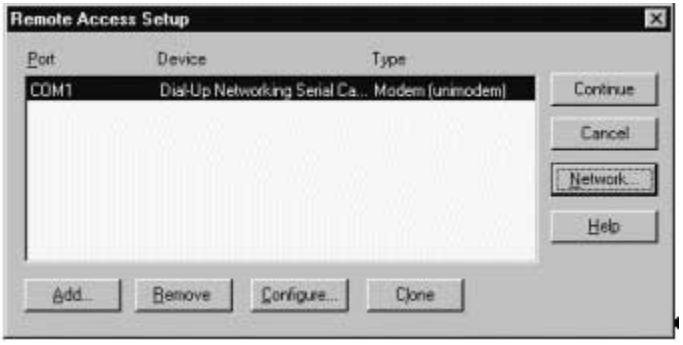
7. In the **Network Configuration** dialog box, select the box **Allow any authentication including clear text**. Make sure the **TCP/IP** option is selected. Click **Configure…**.



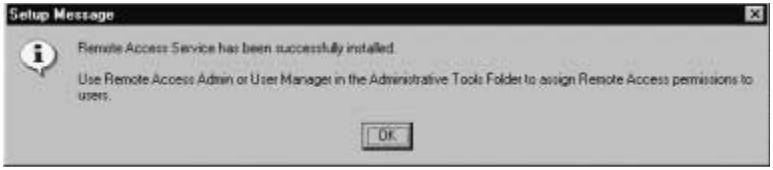
8. In the **RAS Server TCP/IP Configuration** dialog box, first select **This computer only**. Then, select the box **Use static address pool**. Enter the range of IP addresses for your address pool. Check the box **Allow remote clients to request a predetermined IP address**. Click **OK** to continue.



9. Upon returning to the **Remote Access Setup** dialog box, click **Continue**.



10. The **Setup Message** reads: **Remote Access Service has been successfully installed**. Click **OK**.



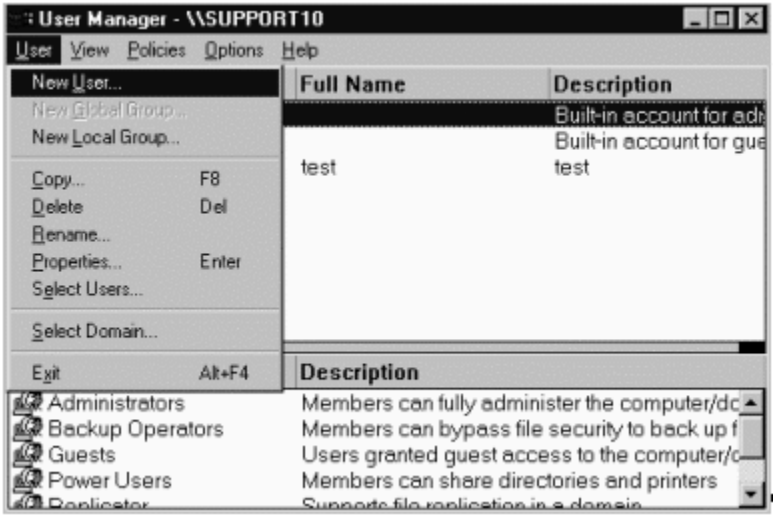
11. The **Network Settings Change** message reads: **You must shut down and restart your computer before the new settings will take effect.** Click **No** at this time.

NOTE: Restart your computer after all services are installed.

Configure a user from the RAS 2004/8 to the Client

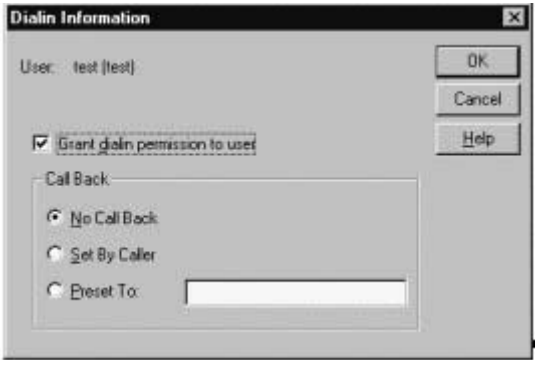
1. Select **Start > Program > Administrative Tools (Common) > User Manager for Domains**.

2. In the **User Manager** dialog box, click **User** > **New User…**.



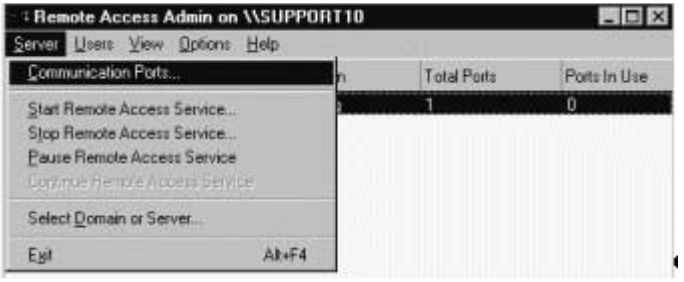
3. In the **User Properties** dialog box, configure your user PPP inbound connection from the NT Server. Enter a name for your connection in the **Full Name** field. Type the desired description in the **Description** field. Type your password in the **Password** and **Confirm Password** fields. Select **Password Never Expires** option.Click **Dialin**.

4. In the **Dialin Information** dialog box, check **Grant dialin permission to user**. Make sure **No Call Back** is selected. Click **OK**.

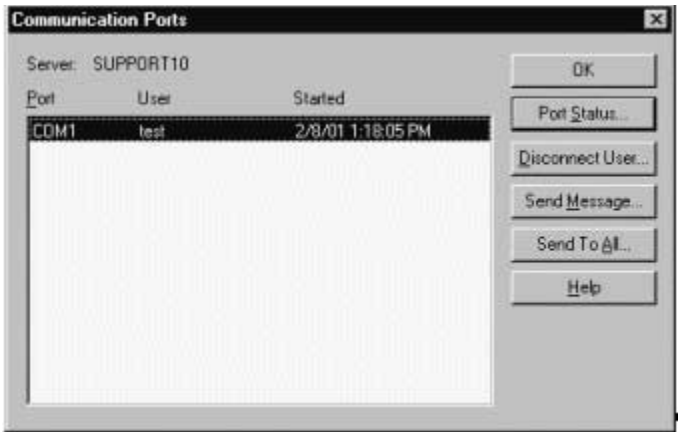


5. To check your **Remote Access Admin Connection**, click **Start > Programs > Administrative Tools (Common) > Remote Access Admin.**

6. Once the PPP connection is established, from the tool bar select **Server** > **Communication Ports**.



7. To verify that the PPP status is connected, **Port**, **User**, and **Started** fields must be highlighted. If these fields are not highlighted, the PPP status is not connected. If not connected, the ability to ping from the RAS 2004/8 is not possible. If status is not connected, make sure that all configurations are set properly.



Configure a Route for the PPP connection from the RAS 2004/8 to the Client

To complete the PPP connection, a route from the RAS 2004/8 to the client must be established. Two files will need to be downloaded from Computone's ftp site. The files are located at ftp.computone.com/pub/Programs. The files are named (invoker.exe and ppproute.exe). PPProute is a program written by Computone that allows automatic adding of the route to a PPP connection after it is established. This is in response to a limitation of Windows NT that prevents the route to remain, unless the PPP connection is active. PPProute.exe runs automatically every 30 seconds to add the route. Once the route is established, it runs every 120 seconds to maintain the route. Installation of PPProute can be made as a service and started automatically by following these steps:

Copy the (invoker.exe and ppproute.exe) to the c:\winnt directory.

Type invoker install, a usage list will appear.

```
     C:\WINNT>Invoker install
   The invoker!  Version: 1.3
Usage:
 invoker install service_name service_label executable
[<start type>]
  service_name   the name used internally by the SCM
  service_label  the display name that appears in the-
                 Services Control Panel. For multiple
                 words, put them in double quotes.
  executable     the full path to the EXE
  <start type>   the service startup type (defaults to
                 manual)(manual, automatic, or dis-
                 abled)
```

Type this command to install PPPROUTE as a service that automatically starts:

```
C:\WINNT>invoker install PPPROUTE PPPROUTE
c:\winnt\ppproute.exe automatic
```

```
C:\WINNT>invoker install PPPROUTE PPPROUTE
c:\winnt\ppproute.exe automatic

The invoker!  Version: 1.3

Service Installed
```

To learn more about PPProute, type `ppproute -? For options`

```
C:\WINNT>ppproute -?

SYNTAX: ppproute.exe [-v|-p|-?] or not options.
        -v   : Displays version info.
        -p   : Displays routing table.
        -d   : Displays environment variables.
        -?   : Displays program syntax.

ppproute with no options runs route addition program.
```

Type `ppproute –v` to display the version number

```
C:\WINNT>ppproute -v
PPProute.exe, Version: 0.1, Compiled: 2/14/01
Computone Corporation: Intended to use with RAS 2004/
8, RAS 2004/8 RCM
 2004/8 Products.
C:\WINNT>
```

Type `ppproute -p` to display the routing table. The NdisWan adaptor is the ppp adaptor. The name that is added in the system variables is the first value in the column, something like “0x3”

```
:\WINNT>ppproute -p
===========================================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x2 ...00 50 04 d1 e0 67 ...... 3Com 3C90x Ethernet Adapter
0x3 ...00 00 00 00 00 00 ...... NdisWan Adapter
===========================================================================
===========================================================================
Active Routes:
Network Destination     Netmask          Gateway      Interface  Metric
        127.0.0.0        255.0.0.0        127.0.0.1       127.0.0.1  1
      192.168.1.0    255.255.255.0    192.168.1.104   192.168.1.104  1
    192.168.1.104  255.255.255.255        127.0.0.1       127.0.0.1  1
    192.168.1.255  255.255.255.255    192.168.1.104   192.168.1.104  1
        224.0.0.0        224.0.0.0    192.168.1.104   192.168.1.104  1
```

Type `ppproute -d` to display help with the variables and values.

```
C:\WINNT>ppproute -d
*****************************************************************
ppproute.exe: This program runs in the background trying every 30 seconds to
              apply a route for inbound PPP RAS interface. This will keep
              the administrator from having to manually use the route com-
              mand each time they want initiate an outbound PPP connection
              from a Computone RAS 2004/8 to a Windows NT 4.0 SP5 machine.
             WARNING!: PPPRoute.exe is intended to run only on Windows
             NT4.0 with ServicPack 5 or greater.

             USAGE: To use ppproute.exe, you must add 5 environment vari-
             ables to the system environment variables. Then reboot.
             They Are:
            PPPGATE-Intended gateway. Most likely will be the remote
                    machines IPAddress.
             PPPIFACE-The interface that PPP is running on. Like 0x3. This
                    will be the NdisWan Adapter. You can locate itby
                    using the route print command. Or by issuing the
                    option of -p to ppproute.exe.
             PPPMASK-Netmask of network. Like 255.255.255.0.
             PPPMETRIC-Metric. Most likely will be 1.
             PPPNET-Subnet that you intend to route to.i.e.192.168.2.0.
            RUNNING:PPPRoute.exe can be used on the cmdline in a cmd shell
                   or added as a service using a freeware program such as
                   Invoker.Invoker is the best method and is recommended.
           DISCLAIMER:
            This is free software with ABSOLUTELY NO WARRANTY!
*****************************************************************
PPPRoute.exe successfully Running. Press 'q' to quit loop.
PPPNET:    192.168.2.0
PPPMASK:   255.255.255.0
PPPGATE:   192.168.2.99
PPPMETRIC: 1
PPPIFACE:  0x3

Plain English:
You intend to connect to a subnet of 192.168.2.0 that uses a
netmask of 255.255.255.0. Your remote machine gateway is 192.168.2.99.
You are running this network on interface 0x3
```

```
You are using a metric of 1, 1 is highest.

I will be issuing command:
route add 192.168.2.0 mask 255.255.255.0 192.168.2.99 metric 1 if 0x3

C:\WINNT>
```

Type `ppproute`, this will show all the environment properties that must be added.

```
C:\>ppproute
************************************************************************
ppproute.exe: This program runs in the background trying every 30 seconds to
            apply a route for inbound PPP RAS interface. This will keep the
             administrator from having to manually use the route command
             each time they want initiate an outbound PPP connection from a
             Computone RAS 2004/8 to a Windows NT 4.0 SP5 machine.

              WARNING!:
              PPPRoute.exe is intended to run only on Windows NT 4.0 with
              Service Pack 5 or greater.
              USAGE:
              To use ppproute.exe, you must add 5 environment variables to
             the system environment variables. Then reboot.
              They Are:
            PPPNET - Subnet that you intend to route too. Like 192.168.2.0.
              PPPMASK - Netmask of network. Like 255.255.255.0.
              PPPGATE - Intended gateway. Most likely will be the remote
              machines IP Address.
              PPPMETRIC - Metric. Most likely will be 1.
              PPPIFACE - The interface that PPP is running one. Like 0x3.
              RUNNING:
               PPProute.exe can be used on the cmdline in a cmd shell or
             added  as a service using a freeware program such as
             Invoker.Invoker is
              the best method and is recommended.

              DISCLAIMER:
              This is free software with ABSOLUTELY NO WARRANTY!
************************************************************************
```

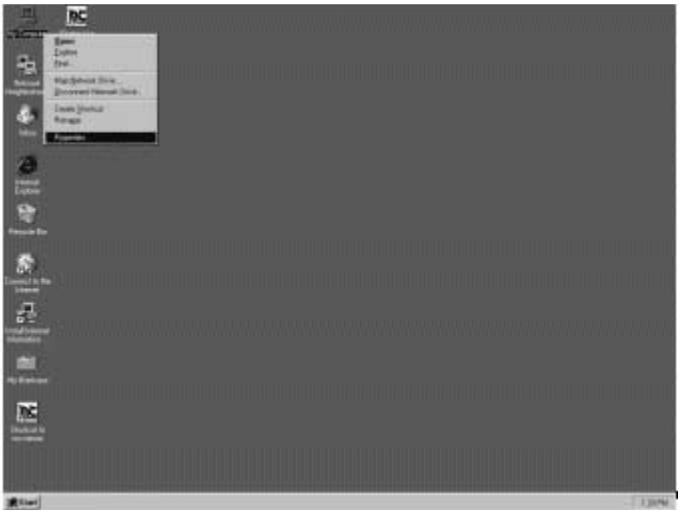
PPPRoute.exe successfully Running

The route addition failed: 87

The error message **The route addition failed: 87** appears every 30 seconds until the PPP connection is made to the Computone RAS 2004/8.

Close Command Prompt Window.

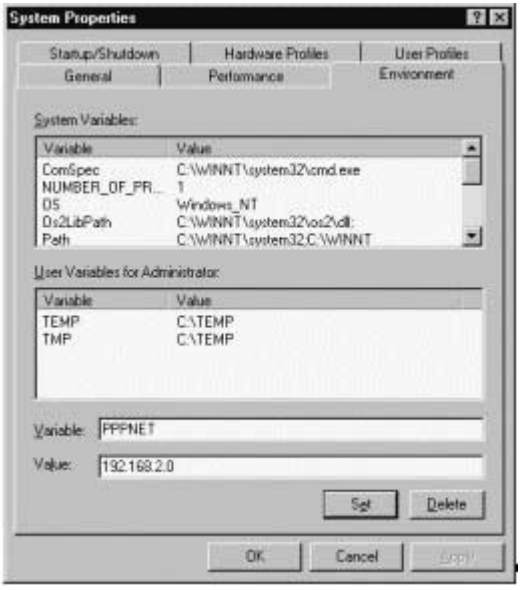
To add the necessary environment variables right click on **My Computer.** Select **Properties**.



In the **System Properties** dialog box, choose the **Environment** tab. Enter the following variables. After entering each **Variable** and **Value field**, press the **Set** button. Make sure the variables entries are made under the **System Variables** field.

Table 4 Variables

VARIABLE	VALUE
PPPGATE	192.168.2.99
PPPIFACE	0x3
PPPMASK	255.255.255.0,
PPPMETRIC	1
PPPNET	192.168.2.0



After verifying that your entries have been recorded and that they are correct, click **OK > Reboot** and the PPProute service will run automatically.

NOTE: If an error is received after rebooting, make sure the Environment Variables are put under System Variables, not under User Variables for Administrator.

Appendix A. RAS 2004/8 Command Syntax Used in this Manual

Netboot:

```
usage: netboot [-s [-b] [-r]] {-a | <hostname> <file-
name>}
   <hostname> = host name or IP address of TFTP host
   <filename> = name of kernel image to download

netboot will download a kernel image from a TFTP host
and either execute the image, or save it to flash mem-
ory.

options:
  -s : saves downloaded image to flash. This option
       will not execute the image.
  -b : allows the boot sector to be updated.
  -r : Executes the image if it differs from rom.
  -a : Loads image via ASCII file dump. If supplied,
       the <hostname> and <filename> is not required.
```

Port:

```
port        - Modify/Display configuration
port     show     [<port-list>     [full|access|hard-
ware|options|counts]]
port set <port-list> from <number>
port set <port-list> {parameter <value>}
                     {parameter <value>} options are:
                                                [login
byport|byscreen|auto|autowait|printer|revtcp|out-
bound|byporttcp]
        [comment <comment>]  [term <type>]   [username
<username>]
       [rterm <type>]  [group <group#>|none]  [autoppp
enabled|disabled]
         [modem enabled|disabled]  [wait enabled|dis-
abled]  [init <initstring>]
          [speed <speed>]  [charsize 5|6|7|8]  [dial-
script <scriptname>]
```

```
        [parity none|even|odd|space|mark]    [stopbits
1|1.5|2]
        [inflow disabled|xoff|rts|xoffrts]
        [outflow disabled|xon|xany|cts|xoncts|xanyxts]
                                        [oxlat     dis-
abled|nl_crnl|cr_nl|strip_cr|crnl_crnl]
       [ixlat disabled|cr_nl|nl_cr] [tabs enabled|dis-
abled]
         [intr <char>]  [erase <char>]  [kill <char>]
[tcp normal|crnl_cr|raw]
         [iview <profile>]  [iset <profile>]  [iprint
<profile>]

port kill <port-list> [session <session-list>]
port hangup <port-list> [session <session-list>]
port output [port] string <text> [forever]
port output [port] pattern barber|columns [forever]
```

Server:

```
     server      - Modify/Display fundamental IntelliS-
erver parameters

+server set [name <name>]
        [address <ip address>]
        [subnet <ip address>]
        [broadcast <ip address>]
        [domain <name>]
        [console <port>]
        [sysloghost <ip address>]
       [facility <LOG_USER | LOG_LOCAL1 | LOG_LOCAL2 |
LOG_LOCAL3 |
                LOG_LOCAL4 | LOG_LOCAL5 | LOG_LOCAL6 |
LOG_LOCAL7>]
        [priority <LOG_INFO | LOG_NOTICE | LOG_WARNING
| LOG_ERR |
                  LOG_CRIT | LOG_ALERT  | LOG_EMERG   |
LOG_VERBOSE>]
        [ethernet <address>]
        [aui enabled|disabled]
        [filter <name>]
```

```
        [rip none|listen|send|both]
        [loginps <login prompt>]
        [userps <user prompt>]
        [passwdps <Password prompt>]
        [telnetrad yes|no]
server show
```

Save:

```
     save       - Save the IntelliServer's configuration

save
        Save configuration locally.

+save <hostname> <filename>
        Save configuration to a remote host.
```

Restore:

```
     restore    - Restore the IntelliServer's configuration

+restore
        Restore local configuration.

+restore <hostname> <filename>
        Restore configuration from a remote host.

+restore factory
        Restore factory defaults.
```

Tipmenu:

```
Usage:
 tipmenu -n port name           (Give the port a sym-
bolic name)
 tipmenu -e [port | all ]      (Enable tipmenu access
to the port)
 tipmenu -E [port | all ]      (Enable tipmenu access
and set the port for tip)
```

```
 tipmenu -d [port | all ]       (Disable tipmenu access
to the port)
 tipmenu -x                     (Reset tipmenu settings
to default)
```

PPP option:

```
ras# set pppoption
     pppoption   - Modify/Display PPP option profiles

+pppoption add|set <profile> {parameter <value>}

        where {parameter options are:

                [accompress  yes|no]    [async  yes|no]
[addrmode disabled|enabled]
        [passive yes|no]     [protocomp yes|no] [magic
yes|no]
       [mru yes|no]         [size  <mru size>] [vjmode
disabled|enabled]
        [bringup yes|no]     [prompt yes|no]    [proxy
yes|no]

pppoption show <profile>|all

+pppoption delete <profile>
```

Remote:

```
ras# set remote
      remote       - Modify/Display a PPP/SLIP remote
interface profile

+remote add <remote name> {parameter <value>}
+remote add <remote name> from <remote name>
+remote  set  <remote  name>|<iface  name>  {parameter
<value>}

        {parameter <value>} options are:
       [ifaddr <local ip address>]   [netmask <ip addr
mask>]
        [type inbound|outbound|disabled]
```

```
        [address <remote ip address>]
        [port <number>|none]   [group <number>|none]
        [mtu <size>]   [async <mask>]
        [delay <seconds>]   [timeout <seconds>]
        [user <dialin name>]   [phone <phone number>]
       [login <script name>]   [option <profile name>]
        [protocol disabled|ppp|slip|cslip|any]   [fil-
ter <name>]
        [authority none|pap|chap]
        [id <chap name>|<pap id>]
        [secret <chap secret>|<pap password>]
        [rip <none|send|listen|both>]

+remote show <remote name>|<iface name>|all|summary
+remote delete <remote name>
```

Appendix B. Downloading and Using Putty for Windows

Steps Required to Download Putty

Putty is a Windows based Telnet and Secure Shell (SSH) client. This appendix will discuss downloading putty from the Computone FTP site and the implementation of this client. In this example, we are using Windows NT.

Putty is available via File Transfer Protocol (FTP) at 'ftp://ftp.computone.com/'.

Start a windows CMD or COMMAND shell and follow the steps below:

Change the current directory to a directory that is in your Windows path:

```
C:>cd \
C:>cd winnt
C:>cd system32
```

Connect to Computone FTP site using Windows FTP client:

```
C:>ftp ftp.computone.com

Connected to starship.computone.com.
220 starship FTP server (Version wu-2.4.2-academ[BETA-
15](1) Tue Oct 14 18:38:17
 PDT 1997) ready.
User (starship.computone.com:(none)):
```

Enter a username of anonymous:

```
User (starship.computone.com: (none)): anonymous
```

```
331 Guest login ok, send your complete e-mail address
as password.
Password:
```

Enter your e-mail address as your password:

```
Password: user@domain.com
```

```
230 Guest login ok, access restrictions apply.
ftp>
```

At the ftp prompt, enter the following commands:

```
ftp> cd /pub/Programs
```

```
250 CWD command successful.
ftp>
ftp> bin
200 Type set to I.
ftp>
ftp> hash
```

```
Hash mark printing On ftp: (2048 bytes/hash mark) .
ftp>
```

Retrieve putty file:

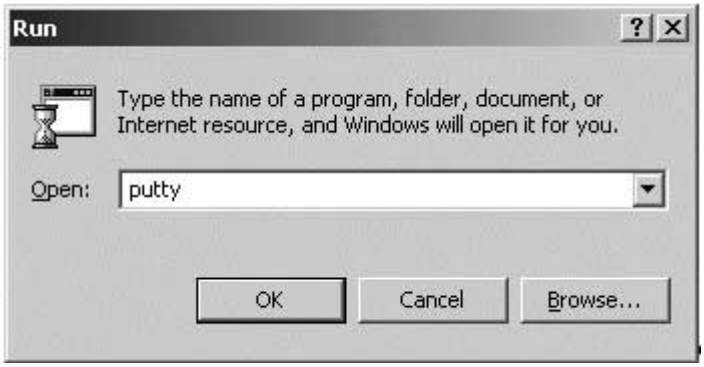
```
ftp> get putty.exe

200 PORT command successful.
150 Opening BINARY mode data connection for putty.exe
(202752 bytes).
############################################################
##############################################
226 Transfer complete.
ftp:    202752    bytes    received    in    0.24Seconds
841.29Kbytes/sec.
ftp>

Log off FTP site:
ftp> quit

221 Goodbye.

C:\WINNT\system32>
```

Exit out of the CMD or COMMAND prompt.

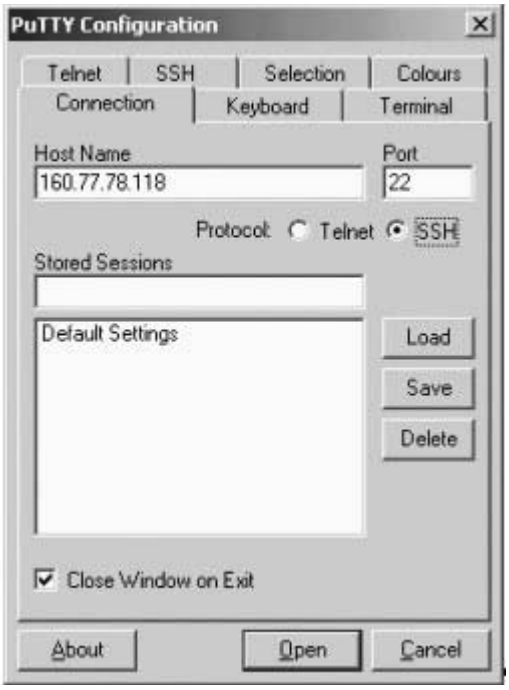
Steps Required to Use Putty

Putty.exe is an executable that does not need installation. By placing it in a directory that is in the system's path statement, it can be executed at any time by typing the name of the program in the run dialog box of windows. The next section will explain how to use the Secure Shell feature of putty to connect up to a RAS 2004/8.

1. Start Putty.exe by clicking on the **Start** button and then selecting **Run**. Type **putty** in the dialog box and press **OK**.



2. On the **PuTTY Configuration** menu, enter the host name or the IP address of the RAS 2004/8. Select **SSH** as the protocol putty will use to communicate. Click **Open** to make a connection to the RAS 2004/8.



Putty will make a connection to the RAS 2004/8.

3. If a security warning appears, select **Yes** to allow the host key to be cached in the window's registry.

A login prompt is given.

4. Login as root and continue:

```
login as: root

Password:
```

Enter root Password:

```
Password: password
```

```
Demo#
```

128-bit encrypted access is now available to your RAS 2004/8.

Appendix C. Headless Install of Remote Control Software

In some cases, an administrator would like to be able to install remote control software on a Windows 2000 server without having to physically be in the server room or attaching a “crash cart” to the computer. This server may be a new unit that was pre-installed with the 2000 operating system. If it has DHCP enabled, it will receive an IP address at boot time. To do further configuration, the administrator must attach a keyboard, mouse, and video to the server or remotely install VNC remote control software. This appendix will explain how to install VNC on the Windows 2000 server without attaching a keyboard, mouse, and video. To use this feature, the Microsoft Server 4.0 Resource kit’s Regini, Shutdown, and Netsvc tools are needed. Also the VNC distribution from ‘http://www.uk.research.att.com/vnc.’ must be downloaded.

The files from the VNC distribution must be extracted . The easiest way to do this is to install the package on a test machine. Install the program files into the directory “c:\program files\orl\vnc.” That directory will contain all but one file needed for the entire distribution.

Copy the omnithread_rt.dll file from “c:\winnt\system32” directory to “c:\program files\orl\vnc”. All of the files needed to make VNC operate should be in that directory now.

Next, copy these files to the remote server. The following steps will explain this procedure:

Login to the remote machine as Administrator. Replace everything in ‘<>’ with the appropriate information for your network:

```
C:\> NET USE \\<remote machine IP>\IPC$ /user:administrator <password>
```

Create VNC directory:

```
C:\>    MKDIR    “\\<remote    machine    IP>\C$\program
files\orl\vnc”
```

Copy the VNC distribution to the remote machine:

```
C:> COPY "c:\program files\orl\vnc" "\\<remote machine
IP>
\C$\program files\orl\vnc"
```

To make VNC run on the remote machine, update the registry on the remote machine with information regarding VNC.

Create a file called vnc.regini on the test machine and add the following lines:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\winvnc
    Type = REG_DWORD 0x00000110
Start = REG_DWORD 0x00000002
ErrorControl = REG_DWORD 0x00000001
ImagePath = REG_EXPAND_SZ “C:\Program Files\ORL\VNC\WinVNC.exe” -service
DisplayName = VNC Server
ObjectName = LocalSystem
HKEY_LOCAL_MACHINE\SOFTWARE\ORL
    WinVNC3
        Default
SocketConnect = REG_DWORD 0x00000001
AutoPortSelect = REG_DWORD 0x00000001
InputsEnabled = REG_DWORD 0x00000001
LocalInputsDisabled = REG_DWORD 0x00000000
Password = REG_BINARY 0x00000008 0xfd3cd8db 0x58147a72
PollUnderCursor = REG_DWORD 0x00000000
PollForeground = REG_DWORD 0x00000001
PollFullScreen = REG_DWORD 0x00000000
OnlyPollConsole = REG_DWORD 0x00000001
OnlyPollOnEvent = REG_DWORD 0x00000000
```

For VNC to successfully run, create registry entries on the target machine. To load the remote target machine's registry, use the following command:

```
C:>REGINI -m \\<remote machine IP> vnc.regini
```

Finally, reboot the Windows 2000 server and VNC should start up as a service. Use the VNC viewer utility on the test machine to connect to the server.

Shutdown the server:

```
C:> SHUTDOWN \\remote machine IP> /R /Y /C /T:0
```

Configuration of VNC on the headless server is now complete.

NOTE: When running the VNC viewer, right clicking on the title bar allows a Ctrl- Alt-Del command to be sent to the remote host.

Notes: