Internet Router Guide
Main Menu

- Configuring your Network Device (Net-Device Utilities)
- Setting up your PCs for Internet Access
- Setting up your PCs for Remote Access
- Setting up your PCs for LAN-to-LAN Routing
- Troubleshooting
- Glossary
- Applications Guide

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Net-Device Utilities

- Introduction
- Net-Device Wizard
- Net-Device Manager
- Net-Device Monitor

Back to Main Menu

Net-Device Utilities Introduction

Congratulations on purchasing the best in networking technology. The Net-Device Utilities (Network Device Utilities) are programs designed to help you configure your new network device both quickly and easily.

The Net-Device Utilities can be used to configure a variety of devices including:

1) Internet Routers
2) Internet Access Servers
3) Remote Access Servers
4) Remote Access routers
5) Proxy Servers

This Net-Device Utilities will automatically detect what kind of network device you have and show you the relevant configuration screens. This version of the Net-Device Utilities Manual was written to configure **Internet Routers**.

Note! The Net-Device Utilities can only configure network devices that were specifically designed to be compatible with the Net-Device Utilities.

The Net-Device Utilities

The Net-Device utilities include:

- **Net-Device Wizard**

  A step-by-step process that will let you input all the basic settings that are needed to configure your network device for general usage. All settings that are entered here will also be shown in their respective menus in Net-Device Manager.

- **Net-Device Manager**

  Net-Device Manager is the main program used to configure all the settings of your network device.

- **Net-Device Monitor**

  Net-Device Monitor is a multi-purpose utility that was designed to monitor the status of the connections of your network device. It provides a step-by-step event monitor whereby on each event you can point and click to bring up an on-line help screen that will advise you of any troubleshooting procedures that are needed. It will also show you what TCP/IP packets your network device is transmitting.

Net-Device Wizard

- Introduction

- Select your Network Device
- Device IP Address
- Port Functions
- Internet Access
- Remote Access
- LAN-to-LAN Routing
- DNS Server IP Address
- Modem Settings

Back to Net-Device Utilities Menu

Setup Wizard

Setup Wizard is a program that will let you configure your network device quickly and easily. Setup Wizard is a step-by-step process that will let you input all the basic settings that are needed to configure your network device for general usage. All settings that are entered here will also be shown in their respective menus in Net-Device Manager.

Setup Wizard will automatically start

After you have installed the Net-Device utilities, you will automatically be brought into Setup Wizard.

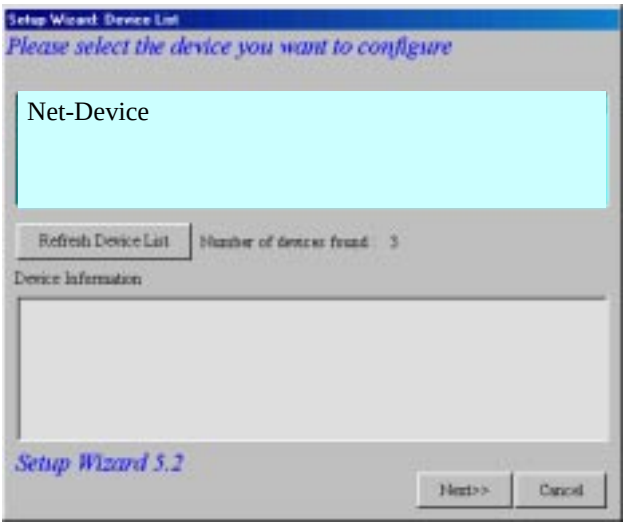
To Run Setup Wizard from the Windows Start Menu

On the Windows 95/98/NT **Start** menu point to **Programs**, then to **Net-Device Manager** and select **Setup Wizard**.

Please Select the Device you Wish to Configure

Setup Wizard will automatically check your network for available network devices. Note that only network devices compatible with the Net-Device Utilities will be displayed. You can click the "**Refresh Device List**" button to update this list.

The first thing you must do is select the network device that you will be configuring from the Device List.



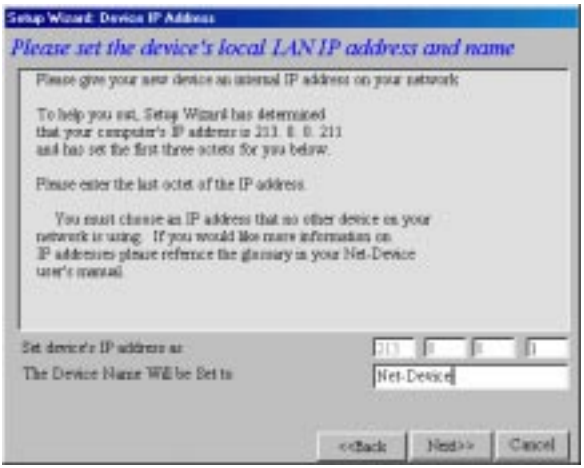
Note! If you can't see your network device listed in the Device List please press the **Refresh Device List** button. If you still can't see it please click here for further instructions.

Please Set the device's IP Address and name

The next thing you must do is give your new network device an IP address on your network. This is **NOT** the IP address from your ISP but the local, internal LAN IP address for the device.

The first three octets of every computer's IP address or device on your network should be the same. Setup Wizard will help you by automatically detecting the IP address of your computer and set the first three octets for you. You need only decide the last octet.

If you wish, you can also change the name of your network device to something else. This name can be anything you wish.



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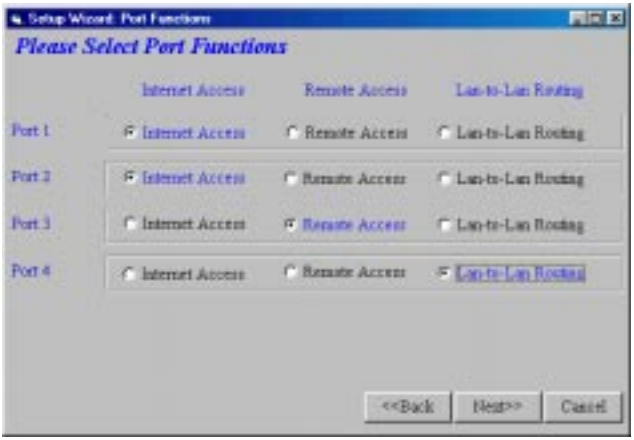
What is an IP address and how does it work?

Please Select Port Functions

The next thing you must do is assign the specific function of each port.

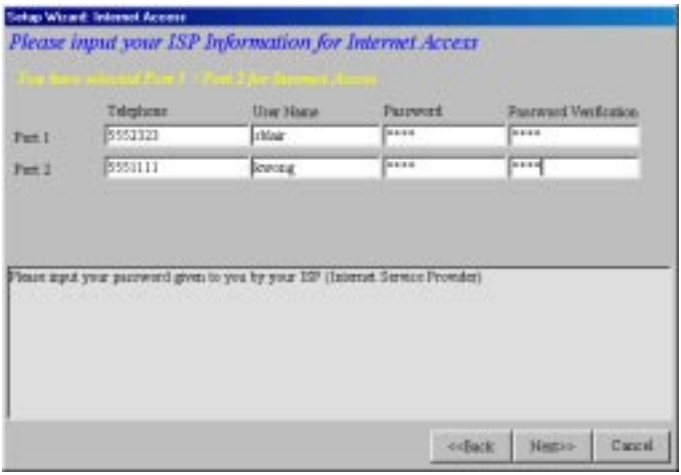
Each port can be selected to fulfill only one specific function. If at a later time you would like to change a port's function you can do so using either Net-Device Manager or Setup Wizard.



In the above example we have selected ports 1 and 2 for Internet Access, port 3 for Remote Access and port 4 for LAN-to-LAN Routing.

Please input your ISP Information for Internet Access

If you have selected some ports for Internet Access, the next thing you must do is input your ISP (Internet Service Provider) information. These fields are required to dial-up and login to your ISP when your clients use their Internet applications.



For each port that you have selected for Internet Access you must enter:

Telephone Number

Enter your ISP's telephone number in the **Telephone Number** field.

Note!

If in your office or company you must dial a number to get an outside line (For example this is often the number "**9**" or "**0**"), you should enter the number plus a "**w**" which will instruct your modem or ISDN TA to wait until a dial-tone is received before dialing. For example the phone number 555-2323 which uses 9 to get an outside line would be entered as **9w555-2323**. Modem and ISDN TAs also supports commas which function as delay variables. So our example number could also be entered as 9,,5552323. Each comma will provide around a 3-4 second delay.

User Name

Enter your username of your ISP account in the **User Name** field.

Password

Enter the Password of your ISP account and then re-confirm it by entering it again in the **Password Verification** field.

???

How can I input a 2nd backup ISP?

You need to use a login script. Click here for more info.

???

How does my network device share one IP address?

It uses NAT. Click here for more info.

Bundling Modem/TA Channels (ML-PPP)

What is ML-PPP?

MODEMS

If you would like to bundle two or more **Modem** channels together you can use your network device's ML-PPP function. After you finish Setup Wizard press the **Run Manager** button which will bring you into Net-Device Manager. Go into the Dial-up Hang-up Settings and enable **ML-PPP**.

ISDN TAs

If you would like to bundle your two ISDN TA B-channels together:

1) You may need to enter the two phone numbers in the **Telephone Number** field depending on what your ISP supports. Usually ISDN TAs support either the "+" or "&" command so when entering the phone numbers you can enter them as either, for example, "555-2323 + 555-2121" or "555-2323 & 555-2121". If your ISDN TA doesn't support "+" or "&" you should see your ISDN TA user's manual to see how it is possible to enter two phone numbers.

2) When you get to the part of Setup Wizard that asks you to select your modem, make sure you select your ISDN TA ML-PPP selection. If your ISDN TA is not listed in the selection list, at the end of Setup Wizard press the **Run Manager** button which will bring you into Net-Device Manager. Then go into **Modem Settings** and set the initial string manually.

IMPORTANT! Please note that an ISDN TA's B Channels are bundled together at the ISDN TA and NOT at your network device. This means that if using an ISDN TA's ML-PPP function you should not have ML-PPP enabled on your network device. The enable/disable ML-PPP selection is in **Dial-up/Hang-up Settings**.

Please Input Your Remote Access Settings

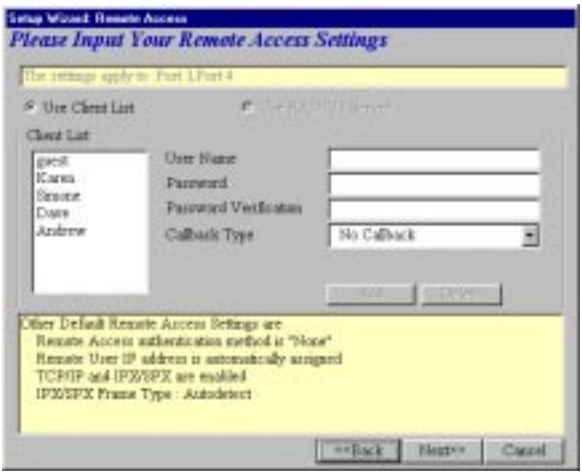
If you have selected some ports for Remote Access, the next thing you must do is input your Remote Access Settings and which clients you will allow remote access.

Note! The configuration that you enter here will apply to all of the remote access ports that you have configured for remote access

Remote Client Authentication

Option A Use Local Client List

The Local Client List is a user list stored in your network device. When a remote PC user dials-in to your network device, his/her user information will be validated by checking the user information stored in your network device. Your network device can save 64 user names and passwords. Your network device comes with a default user called "guest" which has no password to login. For security reasons you should either delete the user "guest" or give it a password.



For each Client you should enter a **User Name, Password** and the **Callback Type**. Callback is an option that lets you give this client the option of having your network device callback after the client calls your network device. In this way the calling charge is reversed. There are 3 different callback options:

No CallBack	If No CallBack is selected this remote client user will be restricted from callback service. This is the default identity for the server.
Fixed CallBack	If Fixed CallBack is selected this remote PC user will be allowed to have callback service but the callback phone number is restricted to a preset phone number. This phone number is defined in the **Callback Telephone No** field.
Variable Callback	If Variable CallBack is selected this remote PC user will be allowed to have callback service and will also be able to specify the callback phone number at dial-up.

Option B Use RADIUS Authentication

Choosing **RADIUS Configuration** will allow you to use the user information (user name, password, etc.) stored on a separate RADIUS server on the network. Basically a RADIUS server is just a popular user/password list that can keep track of accounting information as well as dial-in privileges. When a remote PC user dials-in to your network device, his/her user information will be validated by checking the user information stored in the network RADIUS server. RADIUS configuration is generally used for large companies or ISPs (Internet Service Providers) to keep track of many remote users.

Please Input LAN-to-LAN Routing Settings

If you have selected some ports for LAN-to-LAN Routing, the next thing you must do is input your LAN-to-LAN settings.

Remote IP/Remote Mask

Here you should enter the IP address and netmask of the remote router that you want to route to. For example if your remote subnet has an IP address of **192 . 168 . 1 . X** and the router on your remote network has an IP address of **192 . 168 . 1 . 1** you should enter an IP address of **192 . 168 . 1 . 1** and a netmask of **255 . 255 . 255 . 0**. This will tell your network device to route packets with **192 . 168 . 1 . X** through this LAN-to-LAN routing port to **192 . 168 . 1 . 1**.

Telephone

Enter the telephone number to connect to your other LAN that you wish to do LAN-to-LAN routing with. This other line should be connected to a modem that is also configured to do LAN-to-LAN routing.

Outgoing Name

Enter the user name needed to login to your LAN. This information will be programmed in the network device that is receiving the dial-up call.

Outgoing Password

Enter the password associated with this user name

Note! If you need help in setting up specific LAN-to-LAN routing applications please **see the LAN-to-LAN applications guide at the end of the manual**.

Please Input your ISP's DNS Server IP Address

Enter the DNS Server IP Address provided to you by your ISP. This information is usually provided to you with the information package given to you by your ISP. If you can't find your ISP's DNS Server IP address your easiest solution is probably just to give someone at your ISP a telephone call and ask them for their DNS Server IP address.

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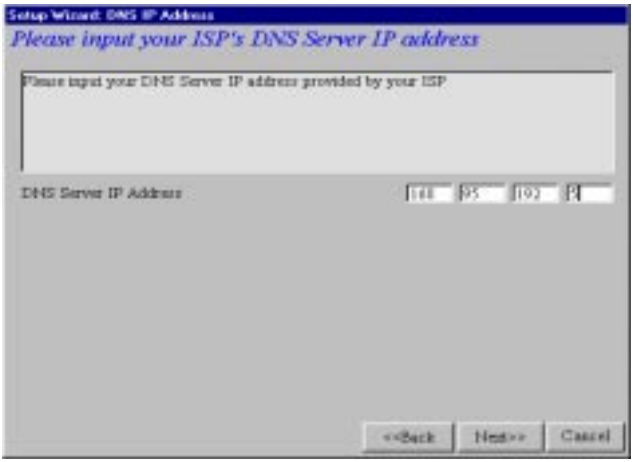
What is a DNS Server IP address?



Please Select Modem and Set Baudrate

The last step is to enter the modem that you are using and the DTE baudrate (i.e the speed of communication between your network device and your modem or ISDN TA). This is a very important setting and determines the communication between your network device's serial port(s) and modem(s).

Modem

You can use the **Select Modem** button to select your Modem or ISDN TA. This setting will configure the initial string in your network device so that it will know how to communicate with your modem. If you are using an analog modem in most cases the default setting of **Standard Modem** will work.

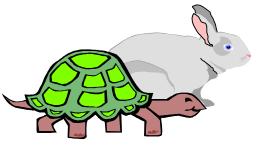
Note!

ISDN TA Setup

!!! Extremely Important !!!

If you do not see your ISDN TA listed, you need to enter the initial string for this TA in **Net-Device Manager's Modem Settings** menu. Once you have finished Setup Wizard press the **Run Manager** button and click **Modem Settings** from the main menu. . **Click here for Modem Settings instructions.**

Baudrate



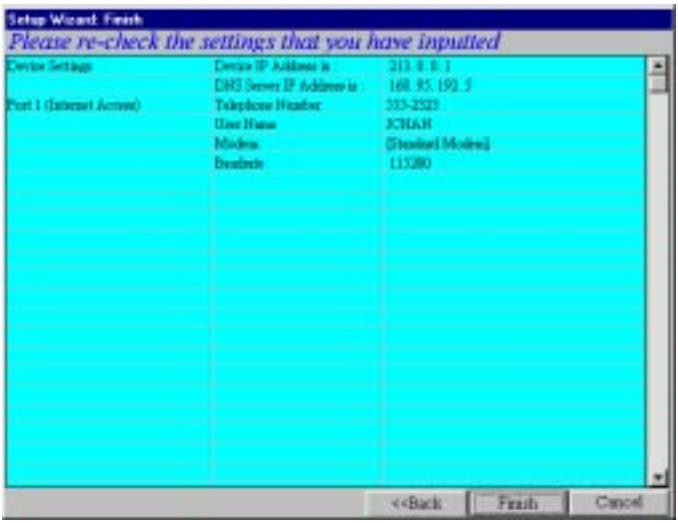
In the Baudrate field select the DTE Speed (i.e the speed of communication between your network device and modem or ISDN TA) Normally this can be about 4 times the speed of your modem for 4 times compression modems.

Note!

The absolute maximum you should set the baudrate for a given port is 4 times the speed of your modem. If you set the baudrate too high, your network device may not be able to dial-up a connection. For example if you have a 14.4Kpbs modem, the highest you should set the baudrate is 57.6Kbps. You should also be aware of the fact that since some ISP connections and phone lines are not of the greatest quality these "compression" baudrates may not be attainable causing your connection not to work. In this case you try setting the baudrate at a lower speed.

Please re-check the setting that you have inputted

The Settings that you have just inputted will be summarized here. Please check to make sure that all the settings you have inputted are correct.



If you see that you have configured a setting incorrectly, you can click on the **Back** button to go back to the screen with the mistake and change it.

….Press Finish to Complete Setup Wizard

You Have Now Completed Setup Wizard

1) Net-Device Manager

If you need to go into Net-Device manager to configure more advanced settings, you can open the program directly by pressing the **Run Manager** button.

2) Internet Access

If you have set one or more ports of your network device for Internet Access and don't need to configure anything else in Net-Device Manager please use Net-Device Monitor's **Test Connection** function to see if your network device can dial-up a connection with the settings that you have configured. You can access Net-Device Monitor by pressing the **Run Monitor** button on the bottom of your screen. Please see **the Net-Device Monitor section** for instructions.

3) Remote Access

If you have set one or more ports of your network device for remote access please **click here on instructions on setting up your remote access clients**.

4) LAN-to-LAN Routing

If you have set one or more ports of your network device for LAN-to-LAN routing and would like more information on LAN-to-LAN applications please **click here to see the LAN-to-LAN applications guide.**

Net-Device Manager

- General Settings
- Modem Settings
- Dialup / Hangup Settings
- DHCP Server
- Routing Table
- IP Mapping
- Client Filter Settings

- Device Name
- Save Settings to File
- Load Settings
- Upgrade Firmware
- General Diagnostic

Back to Net-Device Utilities menu

Net-Device Manager

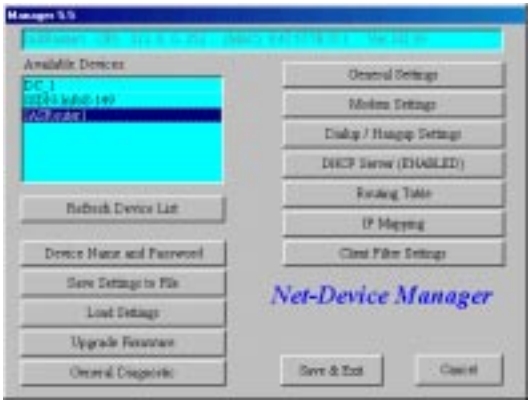
Net-Device Manager is the program used to configure all of the settings of your Network Device.

Note! If you like using on-line help more than following along with the manual, the screens in Net-Device Manager have a **Help** button that will give you a detailed explanation of what needs to be entered in each field.

To Run Net-Device Manager from your desktop

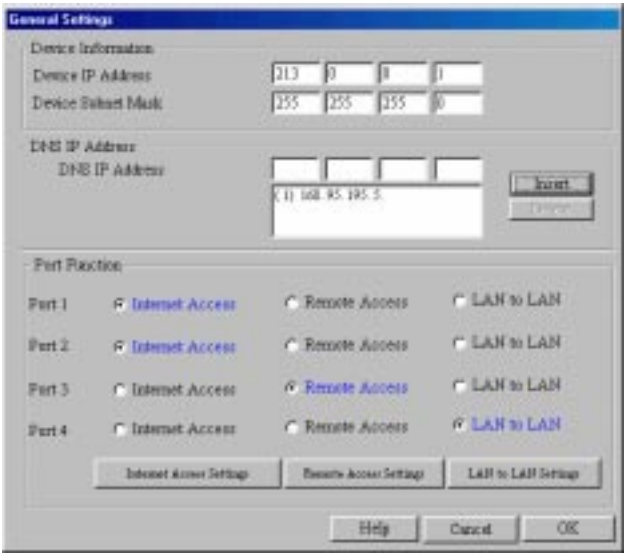
On the Windows 95/98/NT **Start** menu point to **Programs**, then to **Net-Device Manager** and select **Net_Device Manager**.

After you have entered **Net-Device Manager**, it will automatically check your network for compatible network devices which will be displayed in the "**Device List**". You can click the "**Refresh Device List**" button to update this list.



General Settings

The General Settings main screen contains all the major settings of your network device. This includes IP information, DNS IP Addresses and the function of each port.



Device IP Address

The IP address of your network device is the unit's LAN Address. In our example network the IP address of **213 . 0 . 0 . 1** that we gave the network device in *Setup Wizard* is displayed here.

Device Subnet Mask

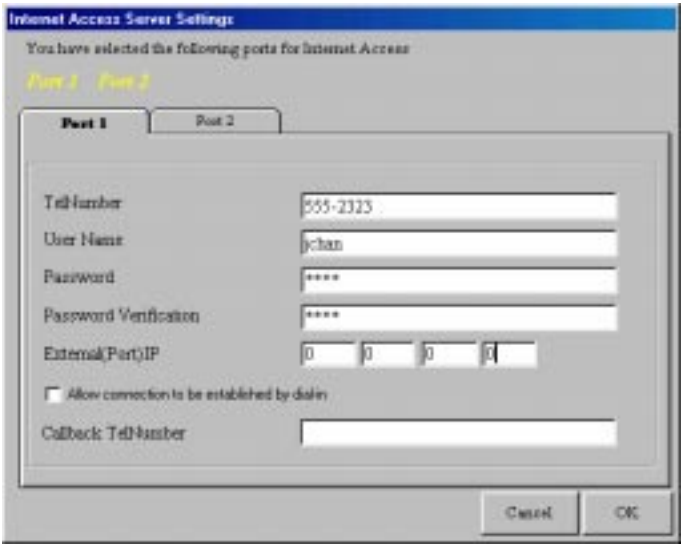
Your network device's Subnet Mask can usually be left as it's default entry "**255 . 255 . 255 . 0**".

DNS Server IP Address(es)

The DNS Server IP address that you entered in Setup Wizard will be displayed here. Your network device supports multiple DNS Servers which can be entered here.

Internet Access Settings

The Internet Access Settings lets you input or change the settings that you have setup for Internet access. Most of the settings displayed here should have been entered in Setup Wizard.



Telephone Number

Enter your ISP's telephone number in the **Telephone Number** field.

Note!

If in your office or company you must dial a number to get an outside line (For example this is often the number "**9**" or "**0**"), you should enter the number plus a "**w**" which will instruct your modem or ISDN TA to wait until a dial-tone is received before dialing. For example the phone number 555-2323 which uses 9 to get an outside line would be entered as **9w555-2323**. Modem and ISDN TAs also supports commas which function as delay variables. So our example number could also be entered as 9,,5552323. Each comma will provide around a 3-4 second delay.

User Name

Enter your username of your ISP account in the **User Name** field.

Password

Enter the Password of your ISP account and then re-confirm it by entering it again in the **Password Verification** field.

???

How can I input a 2nd backup ISP?

You need to use a login script. Click here for more info.

???

How does my network device share one IP address?

It uses NAT. Click here for more info.

Bundling Modem/TA Channels (ML-PPP)

What is ML-PPP?

MODEMS

If you would like to bundle two or more **Modem** channels together you can use your network device's ML-PPP function. After you finish Setup Wizard press the **Run Manager** button which will bring you into Net-Device Manager. Go into the Dial-up Hang-up Settings and enable **ML-PPP**.

ISDN TAs

If you would like to bundle your two ISDN TA B-channels together:

1) You may need to enter the two phone numbers in the **Telephone Number** field depending on what your ISP supports. Usually ISDN TAs support either the "+" or "&" command so when entering the phone numbers you can enter them as either, for example, "555-2323 + 555-2121" or "555-2323 & 555-2121". If your ISDN TA doesn't support "+" or "&" you should see your ISDN TA user's manual to see how it is possible to enter two phone numbers.

2) If you haven't already done so you need to select your ISDN TA in **Modem Settings** .

IMPORTANT! Please also note that an ISDN TA's B Channels are bundled together at the ISDN TA and NOT at your network device. This means that if using an ISDN TA's ML-PPP function you should not have ML-PPP enabled on your network device. The enable/disable ML-PPP selection is in **Dial-up/Hang-up Settings**.

External (Port) IP Address

The External (Port) IP address is the IP address that is given to you by your ISP. An IP address is often dynamically assigned by your ISP (ie. it changes every time you log-on). To have this address assigned by the ISP leave this field as it's default entry " **0 . 0 . 0 . 0** ". If you have been given a static IP address by your ISP you can enter it in this field.

Dial-in is also Enabled:

Please note that THIS FUNCTION IS NOT REMOTE ACCESS in the direct sense of the word. This function can be used to do remote access through the Internet and is generally used with the IP Mapping function of your network device. The IP Mapping function lets you access your LAN via the Internet. For example, to access an FTP site or Web site on your internal LAN (Please see the **IP Mapping section for more details on how to set this up**).

Callback Options:

If you have selected the "**Dial-in is also Enabled**" option, you can use the Callback Telephone number function of your network device

1) No Callback

2) Callback ISP

This Callback ISP feature adds a handy extra to the IP Mapping function of your network device. (Please see the **IP Mapping section for more details on how to set this up**). What if you are away on business and your LAN is on the other side of the world. You need a file from your LAN FTP server but your network device is presently not connected to the Internet. What to do? Begin crying? No! Ask the bellboy? No! Remote access? Too expensive! Luckily for you this network device has the callback ISP feature! You call up the Internet access port of your network device, hang-up and your network device will call back your ISP. Connection established! Now you dial-up the local ISP and you can access the FTP server on your LAN. A very cheap connection to your LAN through the Internet! How do you know the IP address? If your network device has a single port the easiest solution would be to have a fixed IP address. If you have a network device with multiple serial ports, you can dial-in to another port of your network device using remote access. Then use the Net-Device Monitor which will display the dynamic IP address assigned by your ISP. Hang-up this expensive connection and then use the IP Mapping function through the original Internet access port mentioned above. Nuff' said!

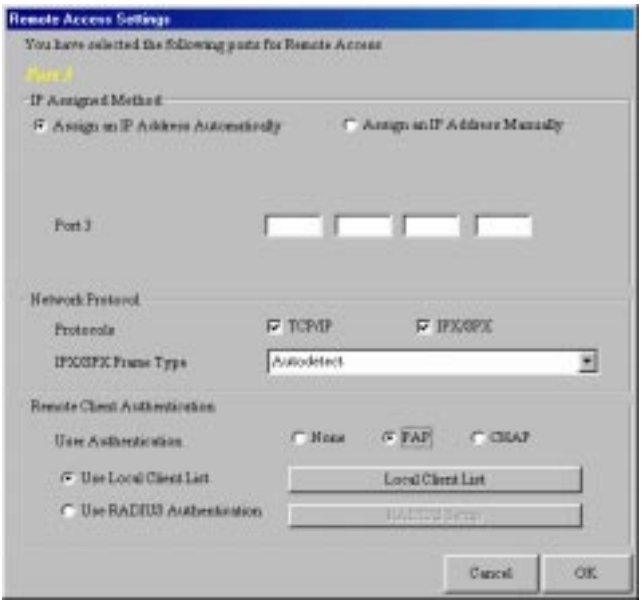
3) Have ISP call me back

For this feature just enter the phone number of this port. After you dial-up your ISP, your network device will hang-up and wait for the ISP to call you back thus reversing the charges. Unfortunately this funky feature only works with those crazy ISPs that offer to pay your connection charges for you. Bummer!

Remote Access Settings

Most of the information displayed in this menu was configured in Setup Wizard.

Note! If you have a network device that does not support remote access these settings do not apply and you can skip this section.



IP Assigned Method

When remote access clients dial-in to this port they will need to be assigned an IP address.

Option A **Assign an IP address Automatically**

This setting will use a DHCP server to assign this client an IP address. The default setting of your network device has it's DHCP server enabled and your network device will use the IP address pool specified in the DHCP server settings to assign your remote access clients an IP address. If you would like to use another existing DHCP server on your network (eg. Windows NT DHCP Server), you need to first disable your network device's DHCP server. Your network device will then act as a DHCP client and allow your existing DHCP server to assign an IP address to each port set for remote access.

Option B **Assign an IP address manually**

The other option is to manually assign an IP address to this Port. This IP address will then be assigned to every remote access client that dials-in to this port.

Network Protocols

Here you can select which protocols you use on your network. If you have a NetWare server you must enable the IPX protocol. If you will be connecting a remote PC to a Windows NT server, at least IP protocol or IPX protocol must be enabled. The default has both IP and IPX enabled.

IPX/SPX Frame Type

Your network device can automatically detect what kind of IPX/SPX frame type you are using. If you would like to manually set the frame type, use the drop down list to choose which type.

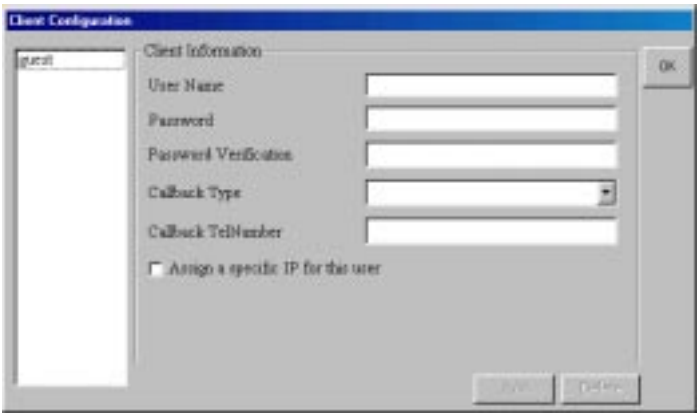
Remote Client Authentication

User Authentication

Please choose what kind of authentication method you would like to use PAP, CHAP or none.

Option A **Use Local Client List**

The Local Client List is a user list stored in your network device. When a remote PC user dials-in to your network device, his/her user information will be validated by checking the user information stored in your network device. Your network device can save 64 user names and passwords. Your NETWORK DEVICE comes with a default user called "guest" which has no password to login. For security reasons you should either delete the user "guest" or give it a password.



Note! The client list used for LAN-to-LAN routing and the client list used for remote access is the same.

To add a new user click **Add User**. Enter the **User Name** and **Password** of the Remote PC user.

Callback Type

Callback Type refers to the function whereby a remote user dials in to your network device and is then purposely disconnected to be called back to reverse the phone charges. There are three options for callback which are listed below

No CallBack	If No CallBack is selected this remote client will be restricted from callback service. This is the default identity for clients.
Fixed CallBack	If Fixed CallBack is selected this remote client will be allowed to have callback service but the callback phone number is restricted to a preset phone number. This phone number is defined in the **Callback Telephone No** field.
Variable CallBack	If Variable CallBack is selected this remote client will be allowed to have callback service and will also be able to specify the callback phone number each time he/she dial-up.

Assign a Specific IP address for this Client

If you would like to have an IP address assigned for this specific user, first enable this setting and then input an IP address for this client. This IP address will always be used for this specific client and will override your IP address assignment method for this port.

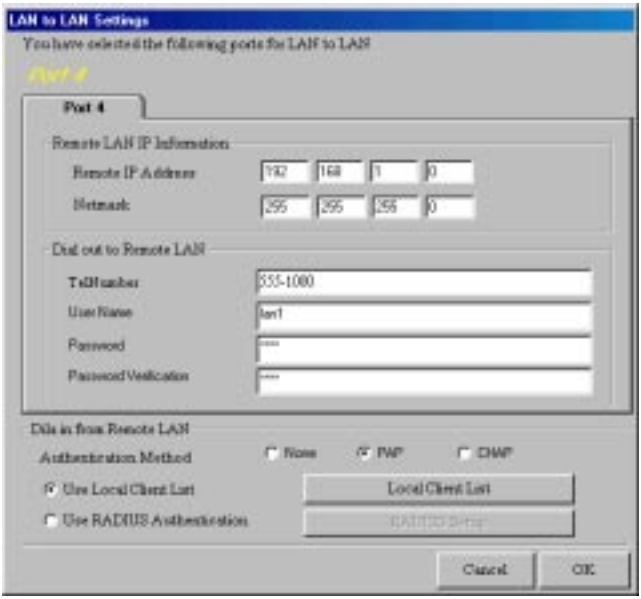
Option B Use RADIUS Authentication

Choosing **RADIUS Configuration** will allow you to use the user information (user name, password, etc.) stored on a separate RADIUS server on the network. Basically a RADIUS server is just a popular user/password list that can keep track of accounting information as well as dial-in privileges. When a remote PC user dials-in to your network device, his/her user information will be validated by checking the user information stored in the network RADIUS server. RADIUS configuration is generally used for large companies or ISPs (Internet Service Providers) to keep track of many remote users.

LAN to LAN Settings

Settings that were not explained in Setup Wizard are detailed below.

Note! If you have a network device that does not support LAN-to-LAN routing these settings do not apply and you can skip this section.



Note! If you need help in setting up specific LAN-to-LAN routing applications please **see the LAN-to-LAN applications guide at the end of the manual** .

Remote LAN IP Information

Remote IP Address/Netmask

Here you should enter the IP address and netmask of the remote router that you want to route to. For example if your remote subnet has an IP address of **192 . 168 . 1 . X** and the router on your remote network has an IP address of **192 . 168 . 1 . 1** you should enter an IP address of **192 . 168 . 1 . 1** and a netmask of **255 . 255 . 255 . 0**. This will tell your network device to route packets with **192 . 168 . 1 . X** through this LAN-to-LAN routing port to **192 . 168 . 1 . 1**.

Dial-out to Remote LAN

TelNumber

Enter the telephone number of your other LAN that you wish to do LAN-to-LAN routing with. This other line should be connected to a router that is also configured to do LAN-to-LAN routing.

User Name

Enter the user name needed to login to your LAN. This information should be programmed in the network device that is receiving the dial-up call.

Password

Enter the password associated with this user name

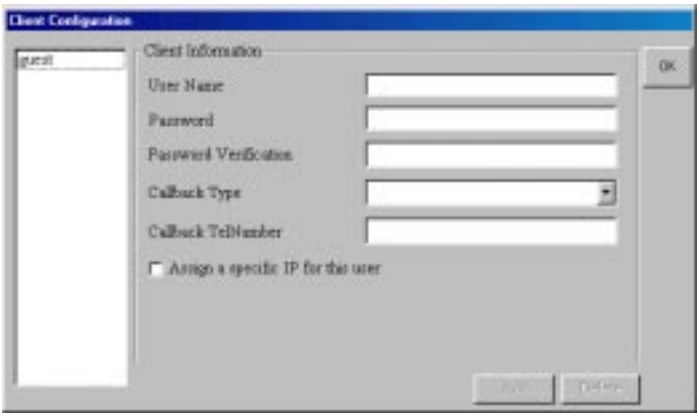
Dial-in from Remote LAN

Authentication Method

Please choose what kind of authentication method you would like to use PAP, CHAP or none.

Option A Use Local Client List

The Local Client List is a user list stored in your network device. When a remote LAN user dials-in to your network device, his/her user information will be validated by checking the user information stored in your network device. Your network device can save 64 user names and passwords. Your NETWORK DEVICE comes with a default user called "guest" which has no password to login. For security reasons you should either delete the user "guest" or give it a password.



Note! The client list used for LAN-to-LAN routing and the client list used for remote access is the same.

To add a new user click **Add User**. Enter the **User Name** and **Password** of this remote LAN.

Callback Type

Callback Type refers to the function whereby a remote client/LAN dials in to your network device and is then purposely disconnected to be called back to reverse the phone charges. There are three options for callback which are listed below

No CallBack	If No CallBack is selected this remote LAN will be restricted from callback service. This is the default entry.
Fixed CallBack	If Fixed CallBack is selected this remote LAN will be allowed to have callback service but the callback phone number is restricted to a preset phone number. This phone number is defined in the **Callback Telephone No** field.
Variable CallBack	If Variable CallBack is selected this remote LAN will be allowed to have callback service and will also be able to specify the callback phone number each time he/she dial-up.

Assign a Specific IP address for this Client

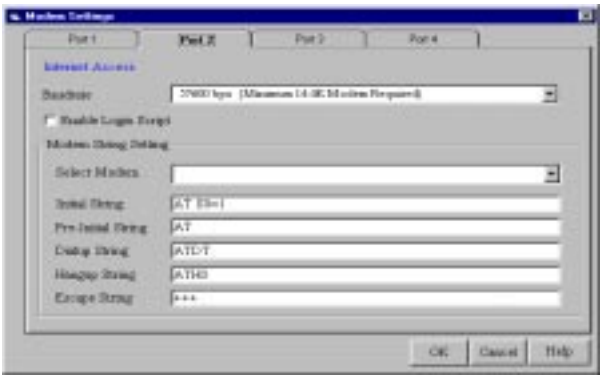
If you would like to have an IP address assigned for this specific LAN, first enable this setting and then input an IP address for this LAN. This IP address will always be used for this specific LAN and will override your IP address assignment method for this port.

Option B Use RADIUS Authentication

Choosing **RADIUS Configuration** will allow you to use the user information (user name, password, etc.) stored on a separate RADIUS server on the network. Basically a RADIUS server is just a popular user/password list that can keep track of accounting information as well as dial-in privileges. When a remote LAN dials-in to your network device, the LAN's user information will be validated by checking the user information stored in the network RADIUS server. RADIUS configuration is generally used for large companies or ISPs (Internet Service Providers) to keep track of many remote users.

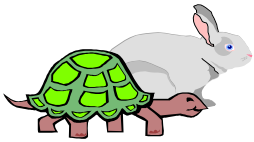
Modem Settings

The Modem Settings instructs each serial port of your network device of the basic communication instructions needed to communicate with the attached modem or ISDN TA.



Baudrate

The baudrate that you entered in Setup Wizard will be displayed here.



Note! The absolute maximum you should set the baudrate for a given port on your NETWORK DEVICE is 4 times the speed of your modem. If you set the baudrate too high your network device may not be able to dial-up a connection. For example if you have a 14.4Kpbs modem, the highest you should set the baudrate is 57.6Kbps. You should also be aware of the fact that since some ISP connections and phone lines are not of the greatest quality, this theoretical maximum speed is not attainable and you should set the baudrate at a lower speed.

Select Modem and Modem String Setting

The most important modem string is the initial string because your network device uses it to establish communication with your modem or ISDN TA. The modem initial string displayed here was configured automatically when you selected your modem or ISDN TA in Setup Wizard. If your modem is not listed in the Modem Selection List, the **Standard Modem** selection will work with most modems.

Note!

ISDN TA Setup

!!! Extremely Important !!!

Unfortunately, unlike most modems, ISDN initial strings vary between different ISDN TAs and there is no "Standard ISDN TA" initial string. If your ISDN TA is not listed in the modem selection list **you must find out what your ISDN TA initial string is**. Your ISDN TA's initial string should be listed in your ISDN TA user's manual. There are probably many initial strings listed for your ISDN TA. The one you are looking for is **Asyn-to-Syn PPP** (Asynchronous to Synchronous PPP). You can enter this initial string if you would like to use only one channel of your ISDN TA. If you would like to bundle both channels of your ISDN TA together, you need to use a different initial string called **Multilink-PPP**. For example, the initial strings for a Zyxel Omninet ISDN TA are:

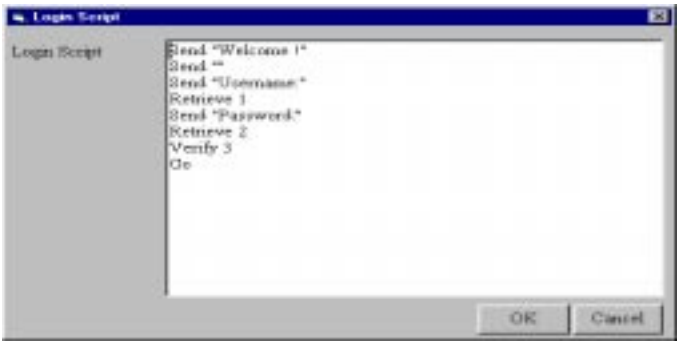
1) **ATB40**: Asyn-to-Syn PPP initial string
2) **AT&J3**: Multilink-PPP initial string

You should also verify that your ISDN TA supports the Dial-up string **ATDT**. Most ISDN TAs will support **ATDT** and usually the rest will support **ATD** or **ATDI**.

Please also note that to bundle the two channels of your ISDN TA together, you must enter the two phone numbers in the **Telephone Number** field of the General settings menu.

Edit Login Script for Remote Access

Note! If you have bought a network device that does not support remote access these settings do not apply and you can skip this section.



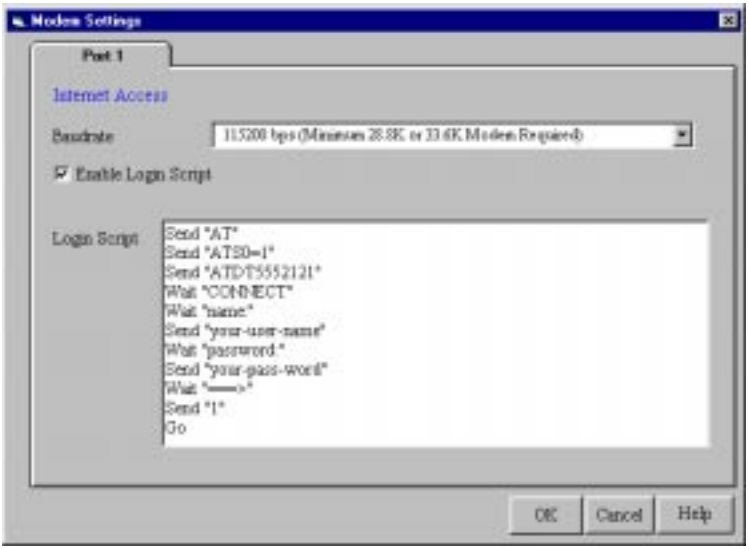
The Login Script above is the default login script for remote access. You most likely do not need to edit this script. If a remote access client has configured his computer to "bring up a terminal window after dialing", this remote access login script will begin.

Default Login Script Meaning	
Login Script	Meaning of Each Login Script Command
Send “Welcome”	Displays message “Welcome” to user
Send “”	Sends enter key command
Send “Username:”	Displays “Username” to user
Retrieve 1	Retrieves username and stores as variable 1
Send “Password:”	Displays “Password” to user
Retrieve 2	Retrieves password and stores as variable 2
Verify 3	Verifies both username and password. If password fail will go back to line 3

Note! More then likely, you can leave the Remote access login script as it's default entry. If you would like to modify it please reference the login script commands explained for the Internet Access login script.

Enable Login Script for Internet Access / LAN-to-LAN Routing

With the login script you can manually input the communication between your Modem and ISP for Internet access or your modem and router for LAN-to-LAN routing. Most ISPs support automatic PPP negotiation but if your ISP does not support automatic PPP negotiation you will have to enter a login script. You can also use the login script to enter a second backup ISP or write a script that makes your network device re-dial until a successful connection has been established. To write a login script, first click on the **Enable Login Script** option box. Your network device login script commands and some examples are provided on the next few pages.



Writing a Login script for Internet Access

Step A) Learn the Login Script Commands Available to you

Example Commands	Result
Send and SH	
Send “ATZ”	Resets Modem
Send “ATDT 555-3636”	Dials phone number 555-3636
Send “JohnSmith”	Types “JohnSmith” at ISP interface
SH “1234”	Types the “1234” at ISP interface but displays **** in Net-Device Monitor display to hide password
Send “”	Types Enter key at the ISP Interface (Important for ISPs like Compuserve)
Wait	
Wait 5	Modem will wait for 5 seconds before going to next command
Wait “CONNECT”	Modem will wait for “CONNECT” to come onto screen before going to next command
Wait “CONNECT” 6	Modem will wait for “CONNECT” to come onto screen before going to next command. If connect does not come onto screen modem will go back to line 6 of Login Script
Other	
Go	Begins PPP
Jump 4	Will go back to command line 4
Hangup	Hangs Up Modem

Step B) Get Login Script Information

Because every ISP has a different interface screen when logging in, you must check to see when and how your ISP requests information from you. Your network device uses PPP user service so when logging into your ISP please find out the selection for PPP Service.

Note! You can get your ISP interface log-in screen by doing a simple dial-up connection using the Dial-up Networking utility in Windows 95. Your Windows 95 **Dial-up Networking** folder is located in the **My Computer** icon.

For example, the screen below shows the opening display screen for an ISP called "HINET". The important parts of the screen where the ISP requests information are highlighted.

```
Annex Command Line Interpreter   *   Copyright
(C) 1988, 1995 Xylogics, Inc.

Checking authorization, Please wait...
Enter username: JChan
Enter password: *****

Last login: Sat Nov 15 12:20:53 1997 on
168.95.95.195/42 (022:03/001:43)
Permission granted

               (Welcome to HiNet)
 ********************************************
1. PPP users service
2. SLIP users service
3. Telnet service
4. Exit
 ( Please key-in your choice ) ===> 1

…..Switching to PPP.
```

Step C) Make your login Script

Below are two examples of the login scripts for our example ISP. On the left is the actual inputted login script. On the proceeding page we highlighted the important parts that you needed to note which are again highlighted below where they are used.

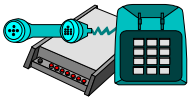
Example 1: Script for Normal Reliable ISP	
Login Script	Meaning of Each Login Script Command
Send “ATZ”	Resets modem
Send “AT S0 = 1”	Sends initial string “AT S0 = 1” to modem
Send “ATDT 5552121”	Dials phone number 555-2121
Wait “CONNECT”	Waits for ISP to send reply “CONNECT”
Wait “username:”	Waits for ISP to send reply “username”
SH “Jchan”	Sends the user- name “Jchan” to ISP
Wait “password:”	Waits for ISP to send reply “password”
Send “1234”	Sends password “1234” to ISP”
Wait “ ===>”	Waits for ISP to send reply “===>”
Send “1”	Selects option 1 (PPP) for this ISP
Go	Starts PPP mode

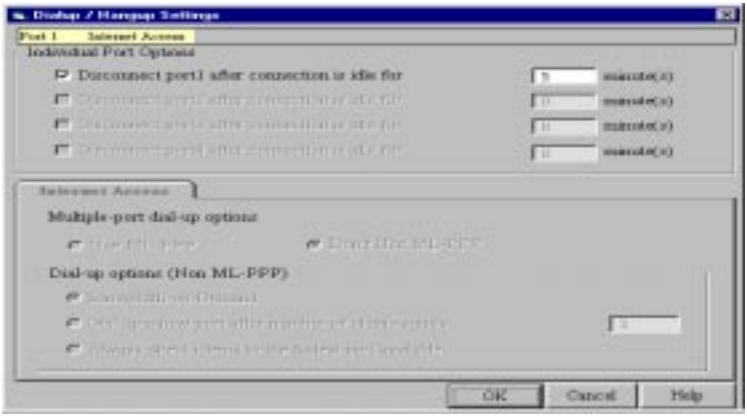
Example 2: Script for Unreliable ISP (Redial until connected)		
#	Login Script	Meaning of Each Login Script Command
1	Send “ATZ”	Resets modem
2	Send “AT S0 = 1”	Sends initial string “AT S0 = 1” to modem
3	Send “ATDT 5552121”	Dials phone number 555-2121
4	Wait “CONNECT” 2	Waits for ISP to send reply “CONNECT”. If not will go back to line 2 to re-dial
5	Wait “username:” 12	Waits for ISP to send reply “username”. If no response will go to line 12
6	Send “Jchan”	Sends the username “Jchan” to ISP
7	Wait “password:”	Waits for ISP to send reply “password”
8	SH “****”	Sends password “****” to ISP”
9	Wait “ ===>”	Waits for ISP to send reply “===>”
10	Send “1”	Selects option 1 (PPP) for this ISP
11	Go	Starts PPP mode
12	Hangup	Hangs up Modem
13	Jump 2	Goes back to line 2 to re-dial

Example 3: Script for unreliable ISP (2nd ISP backup)		
#	Login Script Example 2	Meaning of Each Login Script Command
1	Send “ATZ”	Resets modem
2	Send “AT S0 = 1”	Sends initial string “AT S0 = 1” to modem
3	Send “ATDT 5552121”	Dials phone number 555-2121 (ISP #1)
4	Wait “CONNECT” 12	Waits for ISP to send reply “CONNECT”. If not will go to line 12 for ISP #2
5	Wait “username:” 12	Waits for ISP to send reply “username”. If no response will go to line 12 for ISP #2
6	Send “Jchan”	Sends the username “Jchan” to ISP
7	Wait “password:”	Waits for ISP to send reply “password”
8	SH “1234”	Sends password “1234” to ISP”
9	Wait “ ===>”	Waits for ISP to send reply “===>”
10	Send “1”	Selects option 1 (PPP) for this ISP
11	Go	Starts PPP mode (Rest of script ignored)
12	Hangup	Hangs up Modem
13	Send “AT S0 = 1”	Sends initial string “AT S0 = 1” to modem
14	Send “ATDT 5553333”	Dials phone number 555-3333 (ISP #2)
15	Wait “CONNECT”23	Waits for ISP to send reply “CONNECT”. If not received will go to line 23.
16	Wait “username:” 23	Waits for ISP to send reply “username”. If no response will go to line 23
17	Send “Dblair”	Sends the user- name “DBlair” to ISP
18	Wait “password:”	Waits for ISP to send reply “password”
19	SH “5678”	Sends password “5678” to ISP”
20	Wait “ ===>”	Waits for ISP to send reply “===>”
21	Send “1”	Selects option 1 (PPP) for this ISP
22	Go	Starts PPP mode (Rest of script ignored)
23	Hangup	Hangs up Modem
24	Jump 2	Goes back to line 2 to re-dial ISP #1

Dial-up/Hang-up Settings

The Dial-up/Hang-up settings lets you choose how and when your network device dials-up and disconnects from your ISP (Internet Service Provider.)



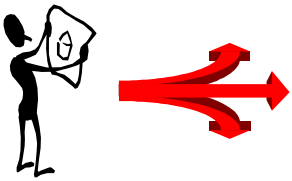


Individual Port Options

Individual Port Options lets you set the idle-time out function for each serial port of your NETWORK DEVICE. Here you can set the number of minutes you wish to let a connection stay idle before disconnecting.

Note! If you turn off the idle-timer, once a client establishes a connection, the connection will be maintained until you turn off your modem, unplug your network device or use the Terminate Connection function in Net-Device Monitor.

Multiple-port Dial-up options



If you have a single port NETWORK DEVICE you can skip this section. If your network device can connect to more than one modem or ISDN TA you have multiple options that you can use to regulate how and when your network clients access the multiple ports. You must first choose between two options; whether to use ML-PPP or not use ML-PPP.

???

What is ML-PPP?

Note! The ML-PPP function mentioned in this chapter has nothing to do with bundling the two channels of your single ISDN TA together. It is for bundling the serial ports of your network device into one channel. To bundle the two channels of a single ISDN TA together please refer to **General Settings – Internet Access**

Option A *Use ML-PPP*

Your ISP must support ML-PPP in order to use the ML-PPP function of your network device. If your ISP supports ML-PPP and you wish to use it, you need to choose what kind of ML-PPP you want to use.

1) Bandwidth-on-Demand

This selection will start ML-PPP for all serial ports after the bandwidth on the first port is saturated.

2) Dial-up a new port after number of clients equals ____

This selection will start ML-PPP for all serial ports after the number of clients using the first port for Internet Access equals a number of your choice.

3) Always Use ML-PPP

This selection will give your clients the fastest connection every time. ML-PPP will always be used starting when the first client accesses your network device.

Option B *Don't Use ML-PPP*

If you would rather not use ML-PPP or your ISP does not support it you can choose between three options:

1) Bandwidth-on-Demand

If Internet and phone line costs are expensive you can select this option to keep costs down. This option will dial-up a new connection through an unused port when an existing connection's bandwidth is already saturated.

2) Dial-up a new port after number of clients equals ____

With this option your network device will dial-up a new connection through an unused port for the next client when the number of clients using an existing connection reaches a certain number.

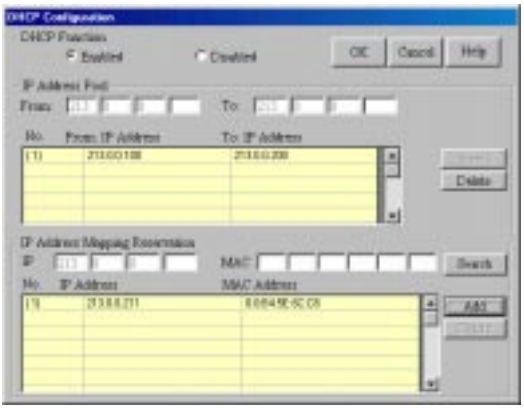
3) Always direct clients to an unused port first.

If using the Internet for your company comes at a flat rate or if costs do not matter this is the option for you. It will ensure that everybody using your network device gets the fastest non-ML-PPP connection possible.

DHCP Server

???

What is a DHCP Server?



DHCP Function

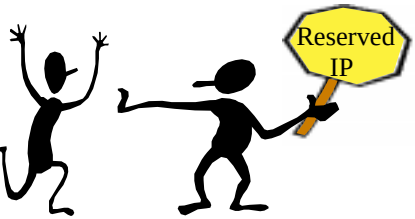
The default setting of your network device comes with the DHCP server already enabled. If you would like to disable the DHCP server click on the **Disabled** circle.

IP Address Pool

The **IP Address Pool** contains the range of the IP addresses that will automatically be assigned to the clients of your network. The default IP address range of the IP address pool is **100** to **200**. If you would like to change this range first select the range then enter a new range and press the insert button. To delete an IP address range first select it and then press the **Delete** button.

IP Address Mapping Reservation

You can use the IP Address Mapping Reservation option to give particular computers on your network the same static IP address every time they turn on their computer.



To assign a computer on your network a static IP address, you can enter the MAC address directly or you can use the MAC address searching tool by entering the IP address of the computer and then using the **Search** button to find the MAC address. Press the **insert** button to reserve the IP address for this computer.

To delete a static IP address first select it and then press the **Delete** button.

??? **Where can I find a computer's MAC address?**

Routing Table

The routing table lets your network device know about other subnet networks that are part of your LAN. For example if one subnet of your LAN has an IP address subnet of **192. 168 . 1. X** and another subnet of your LAN has an IP address subnet of **172 . 16 . 22 . X** , you need a network device like a router or switch to go between them. By setting the routing table, your network device will forward these packets to the appropriate router or through one of the serial ports on your network device.

???

What is a router?

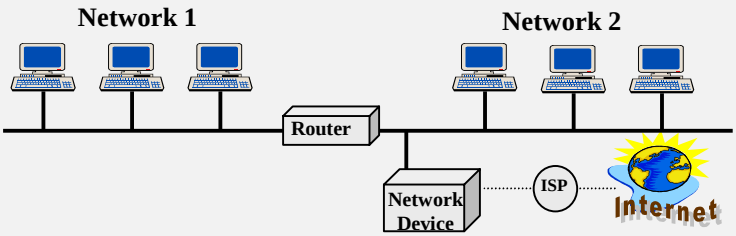
Note! If you need help in setting up specific LAN-to-LAN routing applications please **see the LAN-to-LAN applications guide**.

Note! If you have setup the LAN-to-LAN routing function located in the LAN-to-LAN settings of the General Settings Menu you do not have to setup the route again here. However, if you will be routing to multiple subnets you must enter the extra subnets in the routing table.

???

What is the purpose of the routing table?

The routing table is only important if you have routers on your LAN. The Internet is basically one giant network that uses IP addresses to locate it's different sites and works the same way as IP addressing on your LAN. Say your LAN has two networks and someone on Network 1 wants to send an E-mail locally to Network 2. How does that E-mail know to stay in the LAN and not go out through your gateway (i.e your network device)? The reason is because your router sees the E-mail that has an IP address corresponding to your other network and says "Hey, that E-mail is for the other network , don't go out through your network device. Come with me and I'll send you to the other network!"



In the above example your network device is setup on **Network 2**. The computers on Network 2 are on the same network subnet as your network device and will be able to access your network device. But what about the computers on **Network 1**? They aren't on the same subnet. To let the computers on Network 1 access your network device, first you have to set their gateway as the router. Then in the router itself you can set the router's gateway as your network device IP address. Lastly you have to setup the routing table in your network device like the example given on the previous page. Once these two things are done, the computers on Network 1 and the computers on Network 2 can both access your network device.

For each different subnet that you wish to route to, insert a route in the routing table.

1) IP/Netmask

Enter the IP/Netmask combination of packets that will be routed to your other network. For example if the other network has a subnet of 192.168.5.X you would enter:

IP : 192 . 168 . 2 . 0
Netmask : 255 . 255 . 255 . 0

2) Gateway

The gateway is the router on this local network that connects to your other subnet. Enter the IP address of this local router. Please note that this IP address should be in the same subnet as your network device. If the subnet you are routing to will be routed through one of the ports on this network device set for LAN-to-LAN routing, the gateway should be set as the IP address of your network device.

3) Interface

Select the interface that the routed packet should pass through. Select Local Network if you are using a separate router. If the subnet you are routing to will be routed through one of the ports on this network device set for LAN-to-LAN routing, the Interface should be set as the WAN port that connects to your other subnet.

In the example below, our local network has an IP address subnet of **213 . 0 . 0 . X**. Our remote network that we wish to route to has an IP address subnet of **172 . 16 . 22 . X**. The IP address of our router (the gateway) is **213 . 0 . 0 . 10**. Because we will be routing through a separate router and not through a port on our network device we have set the interface as **Local Network**.

Note!

The Internet and your LAN use the same type of addressing system; IP addresses. So if you have two networks on your LAN, it wouldn't be a good idea to use any IP addressing system on your network that used valid Internet IP addresses. Why? Because this could result in packets that are meant for another network on your LAN being sent through your network device. The solution is that there are certain IP addresses that have been reserved for use on LANs and will never be a valid registered Internet IP address. If you are setting up two networks on your LAN, it would be a good idea to use one of the following IP address subnets:

1) **10 . x . x . x**
2) **172 . 16 . x . x**
3) **192 . 168 . x . x**

- where **x** is any number between 0 and 255

???

What about Novell?

The newer Novell Servers support TCP/IP protocol and can be used to route another network's clients to your network device. If you are using a Novell server that doesn't support TCP/IP protocol to route between two networks, the other subnet will not be able to access your network device.

IP Mapping

With the IP Mapping function you can use your Internet connection to access your LAN from the Internet. For example, you can use the IP Mapping function to access an FTP server on your LAN via your ISP Internet connection.

How does it work? Your device is protected by a firewall. In fact the technology that your network device uses to let everyone on your network access the Internet was originally marketed as a firewall technology. What is this technology? It's called NAT (Network Address Translation). It lets everyone go out through one IP address but won't let anyone from the Internet come into your LAN. But what if you want to have access via the Internet to come in to your LAN. What if you want to poke some "holes" in the firewall? The IP Mapping function will allow you to poke those needed "holes" to let you into your LAN. It will let you specify which computers you allow access to and also which port numbers or services you allow access to on that computer.

Note!

What's my IP address?

How do you know what your external Internet IP address is so that you can access your LAN via the Internet? You can use the Net-Device Monitor which displays your external IP address above each serial port number.

Note!

Save on Long Distance Charges!

To save on long-distance charges, this function works with the callback ISP feature of your network device. **For more information on the callback function please click here.**

To enable the IP Mapping function click the Enabled circle.

For each service that you want to setup:

A) Select which protocol (Either TCP or UDP) the service uses. Most services use TCP (WWW, FTP, E-mail etc..).

B) Enter your IP address supplied by your ISP in the External IP field. If your ISP gives you a dynamic IP address, you can set this as 0.0.0.0. Your network device will then use whatever dynamic IP address your ISP gives you as the external IP.

C) Enter the port number for the service that you will be using for routing. Some common port numbers are listed below as well as a web address where you can find a list of the "Well known ports".

WWW Port# = 80
FTP Port# = 20 or 21
SMTP Port# = 25
POP3 Port# = 110

http://www.metadigm.co.uk/tech/portnum.txt

Note! If you would like to map all ports for this external IP address into a computer on your LAN you can enter the port number 0 . This will mean that whenever anyone accesses your external IP address they will be automatically be "mapped" into the internal computer that you specify regardless of what port number they are using.

???

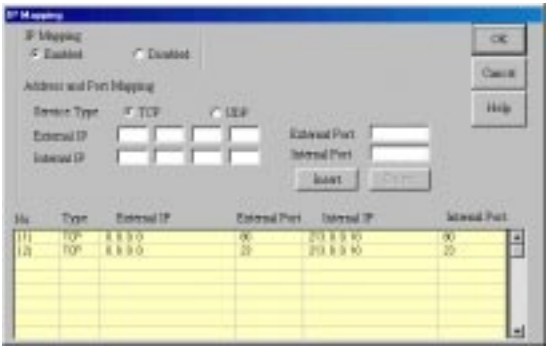
What is a Port Number?

D) Enter the IP address of the server that you want to allow acces to in the External address field. Enter the port number for the service that you will be using for this routing.

E) Press the Insert button to insert this mapping.

Note! A limitation of the IP Mapping function is that you can only use one computer per port. For example, if you set one computer to be mapped to support chat, only that computer can use that program. All request packets from the Internet with a port number corresponding to Chat will then be sent to the internal IP in the mapping.

IP Mapping Example (Web or other Server)



In this example we have set up a mapping with a Web page and Telnet server:

- Both services use TCP. WWW service has a port number of **80** and Telnet has a port number of **23**
- The **External** IP address that we are using is dynamic so we have entered **0 . 0 . 0 . 0.**
- Our Internet site server on our network has an IP address of **213 . 0 . 0 . 10**

Now anyone who tries to access our dynamic IP address will automatically be forwarded to our Internal network server at our internal IP address of **213 . 0 . 0 . 10**.

Note! If you would like to keep the connection permanently open after you have dialed-up your ISP, you should disable the idle-time out function. Click here for more info.

Client Filter Settings

The Client Filter lets you decide what services you allow on your

??? **What is a Port?**

Privileged Clients

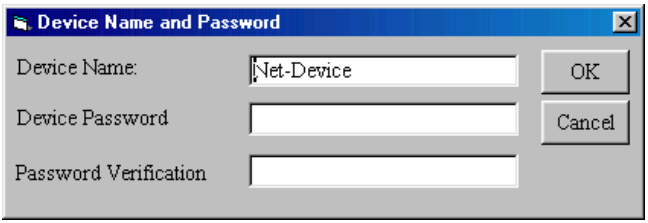
Local Clients

In the privileged client's table enter the clients that you wish to have access to the services that you have selected. The Client filter uses MAC addresses to filter. You can enter the MAC address directly or you can use the MAC address searching tool by entering the IP address of the computer and then using the **Search** button to find the MAC address.

Remote Clients

You can also filter Remote Clients by the port that they are coming in from. These settings only apply to network devices that have remote access or LAN-to-LAN routing capability. For example if you had set port 4 for LAN-to-LAN routing function and would like to add all clients from the remote LAN to the privileged client table you would check off "Include Port 4 clients as privileged clients.

Device Name and Password



Device Name

This field displays the name of your network device. If you would like to change this name, enter the new name in this field.

Device Password

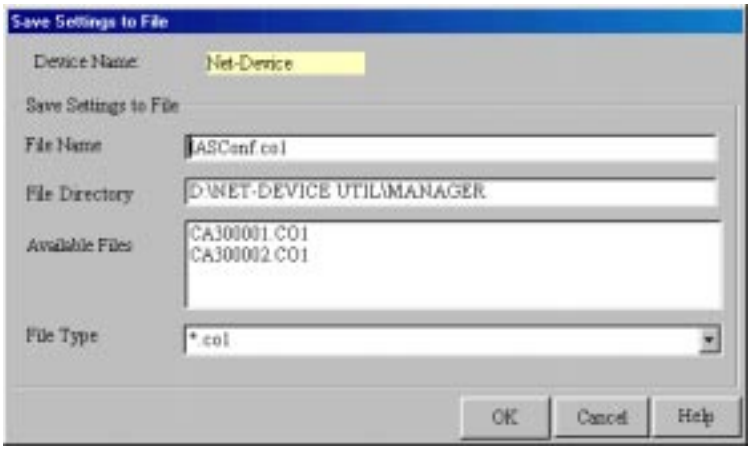
The **Net-Device Manager** does not come with a password. If you choose to give your network device a password, this password will be required the next time and subsequent times that you want to configure your network device. To enter a password, type your password in the **Device Password** field and type it again in the **Password Verification** field.

Warning!

If you choose to enter a password pick something that is easy to remember or write it down in a safe location. If you have completely forgotten your password please contact your place of purchase.

Save Settings to File

The **Save Settings to File** option lets you save the inputted settings to a file to be retrieved at a later time. This will be useful if your settings are deleted accidentally or you want to have more then one batch of settings.

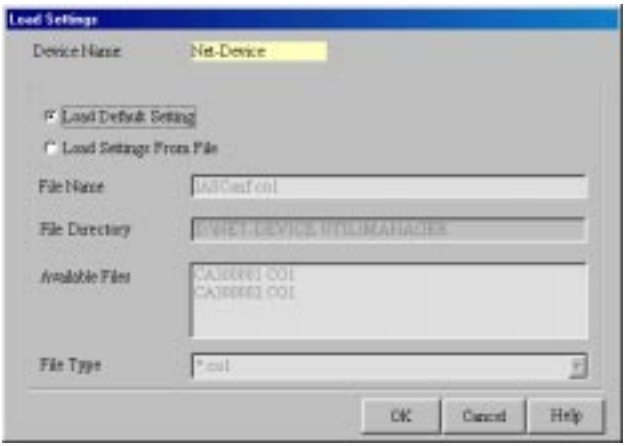


To save the inputted settings to a file, enter the file name in the **File Name** field. Please leave the file type extension as it's default entry because if you ever try and use the load settings function the manager program will look for the specific file extension that is compatible with your device. For example *.co1 is used only for 1 WAN port units and *.co2 is used only for 2 WAN port units.

Press the **OK** button to save the settings to a file.

Load Settings

The **Load Saved Settings** option lets you load the original default settings of your network device or previously saved settings.



First choose whether you want to load the default settings or load settings from a previously saved file. If you are loading previously saved settings from a file you can choose the directory by entering it in the **File Directory** field. The manager program will automatically detect files in the given directory that are compatible with your network device.

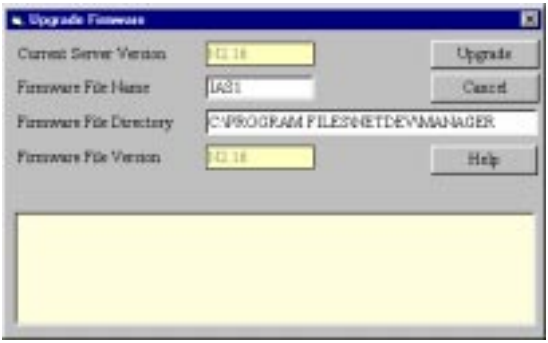
Press the **OK** button to load and apply the previous settings to your network device.

Upgrade Firmware

The Upgrade Firmware option allows you to upgrade the firmware that is in your network device.

??? **What is firmware?**

Note! This function upgrades the firmware actually in your network device and not the Net-Device Utilities on your Windows 95/NT.



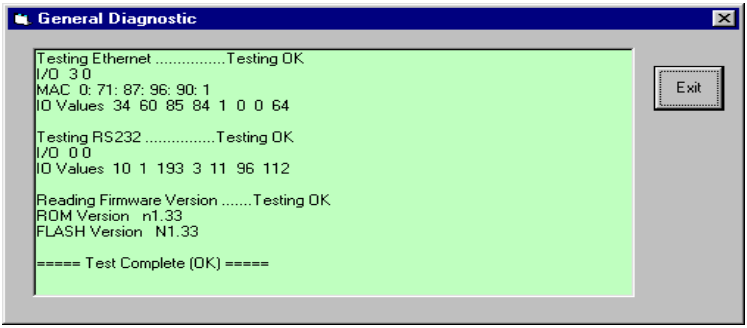
Enter the location of the new firmware file in the **Firmware File Directory**. Net-Device Manager will automatically detect the new firmware name and will be displayed in the **Firmware File Name** field. The **Firmware File Version** will display the version number of your new firmware. Press **Upgrade** to install your new Firmware.

??? **I Tried to Upgrade the firmare but now the manager program can't see the device! What do I do?**

General Diagnostic

The general diagnostic function will perform a check-up on your network device to make sure that everything is functioning correctly.

To start the general diagnostic press the **General Diagnostic** button from the main menu.

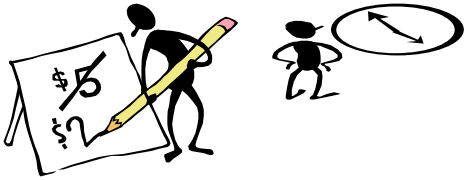


Net-Device Monitor

- Introduction
- Function buttons
- Tab Indicators

Back to Net-Device Utilities Menu

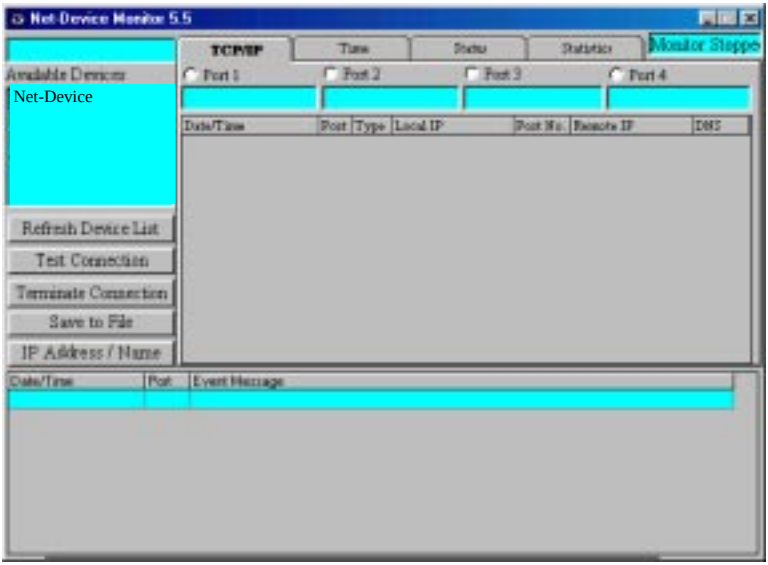
Net-Device Monitor



Net-Device Monitor is a utility that was designed to let you know what your network device is doing and also help you with any connection problems that you may have.

To Run Net-Device Monitor from your Desktop

On the Windows 95/NT **Start** menu point to **Programs**, then to **Net-Device Manager** and select **Monitor**.



Test Connection

The **Test Connection** function lets you test a connection between your network device, modem and ISP. This will test if you have inputted your Internet access settings correctly and whether a problem you may have is due to the modem, network device or some setting that you may have inputted incorrectly.

To test a connection select the network device you want to test and press the **Test Connection** button. Select which port you want to test from the option buttons.

Test Connection will then use the selected port and the modem attached to it to dial-up your ISP and establish a connection.

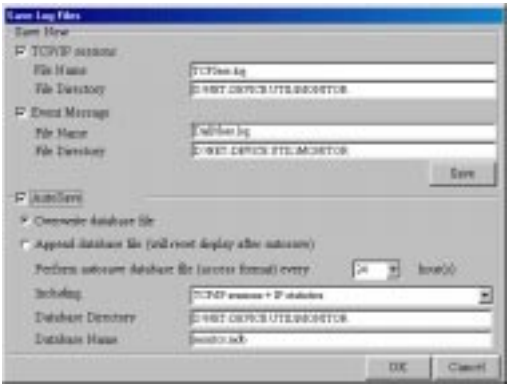
Terminate Connection

The Terminate Connection function was designed to allow the network administrator the ability to terminate a connection of your network device instantly at any time.

To terminate a connection select the server in the **Available servers** box, and press **Terminate connection**. Press the **Disconnect button** corresponding to the port you want to disconnect.

Save to File

If you would like to save the current monitoring session to a file you can click the **Save to File** button.



Save Now

If you wish to save the monitor display now, first select which displays of the monitor you wish to save. You can choose the file name and file directory that you would like to save the file to. Press the **Save** button to save your present monitor session.

Autosave

If you wish to periodically save the monitor display to a database file, enable the **autosave** function. Options include:

1) Overwrite database file

Will periodically save the monitor display to a database file based on the time that you specify, **overwriting** the last saved database file.

2) Append database file (will reset after autosave)

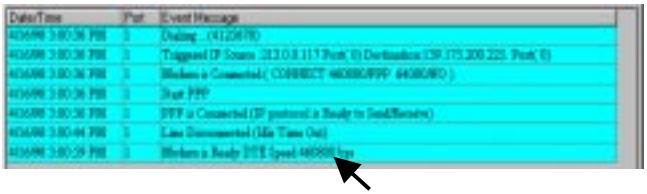
Will automatically save the monitor display to a database file based on the time that you specify, updating and **appending** the last file. Please note that with this option after autosave has appended the database, the monitor will reset and the display screens will be cleared.

IP Address / Name

This function will let you associate a name for specific IP addresses and names on your computer and will be displayed in the relevant monitor displays. This will make it easier for you to see which specific user is transmitting or receiving data without having to remember their specific IP addresses. For this function to work you must give these users fixed IP addresses on your network. This can be done on each individual computer or by using your network device's **DHCP server IP mapping reservation system.**

Event Messages

The event message display located in the lower part of Net-Device Monitor, displays the communication occurring between your network device, modem or ISDN TA and ISP.



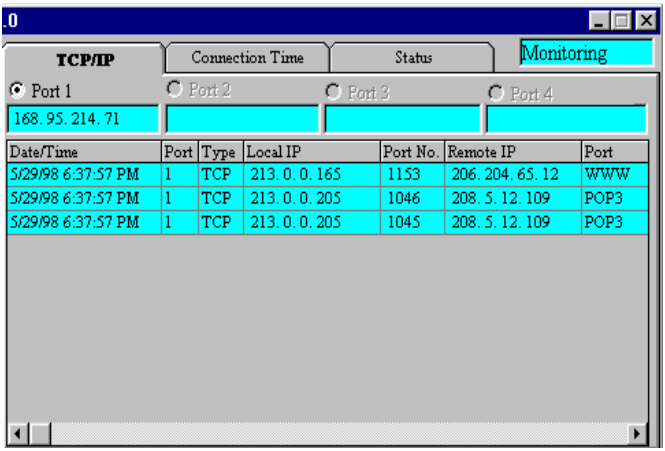
Note! You can use your mouse to point and click on any of the event messages to bring up a help screen. If any errors have occurred you can use this as a guide to help you fix the problem.

TCP/IP Tab

The TCP/IP Tab displays all the TCP/IP requests made by your network device. If you have a network device with multiple ports you will be able to select which port you want to view. For each new IP address request:

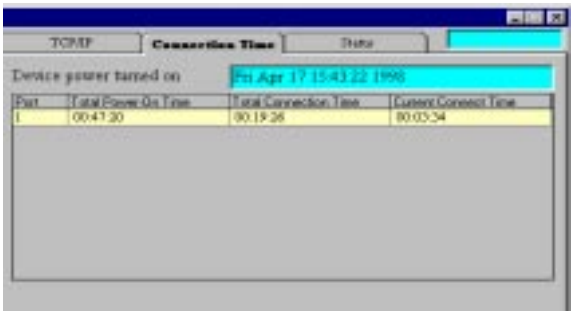
- **Date/Time** will tell you when the request was made
- **Port** will tell you which port you are viewing
- **Type** will tell you what type of request is being made
- **Local IP** will tell you which IP address the request originated from.
- **Remote IP** will tell you what the IP address that was requested.
- **Port No.** will tell you what port was requested

??? **What is a Port?**



Connection Time Tab

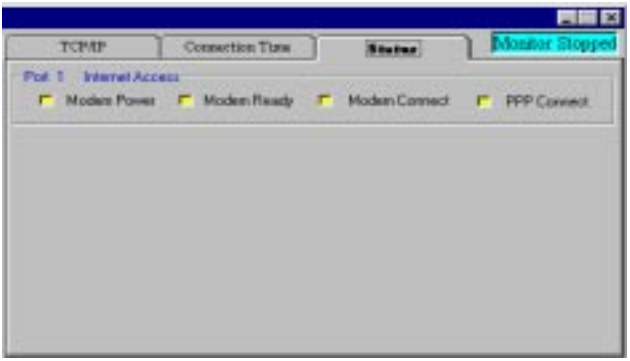
- **Device power turned on** will display the time when your network device was last turned on.
- **Total Power-On-Time** will display the total time since your network device was last turned on.
- **Total Connection Time** will display the total connection time to your ISP that has been logged since the device was last turned on.
- **Current Connect Time** will display the time that has elapsed since the current connection was established.



Status Tab

The Status tab will display four things:

1) **Modem Power**: If your network device detects that your modem is turned on, this indicator light will be lit.
2) **Modem Ready**: Your network device will send pre-initial and initial commands to your modem or ISDN TA. If the communication is successful, this indicator light will be lit and your modem is ready to dial a connection.
3) **Modem Connected**: If your network device has detected that your modem or ISDN TA has successfully dialed up a connection to a remote site, this indicator light will be lit.
4) **PPP Connected**: After the connection is established, if your network device has detected that PPP has successfully started, this indicator light will be lit.



Statistics Tab

The statistics tab will let you know how many bytes of data has come in and out through your network device and through which ports. The statistics tab will display for each IP address using the network device:

Tx Bytes: the number of bytes transmitted from the computer with this IP address.

Rx Bytes: the number of bytes received from the computer with this IP address.

Total Bytes: the total number of bytes that have been received and transmitted from the computer with this IP address.

Setting up your PCs for Internet Access

- Setting up a PC
- Setting up specific applications

Back to Main Menu

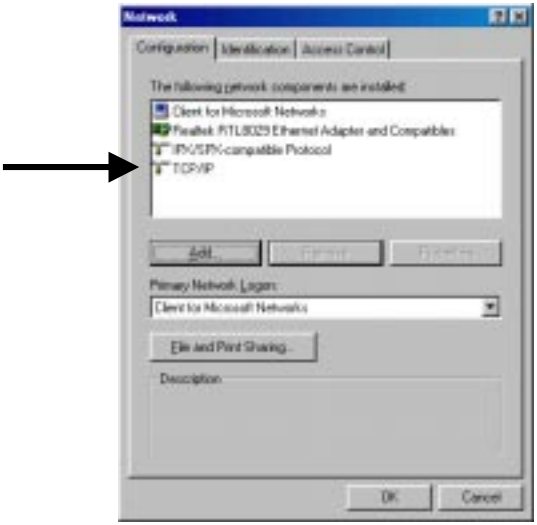
Internet Access : Setting up a PC

STEP 1
TCP/IP Protocol needs to be installed on the PC

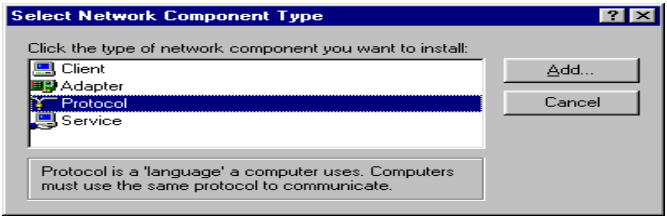
In order for a computer to access the Internet **TCP/IP Protocol** must be installed on that computer. To install or check if **TCP/IP protocol** is installed on a Windows 95/98/NT PC:

A. On the Windows 95/98/NT **Start** menu, point to **Settings** and click **Control Panel**. Click the **Network** icon to open the **Network** window.

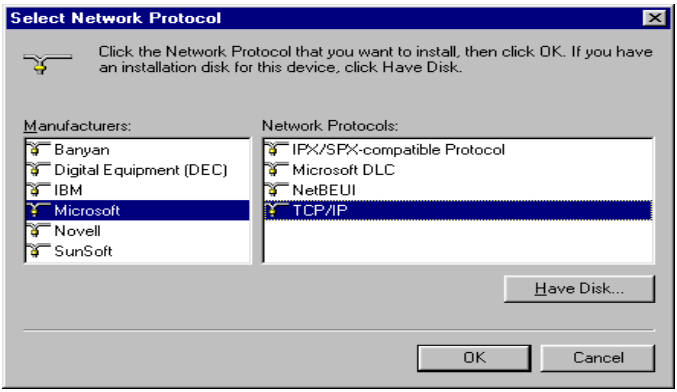
B. If you do not see TCP/IP protocol in "**The following network components are installed**" window you must install it. If TCP/IP protocol is already installed on this computer, please proceed to Step 2.



C. To install TCP/IP click the **Add** button on the Configuration tab. Select **Protocol** and click the **Add** button.



D. Choose Microsoft in the Manufacturers option box and TCP/IP in the Network protocols option box.



E. Click the **OK** button to return back to the Network window where you will see TCP/IP installed under the "**The following network components are installed**" Window.

Step 2
Each PC needs an IP address

The default setting of Windows 95/98 lets your computer automatically get it's IP information (IP Address, DNS Server IP address and Gateway) from the DHCP server that is built-in to your network device. To check or change this setting:

In the same **Network** window as step 1 page, select **TCP/IP** in the "**The Following Network Components are Installed**" window and click **Properties**.

Option A

If you would like to have your network device assign this computer an IP address automatically, on the **IP Address** tab select "**Obtain IP address automatically"** and press **OK**.

Note! If you select "Obtain IP address automatically", this computer will also automatically retrieve it's other TCP/IP information from the DHCP server including it's **Gateway** and **DNS Configuration**.

Warning!

As a general rule you should only have one DHCP server working on your network. If you decide to use a different DHCP Server instead of the DHCP server in your network device, you should disable your network device's DHCP Server. You should also set your network device as your gateway in the other DHCP server .

Option B

If you would like to give this computer a static IP address you can enter it here. Please note that when giving your computer a static IP address you must assign it's:

1) IP address
2) Gateway
3) DNS Server IP Address

In the same **Network** window as step 1, select **TCP/IP** in the "**The Following Network Components are Installed**" window and click **Properties**. On the **IP address** tab select **Specify an IP address** and enter the IP address you want to assign to this computer. Also be sure to enter the **Subnet Mask** of this IP Address which is probably **255 . 255 . 255 . 0**

On the **Gateway** tab enter the IP address that you gave your network device in Setup Wizard and press the **Add** button.

On the **DNS Configuration** tab enter the DNS Server IP address given to you by your ISP and press **Add**.

In the above example we have set the IP address of our IAS (**213 . 0 . 0 . 1**) in the **Gateway** tab and our DNS Server IP address (**168 . 95 . 192 . 5**) in the **DNS Configuration** tab.

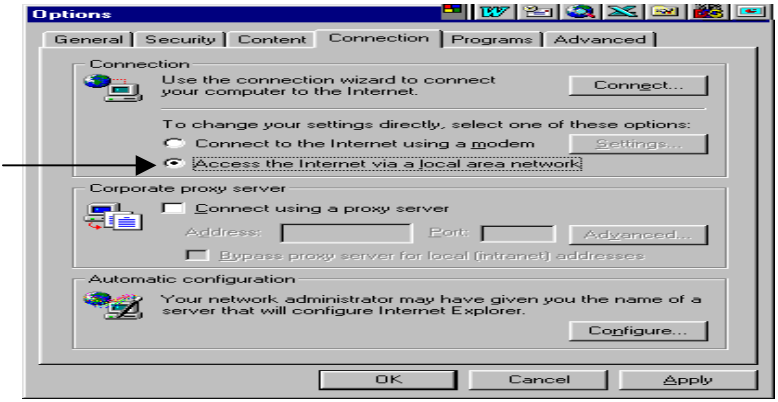
Setting up Specific PC Applications

You and your network client's will be connecting to the IAS through your LAN. This means that when using applications (Netscape, Internet Explorer, etc.) you must set the applications to connect through their LAN. Some examples follow:

Note! Unfortunately we can't list all the Internet applications and versions that you might be using but in all Internet programs there is probably an option field where you can specify how you want to connect the application to the Internet. To use your network device you must set it to connect through your LAN.

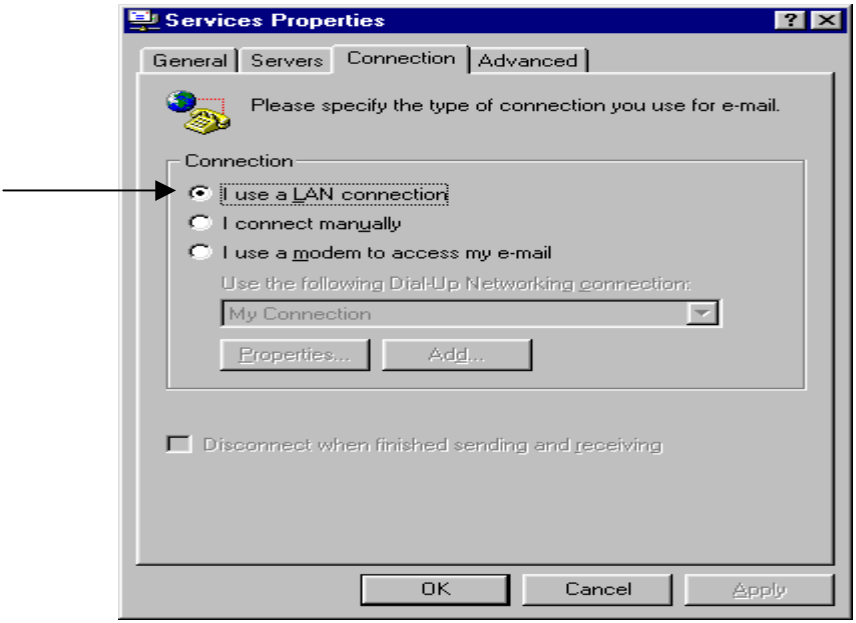
Setting Microsoft Internet Explorer 4.0

On the Internet Explorer **View** menu, click **Options**. Select the **Connection** tab and select the **Access the Internet via a Local Area Connection**. Press **Apply** to enable the new setting and **OK** to exit.



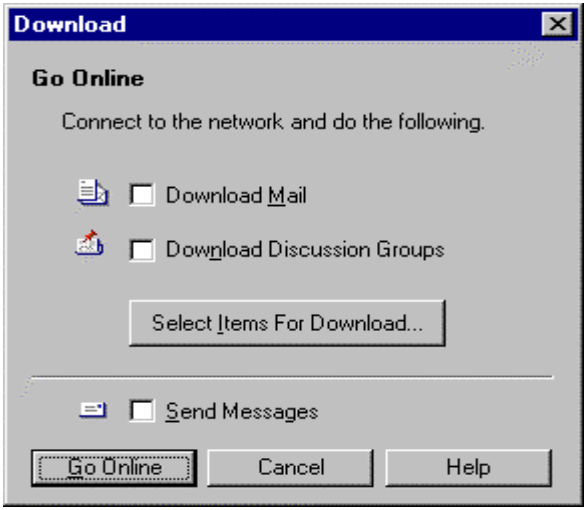
Setting Microsoft Outlook/ Microsoft Exchange

On the **Tools** menu select **Services**. On the **Services** tab select the E-mail profile that you are using and press the **Properties** button. On the **Connection** tab choose "**I use a LAN connection**". Press **Apply** to enable the new setting and **OK** to exit.



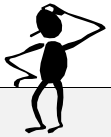
Setting Netscape Communicator

To set Netscape you must set the browser to Go Online through your LAN. You can do this by selecting **Go Online** in the **File Menu**. The following display screen will open on your screen.



Press **Go Online**. Netscape will then be able to access the Web through your LAN.

Some Internet Access FAQs



Q: Can my network device support both dynamic and fixed IP Addresses from my ISP?
A: Yes, your network device supports both dyanmic and fixed IP addresses.

Q: How many simultataneous sessions can my network device handle?
A: Each serial port can simlutaneously handle 16 FTP plus 32 others (WWW, Telnet, mail etc.). For example you can have 32 computers on your network surfing the Internet at the same time or one computer with 32 web browsers surfing on different web sites.

Q : How many simultaneous clients can my network device handle?
A : Each serial port on your network device can handle 32 simultaneous clients

Q : Can my network device be used with Novell or other Networks?
A : Yes. For your network device to work, TCP/IP protocol just needs to be installed on client computers. The computers don't have to interact with Novell or any other servers to access your network device.

Setting up Your Remote Access PCs

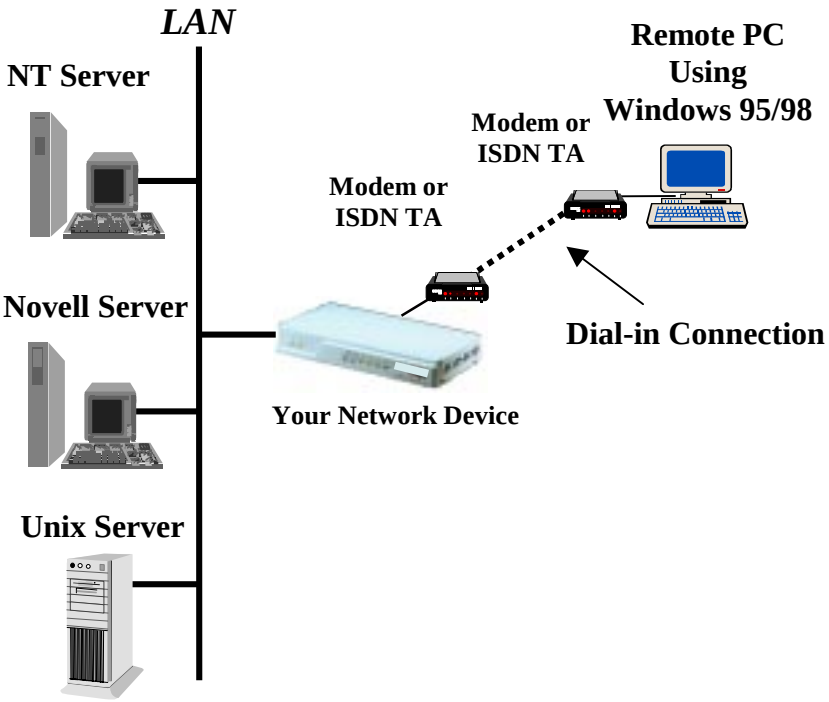
- **Setting up a Win95/98 Client for Remote Access**
  - **Setting up Win95/98 to access NT Server**
  - **Setting up Win95/98 to access NetWare Server**
  - **Setting up Win95/98 to access NT Server and NetWare Server**
  - **Setting up Win95/98 to access Unix Server**

Back to Main Menu

Setting up a Win 95/98 Client for Remote Access

Overview

There are separate configurations for Windows 95/98 that you must set to dial-in to Windows NT, Novell and Unix. This section will go through all the settings needed for your Windows 95/98 to connect to these different servers.



Setting up a Remote Windows 95/98 Client to access a Windows NT Server

Open Your Windows 95/98 Network Window

1. In the Windows 95/98 **Start** menu, point to **Settings** and click **Control Panel**.
2. Double click the **Network** icon to open the **Network** Properties Display.

Add Microsoft Dial-up Adapter:

1. Click the **Add** button
2. Select **Adapter** and click the **add** button

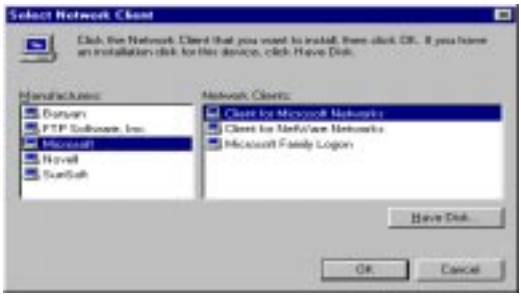
3. Choose **Microsoft** in the **Manufacturers** option box and **Dial-up adapter** in the **Network adapters** option box. Click the **OK** button.

Add TCP/IP Protocol

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **TCP/IP** in the **Network Protocols** option box.
4. Click the **OK** button.

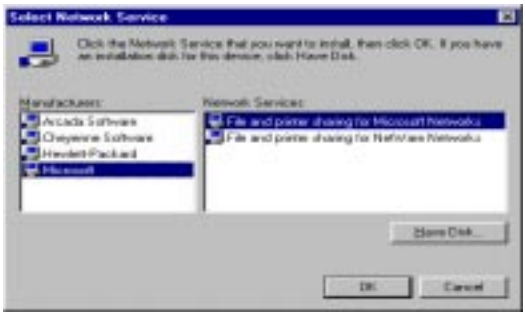
Add Client for Microsoft Networks

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **Client for Microsoft Networks** in the **Network Clients** option box.
4. Click the **OK** button.



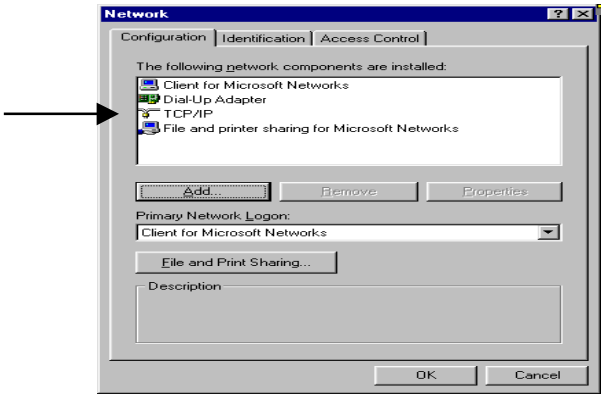
Add File & Print Sharing for MS Networks

1. Click the Add button
2. Select **Services** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **File and Printer Sharing for Microsoft Networks**.



Set Your Primary Network Logon

In the **Primary Network Logon** drop down menu, select **Client for Microsoft Networks**



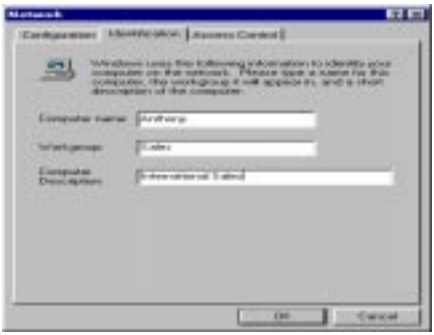
Setup Properties of Components

1. In **"The following components are installed"** window select TCP/IP -> Dial-Up Adapter and click the **Properties** button to open the TCP/IP Properties Screen. On the **IP Address** tab make sure **Obtain an IP address automatically** is selected and press **OK**

2. In **"The following components are installed"** window Select Client for Microsoft Networks and click the **Properties** button. On the **General** tab, enable the "**Log On to Windows NT Domain**" check box. In the **Windows NT Domain** field enter the name of your Windows NT Domain and press **OK**.

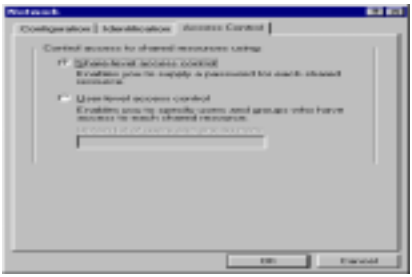
Set your Identification

1. On the **Network** window select the **Identification** tab.
2. In the **Workgroup** field enter the name of your NT domain. If you're not sure what the name of your NT domain is please ask the administrator of your NT server.
3. Enter a name for your computer and a description of your computer in the **Computer name** and **Computer Description** fields. These are for personal use only and can be anything you wish.



Set Your Access Control

1. In the **Network** window select the **Access Control** tab.
2. In the "**Control Access to shared resources using:"** option box, select **Shared-level access control**.



Restart Windows 95/98

Make Your New Connection

1. Double Click the **My Computer** icon on your Desktop
2. Open up your Dial-up Networking Folder
3. Configure a new dial-up connection by double clicking the **Add New Connection** button.
4. Follow the instructions to completion

Set Dial-up Type

1. After you have made your new connection, select it, click the right mouse button and select **Properties**
2. Click the **Server Type** button
3. Enable <u>ONLY</u> **Log on to Network, Enable Software Compression** and **TCP/IP** as shown below.

Dial-up your network device

You are now ready to dial-up your network device. Double click on the new connection that you have made and enter the username and password that is configured for you in your network device. Press the **Connect** button. After you have connected to your network device, your remote Windows 95/98 computer will behave exactly like a real node on your network.

Setting up a Remote Windows 95/98 Client to access a Novell NetWare Server

Open Your Windows 95/98 Client Network Window

1. In the Windows 95/98 **Start** menu, point to **Settings** and click **Control Panel**.
2. Double click the **Network** icon to open the **Network** Properties Display.

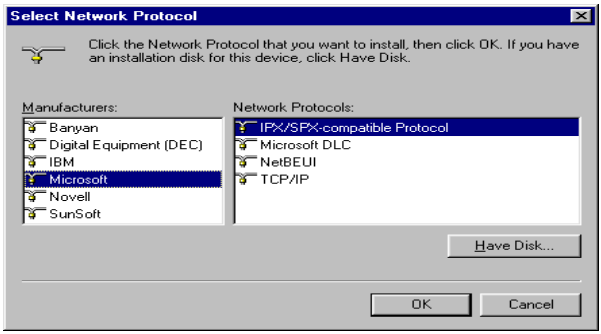
Add Microsoft Dial-up Adapter:

1. Click the **Add** button
2. Select **Adapter** and click the **add** button

3. Choose **Microsoft** in the **Manufacturers** option box and **Dial-up adapter** in the **Network adapters** option box. Click the **OK** button.

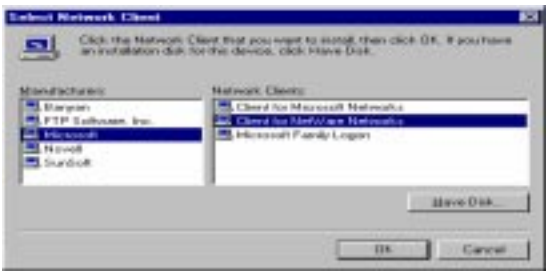
Add IPX/SPX Protocol

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **IPX/SPX Compatible Protocol** in the **Network Protocols** option box.
4. Click the **OK** button.



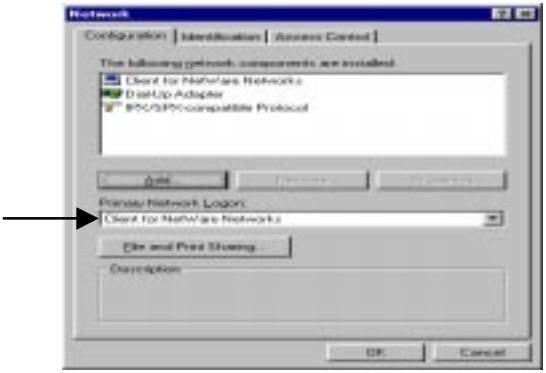
Add Client for Netware Networks

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **Client for Netware Networks** in the **Network Clients** option box.
4. Click the **OK** button.



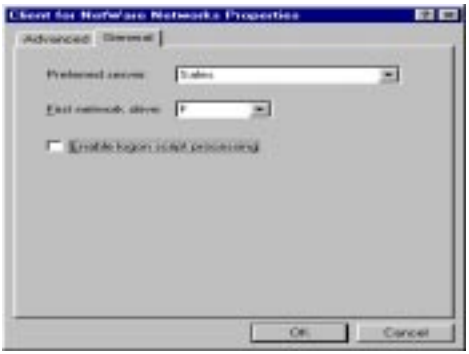
Set Your Primary Network Logon

In the **Primary Network Logon** drop down menu, select **Client for Netware Networks**.



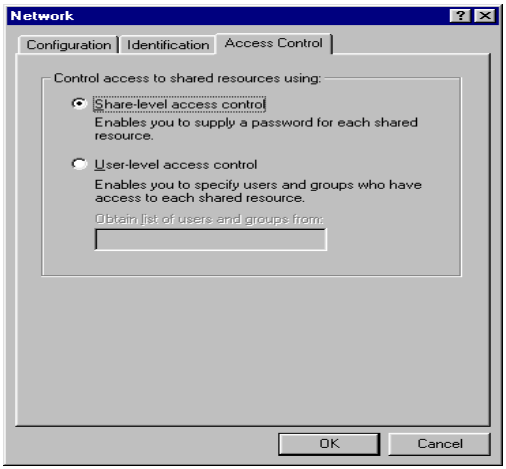
Setup Properties of Components

In **"The following components are installed"** window Select Client for NetWare Networks and click the **Properties** button. On the **General** tab, in the the "**Preferred Server**" enter the name of your Novell Netware Server Domain and select the **First Network Drive**.



Set Your Access Control

1. In the **Network** window select the **Access Control** tab.
2. In the "**Control Access to shared resources using:"** option box, select **Shared Level Access Control**.



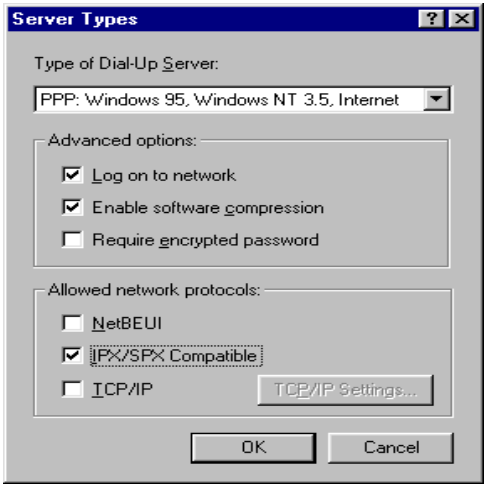
Restart Windows 95/98

Make Your New Connection

1. Double Click the **My Computer** icon on your Desktop
2. Open up your Dial-up Networking Folder
3. Configure a new dial-up connection by double clicking the **Add New Connection** button.
4. Follow the instructions to completion

Set Dial-up Type

1. After you have made your new connection, select it, click the right mouse button and select **Properties**
2. Click the **Server Type** button
3. Enable ONLY **Log on to Network, Enable Software Compression** and **IPX/SPX** as shown in the diagram.



Dial-up your network device

You are now ready to dial-up your network device. Double click on the new connection that you have made and enter the username and password that is configured for you in your network device. Press the **Connect** button. After you have connected to your network device, your remote Windows 95/98 computer will behave exactly like a real node on your network.

Setting up a Remote Windows 95/98 Client to Access a Windows NT Server and Novell NetWare Server

Note!

Before going to your remote site to configure the client please first make sure that the Windows NT Server has TCP/IP already installed

Open Your Windows 95/98 Client Network Window

1. In the Windows 95/98 **Start** menu, point to **Settings** and click **Control Panel**.
2. Double click the **Network** icon to open the **Network** Properties Display.

Add Microsoft Dial-up Adapter:

1. Click the **Add** button
2. Select **Adapter** and click the **add** button

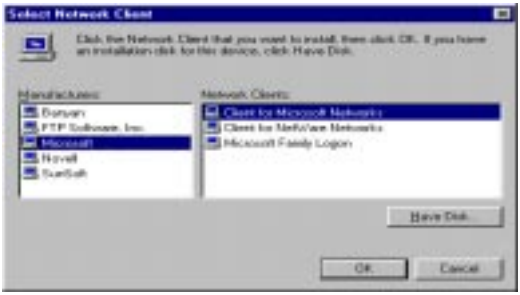
3. Choose **Microsoft** in the **Manufacturers** option box and **Dial-up adapter** in the **Network adapters** option box. Click the **OK** button.

Add TCP/IP Protocol

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **TCP/IP** in the **Network Protocols** option box.
4. Click the **OK** button.

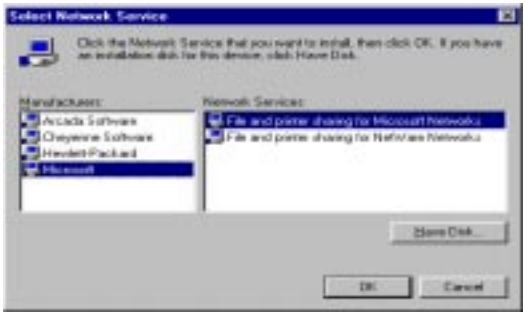
Add Client for Microsoft Networks

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **Client for Microsoft Networks** in the **Network Clients** option box.
4. Click the **OK** button.



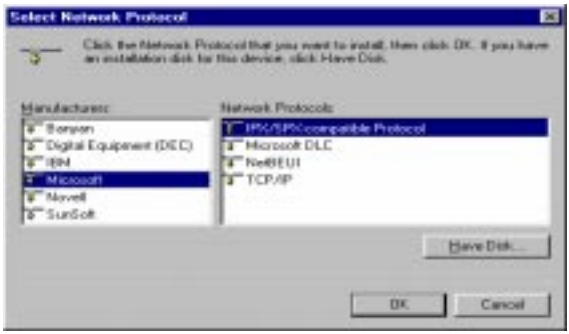
Add File & Print Sharing for MS Networks

1. Click the Add button
2. Select **Services** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **File and Printer Sharing for Microsoft Networks**.



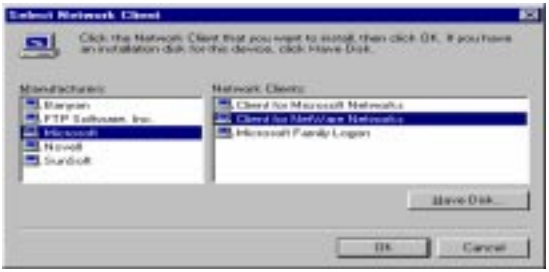
Add IPX/SPX Protocol

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **IPX/SPX Compatible Protocol** in the **Network Protocols** option box.
4. Click the **OK** button.



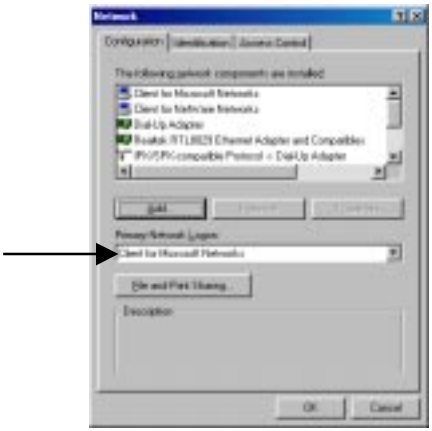
Add Client for NetWare Networks

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **Client for Netware Networks** in the **Network Clients** option box.
4. Click the **OK** button.



Set Your Primary Network Logon

In the **Primary Network Logon** drop down menu, select **Client for Microsoft Networks**

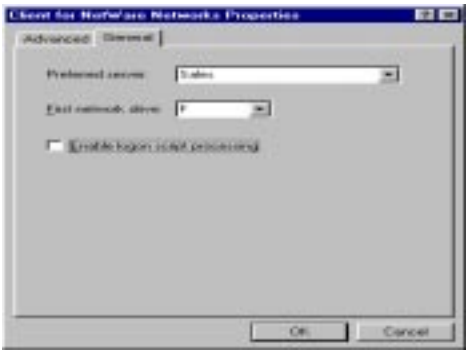


Setup Properties of Components

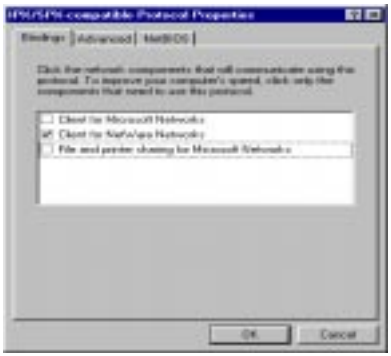
1. In **"The following components are installed"** window select and TCP/IP -> Dial-Up Adapter click the **Properties** button to open the TCP/IP Properties Screen. On the **IP Address** tab make sure **Obtain an IP address automatically** is selected and press **OK**

2. In **"The following components are installed"** window Select Client for Microsoft Networks and click the **Properties** button. On the **General** tab, enable the "**Log On to Windows NT Domain**" check box. In the **Windows NT Domain** field enter the name of your Windows NT Domain and press **OK**.

3 In **"The following components are installed"** window Select Client for NetWare Networks and click the **Properties** button. On the **General** tab, in the the "**Preferred Server**" enter the name of your Novell Netware Server Domain and select the **First Network Drive**.

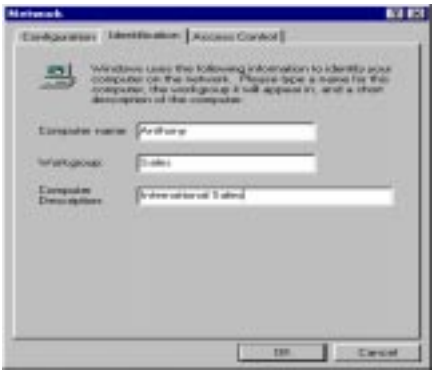


4. In **"The following components are installed"** window select IPX/SPX-compatible Protocol and click the **Properties** button. You must <u>DISABLE</u> **Client for Microsoft Networks** and **File and printer sharing for Microsoft Networks**. This will make sure that when you login to your NT your Windows 95/98 computer will use TCP/IP protocol. You also must <u>ENABLE</u> **Client for Netware Networks**



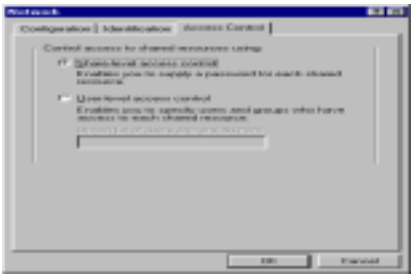
Set your Identification

1. On the **Network** window select the **Identification** tab.
2. In the **Workgroup** field enter the name of your NT domain. If you're not sure what the name of your NT domain is please ask the administrator of your NT server.
3. Enter a name for your computer and a description of your computer in the **Computer name** and **Computer Description** fields. These are for personal use only and can be anything you wish.



Set Your Access Control

1. In the **Network** window select the **Access Control** tab.
2. In the "**Control Access to shared resources using:"** option box, select **Shared Level Access Control**.



Restart Windows 95/98

Make Your New Connection

1. Double Click the **My Computer** icon on your Desktop
2. Open up your Dial-up Networking Folder
3. Configure a new dial-up connection by double clicking the **Add New Connection** button.
4. Follow the instructions to completion

Set Dial-up Type

1. After you have made your new connection, select it, click the right mouse button and select **Properties**
2. Click the **Server Type** button
3. Enable ONLY **Log on to Network, Enable Software Compression, IPX/SPX** and **TCP/IP** as shown in the diagram.

Dial-up your network device

You are now ready to dial-up your network device. Double click on the new connection that you have made and enter the username and password that is configured for you in your network device. Press the **Connect** button. After you have connected to your network device, your remote Windows 95/98 computer will behave exactly like a real node on your network.

Setting up a Remote Windows 95/98 Client to access a Unix Server

Open Your Windows 95/98 Client Network Window

1. In the Windows 95/98 **Start** menu, point to **Settings** and click **Control Panel**.
2. Double click the **Network** icon to open the **Network** Properties Display.

Add Microsoft Dial-up Adapter:

1. Click the **Add** button
2. Select **Adapter** and click the **add** button

4. Choose **Microsoft** in the **Manufacturers** option box and **Dial-up adapter** in the **Network adapters** option box. Click the **OK** button.

Add TCP/IP Protocol

1. Click the Add button
2. Select **Protocol** and click the **Add** button
3. Choose **Microsoft** in the **Manufacturers** option box and **TCP/IP** in the **Network Protocols** option box.
4. Click the **OK** button.

Setup Properties of Components

In **"The following components are installed"** window select TCP/IP -> Dial-Up Adapter and click the **Properties** button to open the TCP/IP Properties Screen. On the **IP Address** tab make sure **Obtain an IP address automatically** is selected and press **OK**

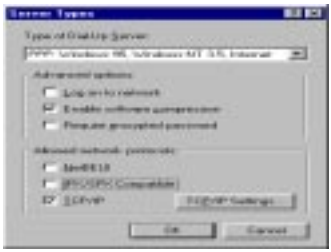
Restart Windows 95/98

Make Your New Connection

1. Double Click the **My Computer** icon on your Desktop
2. Open up your Dial-up Networking Folder
3. Configure a new dial-up connection by double clicking the **Add New Connection** button.
4. Follow the instructions to completion

Set Dial-up Type

1. After you have made your new connection, select it, click the right mouse button and select **Properties**
2. Click the **Server Type** button
3. Enable <u>ONLY</u> **Enable Software Compression** and **TCP/IP** as shown in the diagram.



Dial-up your network device

You are now ready to dial-up your network device. Double click on the new connection that you have made and enter the username and password that is configured for you in your network device. Press the **Connect** button. After you have connected to your network device, your remote Windows 95/98 computer will behave exactly like a real node on your network.

Setting up Your PCs for LAN-to-LAN Routing

- **Introduction**
- **Setting up a Win 95/98 as a file server**

Back to Main Menu

Setting up your PCs for LAN-to-LAN Routing

For LAN-to-LAN routing most of the setting up is done in the Net-Device Utilities when you configure IP routing in your network device. This section will give you an overview on how to make LAN-to-LAN routing easier and show you some of the benefits and limitations of LAN-to-LAN routing.

Note! If you need help in setting up specific LAN-to-LAN routing applications please **click here to open the LAN-to-LAN applications user's guide located on your CD-ROM**.

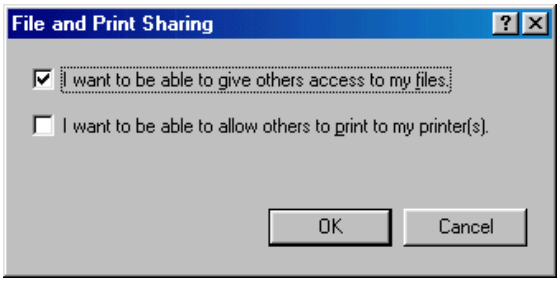
Setting up Windows 95/98 as a File Server

If you would like to share files over your network but don't want to have to install Windows NT you can also use Windows 95/98 to share files. To setup your computer for file sharing:

A. On the Windows 95/98/NT **Start** menu, point to **Settings** and click **Control Panel**. Click the **Network** icon to open the **Network** window.

B. Click the **File and Printer** sharing button

C. Enable the **I want to be able to give others access to my files** selection.



D. If you haven't already done so you should make sure to give this computer a fixed IP address on your network. To do this, in the same **Network** window as step 1 page, select **TCP/IP** in the "**The Following Network Components are Installed**" window and click **Properties**. Here you can give this computer a unique IP address on your network. You will then have to reset your computer for the settings to take effect.

E. Use the **My Computer** directory structure to find the drive or file on this computer that you want to make available for sharing. **Right** Click on the file or drive that you want to share. Select **Sharing**.

F. Enable sharing by selecting **Shared As**. Choose the name that you want to give this computer on your network and select other options

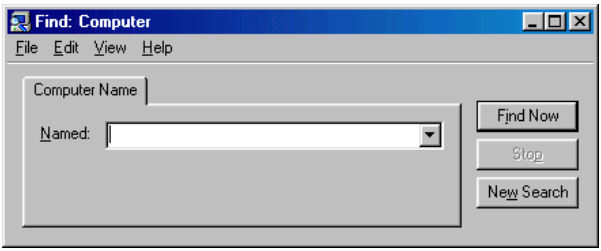
G. You also must make sure that computers that you want to use this sharing function are in the same workgroup. In the original network window select the **Identification** tab. If for example you set the **Workgroup** name for this computer as **Sales** you should set the **Workgroup** name on other computers that want to access this computer as **Sales**.

H. This computer can now be shared. You can use the **Find computer command** on the next page to locate this computer's file across a network

Using the FIND COMPUTER Command

Once your PCs are in different subnets or are separated by a router you will not be able to use the Network Neighborhood function in Windows 95/98/NT to see them.

What you can do however is use the "Find Computers" function of your Windows computer. Press the **Start** button and point to **Find** and then to **Computer**. A dialog box will be shown like below:



In the **Named** dialog box you can now type in the IP address of the computer which has files that you want to access. If you choose a computer that is on a remote network it will cause your network device to dial-up a connection to the remote LAN based upon the settings that you inputted using the Net-Device Utilities.

Note! Please note that if the computer you are trying to access is on a remote LAN you may have to press the **Find Now** button more than once to wait for your network device to dial-up a connection to your remote LAN.

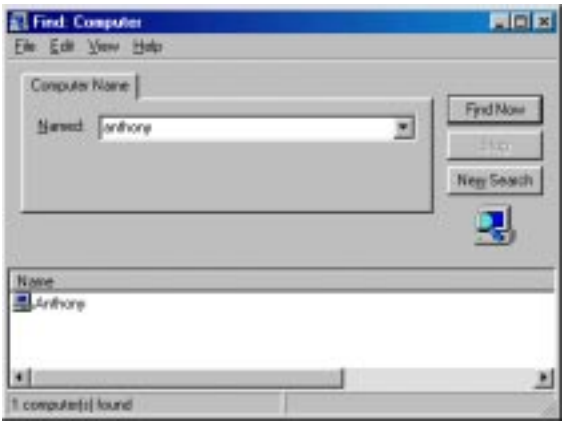
Using LMHOSTS

When using the "**Find Computer**" command, if you would rather enter the actual names of computers instead of the IP addresses you need to enter them in a lookup table that is located in your Windows 95/98/NT computer called "**lmhosts"**. This file can be found in **C:\WINDOWS** file directory where **C** is the location of your Windows operating system.

This file can be edited in any text editor like Notepad. At the end of the file you can enter the IP address plus a space and the computer name that is associated with this IP address. Please note that computers that you put in this lookup table should have fixed IP addresses on your LAN as they will be servers on your network. At the end of the file you should enter the IP address, a space and then the computer name with the IP address. In the example below we have entered in the lmhosts file and hence let our computer know that the computer named **Anthony** has an IP address of **192 . 168 . 1 . 15** and the computer named **ntsales** has an IP address of **192 . 168 . 10 . 3**

After you have inputted mapping the names of the computers to the IP address you should then copy this file over to other computers on your LAN as each computer needs to have this lookup table to use the function.

After this is done each computer on your LAN will be able to enter the name of the computer that they want to access on the LAN without having to remember the IP address. In our example below we have done a search for the computer called **"Anthony**" and the search results are displayed.



Troubleshooting

- General Troubleshooting
- Troubleshooting Internet Access
- Troubleshooting LAN-to-LAN Routing

Back to Main Menu

General Troubleshooting

Trouble #1

- My computer can't detect my network device on the LAN when I start one of the Net-Device Utilities. (ie. "Device Not Found")

✓ Try pressing the "**Refresh Device List**" button

✓ Unplug your network device and plug it back in and press the "**Refresh Device List**" button.

✓ Make sure your computer is a properly configured TCP/IP computer. Check by trying to "ping" the computer you are using. If you can successfully ping yourself, your computer has TCP/IP correctly installed. Then try pinging another computer on your network. If ping is successful your computer is properly connected to the network.

✓ Take TCP/IP Dial-up Adapter off your computer. For instructions on how to do this please see **Trouble #2** on the next page.

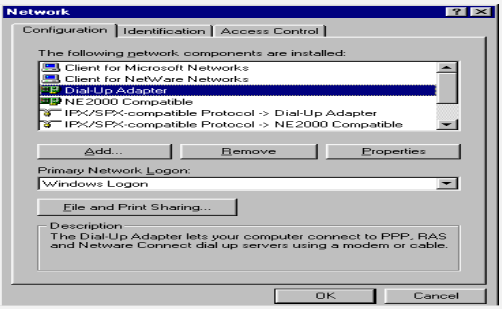
✓ Make sure that your network device is properly connected to your Ethernet hub by pressing "**Refresh Device List**" in either Net-Device Manager or Setup Wizard. If your network device is correctly connected, the "Net" indicator light on your network device will flash. If no flash occurs, it is not properly connected to your network. Reconnect your network device to your hub and try again. If there is still no flash, it is possible your Ethernet cable or hub has a problem.

Trouble #2

- Other computers can connect to your network device but my computer can't.
- Whenever I click on Internet Explorer or Netscape I still see the Windows Dial-up utility popping up on my screen asking for my phone number and password to dial-up my ISP.

✓ Take **TCP/IP dial-up adapter** off all computers that will be using your network device to access the Internet. TCP/IP dial-up adapter is not needed to use your network device to connect to the Internet.

To take off TCP/IP Dial-up Adapter, on the Windows **Start** button, point to **Settings** and then to **Control Panel**. Double click on the **Network** icon. Click on the adapter called **Dial-up Adapter** and press the **Remove** button. Restart your computer and try again.



✓ Make sure that you have a correct IP address. On the Windows 95 Start button, select Run and type "winipcfg". If the IP address field is listed as " 0. 0. 0. 0 " that computer has no IP address. Make sure that the automatic DHCP configuration is setup properly on that computer

(See– Setting up Your Internet Clients, Step 2)

✓ Make sure that the Web browser is set to connect via your LAN

(See– Setting up Your Internet Clients, Step 3)

Trouble #3

- I tried to upgrade the firmware on my network device and after the upgrade failed it is not listed in the Net-Device Utilities "Device List".

✓ No need to panic. All is well.

1) On the side or back of your network device is a switch marked **terminal/normal**. Set the switch to **terminal** which will manually put your network device in configuration mode.

2) After you have done this press the **Refresh Device List** in Net-Device Manager which should display your network device.

3) Go into the **Upgrade Firmware** menu and upgrade the firmware again until successful

4) On the side or back of your network device set the switch back to **normal** which will manually put your network device back into working mode. And that's it. See that wasn't so bad.

Trouble #4

- When I install the Net-Device Utilities I get the error message "missed export file oleaut32.dll

✓ This is because your Win95/NT computer has an old version of the oleaut32.dll file.

1) Download the newest oleaut32.dll file here
2) Go into the directory C:\WINDOWS\SYSTEM\ and backup your old oleaut32.dll to a temporary directory
3) Copy the new file you downloaded to the directory C:\WINDOWS\SYSTEM\ . When Windows asks you if you want to replace the existing oleaut32.dll click yes.
4) After you have successfully copied the file over install the Net-Device Utilities.
5) If you have problems upgrading the file you can use the backup copy to restore the original file.

Troubleshooting Internet Access

Helpful Tools

Tool A

Net-Device Monitor

So you're having some problems. Many problems can be solved by checking out Net-Device Monitor where there is on-line help. Please see **Section – 4 Net-Device Monitor** which details all of the functions and help applications that it has.

Tool B

PING

Ping stands for **Packet Internet Groper**. Ping is a utility that conducts a test to determine if there is a communications path between two devices on a network. Basically it lets your computer ask another computer or device, "Is there anything alive at this IP address?". You can use the PING command in your DOS prompt. You can also type either the IP address or the domain name of the Net-Device you wish to PING. For example both "PING 213.0.0.2" and "PING www.yahoo.com" will work. In the example below we have sent a successful PING to an network device which has an IP address of 213.0.0.2 . So who cares right? Actually it's good. You can ping your network device from your computer to see if there's a connection between your computer and your network device. You can also ping an IP address on the Internet to make sure that your computer has a connection via your network device to the Internet. It's a great way to eliminate some of the potential reasons for troubles. Very useful!

```
C:\WIN95>ping 213.0.0.2

Pinging 213.0.0.2 with 32 bytes of data:

Reply from 213.0.0.2: bytes=32 time=5ms TTL=32
Reply from 213.0.0.2: bytes=32 time=2ms TTL=32
Reply from 213.0.0.2: bytes=32 time=3ms TTL=32
Reply from 213.0.0.2: bytes=32 time=3ms TTL=32

C:\WIN95>_
```

Tool C

WINIPCFG and IPCONFIG

These two tools are great for finding out a computer's IP Configuration, MAC address and default gateway.

1) WINIPCFG is for Windows 95: On the Windows 95 **Start** button, select **Run** and type winipcfg. In the example below this computer has an **IP address** of **213 . 0 . 0 . 199** and the **Default Gateway** is **213 . 0 . 0 . 1**. The default gateway should be your network device IP address. The MAC address in Windows 95 is called the **Adapter address**.

2) IPCONFIG is for Windows NT: In the DOS command type IPCONFIG. Unfortunately this utility will not display the MAC address. To display the MAC address of a Windows NT computer: On the **Start** button, point to **Programs**, then to **Administrative Tools (Common)**, and select Windows **NT Diagnostics**. Select the **Network** tab. On the bottom of the Network tab press the **Transport** button. The MAC address you want to use will be the one that is under "**NO**" in the **WAN** column.

Tool D

TRACERT

Tracert is an extension of the PING utility that lets you trace the route to an IP address. It reports the number of router hops, the time for each hop, and any failed attempts to cross a hop. In this way you can locate the specific site of a failed Ping. You can run Tracert in the DOS command prompt. In the example below we have traced a request for www.yahoo.com by typing in "Tracert www.yahoo.com"

```
C:\>tracert www.yahoo.com

Tracing route to www4.yahoo.com [204.71.200.69]
over a maximum of 30 hops:

  1    45 ms    46 ms    47 ms  h223.s215.ts.hinet.net [168.95.215.223]
  2    73 ms    43 ms    44 ms  h254.s215.ts.hinet.net [168.95.215.254]
  3    45 ms    43 ms    44 ms  168.95.253.190
  4   207 ms   207 ms   208 ms  12.127.193.33
  5   207 ms   205 ms   206 ms  br1-a350s2.sffca.ip.att.net [12.127.1.134]
  6   208 ms   208 ms   211 ms  ar2-a300s1.sffca.ip.att.net [12.127.1.141]
  7   208 ms   208 ms   207 ms  gc-br3-snv-h6-1.sffca.ip.att.net [12.127.194.130
]
  8   208 ms   339 ms   214 ms  fe1-1.cr2.SNV.globalcenter.net [206.251.7.38]
  9   213 ms   215 ms   214 ms  www4.yahoo.com [204.71.200.69]

Trace complete.

C:\>
```

Note! To use your network device, the switch on the side of your network device must be set to "**NORMAL**". The **Terminal** setting on the side of your network device stands for Terminal Setup Mode and is not needed for Windows 95. It is only used for Terminal and Remote Configuration

Trouble #1

- I configured my network device but I can't get it to communicate with my modem.

✓ It's possible that your initial string is configured incorrectly. If you are using an ISDN TA and your ISDN TA was not listed when you were prompted to select your modem in Setup Wizard **you must look up your ISDN TA's initial string** in your ISDN TA user's manual and input it in **Net-Device Manager's Modem Settings** Menu to correct this problem. **See Net Device Manager : Modem Settings**.

✓ If after making sure that the initial string is correct, your network device will still not dial-up a phone number, please use the Net-Device Monitor which has on-line help.

Trouble #2

- My network device dials-up a connection but can't seem to communicate with the ISP

✓ This is most likely a problem due to the fact that your baudrate setting is set too high for your modem or ISDN TA. The maximum baudrate that your modem or ISDN TA claims it can achieve is often not really attainable because of poor phone line quality, modem manufacturing quality and a myriad of other possible reasons. You should go into **Net-Device Manager's Modem Settings** menu to correct this problem to set to a lower baudrate and try again. **See Net Device Manager : Modem Settings.**

✓ If after changing the baudrate, your network device still cannot connect to your ISP, please use the Net-Device Monitor which has on-line help. Please see **Section 4 – Net-Device Monitor**.

Trouble #3

- My network device dials-up a connection but can't seem to communicate with the ISP.

✓ This is most likely a problem due to the fact that your baudrate setting is too high for your modem or ISDN TA. Many times the maximum baudrate that your modem or ISDN TA claims it can achieve is not really attainable because of phone line quality, errors,etc. You should go into **Net-Device Manager's Modem Settings** Menu to correct this problem.

Trouble #4

- Sometimes when I try and use the Internet or get my mail, the application can't access the Internet immediately

✓ This is probably not an error or a problem. If you are the first person to use your network device, there will be a delay while the Dial-on- Demand function automatically dials-up a connection and logs on to your Internet Service Provider. Subsequent users will then be able to use the existing connection that you have just established without a delay.

✓ It is also possible that your modem is dialing but having problems connecting to your ISP. For example your ISP may be returning a busy signal. You can use the Net-Device Monitor to see all events occurring between your modem and ISP.

Trouble #5

- My network device seems to slow down my modem when I install it

✓ Your network device should have no effect on your modem speed. Of course if more then one client is using the same modem through your network device the speed will be reduced.

Trouble #6

- My CA-300/320 keeps dialing-up a connection but nobody is using the Internet

✓ The CA-300/320 will only dial-up a connection if there is a request from one of the computers on your LAN for an IP address on the Internet. There are some programs that are programmed to request information from the Internet. For example, Microsoft Outlook can be programmed to "Check for new mail every X minutes". If you have this function enabled Outlook will send out a request for your Internet POP3 server which will cause your CA-300/320 to dial-up your ISP. To find out which computer on your LAN is the culprit , you can use the Net-Device Monitor's TCP/IP sessions which will tell you which computer is causing the dial-up and also what service (Port #) the computer is requesting.

Troubleshooting LAN-to-LAN Routing

Note! If you need help in setting up specific LAN-to-LAN routing applications please **see the LAN-to-LAN applications guide**.

Glossary

Back to Main Menu

The best site for finding information is on the Internet. Much of the information for this glossary was referenced from a great site at **http://www.pcwebopedia.com**. If you want more information for any of these terms or some terms that may not be listed please check out that site.

Baudrate. Baudrate in regards to your network device refers to the number of bits per second (Bps) that are transmitted between your network device and modem or ISDN TA.

DHCP (Dynamic Host Configuration Protocol)

A protocol that was made to lessen the administrative burden of having to manually configure TCP/IP Hosts on a network. DHCP makes it possible for every computer on a network to extract it's IP information from a "DHCP server" instead of it having to be inputted manually by each network client (or network administrator). Using the DHCP server built-in to your network device, every computer on your network can automatically extract it's IP information from your network device.

Why is it called "dynamic"

Each time a network client turns on their computer your network device DHCP server will automatically give them an IP address from the IP address pool configured in the DHCP Server menu of Net-Device Manager . It is called "dynamic" because the address that they get could be different each time they turn on their computer depending on which addresses have already been assigned.

DNS (Domain Name System) Server IP Address. A DNS Server can be thought of as the computer at your ISP whose job is to take all the DNS addresses that you type into your web browser like www.yahoo.com and translate those addresses into their corresponding IP addresses. So to send this "translator" all your requests for information, you need to know his address and his address is known as the DNS Server IP address.

Ethernet. A LAN (Local Area Network) protocol developed by Xerox and DEC. It is a very commonly used type of LAN

Firewalls. A method of protecting files and programs on one network from users on another network. Firewalls are typically installed to give users access to the Internet while protecting their Internal Information. Your network device uses a firewall known as NAT. (See NAT).

Firmware. Software that has been has been permanently or semi-permanently written onto ROM. Your network device supports flash ROM which means you can upgrade the fimware in your network device very easily by obtaining a copy of the new firmware and using the upgrade firmware function.

FTP (File Transfer Protocol). A protocol which allows a user on one host to access, and transfer files to and from, another host over a network.

Intranet. The Intranet is the use of Internet technologies within a company. Intranets exist only within organizations while the Internet is a global network open to all. Intranets run on private networks within companies and between their branch offices.

IP (Internet Protocol). The Internet Protocol is the network layer for the TCP/IP Protocol Suite. It is a connectionless, best-effort packet switching protocol.

IP Addresses

A Computer on the Internet is identified by it's **IP Address**. A computer's IP address is like a telephone number because it identifies one address or in this case one computer Device. Every computer or device on a network must have a different IP address. An IP address consists of four groups of numbers called **octets** which are separated by periods. For example, 213 . 0 . 0. 1 is an IP address. An IP address consists of a **network portion** and a **host portion**. The network portion identifies the subnet that the computer belongs to. The host portion identifies the particular computer or node on that network. In our example IP address, **213 . 0 . 0 . 1** refers to the network **213 . 0 . 0** with the computer number **1**. IP addresses can either be dynamic (temporary) or static (permanent, fixed). A dynamic IP address is a temporary IP address that is assigned to you by a server (Usually a DHCP server) when you turn on your computer. A static IP address is a permanent IP address that you can set yourself in your computer. When your network device dials-up your ISP your ISP can give it a fixed or dynamic IP address. Likewise when you turn on your computer your network device can give your computer a dynamic or fixed IP address.

ISDN TA. (Integrated Services Digital Network Terminal Adapter) ISDN is a high speed digital telephone connection involving the digitization of the telephone network using existing wiring. An ISDN Terminal Adapter can be thought of like an "ISDN Modem".

ISP (Internet Service Provider). An organization that provides Internet services. An ISP is the company that will provide the connection from your computer or network to the Internet. An ISP can offer a range of services, such as dial-up accounts, E-mail, web hosting or News.

LAN (Local Area Network). A data network intended to serve an area of only a few square kilometers or less. This often means a small private network in companies.

ML-PPP (Also called MP or MPPP) stands for Multilink Point to Point Protocol and is an advancement of the PPP protocol that allows for the bridging or bundling of two ISDN or analog channels for faster connections. What does that mean in practical terms? It means that you can use one computer to use two or more modems to download a single web page. For example, if I'm trying to access www.yahoo.com using two modems, each modem will go get part of Yahoo, then your network device will bundle the information together and then give it to your computer resulting in double the speed. Pretty cool, eh?

MAC address. The hardware address of a Device connected to a shared media. To find out the MAC address of your computer please see **General Troubleshooting**.

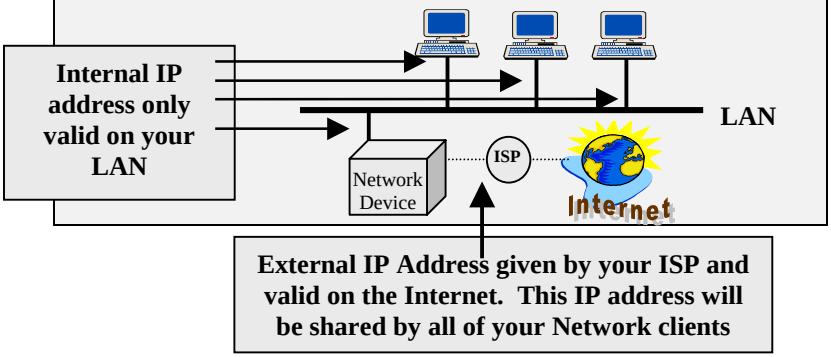
NAT Technology

Your network device uses a technology called Network Address Translation (NAT) (Sometimes called IP Address Masquerading) to let everyone on your network use one IP address given to you by your ISP (Internet Service Provider). This technology is also a firewall in itself.

How does it work? Every IP address on the Internet is a Registered or Legal IP address. Therefore no two IP addresses on the Internet are the same. For you to use your network device to access the Internet you need one of these registered IP address from your ISP (Internet Service Provider). On your private Intranet or LAN, the IP addresses of your computers are probably unregistered or "illegal" IP addresses.

When clients on your network start surfing the Internet, your network device will receive all the requests for information. Your network device will dial-up your ISP and will give your network device a registered legal IP address. Your network device then uses that IP address to ask for all that requested information saying, " Send all information back to me at this IP address." So in essence it looks like all your network client's requests are coming from that one IP address (Hence the name IP masquerading). When all that information comes back to your , it will then sort the data using an Address Translation Table and give the data to the computer on your network that requested it.

In regards to the firewall, what happens if someone on the Internet tries to access your network via your network device? Nothing! There's nothing there but your network device which will not reverse translate unless you have allowed it by using the Virtual Server function.



Network Address. The network portion of an IP address. For a class A network, the network address is the first byte of the IP address. For a class B network, the network address is the first two bytes of the IP address. For a class C network, the network address is the first three bytes of the IP address. In each case, the remainder is the host address. In the Internet, assigned network addresses are globally unique.

Port Number. In addition to meaning a connector on your computer, a port also has another meaning. The other meaning of port can be thought of as a "Service number". Every service that travels over phone lines and modems has a standard port number. For example to use the World Wide Web service the standard port number is **80**. The standard port number for telnet is **23**. Who came up with this system? Port numbers are controlled and assigned by the IANA (Internet Assigned Numbers Authority). How do you know what service has what port number? Most computers have a table in their systems that lists which port numbers have been assigned to which services or you could also find port number lists on the Web.

Protocol. A formal description of message formats and the rules two computers must follow to exchange those messages. You can think of protocols like languages. If two computers or devices aren't speaking the same language to each other, they won't be able to understand or communicate. Just like people!

PPP (Point-to-Point Protocol). PPP enables dial-up connections to the Internet and is the method that your network device connects to the Internet . PPP is more stable than the older SLIP protocol and provides error checking features.

Router. A device which forwards traffic between networks. If you request information from a location on your network or the Internet using **TCP/IP**, your computer will broadcast the **IP Address** request onto your LAN. The router's job is to listen for requests for IP addresses that are not part of your LAN and then route them to the appropriate network which may either be the Internet or another subnetwork on your LAN.

Server. A provider of resources (e.g., file servers and name servers). A computer that uses the resources of a server is called a **Client**. For example your network device provides Internet Access and is thus called an Internet Access **Server**.

Subnet: A portion of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP Addresses have the same prefix. For example, all devices with IP addresses that start with 213 . 0 . 0 . would be part of the same subnet.

Subnet Mask / IP Address Mask. Subnet mask is what is used to determine what subnet an IP address belongs to. Subnetting enables the network administrator to further divide the host part of the address into two or more subnets.

TCP/IP (Transmission Control Protocol/ Internet Protocol) is the standard protocol used on the Internet. This means that every computer that wants to communicate with another computer on the Internet must use TCP/IP protocol to transmit and route data packets. TCP/IP uses **IP addresses** to locate different computers or devices on a network.

UDP (User Datagram Protocol). An Internet Standard transport layer protocol. It is a connectionless protocol which adds a level of reliability and multiplexing to IP.

Internet Routers

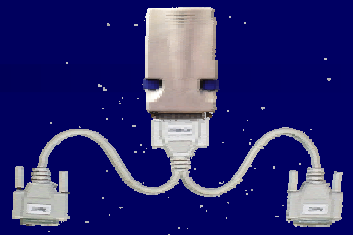
Applications Guide

- An Internet Router for you
- How to use this guide
- Applications Menu
- Back to Main Menu

An Internet Router to Suit You

Internet Router 10

1 WAN Port



Internet Router 20

2 WAN Port

Internet Router H10

1 WAN Port + Hub

Internet Router H20

2 WAN Port + Hub

Internet Router 40

4 WAN Port

How to use this Guide

This Guide was meant to help you with some of the more advanced applications of your Internet Router. Although we have used specific Internet Router models in the diagrams of each application, any WAN port of a given Internet Router model can fulfill the same function.

If the router in the diagram is shown with a number on top, we have made a specific configuration file which can be loaded onto your Internet Router by using the Load Settings function in Net-Device Manager. This file can be loaded for the application shown and will configure your router with the settings shown in the diagram. Please be aware that certain configuration files are associated with certain Internet routers:

***.co1 files can be loaded by 1 WAN Port Internet Routers**
***.co2 files can be loaded by 2 WAN Port Internet Routers**
***.co4 files can be loaded by 4 WAN Port Internet Routers**

Load Settings
❶ IR40_031.co4

Applications Menu

Internet Access

Remote Access

LAN-to-LAN Routing (IP Routing)

Internet Access

Basic Internet Access

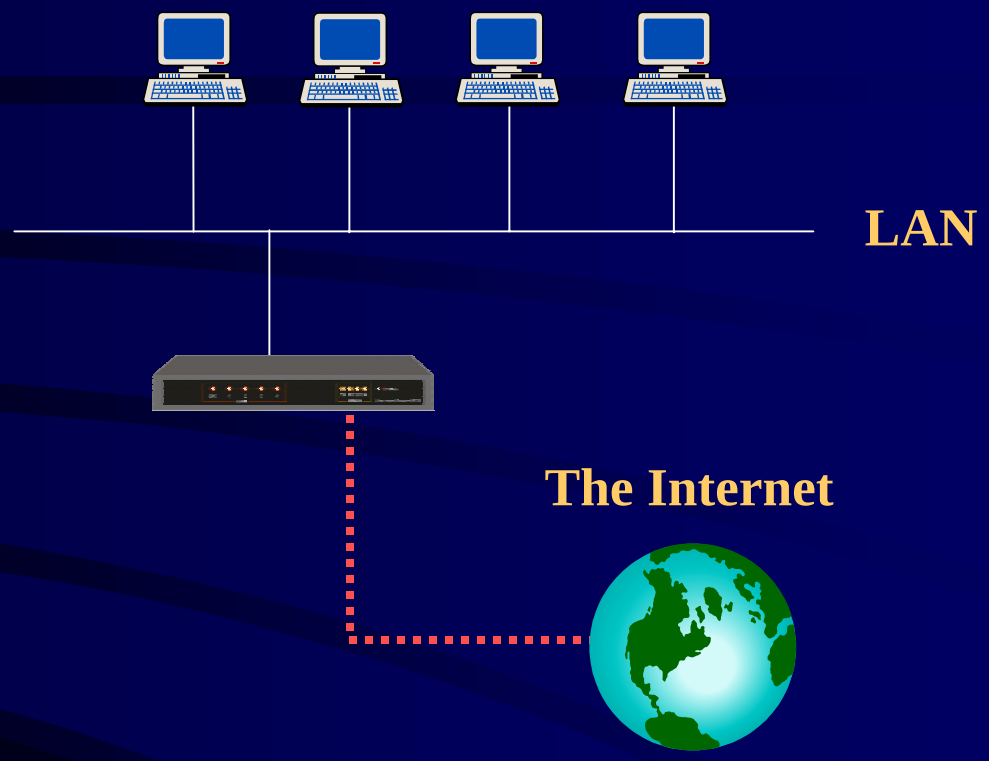
Using IP Mapping for Remote Access via the Internet

Using IP Mapping for LAN-to-LAN Routing via the Internet

Back to Applications Main Menu

Back to Internet Access Menu

Basic Internet Access



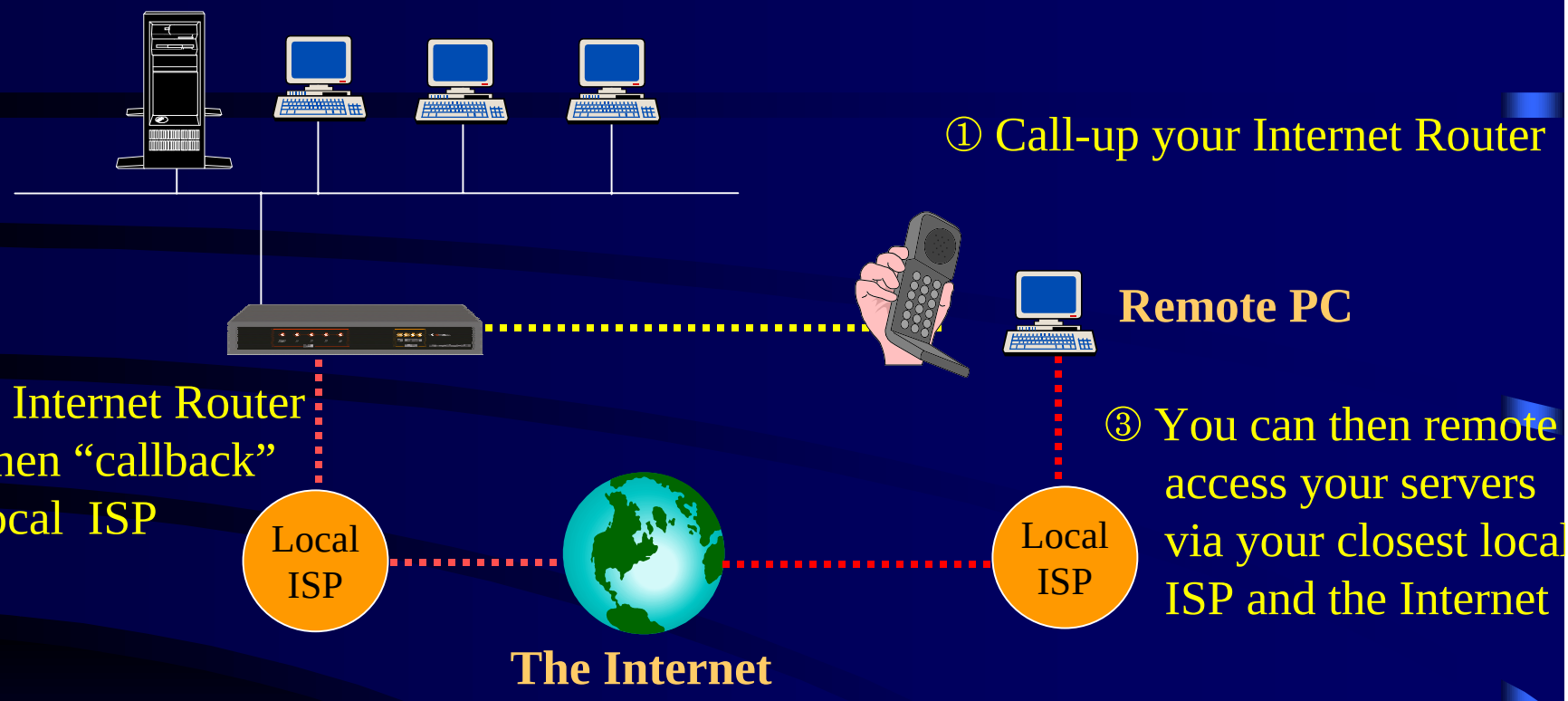
Simultaneous Internet Access for an entire network

Uses any external modem or ISDN TA

Uses any regular ISP account (Dynamic or static IP address)

Back to Internet Access Menu

Using IP Mapping for Remote Access via the Internet



Access your FTP, Mail or other Server via the Internet

Works in conjunction with the Callback feature

Save huge on long-distance charges

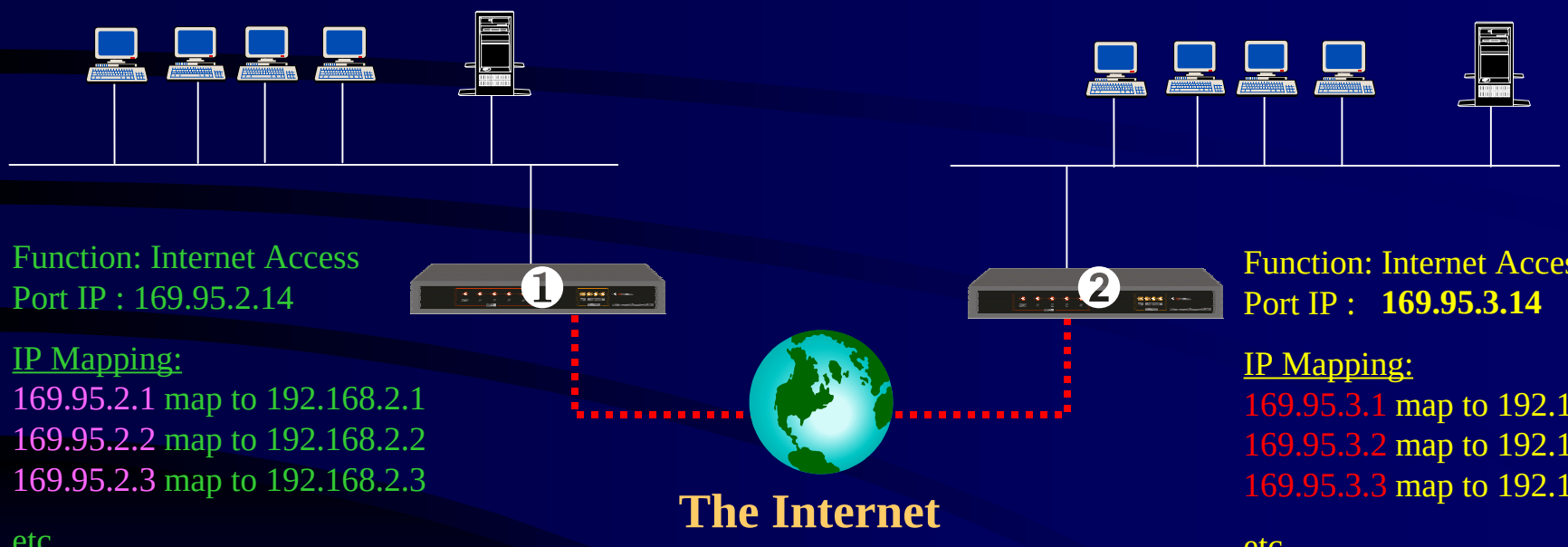
Click Here for Setup Details

Back to Internet Access Menu

Using IP Mapping for LAN-to-LAN Routing via the Internet

192.168.2.X Network
Apply for Legal IP Addresses
169.95.2.1 to 169.95.2.14

168.95.3.X Network
Apply for Legal IP Addresses
169.95.3.1 to 169.95.3.14



Function: Internet Access
Port IP : 169.95.2.14

IP Mapping:
169.95.2.1 map to 192.168.2.1
169.95.2.2 map to 192.168.2.2
169.95.2.3 map to 192.168.2.3

etc...

Function: Internet Access
Port IP : **169.95.3.14**

IP Mapping:
169.95.3.1 map to 192.168.3.1
169.95.3.2 map to 192.168.3.2
169.95.3.3 map to 192.168.3.3

etc...

- **Clients on either network can access each others servers via the Internet**
- **Clients without fixed IP addresses can access the Internet and be protected by a firewall. Clients with fixed IP addresses can access the Internet and be accessed through Internet**

Load settings

❶ **IR10_010.co1**

❷ **IR10_011.co1**

Remote Access

Basic Remote Access

Dial-in for Internet Access

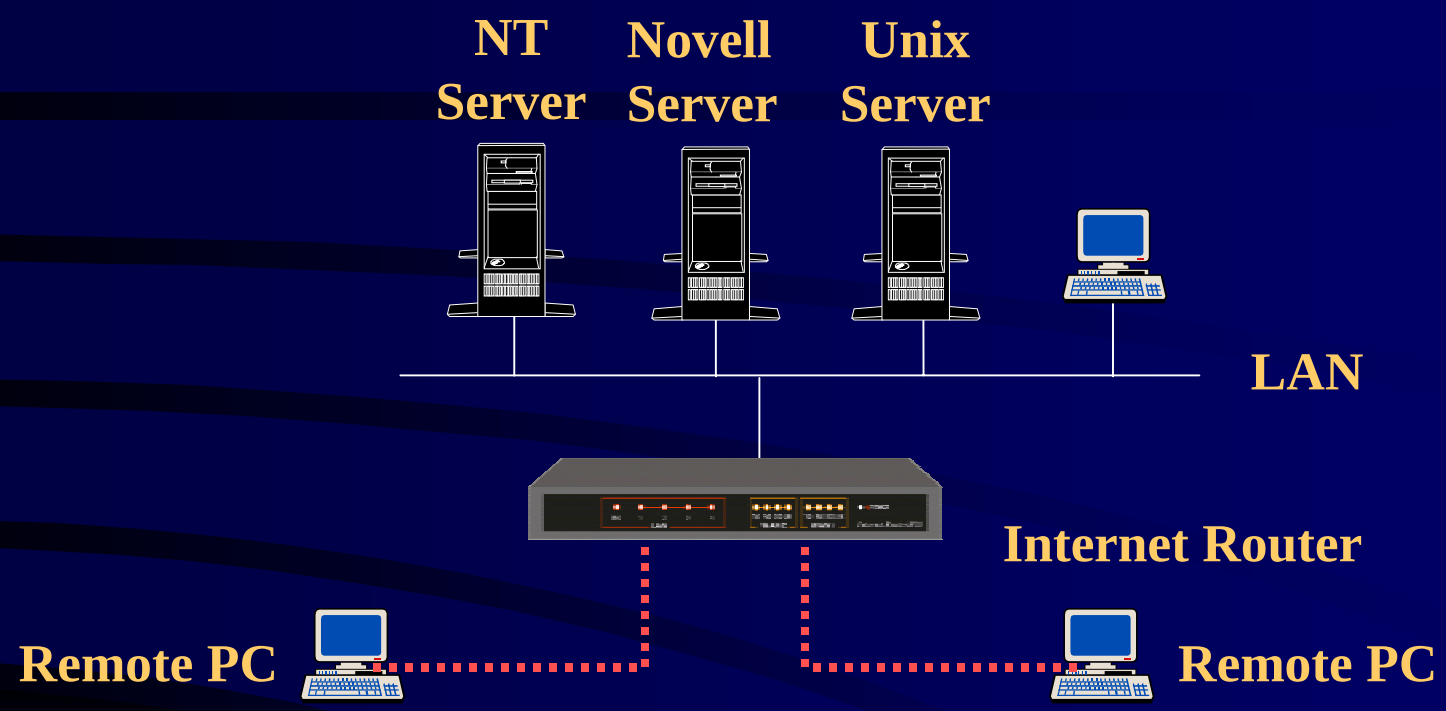
Dial-in for Internet Access via a separate router

Dial-in for LAN-to-LAN Routing

Back to Applications Main Menu

Back to Remote Access Menu

Basic Remote Access



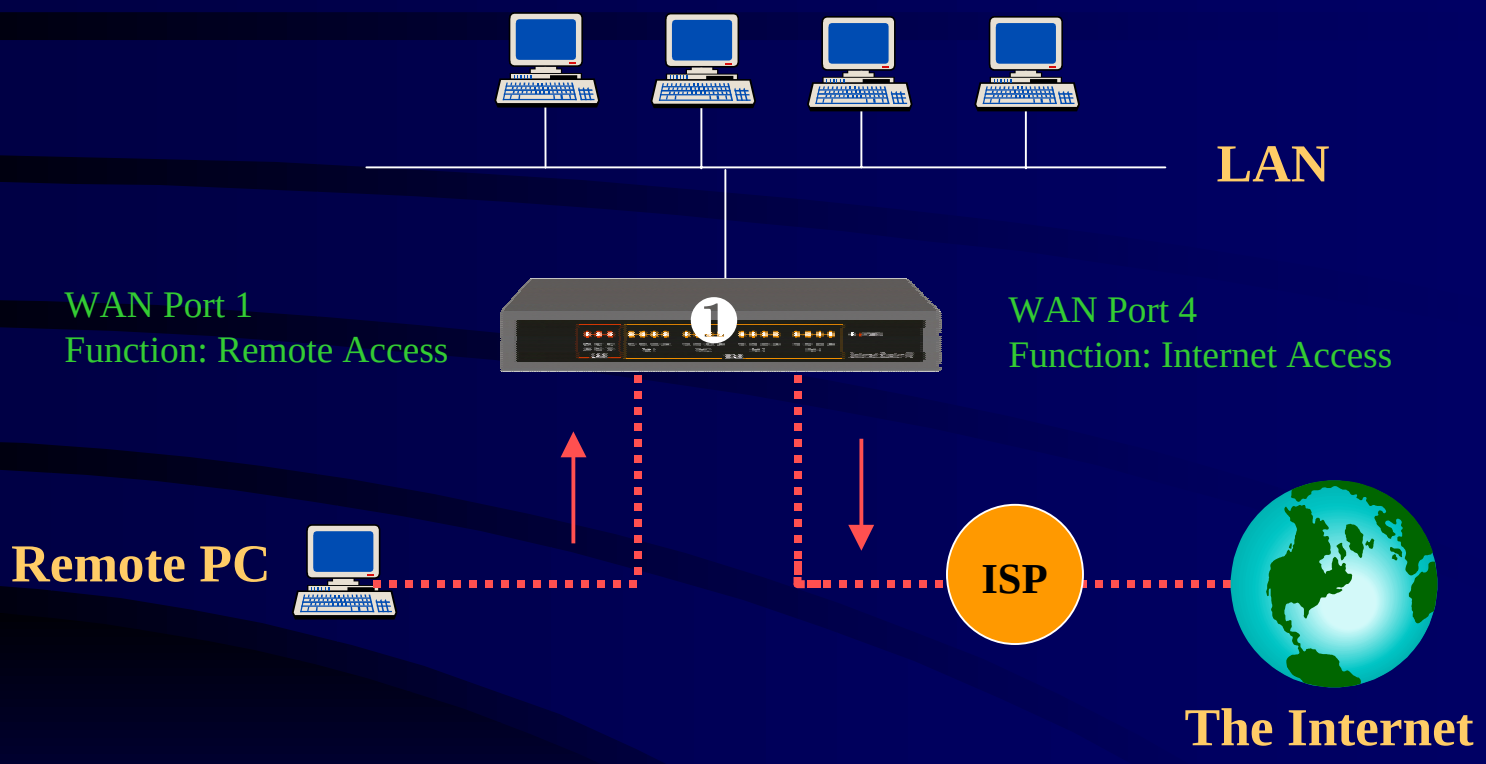
Access your NT, Novell or Unix server on your LAN from anywhere

After dialing in, a remote PC becomes just like a local PC on the LAN

DHCP Server can assign remote clients their IP address

Back to Remote Access Menu

Dial-in for Internet Access



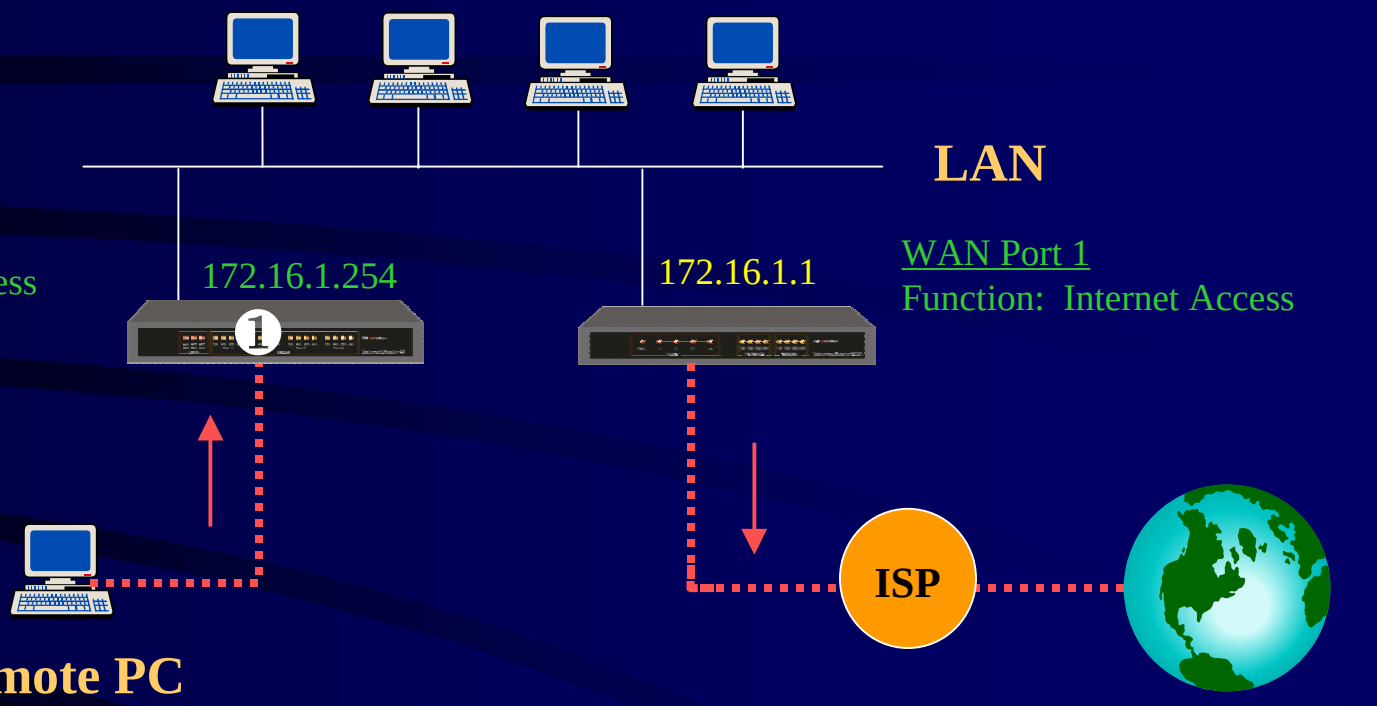
With any 2 or more WAN port Internet Router you can dial-in to the Internet Router on one port and access the Internet via another WAN port set for Internet Access

load settings

❶ IR40_021.co1

Back to Remote Access Menu

Dial-in for Internet Access via a separate router



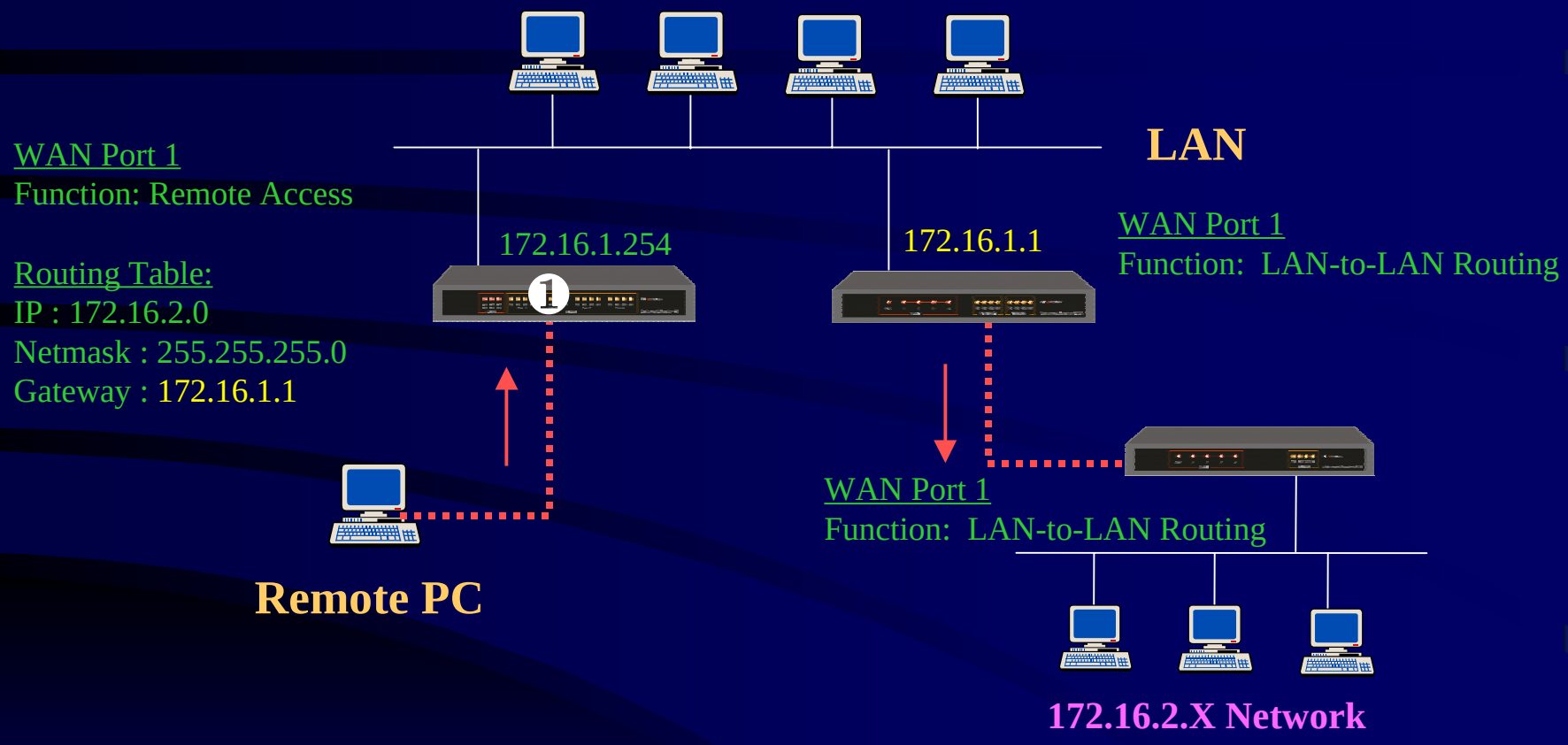
You can dial-in to the Internet Router and access another remote LAN's network via a separate router

load settings

❶ IR40_041.co1

Back to Remote Access Menu

Dial-in for LAN-to-LAN Routing



You can dial-in to the Internet Router and access another remote LAN's network via a separate router

load settings

❶ **IR40_031.co1**

LAN-to-LAN Routing (IP Routing)

Basic LAN-to-LAN Routing

LAN-to-LAN Routing with Internet Access

LAN-to-LAN Routing using ML-PPP

Using fixed IP addresses over the Internet

Connecting Multiple Offices

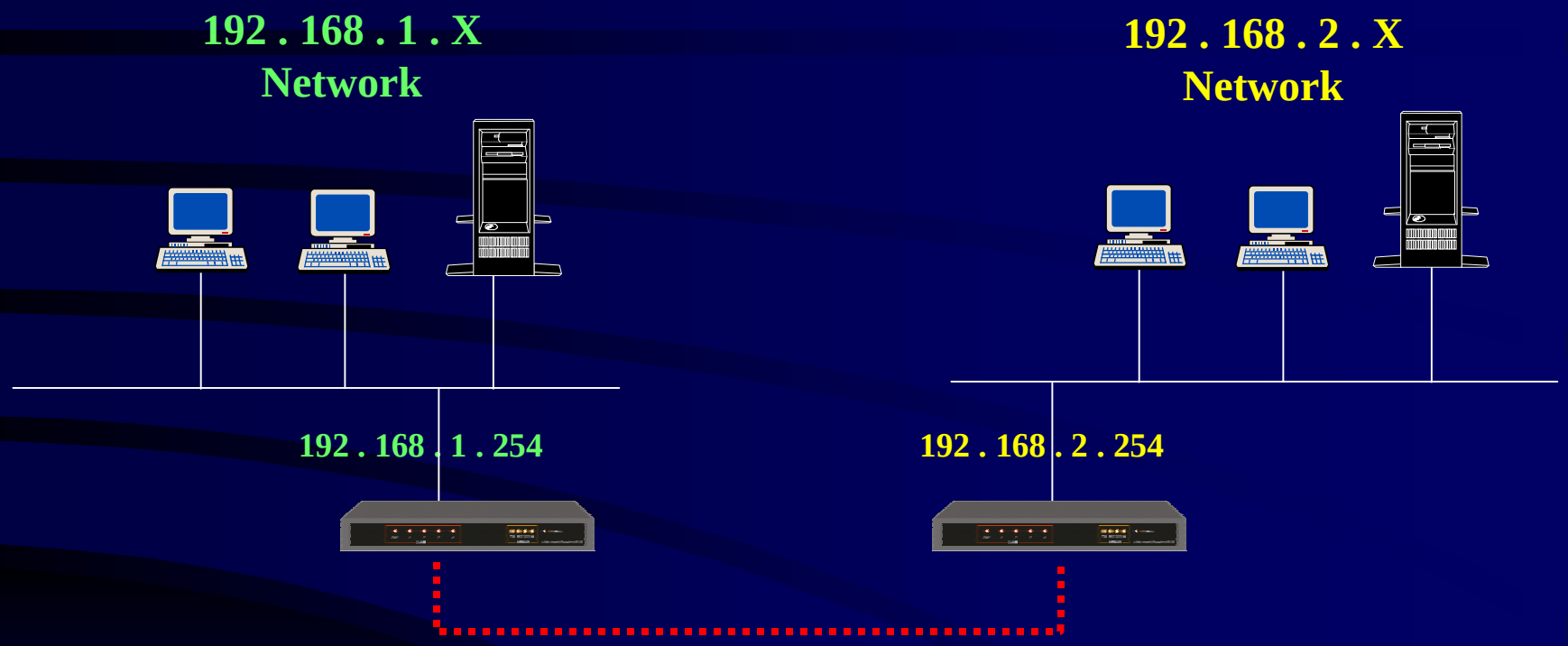
Setting up a Network Head Office

Accessing Servers via the Internet

Back to Applications Main Menu

Back to LAN-to-LAN menu

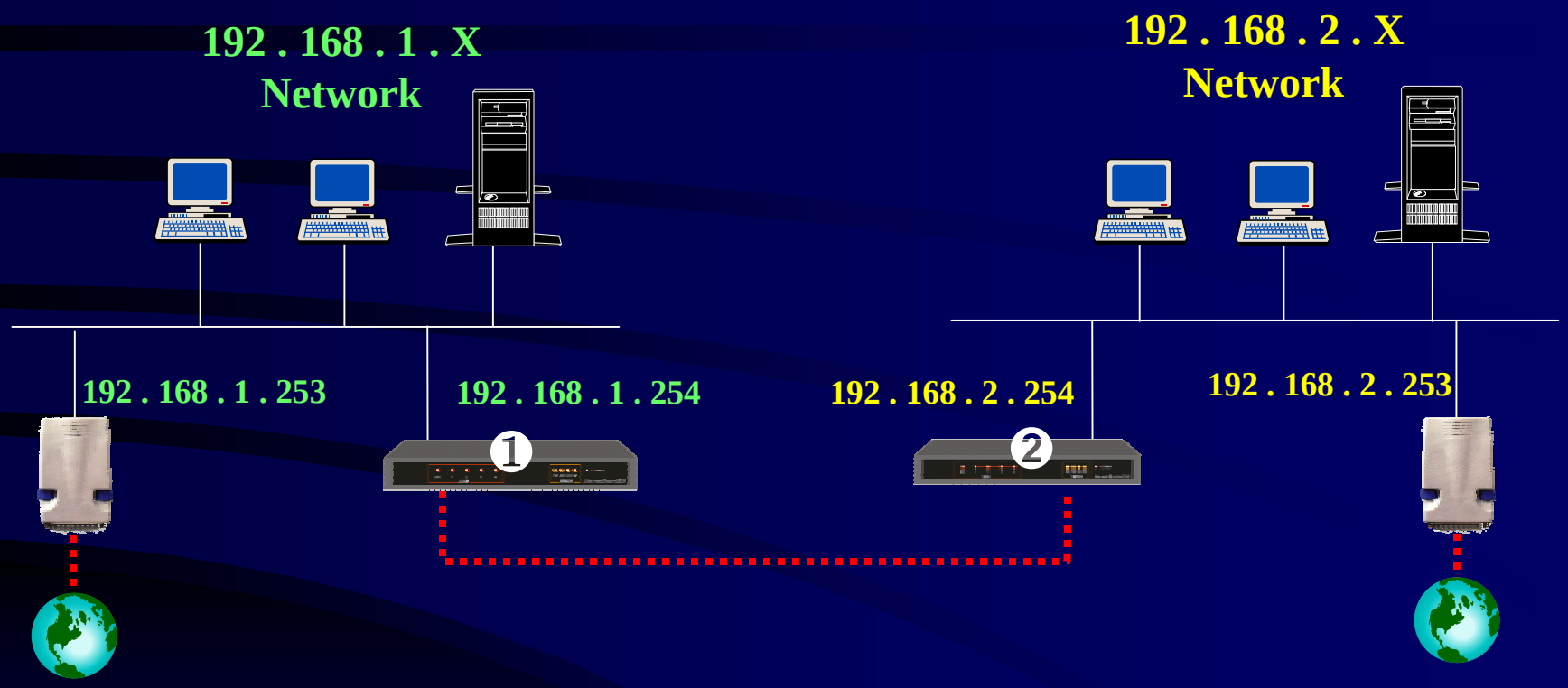
Basic LAN-to-LAN Routing



Allows you to connect LANs over a Wide Area Network

Back to LAN-to-LAN menu

Basic LAN-to-LAN Routing with Internet Access



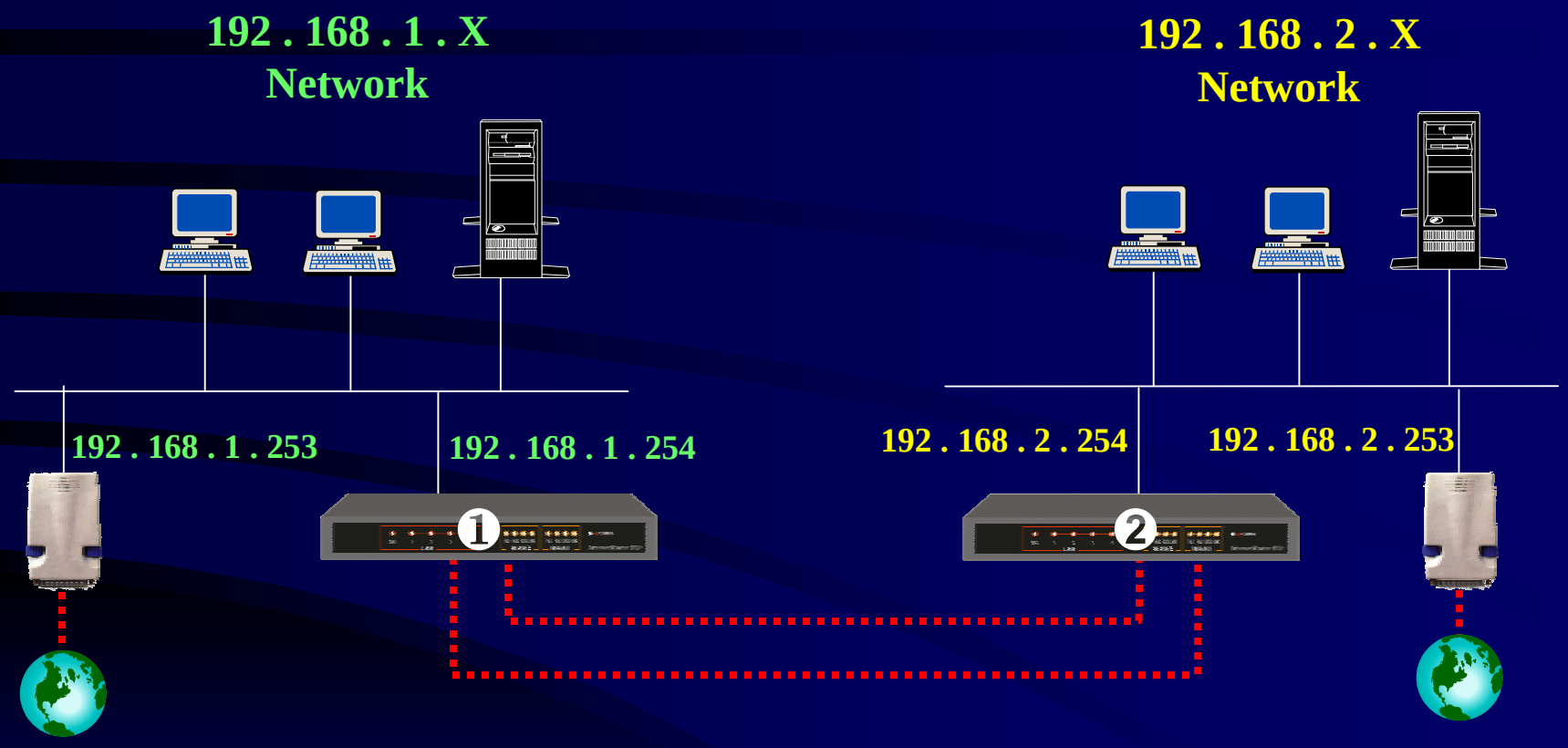
Connect LANs over a Wide Area Network and provide Internet Access for all your Clients

load settings

1. IR10_001.co1
2. IR10_002.co1

Back to LAN-to-LAN menu

LAN-to-LAN Routing Using ML-PPP



Use ML-PPP to double your bandwidth LAN-to-LAN bandwidth speed and provide Internet Access for all your Clients

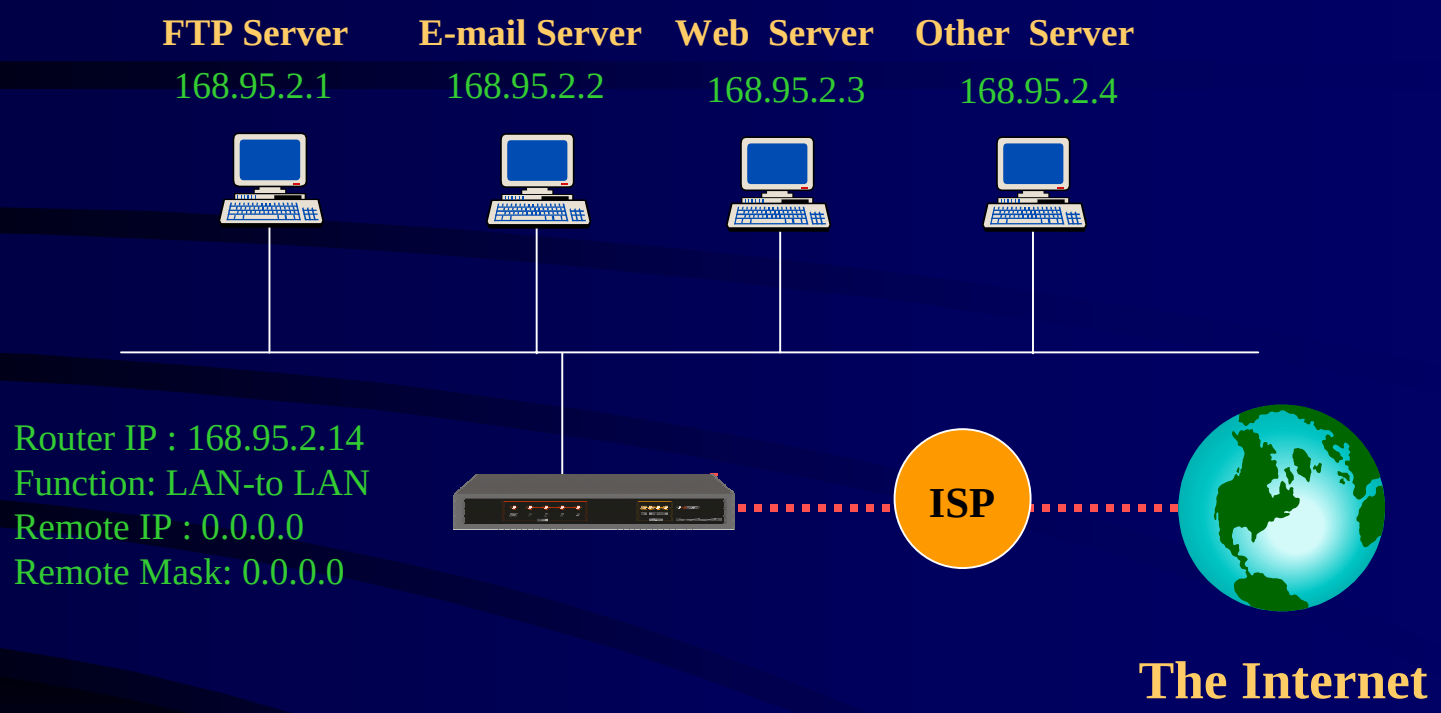
load settings

❶ **IR20_001.co2**

❷ **IR20_002.co2**

Back to LAN-to-LAN menu

Using Fixed IP Addresses



The Internet Router can act as a regular router

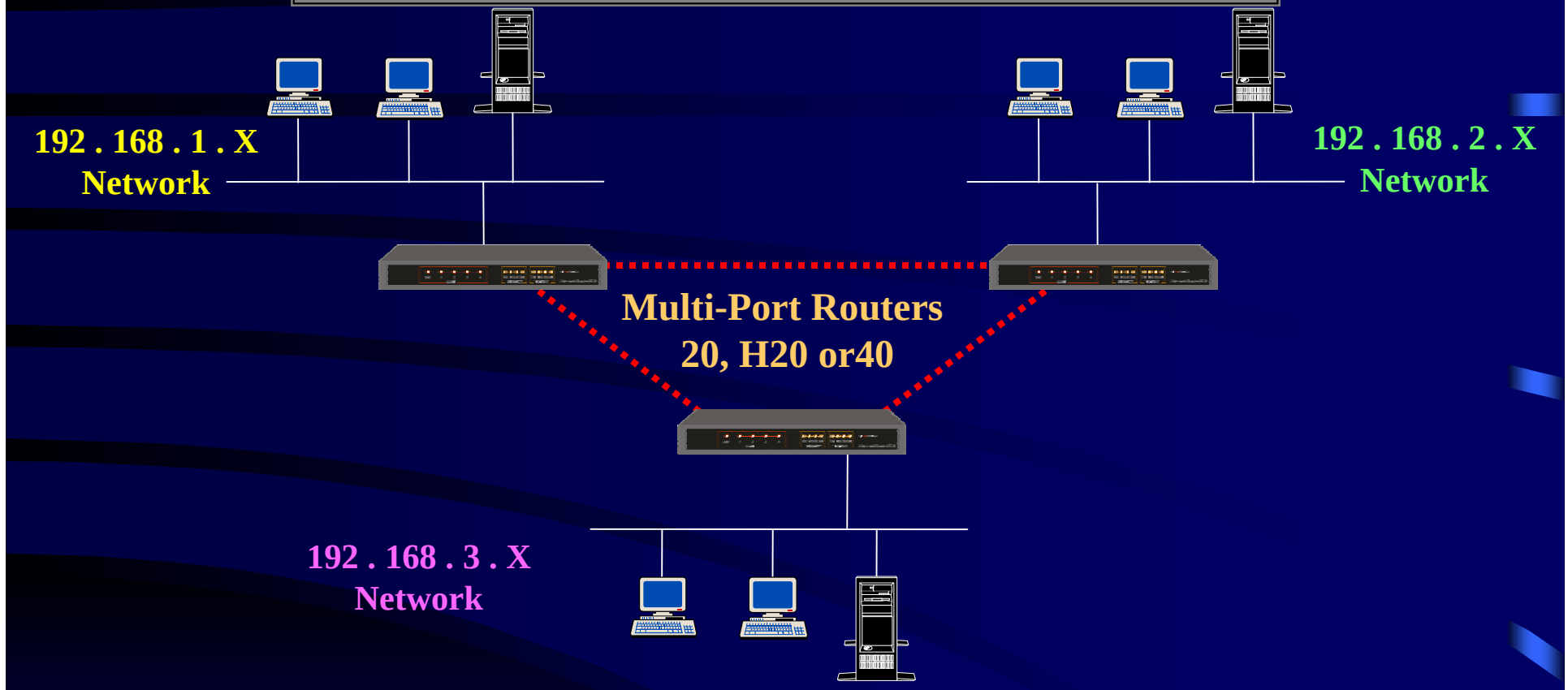
Use it to setup permanent servers on your web like an FTP or Mail Server

load settings

❶ IR10_050.co1

Back to LAN-to-LAN menu

Connecting Multiple Offices



Connect multiple offices together connected by PSTN or ISDN

Any Client on one network can access any server on the other two seamlessly

Setup Example

192.168.1.X Network

WAN Port 1
Function: LAN- to LAN
Remote IP : 192.168.2.254
Remote Mask: 255.255.255.0

Router IP : 192.168.1.254
Netmask : 255.255.255.0

192.168.2.X Network

WAN Port 1
Function: LAN-to LAN
Remote IP : 192.168.1.254
Remote Mask: 255.255.255.0

Router IP : 192.168.2.254
Netmask : 255.255.255.0

WAN Port 2
Function: LAN-to LAN
Remote IP : 192.168.2.254
Remote Mask: 255.255.255.0

Multi-Port Routers
20, H20 or40

WAN Port 2
Function: LAN-to LAN
Remote IP : 192.168.3.254
Remote Mask: 255.255.255.0

Router IP : 192.168.3.254
Netmask : 255.255.255.0

WAN Port 1
Function: LAN-to LAN
Remote IP : 192.168.1.254
Remote Mask: 255.255.255.0

WAN Port 2
Function: LAN-to LAN
Remote IP : 192.168.2.254
Remote Mask: 255.255.255.0

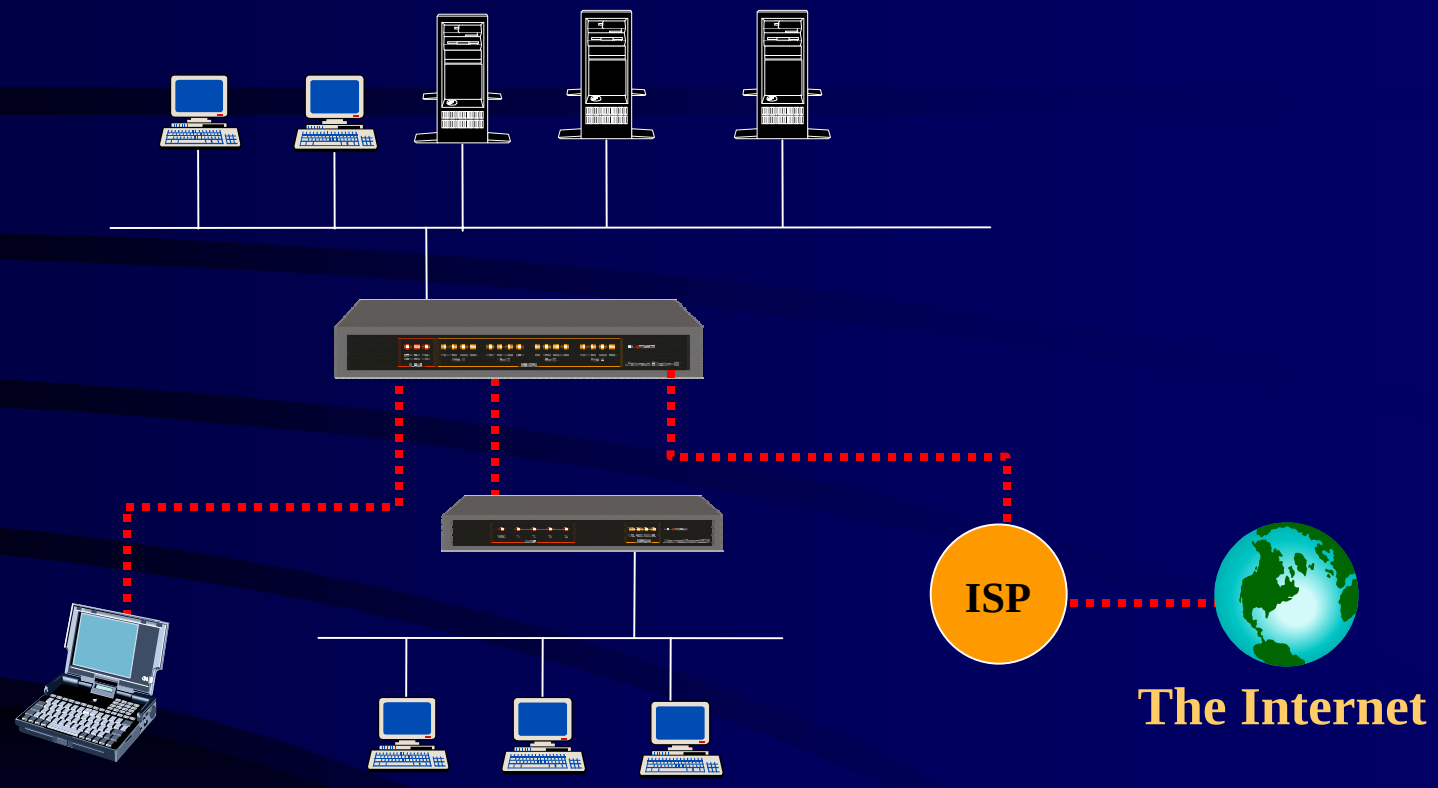
192.168.3.X Network

Load settings

❶ **IR20_010.co2**
❷ **IR20_011.co2**
❸ **IR20_012.co2**

Back to LAN-to-LAN menu

Setting up a network Head Office

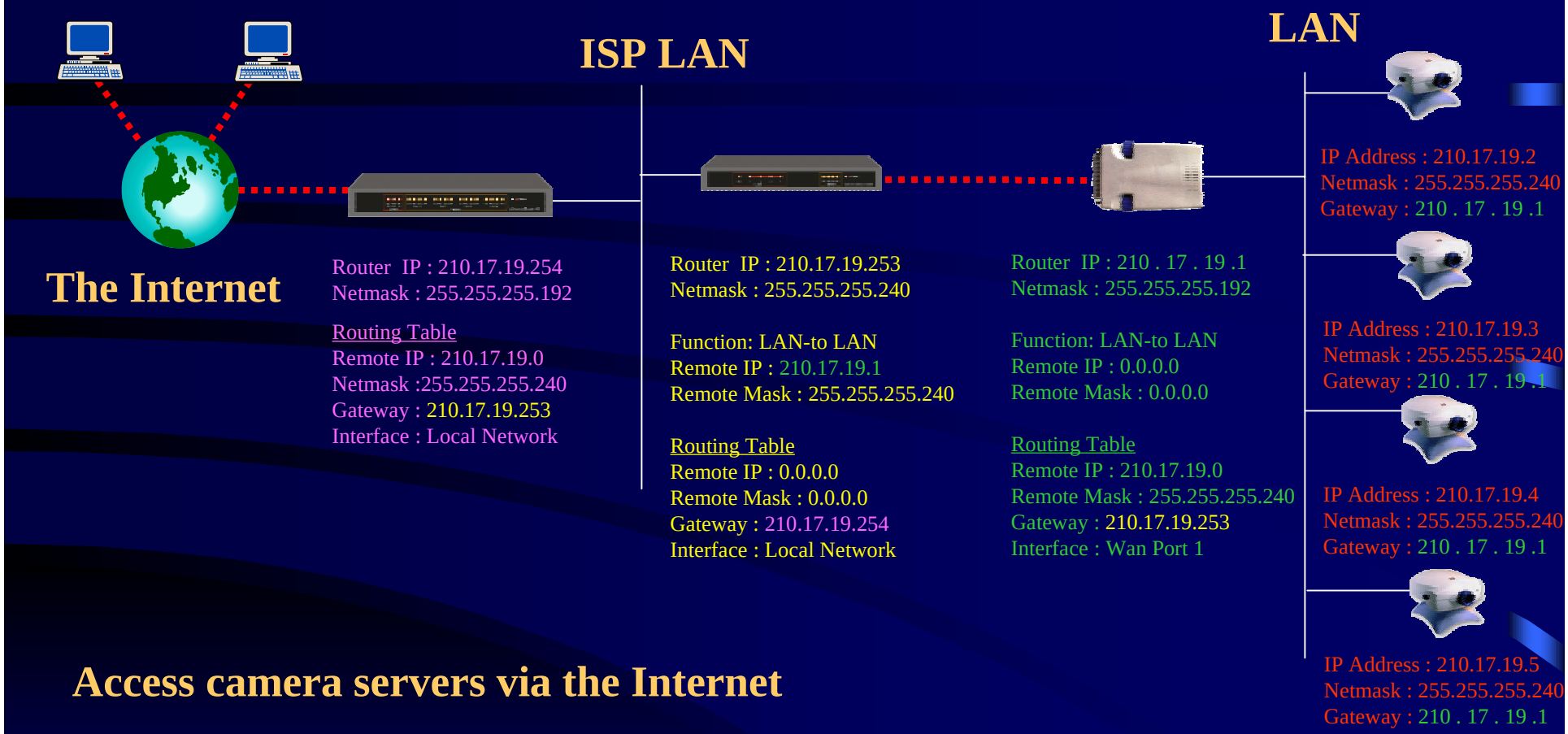


Connect multiple offices together connected by PSTN or ISDN

Any Client in a branch office can access headquarters servers

Back to LAN-to-LAN menu

Accessing Servers via the Internet



Access camera servers via the Internet

Monitor classrooms, traffic, construction sites from anywhere in the world

Other servers (Mail, web, etc) will also work with this setup

Load settings

❶ **IR20_010.co2**

❷ **IR20_011.co2**

❸ **IR20_012.co2**