# **Console Management Implementation Guide**



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# 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 downtime 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 someone 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

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# **Unpacking the RAS 2004/8**

#### The RAS 2004/8 box contains the following 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

#### Table 1 RAS 2004/8 Components

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:

- 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*.

Connect To				Massa	? ×
A ras					
Enter details fo	r the phi	one ni	umber tha	at you want	to dial:
Country/region	c Unite	d Stal	es ol Am	erica (1)	¥.
Ar <u>e</u> a code:	770				
Phone number	:				
Connect using		1			•
			ОК	] Ca	ncel (
		-		-	

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**.

Bits per second:	9600	•
<u>D</u> ata bits:	8	
Parity:	None	•
≦top bits:	1	<u>.</u>
Elow control:	None	<u>×</u>

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 net-
mask 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
                    : 192.168.2.1
  IP Address
  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
                   : No
 Force AUI Port
  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:

Ħ	tipmenu	-E	1
Ħ	tipmenu	-E	2
Ħ	tipmenu	-E	3
Ħ	tipmenu	-E	4
Ħ	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:Se	erverl	17:disabled	33:disabled	49:disabled
	2:Se	erver2	18:disabled	34:disabled	50:disabled
	3:Se	erver3	19:disabled	35:disabled	51:disabled
	4:Se	erver4	20:disabled	36:disabled	52:disabled
	5:Se	erver5	21:disabled	37:disabled	53:disabled
	6:n,	/a	22:disabled	38:disabled	54:disabled
	7:d:	isabled	23:disabled	39:disabled	55:disabled
	8:d:	isabled	24:disabled	40:disabled	56:disabled
	9:d:	isabled	25:disabled	41:disabled	57:disabled
1	L0:d:	isabled	26:disabled	42:disabled	58:disabled
1	L1:d:	isabled	27:disabled	43:disabled	59:disabled
1	L2:d	isabled	28:disabled	44:disabled	60:disabled
1	L3:d:	isabled	29:disabled	45:disabled	61:disabled
1	L4:d:	isabled	30:disabled	46:disabled	62:disabled
1	L5:d:	isabled	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: Port Type: Disabled 1 Comment: Local Term Type: unknown User Name: root Remote Term Type: Group : None Await Input: No Dial Script: Modem: No 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 follow-

ing 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
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
                                     57:disabled
                        41: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
                                     63:disabled
                        47: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**

RCM 4/8 and RAS 2004/8 IntelliServer Console Guide

### **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<sup>®</sup> 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<sup>®</sup>-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<sup>®</sup>, AIX<sup>®</sup>, and HP-UX<sup>®</sup> 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<sup>®</sup>
- FreeBSD<sup>®</sup>
- Sun<sup>®</sup> Solaris<sup>®</sup> Sparc/x86
- SCO<sup>®</sup> OpenServer<sup>®</sup> 5

## **Enabling Serial Console on Linux**

Most Linux distributions include a kernel that is enabled for serial console support. This is true for Caldera<sup>®</sup>, Red Hat<sup>®</sup>, and others. The Debian<sup>®</sup> 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
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 Coff-
man
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 *
```

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:

/boot/boot.0300 exists - no backup copy made.

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

Writing boot sector.

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 $
١
\ 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  $\# < CR > \# \sim^b$  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 shut-down, 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<sup>®</sup> 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<sup>®</sup> 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

#### <u>Configure Windows 2000 Professional for Outbound</u> <u>Connections</u>

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

#### <u>Configure Windows 2000 Advance Server for Inbound</u> <u>Connections</u>

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 [

]

]

1

1

]

]

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 Parity: None Size: 8 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: <sup>^</sup>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
             0 Disabled
     Yes
  1
     Yes
             0 Disabled
             0 Disabled
  2
     Yes
  3
             0 Disabled
     Yes
  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 OBPP1
# set remote OBPP1 address 192.168.1.2
# set remote OBPP1 ifaddr 192.168.1.64
# set remote OBPP1 netmask 255.255.255.0
# set remote OBPP1 type outbound
# set remote OBPP1 port 1
# set remote OBPP1 mtu 1500
# set remote OBPP1 rip both
# set remote OBPP1 login outbound1
# set remote OBPP1 protocol ppp
# set remote OBPP1 authority pap
# set remote OBPP1 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: 255.255.25.0 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:

```
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

# show remote IBPPP1

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

#### Configure Windows 2000 Professional for Outbound Connections

#### <u>Configure a Serial Connection from the Client to the</u> <u>RAS 2004/8.</u>

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:

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

۳ ا	e tollowing r	nodems are	installed.		
Modem	flached 10				
1		Add	Ren	ove	Properties

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 >.

Add/Remove Hardware Wizard	
Install Ne <del>w</del> Modem	
Select the manufacturer and the have an installation disk, click	model of your modern. If your modern is not listed, or if you k Have Disk.
Manufacturers: M	fodels:
IStandard Modern Types) 3Com 3× Accex Accex Accer	Standard 300 bps Modem Standard 200 bps Modem Standard 2400 bps Modem Standard 2400 bps Modem Standard 14400 bps Modem Standard 14400 bps Modem
	Have Disk
	< Back Next > Cancel

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**.

11			
Modem		Attac	hed To
Communicatio	ns cable between tw	o computers COM	1

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

eneral Diagnostics Advanced Port COM1    Speaker volume  Low  Maximum Port Speed	eneral Diagnostics Advanced Port COM1 Speaker volume Low High Maximum Port Speed 19200 4800 9600 9600 19200 Dial Cont 38400 57600 115200 Warl for darkone before Stang	nmunicati	ons cable betwe	en two computers Pr	u
Port CDM1	Port COM1  Speaker volume Low High  Maximum Port Speed  19200  4800  9600  Dial Cord 38400  57600  115200  Wall for clef fore before Stang	ieneral Dia	agnostics Advance	ed	
Speaker volume         High           Low         High           Maximum Port Speed         19200           19200         19200           Jebo         19200           Jebo         19200           Jebo         19200           Jebo         19200           Jial Cont         3600           Jis200         Jis200	Speaker volume Low High Maximum Port Speed  19200 4800 9600 19200 Dial Core 38400 57600 11520 11520 11520 11520 11520 11520 11520 1152 1152	Port COM	11		
Low High Maximum Port Speed 19200 ▼ 4800 9600 19200 Dial Core 57600 115200 ▼	Low High Maximum Port Speed 19200 4800 9600 19200 19200 19200 19200 19200 19200 19200 19200 Wall for clast one before Stating	- Speaker	volume		
Maximum Port Speed	Maximum Port Speed		Low J	High	
4800 9600 19200 Dial Cont 38400 57600	- Dial Cont 38400 115200 Walt for dial tone before Saling	Maximum	Port Speed	-	
57600	57500 115200 Wait for diatione before stalling	Dial Cont	4800 9600 19200 38400		
	<ol> <li>Wattor datore before dang</li> </ol>	and a contr	57600 115200	5	

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

fodem		1	Allached To	_
Communication	na cable between tw	o computers	COM1	
			5 Boord and	

#### <u>Configure a Dial-up Connection from the Client to the RAS</u> 2004/8

 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 >.



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

Setting up your Internet connection			光
If you have an Internet service provider account, yo to connect to it. If your computer is connected to a l access to the internet over the LAN.	u can use your j ocal area netwo	phone line and a R. [LAN], you can	nodem i gain
How do you connect to the Internet?			
I connect through a phone line and a modern			
C I connect through a Jocal area network (LAN)			
	( Back	Next>	Cancel

 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** >.

Internet Connection Wizard	×
Step 1 of 3: Internet account connection information	於
Type the phone number you dial to connect to your ISP.	
Area code	
Country/region meme and code:	
United States of America (1)	
₽ Use area code and daing rules	
To configure connection properties, click Advanced, (Most ISPs do not require advanced settings.)	anced.
< Back	est> Cancel

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

Type the use also be referr contact your	name and password you use to log on to your ISP. Your user n cl to as your Member ID or User ID. If you do not linnow this info SP.	ame may mation,
User name:	Testpp	
Password	(manana manana manan	

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

ernet Connection Wizard	
Step 3 of 3: Configuring your computer	Ť
Information about your Internet account is grouped together as a diakup connection and labeled with a name you provide.	
Type a name for the dial-up connection. This can be the name of your ISP or any name you want to use.	
Connection name	
Jaconceston (childan	
< Back. Next>	Cancel

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



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



 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...**.

Connect using:	
Modem - Communications cable bet	tween two computers (COM
	Configure
Phone number	
Atga coda: Phone number:	
0	Altergates
Country/region code:	
United States of America (1)	•
🔽 Uge dialing rules	Bules
Z Chamisson in task has observed	ad

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

Modem Configuration		<u>?  x</u>
Communications of	able between two computers (CC	(1140
Maximum speed (bps);	115200	
Modem protocol		*
Hardware features		
Enable hardware flow	control	
Engble modern error c	ontiol	
F Enable mgdem compr	ession	
Initialization		
E Show terminal window		
E flow script		y.
	Edit	lowie
F Enable modern speaker		
	OK.	Cancel

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


## Configure Windows 2000 Advanced Server for Inbound Connections

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

To configure a serial connection, perform the following steps:

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

The followin	g moderns are installed	
Modem Attached T	0	
	and the	1

 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.

mmunicat	ions cable between two computers Pro
General D	iagnostics Advanced
Port CO	M1
- Speaker	volume
	Low High
Maximur	n Port Speed
	19200
Dial Con	4600 9600 13200 38400 57600
	Wat for dia tone before dialing

7. Click **OK** to close.



<u>Configure the Network Connection Between the Server and</u> <u>RAS 2004/8</u>

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 >.

<ul> <li>Dial-up to private network Connect using my phone line (modem or ISDN)</li> <li>Dial-up to the Internet Connect to the Internet using my phone line (modem or ISDN)</li> </ul>	
C Dial-up to the Internet Connect to the Internet using my phone line (modem or ISDN)	
Connect to a private network through the Internet Create a Vitual Private Network (VPN) connection or funnel through the Inter	net
Accept incoming connections Let other computers connect to mine by phone line, the Internet, or direct cability	e.
Connect directly to another computer Connect using my serial, parallel, or infrared port.	

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

rk to use for in men (COM2)	coming connections
uters (CDM2)	
uters (CDM2)	
	Pjopentes

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**.

eral Advanced			
Call preferences			
F Operator aunit	lest (marrial) stat		
	call if idle for more t	hen	mins
Cancel the call	l if not connected a	within [	
Data Protocol Compression		*	
	manufacture of the	The second se	
Port speed Data Protocol Compression	115200	*	

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



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

Incoming Virtual Private Con Another computer can create through the Internet or anothe	nection a virtual private connectio r public network.	n to your computer	6
Virtual private connections to your computer has a known n	your computer through the ame or IP address on the li	Internet are possible internet.	only if
Choose whether to allow virtu	al private connections:		
Alow virtual private co	nnections		
C Do not allow virtual priv	vale connections		

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

Network Connection Wizard
Allowed Users You can specify which users can connect to this computer.
Select the check box next to the name of each user you want to allow to connect to this computer. Note that other factors, such as a disabled user account, may affect a user's ability to connect.
Users allowed to connect
Administrator     Guest     Guest     Guest     Mon_TECRA2K (Internet Guest Account)     Go     MvAM_TECRA2K (Launch IIS Process Account)     Go     TsinternetUser (TsinternetUser)
Add Delete Properties
(Back Next) Cancel

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

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

<u>? ×</u>
testppp
This is a ppp test user
XXXXXXXXXX
Maaadoo
OK Cancel

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

Network Connection Wizard	In the second second	and the second se	
Networking Components Networking component kinds of computers.	s enable this computer	to accept connectio	ns from other
Select the check box ni enable for incoming con	ed to the name of each nections.	networking compor	ient you want to
Networking components	£		
M Y Internet Protoco	((TCP/IP)		× 20000000
File and Printer S	Sharing for Microsoft N Ialancing	etworks	-
	jnstal	Urunstall	Properties
Description			
Transmission Control Pro that provides communic	atacal/internet Protoco ation across diverse int	I. The default wide a erconnected networ	rea network protocol ks.
	Ĺ	< <u>₿</u> ack. <u>N</u>	ext> Cancel

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**.

Carrieng The Ville Pri	opertues	114
Network access		
Alow callers	o access my local area network	
TCP/IP address as	signment	
C Assign TCP/I	P addresses automatically using DHCP	
Specify TCP/	IP addresses	
Erom	192 . 168 . 1 . 2	
Īα	192 . 168 . 1 . 3	
Total	2	
Z Alow caling	computer to specify its own IP address	613
the standing of the state	contract to specify to one of the dataset	
	ОК	Cancel

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

Select the check bo enable for incoming (	a next to the name of each networking component you want to connections.
Networking company	ents
File and Phin	acod (TCP/IP)
lan Charles and	Install. Uninstal Properties
Description	
Transmission Control	Protocol/Internet Protocol. The default wide area network protocol
that provides commu	nication across diverse interconnected networks.

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** 

 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.

Cal Services					IX
Action Yew					
Tree	Name /	Description	Status	Startup Type	-
Ph Services (Local)	Performance Logs a	Configures performance logs and alerts.		Manual	
10 mailtonationsed	Plug and Play	Manages device installation and configura	Started	Automatic	
	Print Spooler	Loads files to memory for later printing.	Started	Automatic	
	Protected Storage	Provides protected storage for sensitive	Started	Automatic	
	QoS R5VP	Provides network signaling and local traffi		Manual	
	Remote Access Aut	Creates a connection to a remote networ		Manual	
	Remote Access Con	Creates a network connection.	Started	Automatic	
	Remote Procedure	Provides the endpoint mapper and other	Started	Automatic	
	Remote Procedure	Manages the RPC name service database.		Manual	
	Remote Registry Se	Allows remote registry manipulation.	Started	Automatic	
	Removable Storage	Manages removable media, drives, and lib	Started	Automatic	
	SRouting and Remot	Offers routing services to businesses in lo	Started	Automatic	
	RunAs Service	Enables starting processes under alternat	Started	Automatic	
	Security Accounts	Stores security information for local user	Started	Automatic	
	Server	Provides RPC support and file, print, and	Started	Automatic	
	Smart Card	Manages and controls access to a smart c		Manual	-
	Smart Card Helper	Provides support for legacy smart card re		Manual	
	System Event Notifi	Tracks system events such as Windows lo	Started	Automatic	
	Task Scheduler	Enables a program to run at a designated	Started	Automatic	
	TCP/IP NetBIOS Hel	Enables support for NetBIOS over TCP/IP	Started	Automatic	-
	1				•

**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.

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



 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.



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

	- 11 (V) (1) (V)	?
N)		
ees Eo	skoy	
Г		
		-
COBIS	: Service only)	
Γ		
Ē		-1
	PNJ ecs Ex Access	PN  ess Eolicy Access Service only)

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

i ne table below lists Dial-in connection. C he table. Click Delet	the static routes to lick Add Route to e Route to remove	enable for thi add a route to the selected
oute from the table. Destination	Mask	Metric [
Add Route	Delete	Route

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

hask, and the Metric to	) the destination network.
Destination:	192 . 168 . 1 . 0
Network <u>M</u> ask:	255 . 255 . 255 . 0
Metric:	1 -

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

he table. Click Delete oute from the table.	Route to remove	e the selected
Destination	Mask	Metric
192.168.1.0	255 255 255 0	
Add Route.	Delet	e Route

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

<u>Configure Windows 2000 Professional for Outbound Connec-</u> <u>tions</u>

- 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:

<pre># login add outbound1 line 1 "%s CLIENTCLIENT" # login set outbound1 line 2 "%w CLIENTSERVER"</pre>
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 [

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:

Line 6 [

# 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 Parity: None Size: 8 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: <sup>^</sup>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:
                           Inbound PPP
Connection option:
Initial number of Sessions: 1
Administration Privileges:
                           No
Sess Lock GC#
               Command
                         Arguments/Description
  0
     Yes
            0 Disabled
 1
     Yes
            0 Disabled
            0 Disabled
  2
    Yes
  3
    Yes
            0 Disabled
  4
    Yes
            0 Disabled
  5
     Yes
            0 Disabled
            0 Disabled
  6
     Yes
  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:

```
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

# show remote IBPPP1

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

## Configure Windows 2000 Professional for Outbound Connections

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

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:

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

Modem Attached	ing moderns are installed	
	Add Fiemove	Properties

 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**.

Modem		Altacher	iTo
Communicatio	ins cable between two o	computers COM1	

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

General Diagnostics Advanced Port CDM1 Speaker volume Low High Maximum Port Speed 19200 4600 9600 19200 Dial Con 38400 57600 11520 115200	nunicatio	ns cable betv	veen two compu	tters Pro
Port COM1  Sproker volume Low High Maximum Port Speed  19200  19200  Dial Corr 38400  57600  15200  Vent for dua force before chaining	neral Diag	gnostics Adva	nced	
Speaker volume Lew High Maximum Port Speed 19200 9600 9600 19200 19200 19200 19200 19200 19200 19200 19200 19200 19200 19200 19200	ort CDM	1		
High Maximum Poit Speed 19200 4800 9600 19200 19200 Dial Cont 38400 57600 115200 115200	Speaker v	olome :		
Maximum Port Speed	4		, High	
13200         4600           9600         19200           19200         115200           115200         115200	Maximum F	Port Speed		
9600 19200 38400 57600 115200	4	4800	-	
Walt for die tone before dang	Dial Cont	3600 19200 38400 57600		
	-	Walt for diard	one before dialing	

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

Advanced Advanced The tolkowing moderns are installed: Modern Attached To Communications cable between two computers CDM1 Add. Remove Properties	THE REAL PROPERTY.	ptions
The following moderns are installed: Modern Attached To Communications cable between two computers CDM1 Add. Remove Properties	aling Rules Mode	ms Advanced
Modem Attached To Communications cable between two computers CDM1	The lolow	ing moderns are installed.
Communications cable between two computers CDM1 AddRemoveProperties	Modem	Attached To
Add Remove Properties	2, Communication	s cable between two computers CDM1
Add Remove Properties		
Add. Remove Properties		
Add. Remove Properties		
Add Remove Properties		
OK Cancel Accil		Add Remove Properties

#### <u>Configure a Dial-up Connection from the Client to the RAS</u> 2004/8

 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 >.



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

ernet Connection Wizard			
Setting up your Internet connection			光
If you have an Internet service provider account, yo to connect to it. If your computer is connected to a access to the internet over the LAN.	bu dan use your local area netw	phone line and a n ork (LAN), you can	nodem gam
How do you connect to the Internet?			
Connect through a phone line and a modern			
C I connect through a local area network (LAN)			
	< Back	Nest>	Cancel

 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** >.

Type the pho	e number you dial to co	nnect to your ISI	P.		
Area code.	Telephone number				
Country/regio	n name and code:				
United State	of America (1)	2			
I ∐se area	code and dialing rules				
To contigute (Most ISPs de	connection properties, o not require advanced s	ick Advanced lettings.)		Adyanced .	

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

Type the use also be referr contact your	r name and passivo ed to as your Memb ISP.	and you use to k per ID or User II	og on to your 151 D. If you do not i	P. Your user name unow this informat	imay ion.
∐ser name:	Restppp	-			
Password	[manana	_			

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

ernet Connection Wizard	
Step 3 of 3: Configuring your computer	光
Information about your Internet account is grouped together as a dial-up connection and labeled with a name you provide.	
Type a name for the dial-up connection. This can be the name of your ISP or any name you want to use	
Connection name	
Jaconnestron to PIAS	
< Back Next >	Cancel

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

![](_page_111_Picture_3.jpeg)

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

![](_page_112_Picture_1.jpeg)

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

![](_page_112_Picture_3.jpeg)

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

Modem - Communications cable b	elween two computers (CC
	Configure
Phone number Arga code: Phone number:	
	Alternates
Country/region code:	
United States of America (1)	
🔽 Uge dialing rules	Bules

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

Maximum speed (bps);	iii.	200		2
Modem protocol				*
Hardware features				
Enable hardware flo	lorinoo w			
Engble modem error	control			
Enable modern com	pression			
Initialization				
F Show terminal winds	w			
F flun script				×
		Edi.	Bro	WRE,

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

connection to RAS Properties	<u> </u>
General Options Security Networking	Sharing
Select a device:	
Communications cable between two con	puters (COM1)
	Configure
Show icon in taskhar when connected	4
T Stog contrasted metrostee	*
· · · · · · · · · · · · · · · · · · ·	OK Current

## **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.

![](_page_116_Figure_4.jpeg)

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

The lolk	winn moderne see eat	up on this computer
	ming modelins are set	ap on his computer.
Modem		Attach
•	1	
Add	Bemove	Properties
Dialing Preference	:es	
District from: 1	New Location	
promy nome i	Corr Locaron	
Use Dialing Pri dialed.	operties to modify how	your calls are
	Disling Property	00

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

![](_page_117_Picture_3.jpeg)

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

Click the manufacturer	rand model of your modem. If your modem i llation disk, click Have Disk.	s not listed.
Manufacturers: Standard Modern Types) (VoiceView Modern Types) 3K Aceex Aceex Acer	Models Dial-Up Networking Serial Cable between Standard 300 bps Modem Standard 1200 bps Modem Standard 2400 bps Modem Standard 16400 bps Modem Standard 14200 bps Modem Standard 19200 bps Modem	e Disk
	< Back Next >	Cancel

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

![](_page_118_Picture_3.jpeg)

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

![](_page_119_Picture_1.jpeg)

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

neral	
The following moderns are set up	on this computer
Modem	Attach
C <sub>0</sub> Dial-Up Networking Serial Cable betwee	m 2 PCs COM1
• • • • • • • • • • • • • • • • • • •	
Add	Properties
Dialing Preferences	
Distantion New Josephere	
chaing rom, New Location	
Use Dialing Properties to modify how you dialed.	ir calls are
Dialing Properties	
	12
	1

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

eral Connection	
2 Dial-Up Networkin	ng Serial Cable between 2 P
Port COM1	
Speaker volume	
Love J	High High
Maximum speed	
115200	-
Dr. Comect at	the speed

 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.

RTS/CTS) (ON/XOFF)

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

al       The following moderns are set up on this co         dem	Attach COM1
The following moderns are set up on this co dem Dial-Up Networking Setial Cable between 2 PCs Add. <u>B</u> ernove <u>Prope</u> Ing Preferences	Attach COM1
dem Dial-Up Networking Serial Cable between 2 PCs Add	Attach COM1
DiaHIp Networking Serial Cable between 2 PCs Add	COM1
Add. Bemove Prope	] ⊉ aties
Add. Bemove Property Ing Preferences	ities
Add. <u>B</u> emove <u>Prope</u>	enties
Ing Preferences	
ing Preferences	
saling from: New Location	
lee Dialing Properties to modity how your calls ar ialed.	e
Dialing Properties	
Chre	

**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.

![](_page_124_Picture_3.jpeg)

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

3Com TEAI	TDI Diagnostic 1 nowser	DI	
NetBIOS In	terface		
Server	uration		
Workstation	2		
<u>A</u> dd	Bemove	Properties	Update
Description:	Dimension TR		
SCOM TCAPTC	i biagnostic i bi		

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

Select Network Service Click the Network Service that you you have an installation disk for the	u want to install, t nis component, cli	hen click OK. If ck Have Disk.
Network Service: Network Monitor Tools and Agent Remote Access Service Remoteboot Service RIP for Internet Protocol RIP for NwLink IPX/SPX compatible tra	ensport	×
	]	Have Disk
	OK.	Cancel

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

![](_page_126_Picture_3.jpeg)

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

Add RAS Device	
RAS Capable Devices	OK
CDM1 - Diał-Up Networking Serial Cabl 💌	Cancel
	Help
	Instal Modem
	Install X25 Pad

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

Port	Device	Туре	
COM1	Dial-Up Networking	g Serial Ca Modern (unimodern)	Continue
			Cancel
			Network.
			Help

 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....

work Configuration		
Dial out Protocols		OK
🗖 <u>N</u> etBEU		Cancel
L TOB/H		
E IPA		Help
Server Settings.		
Allow remote clients run	ning	
□ NetBEUI	Configure	
Г ТСЕИР	Configure	
E IPZ	Configure	
Encryption settings:		
Allow gny auther	entication including cl	ear text
C Require encrypt	ted authentication	
C Require Microso	oft encrypted authenti	ication
🗖 Fleguts	e data encryption	
Enable Multilink		

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.

C Estratut		
(F This computer only		Cancel
and a second state		Help
hoose Cancellil you do not want to a	downemote TCP/IP clients to dial in	
Use QHCP to assign remote TCP/	P client addresses	
Clue static address pool		
Begin 192 168 2 .10	End 192,168, 2,165	
11 PD CONTRACTOR CONTRACTOR	Excluded ranges	
Exercise 1	-	
Io		
and the second second second		
Add> < Eenove		

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

ess Setup	
Device	Туре
Dial-Up Networking	Serial Ca Modern (unimodern) Continue
	Cancel
	Network
	Нер
Bemove Cor	fiqure   Clone
	Device DisEUp Network ny

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

![](_page_130_Picture_1.jpeg)

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.

![](_page_130_Picture_3.jpeg)

NOTE: Restart your computer after all services are installed.

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

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

![](_page_131_Figure_2.jpeg)

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

🖙 User Manager	- \\SUPPO	RT10	_ 🗆 ×
User View Polici	es <u>O</u> ptions	Help	
New ∐ser		Full Name	Description
New <u>G</u> lobal Group			Built-in account for add
New Local Group.			Built-in account for gue
Сору	F8	test	test
Delete	Del		
Rename			
Properties	Enter		
Select Users			
Select Domain			
E <u>x</u> it	Alt+F4	Description	
Administrato	rs	Members can fully	administer the computer/dc
🕰 Backup Ope	rators	Members can byp	ass file security to back up f 📰
🕰 Guests		Users granted gue	est access to the computer/c
Power Users	;	Members can sha	re directories and printers 🍡
Can Donlicetor		Supporte filo roplic	etion in e domein

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**.

User Proper	ties		×
Username:	test		ОК
Full Name:	test		Cancel
Description:	test		Help
Password	1100311003		
Confirm Password	[······		
User Mu	it Change Pa	sword at Next Logon	
T Uger Car	not Change i	assword	
	d Never Expir	5	
F Account	Disabled		
E Account	Locked Bir		
© Groups	D Profile	5 Djalin	

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

Dialin Information	×
User: test (test)	0K
	Cancel
Grant glain permission to used	Help
Call Back	
Mo Cali Back	
C Set By Caller	
a construction of the second sec	

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

![](_page_134_Picture_1.jpeg)

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

![](_page_134_Picture_3.jpeg)

**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.

![](_page_135_Figure_1.jpeg)

#### <u>Configure a Route for the PPP connection from the RAS 2004/8</u> to the <u>Client</u>

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
                the service startup type (defaults to
  <start type>
                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 -	þ			
				===
Interface List				
0x1	MS T	CP Loopback inter	face	
0x200 50 04 d1	e0 67 3Com	3C90x Ethernet A	Adapter	
0x300 00 00 00	00 00 Ndis	Wan Adapter		
				===
Active Routes:				
Network Destination	n Netmask	Gateway	Interface Met	ric
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
          192.168.2.99
PPPGATE:
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**.

![](_page_141_Picture_5.jpeg)

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.

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

Startup/Shutdown General	Hardware Ptolies User Ptolies Performance Environment
System Variables: Variable	Ushun
ComSpec NUMBER_OF_PR 05 0s2LibPath Path	C:\WINNT\system32\smd.exe 1 Windows_NT C:\WINNT\system32\sis2\dl: C:\WINNT\system32\sis2\dl:
Lser Variables for Ad	ninistrator:
Variable TEMP TMP	Value C-\TEMP C-\TEMP
(ariable: PPPNET	
/alue: 192.168.2	.0 Sgt Delete

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:

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

#### 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>]
```

```
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]
                         [protocomp yes|no] [magic
        [passive yes no]
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

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.

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

Run				? X
	Type the Internet (	name of a pro resource, and	gram, folder, doo Windows will ope	cument, or n it for you.
Open:	putty			•
	[	ОК	Cancel	Browse

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.

TTY Configurati	ion	
Telnet   SSF	Selection	Colours
Connection	Keyboard	Terminal
Host Name		Port
160.77.78.118		22
Stored Sessions	Protocok ( Te	- -
Default Settings		Load
		Save
		Delete
		0.0
Close Window	on Exit	
		1

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 0 \times 00000110
Start = REG DWORD 0x0000002
ErrorControl = REG DWORD 0x0000001
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 0x0000001
AutoPortSelect = REG_DWORD 0x0000001
InputsEnabled = REG DWORD 0x0000001
LocalInputsDisabled = REG_DWORD 0x0000000
Password = REG BINARY 0x0000008 0xfd3cd8db 0x58147a72
PollUnderCursor = REG_DWORD 0x0000000
PollForeground = REG DWORD 0x0000001
PollFullScreen = REG DWORD 0x0000000
OnlyPollConsole = REG_DWORD 0x0000001
OnlyPollOnEvent = REG_DWORD 0x0000000
```

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: