

**Instant Internet™  
Installation and  
User's Guide  
Technical Update**

**Version 4.0**

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E-mail: [Support@baynetworks.com](mailto:Support@baynetworks.com)

**Bay Networks Inc. (USA)**

Suite 800 Lincoln Center  
7800 I.H. 10 West  
San Antonio, Texas 78230

**Sales:**

Phone: (800) 784-4638  
Fax: (210) 979-2002  
E-mail: [II-Sales@baynetworks.com](mailto:II-Sales@baynetworks.com)

**Technical Support:**

USA Support: (800) 2-LAN-WAN,  
Express Routing Code 167#  
or 508-916-3700  
E-mail: [Support@baynetworks.com](mailto:Support@baynetworks.com)

Internet Service Provider Hotline:

Phone: (210) 979-2010  
E-mail: [ISP@instant.net](mailto:ISP@instant.net)

Bulletin Board System: (210) 979-2012

URL address: [www.instant.net](http://www.instant.net)

Product suggestions/general comments: [feedback@instant.net](mailto:feedback@instant.net)

MADE IN U.S.A.

**Bay Networks (UK) Limited**

Sygnus Court  
Market Street  
Maiden Head, Berkshire SL6 8AD

**Sales:**

Phone: 011 44 1628 774477  
Fax: 011 44 1628 774555

**Technical Support:**

Europe Support: 33-492-966-968  
Australia/Pacific Rim Support:  
61-7-9927-8880

# Instant Internet Identification Information

Fill in the correct information to reference when calling Bay Networks Technical Support for assistance. The model and serial numbers can be found on the back of the Instant Internet unit.

**Model #** \_\_\_\_\_

Example: CQ1001001

**Serial #** \_\_\_\_\_

Example: IO1001234

Technical personnel are available to assist you at these destinations:

## **Internet Service Provider Hotline**

(210) 979-2010

E-mail: ISP@instant.net

## **Bay Networks Technical Support**

### **USA**

(800) 2-LAN-WAN, Express Routing Code 167#  
or 508-916-3700

E-mail: Support@baynetworks.com

### **Europe**

33-492-966-968

### **Australia/Pacific Rim**

61-7-9927-8880



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# Installation and Setup

To set up access to the Internet, follow these simple steps:

- 1 Obtain an Internet connection from an Internet Service Provider (ISP).
- 2 Connect the Instant Internet unit to your Local Area Network (LAN).
- 3 Install the software, preferably to the network.
- 4 Install additional workstations.

---

## Decisions to Make

- Who will be your Internet Service Provider (ISP)?
- What type of connection will you use the dial-up or ISDN connection, a leased line (T1, DDS, V.35, or X.21) built into Instant Internet, or an external router?

---

## Selecting an Internet Service Provider (ISP)

There are perhaps thousands of ISPs. Bay Networks maintains an updated list of the major national ISPs and as many local ISPs as possible. You can choose an ISP from this list, or you can locate a different one. Either way, try to choose an ISP that has a local access number, so you don't have to pay long distance charges. You can look in the yellow page directory for local or regional ISPs, or you can call a national ISP and ask if it offers local dial-up access in your area.

If your ISP is not on the selection list during Instant Internet installation, do one of the following:

- Call the Internet Service Provider Hotline at (210) 979-2010, Monday through Friday, 9 a.m. to 5 p.m. CST.
- Refer to the web page [www.instant.net/isppage.asp](http://www.instant.net/isppage.asp).
- Send an e-mail message to [ISP@instant.net](mailto:ISP@instant.net).

For all of the above options, make sure you supply your provider's name, location, and person-contact phone number so that we can add your ISP to our list. This way, you won't have to call us the next time you install.

### Things to Tell and Ask

After you decide on the type of account, use the following checklist to ensure a smooth installation.



#### Type of Account

If you plan to use Instant Internet's built-in dial-up or ISDN connection to access the Internet, tell your ISP that you need a single-user account. (Even though Instant Internet brings access to your entire network, it uses a single Internet Protocol (IP) address for unlimited access.)

If you plan to use Instant Internet with an added external router, tell your ISP that you need a network account.



#### Dial-up and ISDN Protocols

Ensure that your ISP supplies true IP service using SLIP, CSLIP, or PPP protocols for analog connections. ISDN requires synchronous PPP protocol with authentication via PAP or CHAP. For a 128k connection, multilink PPP must be supported. Some ISPs use their own proprietary protocols or, for ISDN, V.120 rate adaption that is not supported by Instant Internet.



### Connect-time Charges

Some ISPs and local telephone companies charge a flat fee for unlimited connect time, and some charge fees according to the actual amount of time your Instant Internet unit is dialed in and connected. Be sure that you understand your ISP's and local telephone company's policies.



### Installation Information

If you choose an ISP from Bay Networks' list, you only need to give the ISP's telephone number, user name, and password for access.

If you are using an ISDN connection, you can choose Other PPP w/PAP as your provider, and then enter your name servers.

If your ISP is not on our list, call the Internet Service Provider Hotline at (210) 979-2010 and give us some additional information so we can create a dial-up script specific to your ISP's access requirements.



### Additional Information

You might need to provide additional information, such as:

- Whether your ISP uses static (fixed) or dynamic IP addressing
- If static addressing, then the IP address for your account
- If a dial-up connection, whether it is SLIP or PPP; if PPP, whether or not it uses PAP
- The domain name
- The name server IP addresses in numeric format



#### Application Information

Your ISP usually offers some additional services, which you might need:

- Access to a NEWS server, if you want to use the bundled news reader
- Access to a POP mail server (and a SMTP relay), if you plan to use the bundled e-mail package
- Individual POP mail user accounts for each user using the bundled package

---

**Note** If you plan to use the bundled e-mail package, be aware that a single-user account from an ISP generally comes with only one e-mail account. You can arrange with your ISP for additional POP accounts.

---

After completing this checklist, you are ready to begin installing the Instant Internet hardware.

---

## Software Installation

You should have four diskettes for Instant Internet version 4.0 software. The steps in this section guide you through:

- Installing the Instant Internet software that communicates with the server.
- Configuring the Instant Internet unit for your connection:
  - Dial-up
  - ISDN
  - Router
- Installing the software that lets all workstations use the Internet applications.
- Installing multiple workstations.

Begin with **Setting Up the Installation**.

## Setting Up the Installation

- 1 From any workstation, log on with administrative rights and run Windows. (Administrators have rights to certain setup programs unavailable to most users.)
- 2 Insert Instant Internet Install Disk #1 of 4. Choose File | Run. On the command line, type a:\install (where a: is the letter of your 3.5" diskette drive). The Instant Internet Setup program activates only if an administrator logs on the workstation. To force this activation, type: a:\install /admin.
- 3 Click OK. The Registration Information window appears.

---

**Note** If you are reinstalling this unit or adding more units, you will see a list of units instead. If so, select your unit and skip to **step 4**. If you receive the error message: Unable to connect to the Instant Internet Unit, see the **Troubleshooting** card that came with the Instant Internet package.

---

The screenshot shows a 'Registration Information' dialog box with the following fields:

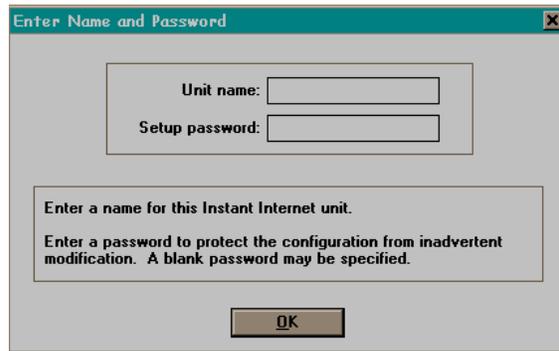
- Customer Information:** Company, Address, Phone, Contact, EMail, Phone, FAX.
- Purchased from:** Company, Address, Phone, Contact, EMail, Phone, FAX.
- LAN Information:** Network (dropdown), Version, # of Workstations.

An 'OK' button is located at the bottom right of the dialog.

- 4 Enter all of the Registration Information in the appropriate fields.

The first time you install a unit, the Install program requests registration information and automatically sends this data to Bay Networks when you first connect to the Internet. As a registered user, you will receive the latest product news and information on upgrades via e-mail from Bay Networks.

After entering all your information, click OK. The Enter Name and Password window appears.



- 5 Enter a Name that identifies your Instant Internet unit. In a single-unit installation, you are provided a default name.

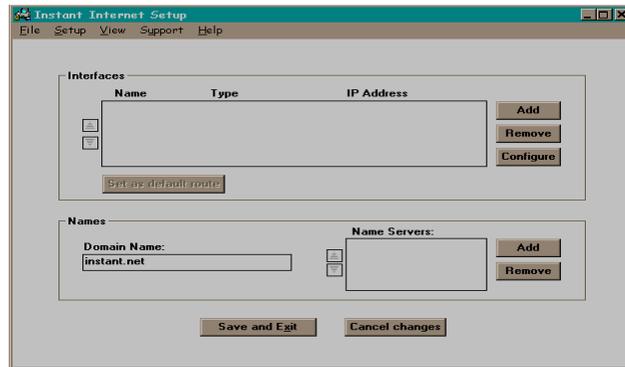
Next, enter a Setup Password that provides security for the unit and lets you change the Instant Internet configuration. You can leave this field blank.

---

**Note** If you choose to enter a password, make a note of it because it is not easy to recover the password if you forget it.

---

Click OK. The Instant Internet Setup window appears.



- 6 Next to Interfaces, click Add. The Select Connection Type window appears.
- 7 Select the Connection Type. Depending on your connection type, you have three choices. If you are using a standard modem, you can select Dial-up or Router. If you are using an ISDN line, you can select ISDN or Router.

Each connection type has unique configuration settings. After you select one type, go to the appropriate section listed below for steps on configuring and completing your installation.

- **Dial-up:** If you are using the built-in modem that comes with the unit, select Dial-up for serial SLIP, CSLIP, or PPP connections. Go directly to **Dial-up Configuration** on page 8.
- **ISDN:** If you are using an ISDN connection, select ISDN. Go directly to **ISDN Configuration** on page 10.
- **Router:** If you are using an external router, select Router. *This selection requires additional router hardware that is not provided with Instant Internet.* Go to **Router Configuration** on page 12.

## Dial-up Configuration

When you select Dial-up, the Enter Dial-up Information window appears.

The screenshot shows a dialog box titled "Enter Dialup Information". It contains the following fields and controls:

- Provider:** A drop-down menu.
- Phone:** A text input field.
- User ID:** A text input field.
- Password:** A text input field.
- Inactivity timeout:** A text input field containing the number "10", followed by "(in minutes)".
- Instructions:** A text box containing the following text:

Select your service provider. If your provider is not listed, call Performance Technology support. Press F1 for more information.  
Enter the phone, user ID and password information as supplied by your provider.  
The inactivity timeout specifies the number of minutes of inactivity over the dialup connection, after which Instant Internet terminates the connection and hangs up the phone.
- Buttons:** "OK" and "Cancel" buttons at the bottom.

- 1 Select a Provider from the drop-down list. Select the provider you are using, or select Other (PPP static or PPP with PAP). *If you select Other as your provider, call the Internet Service Provider Hotline at (210) 979-2010 to make sure your ISP is on our list.*
- 2 Complete the following fields:
  - Phone (your ISP's telephone number)
  - User ID (supplied by your ISP)
  - Password
- 3 Type the Inactivity timeout (in minutes).

Set the timeout, or use the default of 10 minutes. If you enter 0, the inactivity timer is disabled and Instant Internet maintains the connection whether or not there's activity.

The inactivity timeout saves connect-time charges during times when no one is requesting Internet access. It specifies the number of minutes of inactivity over the dial-up connection, after which Instant Internet terminates the connection. When you need access again, Instant Internet automatically reestablishes a connection in seconds.

---

**Note** If your connection is inactive, some ISPs terminate it to make connections available to other account requests. If your connection is terminated, Instant Internet redials when you request a connection.

---

**4** *Possible prompt:* Enter your IP Address. If your ISP uses *static* addressing (always uses the same address), you need to enter the numeric IP address supplied by your ISP. If your ISP uses *dynamic* addressing (uses different addresses), you will not see this prompt.

**5** When you have completed all fields, click OK.

*If you selected your ISP from Bay Networks' list:* Instant Internet probably has all the configuration information it needs. An Instant Internet message box displays the message: Instant Internet is configured!

*If you selected Other as your provider:* You might need to provide additional information. (If so, go to **Prompts for All Connection Types** on page 13.) After you provide additional information, return here to continue. Next, the Instant Internet message box displays the message: Instant Internet is configured!

**6** Click Save and Exit.

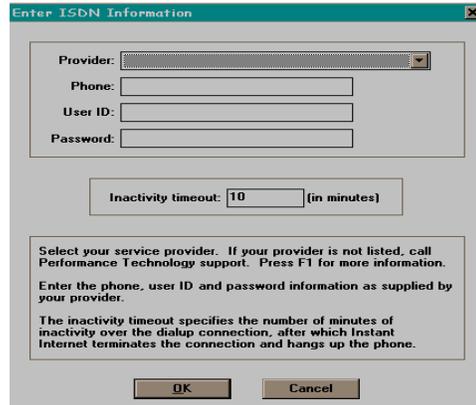
**or**

To change the configuration information, click Cancel changes, make changes, and then click Save and Exit.

Go to **Final Steps to Internet Access** on page 14 and continue.

## ISDN Configuration

If you select ISDN, the Enter ISDN Information window appears.



- 1 Select a Provider from the drop-down list. Select the ISP you are using, or select Other (PPP static or PPP with PAP). If you select Other as your service provider, call the Internet Service Provider Hotline at (210) 979-2010 to make sure your ISP is on our list.

- 2 Complete the following fields:

Phone (your ISP's telephone number)  
User ID (supplied by your ISP)  
Password

- 3 Type the Inactivity timeout (in minutes).

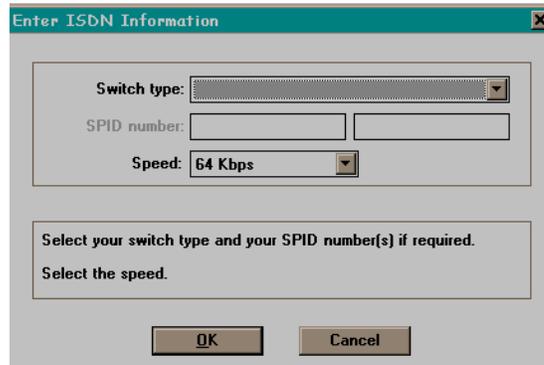
Set the timeout, or use the default of 10 minutes. If you enter 0, the inactivity timer is disabled and Instant Internet maintains the connection, whether or not there's activity.

The inactivity timeout saves connect-time charges during times when no one is requesting Internet access. It specifies the number of minutes of inactivity over the dial-up connection, after which Instant Internet terminates the connection. When you need access again, Instant Internet automatically reestablishes a connection in seconds.

---

**Note** If your connection is inactive, some ISPs terminate it to make connections available to other account requests. If your connection is terminated, Instant Internet redials when you request a connection.

---



Click OK. Another Enter ISDN Information window appears.

- 4 Select the Switch type for the ISDN connection. Click the Down Arrow to view a list of switch types, and then select the type you are using.

If required, enter the SPID number that your local telephone company gave you.

Select the connection speed from the list displayed. Multilink PPP is required to support 112k or 128k multilink capabilities. Your ISP might not offer multilink PPP; if not, the connection is made using one channel (56k or 64k). (Synchronous PPP is required for 56k or 64k.)

- 5 When you have completed all fields, click OK.

*If you are using a provider from Bay Networks' list:* Instant Internet probably has all the configuration information it needs. An Instant Internet message box displays the message: Instant Internet is configured!

*If you selected Other as your provider:* You might need to provide additional information. (If so, go to **Prompts for All Connection Types** on page 13.) After you provide additional information, return here to continue. The Instant Internet message box displays the message: Instant Internet is configured!

- 6 Click Save and Exit.

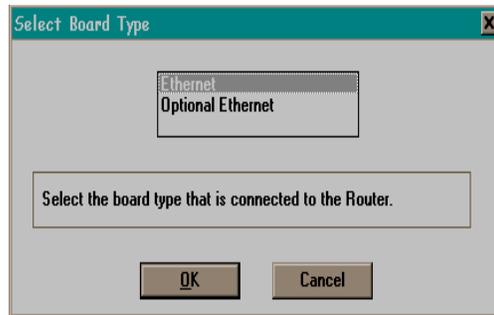
**Or**

To change the configuration information, click **Cancel** changes, make the changes, and then click **Save** and **Exit**.

Go to **Final Steps to Internet Access** on page 14 and continue.

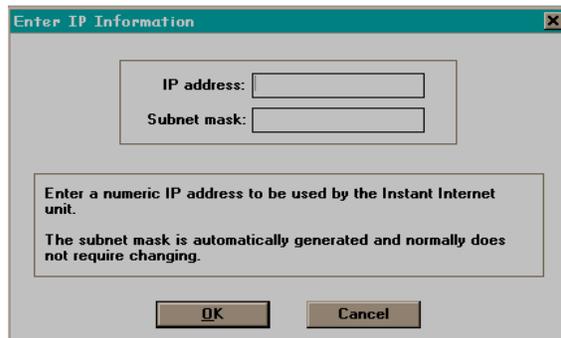
## Router Configuration

If you select Router, the Select Board Type window appears.



- 1 Select the board type connected to the router Ethernet, Optional Ethernet, or Token Ring.

Click **OK**. The Enter IP Information window appears.



- 2 Enter a numeric IP Address from the addresses available for your network.

A numeric Subnet mask automatically calculates and is displayed in its field. *Do not change this field unless your network uses nonstandard subnets and you are familiar with IP addressing.*

Click **OK**.

- 3 Enter the Router Address, which is the numeric IP address of the external router, and then click OK.
- 4 When you have completed all fields, click OK.

*If you are using a provider from Bay Networks' list:* Instant Internet probably has all the configuration information it needs. An Instant Internet message box displays the message: Instant Internet is configured!

*If you selected Other as your provider:* You might need to provide additional information. (If so, go to **Prompts for All Connection Types** on page 13.) After you provide additional information, return here to continue. Next, an Instant Internet message box displays the message: Instant Internet is configured!

- 5 Click Save and Exit.

**or**

To change the configuration information, click Cancel changes, make changes, and then click Save and Exit.

Go to **Final Steps to Internet Access** on page 14 and continue.

### **Prompts for All Connection Types**

Instant Internet automatically prompts you if it needs more information to connect to your ISP. If you are using a dial-up or ISDN connection, you might not see these prompts.

If requested (or if you selected Other as the ISP), do the following:

- 1 Enter the Domain Name supplied by your ISP.

Domain names organize Internet names into manageable groups. If you don't specify one for the host name, Instant Internet uses the default domain name.

For example, if you specify the domain name as *baynetworks.com*, and a connection is attempted to *ftp*, Instant Internet automatically connects to *ftp.baynetworks.com*.

- 2 Enter a Name Server Address, which is the numeric IP address of a name server or *domain name server (DNS)*—as supplied by your ISP. Name servers translate readable host machine names into actual IP addresses.

## Final Steps to Internet Access

Now that you have configured the unit for your specific type of connection, it's time to test the connection, install the software to the network, and install your workstation. Follow these steps to complete installation for all connection types.

The `Restarting Instant Internet` window displays the message: `Waiting for Instant Internet to Restart`. This restart may take a few minutes (disregard the number in parentheses). Soon the `Instant Internet Setup` message box displays the message: `Do you want to test the connection?`

- If you click `Yes`, Instant Internet tests the connection, the name server, and the host name for the unit. Then, it displays a success or failure message.
- If you click `No`, you can continue without testing.

Now it's time to install the software to a directory. If you choose to install to a local directory, you must use the disks each time you install another workstation.



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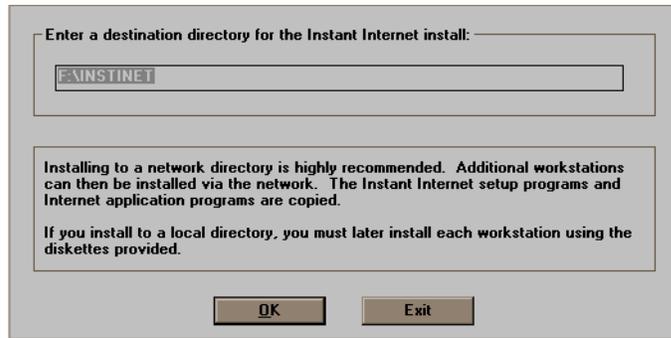
**Tip** When you install to a network directory, you can easily install additional Instant Internet workstations from the network if you are logged on as a Network Supervisor. You can use “`install /admin`” to force this login. Use the disks once and then copy the software from the network for each additional installation.

---

## Installing to the Network

- 1 Insert Instant Internet Disk #1 of 4. Then choose File | Run from the Windows menu to activate the Install program.

The Instant Internet Install window appears.



- 2 Enter a destination directory for the Instant Internet installation software to reside. Enter the drive:\directory name.

By default, the first available network drive appears as well as the default directory name (e.g., f:\instinet). Change the drive and directory as desired.

Click OK.

- 3 Select the components you want to install to the network. The components you select are available to everyone on the network. A check mark next to the component indicates that it is selected. The list includes:

- Administrative Utilities (*displayed only if you have Admin rights*)
- AniTa
- WinVN News reader
- CuteFTP
- WinWeb
- Eudora

Click OK. Now the system copies Disk #1 to the directory you specified.

- 4 Insert Instant Internet Disk #2 of 4 and then click Continue. The system copies Disk #2 to the directory you specified.

- 5 Insert Instant Internet Disk #3 of 4 and then click `Continue`. The system copies Disk #3 to the directory you specified.
  - 6 Insert Instant Internet Disk #4 of 4 and then click `Continue`. The system copies Disk #4 to the directory you specified.
- The network installation is complete.
- 7 Click `OK`.

## Installing the Workstation

- 1 After you install Instant Internet to the network, Instant Internet displays the message: Do you want to make a private copy of the Instant Internet applications or run them from the network installation directory?

*If you click `Network`, the Install program creates desktop icons or Start menu entries that point to the bundled Internet applications in the network installation directory. All users can share a common copy of the applications.*

*If you click `Private`, the Install program copies the application programs to your private directory (usually local) and creates icons or Start menu entries for them. With a private copy, you can still access the Internet, even if the server containing the network directory is down. Note that private copies take up local disk space and require individual attention for upgrades.*

- 2 *If you responded `Private` to the previous prompt:* Enter a `Private` directory for the Instant Internet applications.

You can use the default `c:\instinet` or specify another directory, either on a local drive or on a privately reserved network drive.

Click `OK`. To return to the preceding prompt, click `Cancel`.

**or**

*If you responded `Network` to the previous prompt:* Enter a working directory (usually on the local drive) in which the Internet applications can store temporary files. The Install program creates icons or start menu items that refer to the network installation directory.

Click `OK`. To return to the previous prompt, select `Cancel`.

When you respond `Private` or `Network`, certain machine-specific files, such as `.DLL` and `.INI` files, are transparently copied.

If Instant Internet finds other `winsoc.dll` or `wsock32.dll` files during installation, one of the following messages is displayed:

```
Found winsoc.dll in: <drive:\directory>
```

```
Found wsock32.dll in: <drive:\directory>
```

To run Internet applications properly, Instant Internet requires the Winsock that comes with this product. If it finds another Winsock, you must Delete the pre-existing Winsock file, or Rename it by entering a new name.



---

**Warning!** If you choose to `Continue` installing Instant Internet while allowing multiple versions of `winsoc.dll` to run, you risk improper operation of Instant Internet with the Internet applications.

---

- 3 Select the components you want to install to the workstation. The components you select are available only on the workstation you are installing. A check mark next to the component indicates that it is selected. The list includes:

- Administrative Utilities (*displayed only if you have Admin rights*)
- AniTa
- WinVN News reader
- CuteFTP
- WinWeb
- Eudora

Click `OK`. Now the system installs Instant Internet.

Now you can access the Internet and use the WinWeb browser! Other applications, such as the bundled e-mail package, might require additional configuration for each user. (See the **Third-Party Application Quick Setup Card** that came with your Instant Internet package.)



---

**Tip** Through your Web browser, use the Bay Networks welcome page at [www.instant.net](http://www.instant.net) for information on additional Internet applications and other home pages of interest.

---

To install more workstations, go to **Installing Additional Workstations** on page 19. For information on licensing additional users, go to **Licensing Additional Users** on page 30.

---

## Multiple-Unit Support

You can increase user capacity by installing multiple Instant Internet units on a single LAN. Each unit supports up to 100 sessions. The automatic load balancing feature among the units enhances overall performance. Installing more than one unit also provides fault tolerance, allowing users to restart an Internet application quickly in the event one unit fails.

If you are installing multiple units, be sure to install each unit individually—plug in one unit, configure it, and then complete the installation before plugging in the next unit. This practice maintains the simplicity of installing multiple units and avoids any confusion about which unit is currently being configured.

For a multiple-unit installation, each unit needs a unique name, preferably a meaningful one.

When installing the components of the Instant Internet software (in **Installing the Workstation** on page 16), you need to select an Instant Internet unit for the Internet applications to use. Select one from the list of units displayed on screen.

When installing components for multiple unconfigured units, you also need to select the serial number (located on the back) of the unit you are installing.

To continue, go to **Software Installation** on page 4.

---

## Installing Additional Workstations

If you want to install additional workstations, follow the same steps for each workstation you install. Remember to install each workstation individually, plug it in, configure it, and install it to ensure that you install each workstation successfully.

To begin installing additional workstations:

- 1 Choose **File | Run** from the Windows menu to activate the **Install** program from the Instant Internet network directory. If a network directory was not specified during initial installation, insert disk 1 of the install diskettes to run this program.
- 2 Instant Internet displays the message: **Do you want to make a private copy of the Instant Internet applications or run them from the network installation directory?**

*If you click **Network**, the Install program creates desktop icons or Start menu entries that point to the bundled Internet applications in the network installation directory. All users can share a common copy of the applications.*

*If you click **Private**, the Install program copies the application programs to your private directory (usually local) and creates icons or Start menu entries for them. With a private copy, you can still access the Internet, even if the server containing the network directory is down. *Note that private copies take up local disk space and require individual attention for upgrades.**

- 3 *If you responded **Private** to the previous prompt:* Enter a **Private** directory for the Instant Internet applications.

You can use the default **c:\instinet** or specify another directory, either on a local drive or on a privately reserved network drive.

Click **OK**. To return to the preceding prompt, click **Cancel**.

**or**

*If you responded **Network** to the previous prompt:* Enter a working directory in which the Internet applications can store temporary files.

Click OK. To return to the previous prompt, select Cancel.

When you respond Private or Network, certain machine-specific files, such as .DLL and .INI files, are transparently copied.

If Instant Internet finds other winsock.dll or wsock32.dll files during installation, one of the following messages is displayed:

```
Found winsock.dll in: <drive:\directory>
```

```
Found wsock32.dll in: <drive:\directory>
```

To run Internet applications properly, Instant Internet requires the Winsock that comes with this product. If it finds another Winsock, you must Delete the pre-existing Winsock file, or Rename it by entering a new name.



---

**Warning!** If you choose to Continue installing Instant Internet while allowing multiple versions of winsock.dll to run, you risk improper operation of Instant Internet with the Internet applications.

---

- 4 Select the components you want to install to the workstation. The components you select are available only on the workstation you are installing. A check mark next to the component indicates that it is selected. The list includes:

Administrative Utilities (*displayed only if you have Admin rights*)

AniTa

WinVN News reader

CuteFTP

WinWeb

Eudora

Click OK. Now the system installs Instant Internet.

---

## Changing the Configuration



This section explains how to change your unit's current configuration.

First, click **Instant Internet Setup**, select the appropriate **Instant Internet** unit, and, if required, enter the **Password**. The **Setup** program first ensures that the unit is functioning properly, and then it displays configuration screens.

Go to the appropriate sections that follow for instructions on changing your unit's configuration. Change the fields as your ISP or Bay Networks advises. After each change, click **Save** and **Exit**.

The following prompts are displayed:

Do you want the changes to take effect immediately?

*If you respond No*, **Instant Internet** writes the new configuration data to the unit, but the new configuration does not take effect until you restart the unit.

*If you respond Yes*, **Instant Internet** writes the new configuration data to the unit, disconnects all users, and reinitializes with its new configuration. During the few moments of reconfiguration, the unit does not respond on the network, but screen messages inform you of actions taking place. **Instant Internet** displays the message:

Do you want to test the connection?

*If you respond Yes*, **Instant Internet** tests the Internet connection and advises you of the results and any actions to take. You may choose to test now or anytime later by selecting either option from the **Setup** menu.

### Changing/Adding Configuration Information

An interface is the type of connection you use to access the Internet—in this case, you have dial-up, ISDN, leased-line (T1, DDS, V.35, or X.21), and router connections available. In the **Setup** program, there is usually only one interface type specified. To make minor changes to individual fields, click **Configure** in the **Interfaces** window.

## Changing or Adding an Interface

or

Simply Remove the current interface and Add another one.

### To change an interface type

- 1 In the `Interfaces` window, select to highlight the current entry (if not already highlighted).
- 2 To delete the entry, click `Remove`.
- 3 To specify a new interface, click `Add`.

At this point, you are led through the same series of prompts used during initial installation and configuration, beginning with selecting the connection type.

- 4 After responding to the series of prompts, click `Save and Exit`.

## Using Multiple Interface Types

If your site uses an external router but desires the flexibility of switching between dial-up or ISDN, leased-line (T1, DDS, V.35, or X.21), and router access, you can configure multiple interface types. Note that Instant Internet uses *only one interface* to access the Internet at any given time; you must specify one as the default.

In the `Interfaces` window, you can configure a maximum of two interfaces concurrently — one dial-up, ISDN, or leased-line (T1, DDS, V.35, or X.21) and one router.



---

**Tip** If you are adding a router interface, and the dial-up or ISDN interface is currently the default, you do not have to enter the router's IP address.

---

### To add an interface type

- 1 In the `Interfaces` window, click `Add`.

At this point, you are led through the same series of prompts used during initial installation and configuration, beginning with selecting the connection type.

You can display an interface at the top of the list by using the Up Arrow immediately to the left of the interface list. Any changes you make to this list do not affect the default interface route.

If you have already configured a dial-up, ISDN, or leased-line (T1, DDS, V.35, or X.21) connection, select *Router*, and vice versa. *You cannot configure two entries of the same interface type.*

- 2 Highlight the *Interface* type that you want to use as the default, and then click *Set as Default Route*, which places an asterisk (\*) by the default interface you specify.

When you select *Add* and a default interface already exists, the new interface is *Network*, not *Router*.

- 3 When you are finished, click *Save and Exit*.

## Changing Your ISP

At some point, you might have reason to switch ISPs perhaps to obtain better rates or service. If you change ISPs, you need to reconfigure Instant Internet with the new ISP's information.

---

**Note** This information applies only to using Instant Internet's dial-up, ISDN, or leased-line (T1, DDS, V.35, or X.21) connections. Using the unit with a router generally does not require reconfiguration if you change ISPs.

---

To ensure a smooth transition to a new ISP and minimal interruption of your Internet access, check with Bay Networks Sales before switching ISPs to make sure that your new ISP is on the list of those currently supported. If not, call the Internet Service Provider Hotline at (210) 979-2010, and supply the new provider's person-contact phone number and your account information so that we can add the name to Bay Networks' list of ISPs.

### To change an ISP

- 1 Double-click *Instant Internet Setup*. From the *Interfaces* window, select to highlight the *Dial-up Interface* entry.
- 2 To delete the current entry, click *Remove*.
- 3 To specify a new interface, click *Add*.

At this point, you are led through the same series of prompts used during initial installation and configuration, beginning with selecting the *Connection Type*. Select *Dial-up* or *ISDN*.

- 4 Select the new ISP's name from the list.
- 5 After responding to this series of prompts, click *Save and Exit*.

## Changing the Name Server List

Name servers translate readable host machine names into numeric IP addresses. Your ISP supplies you with one or more name server addresses and also creates and maintains the name servers. If you enter more than one name server, Instant Internet tries to connect to the first name, and if it fails, it continues down the list.

Connection attempts might fail for a variety of reasons, one being the server might be down. Repeated attempts to connect to name servers can cause delays in connecting. You can avoid some delays by reordering the name server list. Each time it connects successfully, Instant Internet promotes the name to the top and reorders the list automatically during operation.

### To permanently reorder the Name Server List

- 1 In the `Name Servers` window, highlight the name server address you want to prioritize. Click the Up Arrow or the Down Arrow to the left of the list to position the selected name server where you want it.
- 2 To Add or Remove a name server from the list, use the appropriate button to the right and the Up Arrow and the Down Arrow to the left of the list to position the name where you want it.
- 3 After you make changes to the list, click `Save` and `Exit`.

## Changing Registration Information

Remember to update registration information periodically so you can access valuable news and support tips on Instant Internet through Bay Networks' web site.

### To update the registration information you entered during initial installation

- 1 Double-click `Instant Internet Setup`. If you have multiple Instant Internet units, select the unit for which you want to edit the registration information.
- 2 Choose `Setup | Registration` from the menu bar.
- 3 Change or add the appropriate information.
- 4 Click `OK`.
- 5 Click `Save` and `Exit`.

### Changing the Unit's Configuration Password

#### To change the unit's configuration password

- 1 Choose **Setup | Change Password** from the menu bar. Be sure to accurately note your password you must enter it to make any subsequent configuration changes to the unit.
- 2 Change or add the appropriate information.
- 3 Click **OK**.
- 4 Click **Save and Exit**.

### Changing the Unit's Name

#### To change the name of the Instant Internet unit

---

**Note** When you change the name of the Instant Internet unit, you must configure all clients to use the new name. This can be done by either reinstalling the software (see **Software Installation** on page 4) or by contacting Technical Support at (800) 2-LAN-WAN (Express Routing Code 167#) for instructions on how to edit the Winsock.ini file.

---

- 1 Choose **Setup | Change Name** from the menu bar. You are prompted for the new unit name.
  - 2 Change or add the appropriate information.
  - 3 Click **OK**.
  - 4 Click **Save and Exit**.
- To exit the window without changing the date and name, click **Cancel**.

### Changing the Unit's Time and Date

#### To change the time or date for a selected Instant Internet unit

- 1 Choose **Setup | Time** from the menu bar. A window displays the current date and time, and fields for a new date and time.
  - 2 Enter the new date and time in the appropriate fields; click **Set Time**.
  - 3 Click **OK**.
  - 4 Click **Save and Exit**.
- To exit the window without changing the date or time, click **Cancel**.

Backing Up a Unit Configuration to Disk	<p><b>Backing Up/Restoring Configuration Settings</b></p> <p>Instant Internet can back up the configuration settings to a disk file, so you can easily restore the configuration when you exchange or upgrade a unit.</p> <p><b>To back up the new configuration to disk</b></p> <ol style="list-style-type: none"> <li>1 Choose <code>File   Backup to Disk</code> from the menu bar.</li> <li>2 Select the drive and directory to which you want to save the configuration.</li> <li>3 Enter a name in the <code>File Name</code> field, and then make the appropriate selection in the <code>Save File as Type</code> field.</li> <li>4 To start the backup, click <code>OK</code>.</li> </ol>
Restoring a Unit Configuration from Disk	<p>Instant Internet can easily restore a unit's previous configuration backed up on disk.</p> <p><b>To restore the previous configuration from disk</b></p> <ol style="list-style-type: none"> <li>1 Choose <code>File   Restore from Disk</code> from the menu bar.</li> <li>2 Select the drive and directory of the configuration file on disk that you want to restore. Enter the <code>File Name</code>, and then click <code>OK</code> to start restoring the configuration file.</li> <li>3 You are prompted to verify the restoration. After you respond, click <code>Save and Exit</code>.</li> </ol>
Restarting the Instant Internet Unit	<p>To restart Instant Internet any time, choose <code>File   Restart Unit</code> from the menu bar.</p>
Viewing a Unit Log	<p><b>Viewing Unit Information</b></p> <p>The unit log details a specific unit's activity since restart.</p> <p><b>To view the current unit log</b></p> <ol style="list-style-type: none"> <li>1 In the <code>Instant Internet Setup</code> window, choose <code>View   Unit Log</code> from the menu bar.</li> <li>2 While viewing the unit log, you can <code>Save As</code> to a file for later use with other applications, <code>Print</code> the file, or <code>Exit</code> the window.</li> </ol>

## Viewing a Unit's Users

### To view a log of users currently connected to a specific unit

- 1 In the `Instant Internet Setup` window, choose `View|Users` from the menu bar. (You cannot manually edit this list.)
- 2 To view up-to-the-minute changes in users for the unit, click `Refresh`.
- 3 To return to the main `Setup` window, click `Cancel`.

## Viewing a Unit's Update History

### To view a log of the updated history of each Instant Internet version update installed on that unit

- 1 In the `Instant Internet Setup` window, choose `View|Update History` from the menu bar.
- 2 You can select to `Save As` the file, `Print` the file, or `Exit` the window.

### Viewing Support Configuration

For more information on TCP/IP settings, see **Advanced TCP/IP Settings** on page 37 of this update.

## Viewing a Unit's Advanced TCP/IP Settings

### To view the advanced TCP/IP settings for a unit

- 1 In the `Instant Internet Setup` window, choose `Support|Advanced TCP/IP Settings` from the menu bar. A window appears that contains settings. See **Advanced TCP/IP Settings** on page 37 for more information.
- 2 You can select to `Save As` the file, `Print` the file, or `Exit` the window.

## Viewing a Unit's Support Services

### To view a list of the support services for this unit

- 1 In the `Instant Internet Setup` window, choose `Support|Services` from the menu bar. A window appears that contains a `Service List`. *Do not edit this list unless you have previous service list experience.*
- 2 You can select to `Save As` the file, `Print` the file, or `Exit` the window.

## Viewing a Unit's Support Hosts

### To view the support hosts for this unit

- 1 In the Instant Internet Setup window, choose Support | Hosts from the menu bar. A window appears that contains a Host List. *Do not edit this list unless you have previous experience with static hosts.*
- 2 You can select to Save As the file, Print the file, or Exit the window.

### Viewing/Selecting Additional Support Options

You can view and select additional support options. In the Instant Internet Setup window, choose Support | Other from the menu bar. Then you can:

- Select to Enable IP Forwarding of the unit.
- Select to Enable SNMP monitoring for the unit.
- Enter the Number of Log Entries to define the maximum number of unique users (and summary usage information) that can be viewed in the Instant Internet Monitoring program.

## Enabling IP Forwarding

### To enable IP forwarding

If you have a network interface, you can enable IP forwarding. By default, if two TCP/IP interfaces are enabled on Instant Internet, IP traffic cannot pass between them. The two interfaces are totally independent TCP networks. Once enabled, IP forwarding allows IP traffic between the two interfaces. Also see **Advanced TCP/IP Settings** on page 37 of this update.

- 1 Choose Support | Other Settings from the menu bar.
- 2 Select the Enable IP Forwarding check box an X appears. Now Instant Internet allows IP forwarding for a specified Instant Internet unit.

---

**Note** The Enable IP Forwarding option is available only if the unit has two interfaces defined.

---

IP forwarding lets Instant Internet act as a router in some specialized applications. Use this feature with caution to ensure that Instant Internet's firewall is maintained at all times.

## Enabling SNMP Monitoring

### To enable SNMP monitoring

- 1 Choose `Support | Other Settings` from the menu bar.
- 2 Click the `Enable SNMP` check box. An `X` appears. Now Instant Internet automatically responds to SNMP requests by monitoring applications for a specified unit.

## Entering Number of Log Entries

### To enter the number of log entries

- 1 Choose `Support | Other Settings` from the menu bar.
- 2 Enter the number of users logged on in `Number of Log Entries`. Now the Instant Internet Monitoring program displays the number of current users and indicates any users beyond this number as `Others`.

By default, this log displays only 20 users, but you can instruct the Monitoring program to display more than 20 users.

Instant Internet's Monitoring program tracks the activity of a unit's users. This information shows up in the Full Monitoring User Log and includes the user's name, data sent and received, length of time a user accessed the unit since the log was last cleared, applications the user has active, etc.

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## Special Applications Instructions

Some of the bundled applications that come with Instant Internet, such as e-mail, require additional setup or configuration for each user. For setup and configuration information, see the **Third-Party Application Quick Setup Card** in your Instant Internet package.

---

## Instant Internet Add-on Packs

One Instant Internet unit can support a maximum of 100 users at a time. Each unit is shipped with automatic licensing for 20 users. If you require additional licensing, you can purchase Add-on Packs to increase the number of licensed users.

### **Licensing Additional Users**

Instant Internet Add-on Packs facilitate the licensing of additional users for individual Instant Internet units.

An Add-on Pack includes:

- An Instant Internet Add-on Pack diskette
- An Add-on Pack Quick Setup card

For instructions on licensing additional users, see the **Instant Internet Add-on Pack Quick Setup Card**.

# SOCKS Firewall Protocol Support

SOCKS is an Internet protocol that lets IP client applications connect to the Internet through a firewall. Instant Internet supports the SOCKS version 5 (SOCKS5) protocol.

---

## How Instant Internet Uses SOCKS

SOCKS is useful for IP-only clients on the LAN that are connected to the Internet through Instant Internet. In the past, clients that don't use the IPX network protocol could not fully take advantage of Instant Internet. Now, with SOCKS-enabled applications, these IP-only clients can use Instant Internet for Internet access.

Because SOCKS-enabled applications are available for many platforms, SOCKS allows Macintosh, OS/2, and many other clients to use Instant Internet. The only requirements are that these clients have properly configured TCP/IP network support and that the applications are SOCKS-enabled, either directly or through third-party *socksifying* software.

---

## Configuring Instant Internet for SOCKS

All communication between your SOCKS clients and the Instant Internet unit use IP-based protocols. This requires that both the Instant Internet unit and the client workstations be properly configured to run TCP/IP.

When you initially set up your Instant Internet, you were required to select at least one interface through which you connect to the Internet. If your connection to the Internet is via a dial-up line (e.g., 28.8 modem, ISDN, etc.), you selected a dial-up type interface and configured it to typically use PPP or SLIP. If your site is hardwired to the Internet, you selected a network interface and configured it with a valid IP address.

In order to use SOCKS, you must have a network interface. If you do not, you must add this interface. See **Changing the Configuration** on page 21 for instructions on how to add and configure additional interfaces.

The two most common interface configurations are described below:

**1 *Your Internet connection is via a dial-up interface, and you do not have a network interface configured.***

In this configuration, you must add a network interface. The IP address you assign to this interface must be a valid IP address, though it may be from the reserved address ranges (e.g., 10.x.x.x, etc.). This interface's address and your client's addresses must belong to the same network or subnet. *The Instant Internet SOCKS server acts as a firewall between this internal network and the Internet; it is invisible from "outside" the firewall.*

**2 *Your Internet connection is via a network interface (i.e., router), and this is the only interface configured.***

In this configuration, you may need to add a network interface. If your SOCKS clients and your Instant Internet all have legally assigned IP addresses, you do not have to add another interface; however, it is common to have the network router on one interface (typically called the "router" interface), and the LAN on another interface (typically the "network" interface).

A normal SOCKS configuration would have two network interfaces; the router interface would have a legally assigned IP address, while the local network interface and the SOCKS clients would have different, private IP addresses. The Instant Internet SOCKS server acts as a firewall between this internal private network and the router interface, making the private network invisible from "outside" the firewall.

---

## Enabling SOCKS

SOCKS support is normally not enabled in Instant Internet; however, you can manually enable it as follows:

- 1 In Windows, run the Instant Internet Setup program.
- 2 Select the Instant Internet unit that will use your SOCKS server.
- 3 Choose `Support | Advanced TCP/IP Settings` from the menu bar. An editable text window, listing several advanced configuration options, appears.
- 4 Add the line `start socks nnn.nnn.nnn.nnn` at the end of this edit window. There are possibly several other ‘start ...’ lines that start other services; the ‘start socks’ line is grouped with these lines. The `nnn.nnn.nnn.nnn` must be replaced with the IP address that you configured for the network interface connected to your SOCKS clients.

```
# Services
#
start echo
start discard
start chargen
start ident
start dnsproxy
start socks < nnn.nnn.nnn.nnn> (ip address of SOCKS server)
```

- 5 If your LAN does not have a directly connected Domain Name Server (DNS), you will also need to add the line `start dnsproxy` to this edit window. This line should be inserted just above the “start socks” line as shown in the example above.

Once enabled, Instant Internet must be restarted before SOCKS service is available.

### Common TCP/IP Client Configuration

Configuring your client workstations for TCP/IP is entirely dependent on the type of client. You should refer to your workstation documentation if you have not previously installed and configured TCP/IP.

There are, however, two configuration items that may need to be changed.

- The default route will typically be set to the IP address of your Instant Internet SOCKS server.
- Unless you have a directly connected domain name server (DNS) you will specify your Instant Internet SOCKS server's address as your DNS server. You must have added the `start dnspox` to the advanced TCP/IP settings as described in the previous section.

### Configuring SOCKS-Enabled Client Applications

Configuring client software varies for each application. See your software documentation for specific instructions. Note that when you use SOCKS-enabled client software, the platform (Macintosh, OS/2, etc.) does not matter; however, the setup might be different in each platform.

There are several common pieces of information with which to configure most clients. You typically need to provide the following information:

- The IP address of the SOCKS server (i.e., the `nnn.nnn.nnn.nnn` part of the `start socks nnn.nnn.nnn.nnn` line).
- The domain name, which is also shown in Instant Internet Setup.
- The SOCKS proxy port. This port is currently required to be 1080, which is the defined port for SOCKS servers.
- The SOCKS protocol version. Instant Internet supports both SOCKS version 4.0 and 5.0. If required, select the latest version supported by your application.
- If SOCKS version 5.0 is supported, you might have the option of selecting authentication methods. Instant Internet supports the SOCKS 4.0 UserId method as well as the 5.0 Username/Password method. GSSAPI and CHAP are not currently supported.

#### Configuring Common SOCKS-Enabled Software

#### To configure Netscape Navigator v3.01 for the PC

- 1 Choose `Options | Network Preferences` from the menu bar.
- 2 Select `Proxies`.

- 3 Select `Manual Proxy Configuration`.
- 4 To see the current proxy configuration, click `View`.
- 5 Be sure that you complete the `SOCKS host` and `Port` fields using the information described in the previous section.
- 6 Click `OK` through all windows to exit `Navigator`.

`Navigator` now uses the `SOCKS` server when connecting to any non-local host.

### To configure Internet Explorer v3.xx for the PC

- 1 Choose `View|Options` from the menu bar.
- 2 Select `Connection`.
- 3 Select the `Connect through a proxy server` check box.
- 4 Be sure that you complete the `SOCKS host name` or `IP address` and the `server port` fields with the information described in the previous section.

Local network connections can be via the `SOCKS` server or direct. The `Do not use proxy server for local (intranet) addresses` check box controls this action.

### Third-Party Socksifying Software

Although `SOCKS` is supported directly by some common applications, many older applications that are not `SOCKS`-enabled can be *socksified*. Socksifying allows these applications to use the `SOCKS` server transparently. `SOCKS` client software, which performs this transparent socksification of non-`SOCKS` enabled software, is often called a socksifying layer because it acts as an invisible layer between the application and the platform's native `TCP/IP` software.

For the PC platform, several third-party socksifying layers are available, both commercially and publicly. (See your software product documentation for setup information.) Again, you are likely to need the information described earlier when setting up the socksifying layer.

### **For More Information**

More information on socksifying software packages can be found on the following web sites:

- *www.aventail.com*  
Aventail produces AutoSocks, a completely transparent layer that runs on Windows, Windows 95, and Windows NT. AutoSocks is a commercial product.
- *www.socks.nec.com*  
NEC is a driving force in developing SOCKS as a standard protocol. NEC produces several public domain socksifying layers for various platforms, including Windows, Windows 95, Windows NT, and several Unix operating systems.
- *www.hummingbird.com*  
Hummingbird produces a freely downloadable socksifying layer for NT 4.0. Its technology was used by Microsoft for Internet Explorer's SOCKS support.

*The Instant Internet SOCKS server has been tested with NEC's SOCKS CAP32 client software and with Aventail's AutoSOCKS v2.03.*

# Advanced TCP/IP Settings

In its role as a conventional IP router, Instant Internet maintains a routing table to determine where to transmit packets. Some routes are created implicitly, such as when specifying the netmask for an interface. For example, if an interface has address 1.2.3.4 and netmask 255.255.255.0, a route is automatically created for 1.2.3.0/24, which is directly accessible via that interface.

Note that routes are specified using the “address/bits” nomenclature for brevity. In other words, 1.2.3.0 with netmask 255.255.255.0 is identical to 1.2.3.0/24, the /24 meaning that the first 24 bits of the address specify the network portion with the remaining 8 bits specifying the host address.

In many cases, the route to an IP network may not automatically be derived from the interface address and netmask information. This occurs any time another router must be used to reach a particular network. The most common example of this is the “default route,” which is used to reach any network which is not specified by any other route. Typically, the default route refers to the Internet, but, in certain situations, it may refer to another router which in turn can reach both other internal networks as well as the Internet. When direct Internet connectivity is available, the default route always specifies the route to the Internet.

Instant Internet supports both “static routes” as well as the Routing Information Protocol commonly known as RIP.

**Static routes** are essentially “manually specified” route entries, which must be explicitly entered and maintained for accuracy, but are very simple to specify and leave little ambiguity in terms of the routing that is used.

**RIP** provides a method for routers automatically to communicate routing information to each other and is often used in more complex or dynamic networks.

Both methods are specified in the Advanced TCP/IP Settings of the Instant Internet Setup program. Note that these settings should be entered before the Start commands and should be put in the order in which you want them to run.

---

## Static Routes

The syntax for adding a static route is as follows:

```
route add[private] address[/bits][default interface [gateway] [metric]
```

The “private” suffix (which can be abbreviated to “p”, as in “addp”) indicates that this route entry shall be neither announced in any RIP advertisements nor overridden by RIP messages received from other routers. If RIP is not being used, then the suffix has no effect.

*address[/bits]*

Specifies the target or destination address, or, in other words, the address that is intended to be reached by this route entry. If */bits* is not specified, 32 (an individual host) is assumed. If “default” is specified, this entry is specifying the default route.

*interface*

The name of the IP interface on which to transmit packets intended for this destination. This is a named interface such as “network,” “router,” “ISDN,” etc.

*gateway*

If specified, gateway is the IP address of another router (reachable on the specified interface) to which packets to the destination should be forwarded. If not specified, it is assumed that the destination is directly reachable on the specified interface, in which case the *metric* defaults to zero.

*metric*

Indicates the number of “hops” or additional routers through which a packet must pass in order to reach the destination. For example, a metric of “2” means that a packet leaving the Instant Internet unit must pass through two routers before being delivered to the final destination. If a *gateway* is specified, then *metric* defaults to one; otherwise, it defaults to zero. Note that *metric* is meaningful only when RIP is used in relatively complex environments when multiple paths to a destination may exist.

---

## Routing Information Protocol (RIP)

RIP provides a relatively automatic means for routers to communicate with each other. Once activated in a properly configured network, the routers will automatically “learn” the routes to all available networks from each other.

### **RIP announcement commands (sending RIP to other routers)**

`rip add destination`

Begins sending RIP announcements for all non-private routes to the specified destination address (using the split horizon algorithm). If an interface name is given, RIP announcements will be sent to the broadcast address of that interface (meaning that only a network interface can be used). If a specific IP address is given, RIP announcements are sent to that specific router address. Normally, either an interface name, or the subnet broadcast address for an interface is specified; both accomplish the same thing. Another option is to specify the all-ones broadcast address, 255.255.255.255, which broadcasts RIP announcements on all interfaces. Note that multiple “rip add” commands can be specified for multiple destinations.

`rip version [1|2]`

Indicates the version of RIP announcements. The default is version 1. RIP announcements from other routers are accepted in either version format.

## RIP listening commands (accepting RIP from other routers)

`rip accept [gateway[/bits]][interface]`

Specifies that RIP announcements should be accepted only from the specified address(es) or any address contained within the network connected to *interface*. If no “rip accept” commands are present, no announcements will be accepted. The first “rip accept” command enables reception of RIP packets. If no address or interface is specified, announcements are accepted from any router; otherwise, only announcements from the specified addresses are accepted. This command may be specified multiple times to indicate more than one address or network from which announcements can be accepted. Note that using both the “rip accept” and “rip refuse” commands simultaneously, while allowable, rarely is necessary and can be confusing.

`rip refuse [gateway[/bits]][interface]`

Specifies that RIP announcements should be rejected from the specified address(es) or any address contained within the network connected to *interface*. This command may be specified multiple times to indicate more than one address or network from which announcements can be accepted. Note that using both the “rip accept” and “rip refuse” commands simultaneously, while allowable, rarely is necessary and can be confusing.

## Examples

Normally, for full RIP interoperability, only one command per interface, plus one command to accept announcements from other routers, is required.

`rip add network`

Sends RIP announcements to the broadcast address for the “network” interface.

`rip accept network`

Accepts announcements from any router connected to the same network.

---

## IP Filtering

Each filter has a logical name, and contains a list of rules. Filters can be applied to any interface on either input and/or output processing. Filter rules are processed in the order specified, and there is an implicit “deny all” at the end of the list.

When a filter is not specified for an interface, all traffic is allowed.

### Commands for creating and maintaining filters

*ip filter <name> [<keywords>...]*

Creates a new filter and /or adds a new rule to a filter. Filters can have any number of rules. Rules are processed in the order specified until a match is found. If no match is found, the packet is denied access. Any number of keywords can be specified and in any order.

### Keywords

*allow*

Allows access for any packet matching the filter rule.

*deny*

Denies access for any packet matching the filter rule.

*source [<address spec>]*

Matches IP source address. Default is any source address.

*destination [<address spec>]*

Matches IP destination address. Default is any destination address. Note that source-routed packets have an effective destination address of the final destination host.

*protocol [<name or number>]*

Specifies the protocol that this rule matches. Default is any IP packet. Values are specified by name (e.g., tcp, udp, icmp) or by number.

*tcp*  
*udp*  
*icmp*  
*ip*

Short forms for specifying the protocol. These are the same as if specified after the “protocol” keyword.

*established*

Matches TCP packets belonging to established connections (having SYN clear or ACK set). This is typically used to allow packets for established client sessions while preventing access to servers.

*source-route*

Matches only packets which contain source routing information using either the loose or strict routing IP protocol options. If not specified, source routing information is not checked.

*silent*

Causes any packet that matches the rule to be silently discarded. Without this keyword, a notification is transmitted to the sender of the packet indicating that access is denied (ICMP destination unreachable, host unreachable).

### **Address Specifications**

Specifications contain up to three fields: IP address, number of bits, and port number(s).

*[ip address or name][/bits][:port]*

*[ip address or name][/bits][:<maximum]*

*[ip address or name][/bits][:>minimum]*

*[ip address or name][/bits][:[minimum]-[maximum]]*

The IP address can be specified using dotted decimal (x.x.x.x) or any valid host name. The default, if not specified, is 0.0.0.0, with 0 bits, which matches an IP address.

The number of bits is specified after a slash (/) character. If not specified, 32 is used. This number is the number of significant bits for the address. For example, to match an entire Class C network, specify x.x.x.0/24.

The port number can be specified using a variety of forms and is meaningful only for TCP or UDP filter rules. Port numbers can be given numerically or as service names. Formats include:

*port*

Matches only the specified *port* number.

*<maximum*

Matches ports less than the maximum, i.e., 0 through (maximum-1).

*>minimum*

Matches ports greater than the minimum, i.e., (minimum+1) to 65535.

*minimum-maximum*

Matches ports in the specified range. Omitting minimum assumes 0 and omitting maximum assumes 65535.

## Interface Configuration

Filters are associated with an interface's input or output stream through keywords for the *ifconfig* command. The new keywords are as follows:

*infilter <name>*

Applies the names filter to incoming packets as they are received.

*outfilter <name>*

Applies the named filter to packets being forwarded (routed) as they are moved to the transmitting interface.

## Examples

### Example One

```
ip filter test1 deny source-route
ip filter test1 allow tcp established
ip filter test1 deny tcp
ip filter test1 allow ip
ifconfig network outfilter test1
```

This example creates a filter named *test1* that:

- denies any packet with source-routing information.
- allows established TCP packets
- denies all other TCP packets (those attempting to establish an incoming session with a server).
- allows all other IP (non-TCP) traffic.

The filter is then applied to the output of the *network* interface. In other words, the *network* interface will no longer transmit a packet onto the network that matches this filter. Note that this also will prevent FTP transfers because the “server” actually connects back to the client (i.e., the client must accept incoming connections).

### **Example Two**

```
ip filter test1 allow icmp
ip filter test1 allow tcp established
ip filter test1 allow tcp source :20
ip filter test1 allow tcp dest :1024-
ip filter test1 allow tcp dest ftp.mydomain.com:21
ip filter test1 allow tcp dest www.mydomain.com:www
ip filter test1 allow udp source :53 dest :>1023
ifconfig network infilter isdn
```

This example creates a filter named *test1* that:

- allows ICMP (ping) access.
- allows established TCP sessions.
- allows incoming connections from source port 20. Most FTP servers will connect to the client from this port when in active mode.
- allows incoming connections to non-well-known ports (1024 and higher).
- allows incoming FTP connections to the designated host, ftp.mydomain.com.
- allows incoming Web (WWW, port 80) connections to the designated host, www.mydomain.com.
- allows incoming UDP packets from port 53 to any non-well-known port. These packets would be responses to a DNS query.
- denies all other packets (implied by end of list).

The filter is applied to the input of the *isdn* interface, meaning that packets are examined as they are received from the ISDN line.

### Complex Example

```
ip filter test1 deny source-route
                                #optional: drop all source-route packets
ip filter test1 deny source 199.200.201.0/24
                                #prevent spoof
ip filter test1 allow icmp
                                #allow any ICMP packets
ip filter test1 allow tcp established
                                #allow established connections
ip filter test1 allow tcp dest :6
                                #Instant Internet registration
ip filter test1 allow tcp dest :echo
                                #allow incoming echo
ip filter test1 allow tcp dest :discard
                                #allow incoming discard
ip filter test1 allow tcp dest :chargen
                                #allow incoming chargen
ip filter test1 allow tcp dest mail.mydomain.com:smtp
                                #mail server
ip filter test1 allow tcp dest ftp.mydomain.com:ftp
                                #anonymous ftp server
ip filter test1 allow tcp dest ftp.mycomain.com:>1023
                                #passive ftp transfer to non-well-known port
ip filter test1 allow tcp source :ftp-data dest :>1023
                                #active ftp transfer to non-well-known port
ip filter test1 allow tcp dest ns1.mydomain.com:domain
                                #primary DNS zone transfer
ip filter test1 allow tcp dest ns2.mydomain.com:domain
                                #secondary zone transfer
```

```

ip filter test1 allow udp dest ns1.mydomain.com:domain
    #primary DNS queries
ip filter test1 allow udp dest ns2.mydomain.com:domain
    #secondary DNS queries
ip filter test1 allow udp source :domain
    #DNS responses from distant servers
ip filter test1 allow tcp dest :auth
    #identification queries
ip filter test1 allow tcp dest news.mydomain.com:nntp
    #news server
ip filter test1 allow udp dest :ntp
    #Network Time Protocol (NTP) packets
ip filter test1 allow tcp dest www.mydomain.com:www
    #primary web server
ip filter test1 allow tcp dest mail.mydomain.com:pop
    #POP
ip filter test1 allow tcp dest mail.mydomain.com:pop3
    #POP3
ip filter test1 allow udp dest :>899
    #Gopher, traceroute, etc.

```

### **WINSOCK Compatibility**

Note that filters apply to the WINSOCK server's packets, although input filters would not apply since these packets are always generated internally and never come from an external source. If you do not want the WINSOCK to be constrained by the output filters for an interface, simply "allow" all traffic from Instant Internet's own IP address. For example:

```

ip filter winsock allow source x.x.x.x
ifconfig network outfilter winsock

```

where x.x.x.x is the IP address assigned to the *network* interface. This address works because internally-generated packets destined for hosts on the network connected to the *network* interface will always have a source IP address of the *network* interface.

### **General Comments**

This architecture is designed to allow you to create filters that form templates for performing a particular type of filtering. The reason for creating filters and then applying them to an interface, versus just applying the filter rules directly to an interface, is that this method provides inherent consistency and allows you to apply the same list of rules to multiple interfaces without having to ensure consistency each time.

A common question is “When do you use an input filter versus an output filter?” In many cases, it does not make a difference. In complex configurations with multiple interfaces, however, there is a benefit to one method over the other. For example, if you have a network with a host to which no one should be allowed to telnet, you can apply an output filter to that interface. Then there is no need to apply this filter to the input of all other interfaces.

