

EL02 Student Guide V5 iSeries Dynamic IP



ITSO iSeries Technical Forum 2003

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Introduction to this Lab

iSeries Navigator is built for the most part with a single iSeries administrator in mind. That is, it is very unlikely that you will have two iSeries administrators both changing the DHCP configuration, for example.

The green screen example is that it would be rare (and dangerous) if two administrators were in the middle of the CHGTCPA. In this case the last administrator to hit enter 'wins' and that configuration is saved and used on the iSeries.

iSeries Navigator is the same way.

What makes matters worse is that in this lab environment we will have from 12 to 20 teams (administrators) all requesting the same Operation Navigator functions.

To resolve this conflict some of the configurations that you would normally do to set up a server on the iSeries via iSeries Navigator has been done for you. All you must do is **browse** the configuration and **cancel** - making sure you do not make any changes.

In other more interesting places you will still be expected to go in and make the changes - but only one team at a time can do so.

To prevent conflicts, your administrator will manage a board controlling access to certain functions within iSeries Navigator and the physical lines.

This is the symbol you will use to indicate your team is IN a restricted area.





And above is the symbol when you are finished and out - meaning you have closed all the iSeries Navigator configuration and stopped all your active configurations.

0.1 The hardware lab environment

Figure 1 shows the hardware environment as used in the following labs. You will need the information when performing several of the configuration tasks. You might want to 'rip this page out'



Figure 1. Lab hardware environment for Team nn

0.2 Your Team number: nn = __ __

0.3 Physical layout of the iSeries servers

Open two iSeries Navigator windows. Left: <System_1> and right: <System_2>:



Figure 2. Open two iSeries Navigator windows to administer your two servers

Lab 1. Virtual IP Interface and proxy ARP

This lab provides you the opportunity to configure a virtual IP interface with fault tolerance through the use of proxy ARP.

After you complete this lab, you will have an ability to configure a virtual IP interface on the iSeries server considering the fault tolerance.

Objectives

This lab allows you to learn how to:

- Configure a virtual IP interface on the iSeries server.
- Plan the network configuration using virtual IP fault tolerance.

Scenario

Your customer requires uninterrupted IP communication to the iSeries server to improve availability of business-critical applications. Two physical Token-Ring interfaces (TRNLINE1 and TRNLINE2) are hooked up to the Token-Ring network. Using these two physical lines, is it possible to provide an uninterrupted and fault tolerant IP communication path using a single virtual IP address to access the iSeries server. This setup allows uninterrupted access to the system even if one of the physical interfaces goes down.





You will perform the following tasks in order:

- Task 1: "Create a new virtual IP interface" on page 9.
- Task 2: "Verify your virtual IP address from your workstation" on page 13.
- Task 3: "Enable Proxy ARP for Virtual IP address" on page 13.
- Task 4: "Configure iSeries Navigator to use your virtual IP address" on page 14.
- Task 5: "Test fault tolerance with your virtual IP interface" on page 15.

Task 1: Create a new virtual IP interface

Important: In this lab, you will be working with the <System_1> server. Login to the correct system using iSeries Navigator. Use Figure 3 as a guide.

- 1. Start iSeries Navigator on your workstation by clicking Start -> Programs
 -> IBM iSeries Access for Windows -> iSeries Navigator. iSeries
 Navigator window will appear.
- ___ 2. Double-click My Connections.
- ___ 3. Expand your iSeries server <System_1>. You may be asked to enter your userid and password.

UserID TCP52Unn Password V5R2

- ____ 4. Expand Network -> TCP/IP Configuration -> IPv4.
- __ 5. Right-click Interfaces and select New Interface -> Virtual IP as shown in Figure 4.



Figure 4. Interfaces: New Interface: Virtual IP

___ 6. The Welcome panel of the New IPv4 Interface wizard appears as shown in Figure 5. Click **Next**.



Figure 5. New IPv4 Interface wizard: Welcome page

____ 7. In the Settings window, enter the virtual IP address 172.23.1nn.88, a description for the interface (used in iSeries Navigator only) and the subnet mask 255.255.255.255 as shown in Figure 6. The subnet mask should be 255.255.255.255 to avoid routing ambiguity. Click Next.

New IPv4 Interface - Settings			×
	<pre>vWhat are the settings for t IP address: Description: Subnet mask: Network: Host:</pre>	his TCP/IP interface? 172.23.1nn.88 VIPA for team nn 255.255.255.255	
	< Back	Vext > Cancel	Help

Figure 6. New IPv4 Interface wizard: Settings

___ 8. The Start TCP/IP panel is presented as shown in Figure 7. Accept the default values and click **Next**.

New IPv4 Interface - Start	Do you want to start this TCP/IP interface every time TCP/IP is started? ves No Do you want to start this TCP/IP interface now? Yes No	X
	< Back Next > Cancel Hel	p

Figure 7. New IPv4 Interface wizard: Start

____9. The Summary window is presented as shown in Figure 8. It shows the values that have been selected in the creation process. Click on **Finish**.

New IPv4 Interface - Summary			×
	IP address: Description: Subnet mask: Network: Host address:	172.23.100.88 VIPA for team 00 255.255.255.255 172.23.100.88 0.0.0.0	
	< Back	Finish Cancel He	slp

Figure 8. New IPv4 Interface wizard: Summary

____ 10.Your are now presented with the Test TCP/IP Interface window as shown in Figure 9. If the **Test now** button is clicked, a PING will be done to the interface. After running the test, click the **OK** to finish running the wizard.

Test TCP/IP Interface - 172.23.	100.1	<u>? x</u>	J
	Since you have chosen to start the TCP/IP like to test it first? Test results: Test Pinging 172.23.100.88 (This interface).	interface, would you Test Results Successful	
		 ОКНеір	

Figure 9. New IPv4 Interface wizard: Test TCP/IP Interface

Question 1:Where was the option to configure Proxy ARP for this IPv4 Virtual IP address?

Task 2: Verify your virtual IP address from your workstation

In this task, you will try to PING your newly created virtual IP address using a command prompt on your Windows 2000 workstation.

- ____1. Click **Start->Programs->Accessories->Command Prompt** to start a command prompt on your workstation.
- ____ 2. Enter the following command to PING your team's virtual IP address on the iSeries server:

ping 172.23.1**nn**.88

Question 2:Did the PING complete successfully?

Question 3: If not, why did the PING fail?

Task 3: Enable Proxy ARP for Virtual IP address

By now, you have noticed that the new IPv4 Interface wizard did not enable proxy ARP by default. To enable proxy ARP, you have to manually change the virtual IP interface configuration as described in the following steps:

- __ 1. Using iSeries Navigator to <system_1>, expand Network -> TCP/IP Configuration -> IPv4.
- ___ 2. Click Interfaces.
- ___ 3. Right-click on your team's virtual IP interface and select Stop.
- ____4. Right-click on your team's virtual IP interface and select **Properties**. The interface Properties window appears as shown in Figure 10.

172.23.100.88 Properties - 172.23.100.	1		×
General Advanced			
۲۶ IP address:	172.23.100.88		
Subnet mask:	255.255.255.255]	
Network: 172.23.100.88	Host: 0.0.0.0		
Line:	Virtual IP	Properties	
Description:	VIPA for team 00	1	-
	OK	Cancel	Help ?

Figure 10. Virtual IP: Properties: General tab:

____ 5. Click the **Advanced** tab. The window in Figure 11 is shown. Check the box next to **Enable proxy ARP** and click **OK** to save your changes.

172.23.100.88 Properties - 172.23.100.1	×
General Advanced	
Start interface when TCP/IP is started	
Maximum transmission unit:	576 vytes
Type of service:	Normal
► Enable proxy ARP	
	OK Cancel Help ?

Figure 11. Virtual IP interface: Properties: Advanced tab

___ 6. Right-click on your team's virtual IP interface and select Start. Proxy ARP is now active for your virtual IP interface.

Task 4: Configure iSeries Navigator to use your virtual IP address

In the following steps you will add a new connection to your iSeries Navigator that uses your team's virtual IP address. This step serves two purposes. First, it allows you to verify that a client application, such as iSeries Navigator, can use the virtual IP address you just created. Secondly, this connection is necessary to test fault tolerance without interrupting the connection from your workstation to the iSeries server, which would be the case when you disable the interface address you are currently connected to.

- ____ 1. Within iSeries Navigator right-click My Connections and select Connection to Servers -> Add connection.
- ____ 2. Enter your team's Virtual IP interface address 172.23.1nn.88 as the Server name as shown in Figure 12 and click Next.

Add Connection - Welcome		X
	Welcome to the iSe	ries Navigator Add Connection wizard.
	What is the name o want to connect?	f the server to which you
	Server:	172.23.1nn.88
	Description:	VIPA interface
	Environment:	My Connections
		< Back Next > Cancel

Figure 12. Add Connection window

- ____ 3. On the Signon Information window, enter your user profile and click Next.
- ____ 4. Click Finish on the Verify Connection window.
- 5. Expand your new system connection and sign on to verify that iSeries Navigator is able to connect to the iSeries server using the virtual IP address.

Task 5: Test fault tolerance with your virtual IP interface

After proxy ARP has been activated for your virtual IP interface, the iSeries server should now respond to ARP requests and answer your PING requests.

____1. From the Windows 2000 command prompt enter the following command:

ping 172.23.1**nn**.88 -t

This command will keep sending ICMP Echo requests to your virtual IP interface address 172.23.1nn.88. To end the PING press Ctrl-C.

____ 2. Open a second Windows 2000 command prompt window and enter the following command:

```
arp -a
```

The arp -a command displays the ARP cache of the Windows 2000 workstation. The following example shows that the MAC address of the first Token-Ring line on the iSeries server is associated with the virtual IP address.

```
C:\>arp -a
Interface: 172.23.102.50 on Interface 0x2000003
Internet Address Physical Address Type
172.23.102.88 40-00-a0-00-01 dynamic
```

Note down the Physical Address (MAC address) that is associated with your team's virtual IP address.

_____3. While the Windows2000 client is sending ICMP Echo requests to 172.23.1nn.88, use iSeries Navigator to disable the IP address that is associated with the MAC address you wrote down in the previous step. For example, if you are team 02 and the MAC address from the previous step is 40-00-0a-00-00-01 which is the MAC address of TRNLINE1 (associated IP address 172.23.102.1), you need to disable the interface 172.23.1nn.1. If the MAC address ends with a 2, you need to disable the IP interface with the address 172.23.1nn.2. You can disable IP interfaces by expanding the iSeries Navigator tree to Network -> TCP/IP Configuration -> IPv4 -> Interfaces and then right-click the interface you want to work with and select Stop.

Question 4:Does the PING still work?

____ 4. Enter the arp -a command again.

Question 5:What MAC address is now associated with your team's virtual IP address?

- ___ 5. Enable the IP interface you previously disabled. You will not experience any interruption of the ICMP Echo Requests.
- ___ 6. Now disable the second IP interface and display the ARP cache on the Window 2000 workstation again.

Question 6:Did the associated MAC address change again?

___7. Start the second IP interface again.

You have now seen that proxy ARP allows you to build a fault tolerant IP network that helps you improve your server's availability by performing just a few simple configuration steps.

Lab 2. Multilink PPP configuration

This lab provides you with the opportunity to configure multilink PPP configuration for fault tolerance.

After you complete this lab, you will have learned how to configure multilink PPP configuration for fault tolerance. You will also have the knowledge to plan a reliable PPP network configuration using the multilink protocol.

Objectives

This lab allows you to learn how to:

- Configure multilink PPP configuration for fault tolerance.
- Plan a reliable PPP network configuration using the multilink protocol.

Scenario

Two iSeries servers are connected with two PPP connections through a public analog network (switched line). Due to line quality problems, these PPP connections often experience unexpected disconnections. Your customer requires a reliable and highly available PPP connection and automated re dial in case of a disconnected line.



Figure 13. Multilink PPP configuration fault tolerance lab

You will perform the following tasks in order:

- Task 1: "Create Originator profile on <System_1> to support fault tolerance" on page 17.
- Task 2: "Create a Receiver profile on <System_2> to support fault tolerance" on page 24.
- Task 3: "Test the configuration" on page 30.

Task 1: Create Originator profile on <System_1> to support fault tolerance

Before you get started please make sure you understand the big picture of what you are trying to accomplish in this task. Refer to Figure 1 on page 7.

At a high level you are going to be creating an Originator profile on **<System_1>** that contains two links in a multilink bundle. Each link is represented by a line

description on the iSeries that is associated to a Communications Resource name. These Communication Resource names in turn are associated to the physical ports on the #2761 which are connected to ports on our PBX phone system.

Question 7:What are the two Communication Resource names that you will be using to make the originating calls from <System_1> to <System_2>?

Question 8:What are the two phone numbers that <System_1> must call to connect to <System_2>?

- 1. Start the iSeries Navigator by clicking Start -> Programs -> IBM iSeries Access for Windows -> iSeries Navigator. The iSeries Navigator window appears.
- __ 2. Expand your iSeries server <System_1> (refer to Figure 1 on page 7 for the IP address of this system). This may require that you enter a userid and password.
- ___ 3. Expand Network -> Remote Access Services.
- 4. Right-click Originator Connection Profiles and select New Profile as shown in Figure 14.



Figure 14. Originator Connection Profile: New Profile

__ 5. The New Point-to-Point Connection Profile Setup window appears as shown in Figure 15. The only parameter that needs to be changed on this window is **Type of line service.** Select **Line pool** and then click **OK** to proceed to the next window.

New Point-to-Point Connectio	on Profile Setup - As20.itsoroch.ibm.com	<u>?</u> ×
New point-to-point connection p	rofile properties setup information:	
Protocol type: PPP		
C SLIP		
Mode selections Connection type: Switched line Leased line L2TP (virtual line) PPP over Ethernet		
Operating mode:	Dial	-
Link configuration		
Type of line service:	Line pool	•
	OK Cancel Hei	<u>ه</u>

Figure 15. Originator Connection Profile: Type of line service: Line pool

____6. The New Point-to-Point Profile Properties window General tab is displayed as shown in Figure 16. Enter a name for the profile, for example, Multiorgmm as a short hand note to ourselves that this is a multilink originator profile that we are configuring. Optionally enter a description.

New Point-to-Point P	rofile Properties - 172.23.102.88	? ×
General Connection	Authentication TCP/IP Settings DNS Other	
Name:	Multiorg02	
Description:	Multilink Orginiator profile - Team 02	
Protocol type:	PPP	
Mode type:	Switched line-dial	
	OK Cancel Help	

Figure 16. Originator Connection Profile: General tab

____7. Click the Connection tab. From the Connection tab, you need to give the line pool a name of Multilinem as shown in Figure 17. Click New to proceed to the New Line Pool Properties window.

Type of line service:	Line pool
Name:	Multiline02 New
	Open
Enable multilink protocol	Multilink Settings
Remote phone numbers	
	Add Move Up
	Remove Move Down
Dial options:	
O not move number if	dialed successfully
C Move number to top of	list if dialed successfully
C Move number to botton	n of list if dialed successfully

Figure 17. Originator Connection Profile: Connection tab: Connection tab

_____8. The New Line Pool Properties window appears as shown in Figure 18. New lines are created by clicking on the New Line button. Lines that are created will appear in the left pane. Lines in the left pane may be moved to the line pool in the right pane by selecting the buttons that reside between the two panes. You need to create your own lines MLTLNKnn0 and MLTLNKnn1. Click New Line to add the first line for your team.

w Line Pool Properties -	172.23.102.88				?
General	Multiline02			_	
Available lines:	J	\$	Selected lines t	for pool:	
Line Modem	Shared		Line	Modern	Shared
		Add>			
		Add All>			
New Line New Line B	ased On Open Line		OK	Cancel	Help

Figure 18. Originator Connection Profile: New Line Pool Properties: Selected lines for pool

9. The New Line Properties window appears. Enter MLTLINGNO as the name for the first line you are about to create. Next you need to select the hardware resource of your modem as shown in Figure 19. Refer to Figure 1 on page 7 for the CMNxx hardware resource name of the modem for this lab. Important

The CMNxx resource pictured in Figure 19 most likely is not the correct resource. Please refer to Figure 1 on page 7 or ask your instructor if you are not sure which is the correct resource.

w Line Properties - 172.	23.102.88		?
General Connection Link	Limits Modern Oth	ier 🗍 Additional Para	ameters
The settings on this page a	affect the settings available	e on the rest of the p	roperty
Name:	MLTLNK020		
Description:	Internal modern Cl	/N04	
Hardware resource —			
Resource	Туре	Description	
CMN04	2761	Comm Port	
CMN05	2761	Comm Port	
CMN06	2761	Comm Port	
CMN07	2761	Comm Port	-1
CMNIDO	0764	Comm Dort	
 List by name List by location 			
Interface type:	Internal Modern	Ŧ	
Mode type:	Switched line-dial		
Framing:	Asynchronous	•	
	01	Cancel	Help

Figure 19. New Line Properties window

- ____ 10.Click **OK** to save your new line.
- ____ 11. Repeat the previous step to create the second line for your line pool. Use the line name MLTLINKm1 and the corresponding hardware resource as listed in Figure 1 on page 7.
- 12.From the New Line Pool Properties window select your lines MLTLNKnn0 and MLTLNKnn1 and add them to the Selected lines for pool pane as shown in Figure 20.

ine pool nar	ne:	Multili	ne02				
Available line	IS:				Selected lines f	or pool:	
Line	Modem		Shared	Add> < Remove Add All> < Remove All	Line MLTLNK021 MLTLNK020	Modem 2761 Internal Modem 2761 Internal Modem	Shared No No
New Line	New Line Bas	sed On	Open Line				

Figure 20. New Line Pool Properties window

- ____ 13.Click **OK** to save your new line pool definition.
- ____ 14.You are brought back to the Connection tab as shown in Figure 21. Select **Enable multilink protocol** to enable MP.

Link configuration Type of line service:	Line pool		
Name:	Multiline02	•	New
			Open
Enable multilink protocol	Multilink Settings	1	
Remote phone numbers		_	
		Add	Move Up
		Remove	Move Down
Dial options:	ialed successfully.		
C Move number to top of I	st if dialed successfully		
C Move number to bottom	of list if dialed successfully	/	
	Advanced		

Figure 21. Originator Connection Profile: Connection tab: Enable multilink protocol

____ 15.The Define Multilink Configuration window appears as shown in Figure 22. Maximum number of links per bundle will remain at two since you will use two links for the multilink connection. Click OK. Question 9:Why should you *not* select Allow remote system to initiate a call from this system?

Question 10:Why should you *not* select Enable bandwidth utilization monitoring?

Define Multilink Configuration - 172.23.1	02.88	? ×
Maximum number of links per bundle (1 - 6):	2	- -
🔲 Allow remote system to initiate a call from t	this system	
🔲 Enable bandwidth utilization monitoring		
Add link when usage rises above	90	💌 per cent
for at least	15	★ seconds
Drop link when usage falls below	40	💌 per cent
for at least	15	* seconds
Bandwidth test direction: Inbound and outbound Outbound only		
OK	Cancel	Help

Figure 22. Define Multilink Configuration window

16.We will now add the phone numbers for the remote site. Click Add and enter the phone numbers for the remote location as shown in Figure 23. Refer to Figure 1 on page 7 for the two phone numbers you have to enter. Once you are finished, click Advanced.

New Point-to-Point Profile Pro	operties - 172.23.102.88		?	'×
General Connection Authen	ntication TCP/IP Settings DNS	Other		
Link configuration Type of line service:	Line pool			
Name:	Multiline02	-	New	
			Open	
Enable multilink protocol	Multilink Settings			
Remote phone numbers				1
106		Add	Move Up	
		Remove	Move Down	
Dial options:				
O not move numb	er if dialed successfully			
C Move number to to	p of list if dialed successfully			
C Move number to be	ottom of list if dialed successfully			
	Advanced			
	ОК	Canc	el Help	

Figure 23. Originator Connecting Profile: Connection tab: Remote phone numbers

____ 17.On the Advanced Dial Parameters window, check **Re-dial on disconnect** as shown in Figure 24. Click **OK** to continue.

Advanced Dial Parameters - As20	<u>? ×</u>
🔽 Re-dial on disconnect	
Number of dial attempts:	3 +
Delay between dial attempts:	15 🔹 seconds
Line inactivity timeout (15 - 65535):	No maximum 💌 seconds
OK	Cancel Help

Figure 24. Advanced Dial Parameters window

- 18.On the New Point-to-Point Profile Properties window, click the TCP/IP Settings tab.
- ____ 19.In this lab you will allow <System_2> to assign IP addresses and therefore will take the defaults as shown in Figure 25. Click OK to save the new originator connection profile.

New Point-to-Point Profile Properties - 172.23.102.88	×
General Connection Authentication TCP/IP Settings DNS Other	
CLocal IP address	
 Assigned by remote system 	
O Use fixed IP address:	
Remote IP address	
Assigned by remote system	
C Use fixed IP address:	
Routing	
No additional routing is required	
C Add remote system as the default route	
Define additional static routes	
Routes	
Hide addresses (full masquerading)	
Auvanced	
OK Cancel Help	

Figure 25. Originator Connection Profile: TCP/IP Settings

Task 2: Create a Receiver profile on <System_2> to support fault tolerance

In this task you will configure the system that answers connection requests. You will configure a receiver connection profile that will listen on two communication lines for incoming requests.

Question 11:What are the two Communication Resource names that you will be using to receive the calls on <System_2>?

1. Start the iSeries Navigator by clicking Start -> Programs -> IBM iSeries Access for Windows -> iSeries Navigator. The iSeries Navigator window appears.

-Note:-

It may be necessary to create a new connection to this system by its IP address.

- ___ 2. Expand your iSeries server <System_2> (refer to Figure 1 on page 7 for the IP address of this system). This may require that you enter a userid and password.
- ___ 3. Expand Network -> Remote Access Services.
- 4. Right-click on Receiver Connection Profiles and select New Profile as shown in Figure 26.



Figure 26. Receiver Connection Profiles: New Profile

____ 5. The New Point-to-Point Connection Profile Setup window appears as shown in Figure 27. The only parameter that needs to be changed on this window is **Type of line service**. Select **Line pool** and then click **OK** to proceed to the next window.

New Point-to-Point Connection	Profile Setup	- 172.23.102	.20	<u>? ×</u>
New point-to-point connection pro Protocol type:	file properties set	up information:		
C SLIP				
Mode selections Connection type: Switched line Leased line L2TP (virtual line)				
Operating mode:	Answer			•
Link configuration				
Type of line service:		Line pool		
		ОК	Cancel	Help

Figure 27. Receiver Connection Profile: Type of line service: Line pool

____ 6. The New Point-to-Point Profile Properties window General tab is displayed as shown in Figure 28. Enter Multircvmm as the name for your receiver profile. Optionally enter a description.

New Point-to-Point F	Profile Properties - 172.23.102.20	ĸ
General Connection	h Authentication TCP/IP Settings Other	
Name:	Multircv02	l
Description:	Receiver connection profile for team 02	l
Protocol type:	PPP	l
Mode type:	Switched line-answer	
		l
		l
		l
		l
		l
	OK Cancel Help]

Figure 28. Receiver Connection Profile: General tab: Name: Multirec

____7. Click the Connection tab. From the Connection tab, define the lines to be used for MP. Enter the name Multilinenn as the name for your line pool as shown in Figure 29. Click New.

w Point-to-Point Profile Properti	es - 172.23.10	2.20		?
General Connection Authentication	n TCP/IP Setting	s Other		
Link configuration				
Type of line service:	Line pool			
Name:	Multiline02		•	New
				Open
Maximum number of links:		[1		
Multilink configuration				
Enable multilink protocol				
Maximum number of links per	bundle:	1	* *	
E Require bandwidth alloca	tion protocol			
Line inactivity timeout (15 - 65535):		No max	kimum 💌 seco	onds
		ок	Cancel	Help

Figure 29. Receiver Connection Profile: Line pool name: Multilinenn

8. The New Line Pool Properties window appears as shown in Figure 30. New lines are created by clicking on the New Line button. Lines that are created will appear in the left pane. Lines in the left pane may be moved to the line pool in the right pane by selecting the buttons that reside between the two panes. You need to create your own lines MLTLNKnn0 and MLTLNKnn1. Click New Line to add the first line for your team.

ine pool name	a: Multilir	ne02				
Available lines	:			Selected line	es for pool:	
Line MULTILINK0 MULTILINK1 ANSDHCP2	Modem 2761 Internal Modem 2761 Internal Modem 2761 Internal Modem	Shared No No No	Add> < Remove Add All> < Remove All	Line	Modern	Shared
New Line	New Line Based On	Open Line				

Figure 30. Receiver Connection Profile: Multilinenn Properties

9. The New Line Properties window appears. Enter MLTLNKnn0 as the name for the first line you are about to create. Next you need to select the hardware resource of your modem as shown in Figure 31. Refer to Figure 1 on page 7 for the hardware resource name of the modem for this lab.

Seneral Connection Link	Limits Modem Other	Additional Parameters	
The settings on this page aff	ect the settings available or		
		The rest of the property	
Name:	MLTLNK020		
Description:	Internal modem recei	ver CMN04	
Hardware resource			
Resource	Туре	Description 🔺	
CMN04	2761	Comm Port	1
CMN05	2761	Comm Port	1
CMN06	2761	Comm Port	
CMN07	2761	Comm Port 🖉	1
	0764	Comm Bort	1
List by name List by location	Internal Modern	J	
Mode type: Framing:	Switched line-answer		
			ln.

Figure 31. New Line Properties window

- ____ 10.Click **OK** to save your new line.
- ____ 11.Repeat the previous step to create the second line for your line pool. Use the line name MLTLNKml and the corresponding hardware resource as listed in Figure 1 on page 7.
- 12.From the New Line Pool Properties window select your lines MLTLNKnn0 and MLTLNKnn1 and add them to the Selected lines for pool pane as shown in Figure 20.

∖vailable lines	:			Selected lines f	'or pool:	
Line MULTILINKO MULTILINK1 ANSDHCP2	Modem 2761 Internal Modem 2761 Internal Modem 2761 Internal Modem	Shared No No No	Add> < Remove Add All> < Remove All	Line MLTLNK021 MLTLNK020	Modem 2761 Internal Modem 2761 Internal Modem	Shared No No

Figure 32. New Line Pool Properties window

____ 13.Click **OK** to save your new line pool definition.

14. You are brought back to the Connection tab. Click Enable multilink protocol as shown in Figure 33. You have two lines available in your pool and will therefore specify two for Maximum number of links per bundle.

Question 12:Should you enable Require bandwidth allocation protocol for this profile?

w Point-to-Point Profile Prope	rties - 172.23.102.20	1		?
eneral Connection Authenticat	tion TCP/IP Settings	Other		
Link configuration				
Type of line service:	Line pool			
Name:	Multiline02		•	Vew
				Open
Maximum number of links:		2	<u>×</u>	
Multilink configuration				
Enable multilink protocol				
Maximum number of links p	er bundle:	2	•	
🔲 Require bandwidth allo	cation protocol			
Line inactivity timeout (15 - 65535	9:	No maxim	um 💌 secor	nds
		ок	Cancel	Help

Figure 33. Receiver Connection Profile: Multilink configuration: Enable multilink protocol

15.Click the TCP/IP Settings tab. You need to specify a local and remote IP address. The local address needs to be an existing interface on the iSeries <System_2>. In this case, the local address is the local LAN interface address for your team on <System_2>. Refer to the hardware environment as shown in Figure 1 on page 7 for the IP address to be used as the local address. For the remote address enter 10.1.1.1mm. Enter the information as shown in Figure 34 and click OK to save the connection profile.

Multircv02 - 172.23.102.20	<u>?</u> ×
General Connection Authentication TCP/IP Set	tings Other
Local IP address	
Assign fixed IP address:	10.1.1.20 (Token Ring)
Remote IP address	
IP address assignment method:	Address pool
Starting IP address:	10.1.1.102
Number of addresses:	1
Define additional IP addresses based on re	emote system's user ID
IP Addresses Defin	ed By User Name
Allow remote system to assign its own IP	address
Allow remote system to access other network	ks (IP forwarding)
Adva	nced
	OK Cancel Help

Figure 34. Receiver Connection Profile: TCP/IP settings

Task 3: Test the configuration

Now it is time to test your multilink configuration. You will test the configuration by first establishing a connection over both links in the multilink protocol (MP) bundle and then simply disconnecting one of the active RJ-11 connectors from the telephone switch (PBX).



____1. To start the receiver profile on <System_2>, right-click on the profile Multircvnn and select Start as shown in Figure 35.

5 🗁 13 🕨 🔍 🗹 😏 🗊 🍳						1 minutes old	
Environment: My Connections	172.23.102.2	20: Receiver Connec	tion Profiles				
jer 📓 172.23.102.20 🔺	Profile	Protocol	Status	Connection type	Line	Line type	
Basic Operations Work Management Configuration and Service Network TCP/IP Configuration Remote Access Services Originator Connection Prof Receiver Connection Prof Modems	Testrc	Start Start Start Options > Stop Jobs Connections Delete	Inactive Ended - i	Switched line-answer Switched line-answer	Multiline02 ANSDHCP2	*POOL *ppp	
⊞ ⊡ Servers		Properties					

Figure 35. Receiver Connection Profile: Start

___ 2. To start the originator profile on <System_1>, right-click on the profile and select Start as shown in Figure 36.

5- 5- 79 D 💿 X 🖻 🥩 🖪 🤇	>					0 minutes old
Environment: My Connections	172.23.102.88: 0	Iriginator Conne	ction Profiles			
😟 😼 Basic Operations 🖉	Profile	Protocol	Status	Connection type	Line	Line type
Configuration and Service Configuration and Service Configuration Remote Access Services Conjunator Connection Prof Configurator Connection Prof Consection Prof Consection Prof Consection Prof Consection Prof	Multiorg Multioran2 Start Start Stop Jobs Conne	PPP DOD Options >	Inactive Inactive	Switched line-dial Switched line-dial	Multiline Multiline02	*POOL *POOL
IP Policies Windows Administration	Prope	erties				

Figure 36. Originator Connection Profile: Start

____ 3. Right-click on Originator profile on **<System_1>** and select **Connections** to view the status of the connection (see Figure 37).



Figure 37. Originator Connection Profile: Connections

4. The Connections window is displayed as shown in Figure 38. The first line shows the active connection between the two iSeries servers. The second and third line show the modem connections. You should have two links active.

Active Active	Operational.	10.1.1.102	10.1.1.20	QMPTX2000	
Active	Modem connect Modem connect	*MULTILINK *MULTILINK	QMPTX20006 QMPTX20006	MLTLNK021 MLTLNK020	Details
				Þ	
				Refresh	
					Refresh

Figure 38. Originator Connection Profile: Multiorig connections: Two lines active

____ 5. Pull one of the phone jacks from PBX Line sharing device that are used for your multilink connection. This causes a failure to one of the lines. The connections window shows that one modem connection remains active and keeps the connection functional as seen Figure 39. The originator system will try to reestablish a connection over the failed line until the number of retries are exceeded.

MULTIORG02 Con	nections - 172.2	3.102.88				<u>? x</u>
Connected user	Primary Status Active Active Calling remote	Secondary Status Operational. Modem connected. DIALING 107	Local IP 10.1.1.102 MULTILINK MULTILINK	Remote IP 10.1.1.20 0MPTX20007 0MPTX20007	Lir QN ML ML	Jobs Details
•				Refre	sh cel	Help

Figure 39. Originator Connection Profile: Multiorig connections: Link failure

- ____6. From **<System_1>** ping **<System_2>** at IP address 10.1.1.20.
- ____7. Reconnect the line and verify that both lines return to active.
- ___ 8. Stop your Originator profile on <System_1> and the Receiver profile on <System_2>.

Multilink - Use the Board

You MUST use the board to leave the multilink test area!

This symbol means my team is OUT - let the next team that is in queue know.



Lab 3. Dynamic resource sharing scenario

The PPP Dynamic Resource Sharing function provides the capability to designate an (analog) line resource as *shared*, allowing PPP dial profiles to "borrow" a line being used to listen for incoming calls in order to place an outgoing call.

In this scenario, we are going to show how to configure the dynamic resource sharing for both an originator and receiver connection profile.

Scenario overview

Here are the conditions that you may choose this scenario:

- If your communication application needs Receiver connection profile running for incoming call and Originator profile running for outgoing calls
- These calls need not to be active at the same time.
- You have a limited number of switched line ports and you cannot afford to dedicate each port for either an originating or receiving application.

Sample network configuration

Figure 40 shows the sample network configuration of this scenario.

Note

You will not be using the PBX or clients in this scenario. In this scenario you will be configurating the iSeries (only) and watching the behavior of the dynamic resource sharing Originator and Receiver profiles.



Figure 40. Sample network configuration: Dynamic resource sharing scenario

Task 1: Configuring the Originator resource and shared Link configuration

Question 13:How many line descriptions will you be creating to support the Originator and Receiver profiles?

To configure an Originator profile and associated shared Link configuration do the following steps:

- __ 1. Start the iSeries Navigator on by clicking Start -> Programs -> IBM iSeries Access for Windows -> iSeries Navigator. The iSeries Navigator window appears.
- __ 2. Expand your iSeries server <System_1> (refer to Figure 1 on page 7 for the IP address of this system). This may require that you enter a userid and password.
- ___ 3. Expand Network -> Remote Access Services.
- __ 4. Right-click Originator Connection Profiles and select New Profile as shown in Figure 41.



Figure 41. Originator Connection Profile: New Profile

_ 5. The New Point-to-Point Connection Profile Setup window appears as shown in Figure 42. Accept the defaults and click **OK** to proceed to the next window.

New Point-to-Point Connectior	n Profile Setup - 9.170.6.140	<u>?</u> ×
New point-to-point connection pro	file properties setup information:	
Protocol type: PPP C SLIP		
Mode selections Connection type: © Switched line © Leased line © L2TP (virtual line) © PPP over Ethernet		
Operating mode:	Dial	•
Link configuration		
Type of line service:	Single line	•
	OK Cancel Hel	P

Figure 42. Originator Connection Profile: Type of line service: Line pool

_____6. The New Point-to-Point Profile Properties window General tab is displayed as shown in Figure 43. Enter a name for the profile, for example, ORGSHARERM as a short hand note to ourselves that this is a originator profile that we are configuring that will share the link resource. Optionally enter a description.

New Point-to-Point P	rofile Properties - 9.170.6.140
General Connection	Authentication TCP/IP Settings DNS Other
Name:	ORGSHAREnn
Description:	Teamnn briginator Profile for Dyn Resource Sharing
Protocol type:	PPP
Mode type:	Switched line-dial
	OK Cancel Help

Figure 43. Originator Connection Profile: General tab

____ 7. Click the Connection tab. From the Connection tab, you need to give the line pool a name of DYNLINKm as shown in Figure 44. Click New to proceed to the New Line Pool Properties window.

ink configuration	1 21		
Type of line service:	Single line		
Name:	DYNLINKnn	•	New
			Open
Enable multilink protocol	Multilink Settings		
emote phone numbers			
		Add	Move Up
		Remove	Move Down
Dial options:			
C Do not move number if	dialed successfully		
C Move number to top of	list if dialed successfully		
C Move number to botton	n of list if dialed successful	Ιy	
	Advanced		

Figure 44. Originator Connection Profile: Connection tab: Connection tab

____ 8. The New Line Properties window appears as shown in Figure 45. You need to select the hardware resource of your modem. Refer to Figure 1 on page 7 for the hardware resource name of the modem for this lab. Select the Modem tab.

New Line Properties - 9.170.6.	140	? ×
General Connection Link	Limits Modern Other	Additional Parameters
The settings on this page affec	الار t the settings available on th	ne rest of the property
Name:	DYNLINKnn	
Description:	for team nn	
Hardware resource	,	
Resource	Туре	Description
CMN06	2761	Comm Port
CMN07	2761	Comm Port
CMN08	2761	Comm Port
CMN09	2761	Comm Port
	1745	
 List by name C List by location 		
Interface type:	Internal Modem 💌	
Mode type:	Switched line-dial	
Framing:	Asynchronous 💌	
	ок	Cancel Help

Figure 45. New Line Properties window

___ 9. The New Line Properties panel is shown as seen in Figure 46. Select Enable dynamic resource sharing.



Figure 46. New Line Properties: Select Enable Dynamic Resource Sharing

- ____ 10.Click **OK** to save your new line.
- ____ 11.On your Originator profile screen Connection tab enter a phone number such as 555. We will not be making a call so it does not matter what number you use.

Task 2: Configuring the Receiver profile to use the shared link configuration

To configure an Receiver profile and associated shared Link configuration do the following steps:

____1. Right click on **Receiver Connection Profiles** and select **New Profile** from the context menu. This is shown in Figure 47. Examine the choices. You will take all the defaults. Click **OK** to continue.

New Point-to-Point Connectio New point-to-point connection pr Protocol type:	n Profile Setup - 172.23.100.20 ofile properties setup information:	<u>? x</u>
C SLIP		
Mode selections Connection type: Switched line Leased line L2TP (vitual line)		
Operating mode:	Answer	•
Link configuration		
Type of line service:	Single line	•
	OK Cancel H	lelp

Figure 47. New Point-to-Point Connection Profile Setup

____ 2. On the General tab, name your Receiver profile ANSHAREnn and give it a description that is worthy of your team as shown in Figure 48. Click the Connection tab to continue.

New Point-to-Point P	rofile Properties - 9.170.6.140	? X
General Connection	Authentication TCP/IP Settings Other	
الا Name:	ANSSHAREnn	
Description:	for Team nn and nobody else	
Protocol type:	ррр	
Mode type:	Switched line-answer	
	OK Cancel He	ql

Figure 48. New Point-to-Point Connection Profile Properties: General tab

____ 3. On the Connection tab, pull down the line description name of DYNLINKnn as shown in Figure 49. This name is the same as you created for a previous step and is mapped to port on the #2761 to which you will be making your modem connection. See Figure 1 on page 7 for a diagram of the network.

New Point-to-Point Profile Propertie	New Point-to-Point Profile Properties - 9.170.6.140					
General Connection Authentication TCP/IP Settings Other						
-Link configuration	• • •	[
Type of line service:	Single line					
Name:	New New					
	DYNLINKNN Open					
Maximum number of links:	MLTLNIKOO MLTLNIKOOO MLTLNIKOO1 QPPPCMNO2					
-Multilink configuration						
Enable multilink protocol						
Maximum number of links per l	bundle:					
Require bandwidth allocat	iion protocol					
Line inactivity timeout (15 - 65535) :	No maximum 💌 seconds					
	OK Cancel H	lelp				

Figure 49. New Point-to-Point Connection Profile Properties: Connection tab

_ 4. Click **Open** to view the properties for DYNLINK**nn** to confirm that this is the same line definition as you created in Task 1: Create Originator profile on

<System_1> to support fault tolerance. In addition, click on the Modem tab to verify that Enable dynamic resource sharing is still selected.

Click OK to continue.

- ___ 5. Click the **TCP/IP Settings** tab to continue.
- 6. On the TCP/IP Settings tab, pull down Assigned fixed IP address to 10.4.4.1 as shown in Figure 50. For the Remote IP address we will assign this using a fixed IP address starting at 10.4.4.2. Click OK to create your Receiver profile.

New Point-to-Point Profile Prope	ties - 9.170.6.140			? ×		
General Connection Authenticat	ion TCP/IP Settings	Other				
-Local IP address						
Assign fixed IP address:	1	0.4.4.1 (Tok	en Ring)	•		
Remote IP address						
IP address assignment method	: Fi	xed IP addre	SS	-		
Starting IP address:		10.4.4.2				
Number of addresses:		1				
Define additional IP addres	ses based on remote	system's us	er ID			
IP A	ddresses Defined By	y User Name				
Allow remote system to as	Allow remote system to assign its own IP address					
Allow remote system to access other networks (IP forwarding)						
		ок	Cancel	Help		

Figure 50. New Point-to-Point Connection Profile Properties: Connection tab

Do not yet start your Receiver or Originator profiles as other teams may be using the communication resource right now.

Task 3: Testing the dynamic resource sharing scenario

No two teams can use the same communications resource.

– Hint –

As you are starting and stopping both Receiver and Originator profiles you should be refreshing the status of both profiles as they 'interact' with each other. The screen shots that follow do not show all the profile states.



1. On iSeries Navigator screen, start your Receiver profile which shares the line resource with Originator profile. In this example, start the Receiver profile ANSSHAREnn as shown in Figure 51. The status will change to Waiting for incoming call.



Figure 51. iSeries Navigator screen: ANSSHAREnn is Waiting for incoming call

2. On iSeries Navigator screen, start your Originator profile which shares the line resource with Receiver profile. In this example, start the Originator profile **ORGSHAREnn** as shown in Figure 52. The status of ORGSHAREnn is now **Calling remote system**.

Ø iSeries Navigator						_ 🗆 ×
<u>File E</u> dit <u>V</u> iew <u>H</u> elp						
S 🗁 🏷 🕨 🕥 X 🖆 🏈 👿 🔍						0 minutes old
Environment: My Connections		9.170.6.140: Origin	ator Connectio	n Profiles		
Ē 📲 172.23.100.1		Profile	Protocol	Status		Connection typ
😟 📲 172.23.100.20		Multiorg00	PPP	Inactive		Switched line-c
庄 – 📓 172.23.100.30		✓ Orgshare00	PPP	Calling remote s	system	Switched line-c
😟 📲 172.23.100.88		Test	PPP	Inactive		Switched line-c
庄 – 📓 9.131.192.80						
🚊 🖷 📓 9.170.6.140						
🕀 🈼 Basic Operations						
😟 🛱 Work Management						
🕀 🥵 Configuration and Service						
🖻 🖓 Network						
ICP/IP Configuration						
E Remote Access Services						
- 😴 Originator Connection Profiles						
🖻 े Receiver Connection Profiles						
🖓 Group Access Policies						
Modems						
😟 🗍 Servers						
IP Policies						
📃 👘 🕮 Windows Administration						
🚔 My Tasks - 9.170.6.140 🔤	Remo	ote Access Services ta	nsks			▲ _
Add a connection) هۆ	Configure a new Point-t	o-Point modem		🚽 🛫 Create an AT&T Global Network dial (connection 📃
Install additional components	g/ C	reate a new Point-to-F	oint originator	connection profil	9 New Intranet or ISP Dial Connection	
	0 چ	Create a new Point-to-F	oint receiver c	onnection profile	📲 Configure IBM Universal Connection	•
1 - 3 of 3 objects						

Figure 52. Series Navigator screen: Cmn10org is Calling remote system

_____3. While the Originator profile is initiating a call, look at the Receiver profile status. In this example, look at the Receiver profile ANSSHAREnn as shown in Figure 53. The status of ANSSHAREnn is now Resource sharing - waiting for line to become active. This represents that Receiver profile ANSSHAREnn is waiting for a line resource ready which is currently used by Originator profile ORGSHAREnn.



Figure 53. iSeries Navigator screen: ANSSHAREnn is now Resource sharing

____ 4. Next stop the Originator connection profile ORGSHAREnn. Again, watch the status change on both ORGSHAREnn and ANSSHAREnn. Eventually watch the Receiver Connection profile go back to a status of Waiting for incoming call.

___ 5. Stop the Receiver connection profile ANSSHAREnn.



Lab 4. DHCP Proxy Client

This lab provides you the opportunity to configure DHCP proxy client working with PPP connection. DHCP proxy client leases IP address to the remote PPP client.

After you complete this lab, you will have an ability to configure DHCP proxy client configuration and Receiver connection profile for DHCP proxy client.

Objectives

This lab allows you to learn how to:

- Configure DHCP proxy client
- Configure Receiver connection profile for DHCP proxy client

Scenario

Your customer has DHCP server running in Token Ring network. Clients running in Token Ring network have IP address leased by DHCP server. Now your customer has a plan to install several remote PPP clients. Your customer needs remote PPP clients to have IP addresses assigned within the IP address range specified in DHCP server configuration.



Figure 54. DHCP server and remote PPP clients

Task 1: Verify DHCP server configuration on <System_1>

Before you arrived your instructor configured the DHCP server on **<System_1>**. As pictured in Figure 54 this DHCP server will lease addresses for the 10.2.2.0 subnetwork with the address range of 10.2.2.2 through 10.2.2.254. 10.2.2.1 is reserved for the iSeries local LAN address.

You should verify the DHCP configuration on **<System_1>** before you start.

- __ 1. Expand Network -> Servers.
- ____ 2. Click TCP/IP to bring up a list of all the servers on the right. Find the DHCP server and make sure it is Started.

If not, please feel free to start it yourself.

____ 3. Right click on DHCP and select **Configuration** from the context menu. You will be presented with the DHCP Server Configuration window as shown in

Figure 55. Right click on Subnet 10dot2 and select **Properties** from the context menu.

DHCP Server Configura	tion - 172.23.100.88			?	×
Elle Edit View Server H	elp				
Modified Configuration		Contents o	f Subnet 10dot2		—
□ 📅 DHCP Server - 172.23 □ 🌍 Global □ 😲 Subnet 10do	8.100.88	Name	Descri	otion	
Class IBMNS Class IBMNS Class IBMNS	New Class New Client				
	New Excluded Client				
	Enable Disable				
	Delete	Options for	Subnet 10dot2		—
	Properties	Tag ⓒ1 ⓒ51	Name Subnet mask IP address lease time	Value 255.255.255.0 1 hours	
Subpet: 10dot2_Mask:	255.255.255.0 Address range: 1	0.2.2.1 - 10.2	.2.254 Status: Message	ID:	

Figure 55. DHCP Server Configuration: Right click on Subnet 10dot2 to see the Properties

4. Examine the different tabs on the Subnet 10dot2 Properties panel. The one you should be the most interested in is the Address Pool tab as shown in Figure 56.

As pictured in Figure 54 on page 45 this DHCP server will lease addresses for the 10.2.2.0 subnetwork with the address range of 10.2.2.2 through 10.2.2.254. 10.2.2.1 is reserved for the iSeries local LAN address.

Do not make any changes. Click **Cancel** on the Subnet 10dot2 Properties panel and close the DHCP Server Configuration panel. Do not save any changes.

Subnet 10dot2 Properties - 172.23.10	0.88		<u>?</u> ×
General Address Pool Leases Option	ons Dynamic DNS Clier	nt Support Other	
_Available IP addresses			
C Subnet address:	10.2.2.0		
Range to assign:			
Start address:	10.2.2.1		
End address:	10.2.2.254		
Subnet mask:	255.255.255.0		
- IP addresses excluded			
G. Liddroom	_	Addresses excluded from pool:	-
· Address.		10.2.2.1	
C Address range:			
Add	Remove		
		<u> </u>	
		DK Cancel He	lp

Figure 56. Subnet 10dot2 Properties

Task 2: Verify DHCP proxy client is enabled on <System_1>

Normally you must right click the **Remote Access Services** and select **Services** from the context menu to enable DHCP proxy client on the iSeries. Then, you would proceed to use DHCP proxy client in your Receiver connection profiles.

Due to the nature of this lab environment the DHCP proxy client has already been enabled for you in the Remote Access Services. Your task is to merely verify that the DHCP proxy client function has been enabled.

- ___ 1. Expand Network.
- ____ 2. Right click on **Remote Access Services** and select **Services** from the context menu as shown in Figure 57.



Figure 57. Remote Access Services: Services

____3. The Remote Access Services for Receiver Profiles is displayed. Select the **DHCP WAN Client** tab as shown in Figure 58. The Enable DHCP WAN client check box should be checked and the Client IP address are already completed for you. Click **Cancel** (do not make any changes).

Question 14: Why is this called a DHCP WAN Client?

Remote A	ccess Services for Receiver Pro	ofiles - 172.23.100.88	<u>? ×</u>
RADIUS	DHCP WAN Client		
The assi a loc reco This a DH runn If ne Othe Serv I	DHCP WAN client allows remote aco griment service that is provided to L cal DHCP server or relay agent must panel allows up to sixteen client IP iCP server or relay agent is running ing, its' configuration file is checked ather is running, an option to configu- erwise, the client interface must be in vers support. Enable DHCP WAN client P addresses for the client interface	cess users to obtain the same TCP/IP a AN attached users. To enable this serv is erunning and must be configured to the the client interface. addresses to be specified and determin on the same (local) system. Based on I to verify that the client IP address is d ire and start a local DHCP relay agent it manually configured using the iSeries N to a running local DHCP server or relay	ddress rice, mes whether which one is efined. s available. lavigator -
	Client IP Address	Local Server Type	Add
	10.2.2.1	DHCP server	Remove
		OK Cancel	Help

Figure 58. Remote Access Services for Receiver Profiles: DHCP WAN Client

Task 3: Configure Receiver connection profile for DHCP proxy client

Question 15:What is the Communication Resource name that you will be using to receive the incoming calls on <System_1>?

____1. Right click on **Receiver Connection Profiles** and select **New Profile** from the context menu. This is shown in Figure 59. Examine the choices. You will take all the defaults. Click **OK** to continue.

New Point-to-Point Connection	on Profile Setup - 172.23.100.20	<u>?</u> ×
New point-to-point connection p	profile properties setup information:	
Protocol type:		
• PPP		
O SLIP		
Mode selections Connection type:		
 Switched line 		
C Leased line		
C L2TP (virtual line)		
Operating mode:	Answer	-
Link configuration		_
Type of line service:	Single line	-
	OK Cancel Hel	p

Figure 59. New Point-to-Point Connection Profile Setup

2. On the General tab, name your Receiver profile ANSDHCPnn and give it a description that is worthy of your team as shown in Figure 60. Click the Connection tab to continue.

New Point-to-Point P	rofile Properties - 172.23.100.20	×
General Connection	Authentication TCP/IP Settings Other	
Name:	ANSDHCPnn	
Description:	Receiver profile for DHCP Team nn	
Protocol type:	PPP	
Mode type:	Switched line-answer	
	OK Cancel Help	

Figure 60. New Point-to-Point Connection Profile Properties: General tab

____ 3. On the Connection tab's Link configuration enter a line description Name of DHCPLINnn as shown in Figure 61. Click New to configure the details of this new line description including the ever-important hardware resource identifier.

Ansdhcp00 - 172.23.100.88				? ×
General Connection Authentication	TCP/IP Settings	Other		
Link configuration				
Type of line service:	Single line			
Name:	DHCPLINnn		•	New
				Open K
				opon
Maximum number of links:		P.	<u> </u>	
- Multiliak configuration				
Enable multilink protocol				
Maximum number of links per b	undle:	1	* *	
Require bandwidth allocation	n protocol			
Line inactivity timeout (15 - 65535):		No maximu	um 💌 seco	unds
		ок	Cancel	Help

Figure 61. New Point-to-Point Connection Profile Properties: Connection tab

4. A new window will pop up (as seen in Figure 62) that allows you to associate this new line description with the CMNxx communications resource that will be handing all the incoming calls for your ANSDHCPnn Receiver profile. Enter a description.

Select the correct communications hardware resource. Click $\ensuremath{\text{OK}}$ to continue.

Important –

The CMNxx resource pictured in Figure 62 most likely is not the correct resource. Please refer to Figure 1 on page 7 or ask your instructor if you are not sure which is the correct resource.

New Line F	Properties - 172.23	3.100.88			<u>?</u> ×
General	Connection Link	Limits	10dem Other	Additional Param	neters
The set	tings on this page aff	ect the settin	ngs available on t	the rest of the pro	operty
Name:		DHCPI	LINnn		
Descrip	ition:	Define	e line description	for answering D	HCP calls
Hardv	ware resource ——				
Re	esource	Туре		Description	▲
CN	/N02	2761		Comm Port	
CN	4N03	2761		Comm Port	
CN	4N04	2761		Comm Port	
CN	nnoshig	2761		Comm Port	_
	MICC.	7764		Comm Bost	
C Inter	List by name List by location rface type:	Interna	al Modern 🔄]	
Mode ty Framing	ype: j:	Switch Async	ed line-answer hronous]	
			ок	Cancel	Help

Figure 62. New Line Properties: Associating the line description with the CMNxx resource

5. Back to the New Point to Point Profile Properties select the TCP/IP Settings tab and pull down Assigned fixed IP address to 10.2.2.1 as shown in Figure 63. For the Remote IP address we will assign this using DHCP WAN Client. Use the pull down to select DHCP. Click OK to create your Receiver profile.

Ansdhcp00 - 172.23.100.88	? ×						
General Connection Authentication TCP/IP 3	eneral Connection Authentication TCP/IP Settings Other						
Local IP address							
Assign fixed IP address:	10.2.2.1 (Token Ring)						
Remote IP address							
IP address assignment method:	DHCP						
Starting IP address:	Fixed IP address Based on remote system's user ID						
Number of addresses:							
Define additional IP addresses based or	n remote system's user ID						
IP Addresses De	fined By User Name						
Allow remote system to assign its own	Allow remote system to assign its own IP address						
Allow remote system to access other network	rorks (IP forwarding)						
Ac	Ivanced						
	OK Cancel Help						

Figure 63. New Point-to-Point Connection Profile Properties: Connection tab

Do not yet start your Receiver profile as other teams may be using the communication resource right now. You are now ready to configure the Windows 2000 client for the call.

Task 4: Configure your Windows 2000 client for a call

If you are using your Instructors laptop!!!

Your instructor has already created outgoing connections and placed then on his desktop. They are named to102 through to107 to indicate which port on the PBX they will call. You can use icons if you want.

1. Right click on My Network Places (found on the Windows desktop) and select Properties from the context menu. This is shown in Figure 64. Double click Make New Connection.

🗈 Network and Dial-up Connections							
Eile Edit View Favorites Iools Advanced Help							
←Back → → → 🛅 @ Search 🕒 Folders 🎯 🖺 🕾 🗙 🕫 📰 -							
Links 🝘 IBM Business Transformation 🛛 🖗 IBM Internal Help 🖉 IBM Standard Software Installer 🖉 IBM Standard Software 💦 👋							
Address 💷 Network and Dial-up Connections							
	Name 🛆	Туре	Status				
	Make New Connection						
Laurenter Research	ØAT&T Net Client K	Dial-up	Disconnected				
Network and Dial-up Connections	🕹 Local Area Connection	LAN	Network cable unplugged				
	He Local Area Connection 2	LAN	Enabled				
	- 🖓 to 102	Dial-up	Connected				
Make New Connection	(2) to103	Dial-up	Disconnected				
The Matural Connection winned halos	\$\overline\$ to104	Dial-up	Disconnected				
vou create a new connection so that	(2) to105	Dial-up	Disconnected				
your computer can have access to	(2) to106	Dial-up	Disconnected				
other computers and networks.	20107	Dial-up	Disconnected				
	•		Þ				
1 object(s) selected							

Figure 64. Network and Dial-up Connections

____ 2. Answer all the questions in the Network Connection Wizard. You should specify:

Network Connection Type	Dial up to private Network
Modem	Select your modem (only)
Phone Number	Use the three digit extension number for port at which your Receiver profile is waiting to answer. Use Figure 1 on page 7 for that information.
Name it	callDHCP nn

You are now ready to make the call.

Task 5: Make the call and test the connection

You are now ready to make the call and test your connection.

DHCP Proxy Client- Use the Board

You MUST use the board to wait your turn to test your DHCP Proxy Client Configuration!

This symbol means my team is IN - and everybody else must be OUT.



 You now want to start your Receiver profile ANSDHCPnn. Right click on the profile name and select Start from the context menu as shown in Figure 65.

Make sure the Status goes to Waiting for incoming calls.

- Note! -

You may have to refresh the Receiver Connection Profile screen to enable the Start option in the context menu.

172.23.1	172.23.100.20: Receiver Connection Profiles							
Profile	Profile Protocol		Status	Connection type	Line	Line type		
Group Anso Multin Testr	Start Op Start Op Stop Jobs Connect	tions tions	Inactive Active co Ended - i	Switched line-answer Switched line-answer Switched line-answer	ANSDHCP2 Multiline02 ANSDHCP2	*ppp *pool *ppp		
	<u>D</u> elete							
	Propert	ies						

Figure 65. Start Receiver Connection Profiles

- ____ 2. Make the call. On your Windows 2000 client Double click on the connection document that will originate the call.
- ____3. On your iSeries Navigator connection to the iSeries <System_1> monitor the connection. You should see it going through a series of states ending with Active as shown in Figure 66.

⊘iSeries Navigator Eile <u>E</u> dit <u>V</u> iew <u>H</u> elp						_ 🗆 ×
<u>~</u> ~ ~ ~ ~					3	7 minutes old
Environment: My Connections	172.23.100.20: Receiver Connection Profiles					
🗄 📲 My Connections		Profile	Protocol	Status	Connection type	Line
Part 172:23:100.1 Basic Operations Basic Operations Configuration and Service Configuration and Service Configuration Remote Access Services Originator Connection Profiles Receiver Connection Profiles Group Access Policies Modems Concerts For TCP/IP		Migroup Access Ansdhepnn Multicv02	ррр ррр ррр	Active Active co Ended - i	Switched line-answer Switched line-answer Switched line-answer	ANSDHCF Multiline0: ANSDHCF
My Tasks - 172:23:100:20 Add a connection O Install additional components		ote Access Services ta Configure a new Point-to-F Create a new Point-to-F Create a new Point-to-F	sks o-Point modem ?oint originator o ?oint receiver c	cor 📲 Crea cor 📲 Nev onr 🍘 Con	ate an AT&T Global Net v Intranet or ISP Dial Co figure IBM Universal Co	work dial coni nnection
1 - 4 of 4 objects						

Figure 66. iSeries Navigator: Receiver Connection Profiles: Monitor using refresh

____ 4. On your Windows 2000 client PING your iSeries:

ping 10.2.2.1

____ 5. On your Windows 2000 client find the IP address that has been dynamically assigned by the iSeries DHCP server.

ipconfig /all

You should see something similar to:

PPP adapter to102:

Connection-specific DNS Suffix . : Description : WAN (PPP/SLIP) Interface Physical Address. : 00-53-45-00-00 DHCP Enabled. : No IP Address. : 10.2.2.1 Subnet Mask : 255.255.255 Default Gateway : 10.2.2.1 DNS Servers :

____6. On your iSeries Navigator connection to the iSeries <System_1> use the DHCP monitor to identify the lease for your Windows 2000 client. To do this expand Network -> Servers and then select TCP/IP. Right click on DHCP and select Monitor from the context menu. You should be able to find your lease based upon the IP address assigned to you from the DHCP server as shown in Figure 67.

Mail DHCP Monitor - 172.23.100.20					_ 🗆 🗙
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>H</u> elp					Ø
					0 minutes old
DHCP server running	172.23.100.20	: 10dot2			
🗆 🖓 DHCP Monitor	IP Address	Status	Client Identif Host Name	Domain Name	Start Time
E-GE Subnets	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Leased Free Free Free Free Free Free Free Fr	D-0x3450585		Jul 7, 2002 8:02:05 AM
Total Addresses: 254 Leased: 1 ((0%) Excluded: 1	Not available	252 (99%) Other: 0		1 - 20 of 254 objects

Figure 67. DHCP Monitor: Shows the active lease for clients in the 10.2 subnet

Task 6: Clean up for the next team!

You need to end your analog connection to iSeries **<System_1>** and end your Receiver profile ANSDHCP**nn**.

- 1. End the call. On your Windows 2000 client Double click on the connection document and click **Disconnect**.
- ____ 2. On your iSeries Navigator connection to the iSeries <System_1> click Receiver Connection Profiles. Right click on your profile ANSDHCPnn and select Stop from the context menu.

DHCP Proxy Client- Use the Board

You MUST use the board to leave the DHCP Proxy Client test area!

This symbol means my team is OUT - let the next team that is in queue know.



Answers

This is the Answers section. Include answers to all questions, and fill in any incomplete tables that the reader was previously required to complete. Also, include any other relevant information that the reader may find useful. Provide answers and completed tables by lab task number.

Lab 1. Virtual IP Interface and proxy ARP

These are the answers.

Question 1: Where was the option to configure Proxy ARP for this IPv4 Virtual IP address?

The New IPv4 Interface wizard does not give you the choice to create a Virtual IP address with the option for Proxy ARP.

Let's continue on and test to see how your new Virtual IP address behaves.

Question 2: Did the PING complete successfully?

No it did not.

Question 3: If not, why did the PING fail?

The New IPv4 Interface wizard did not give you the choice to create a Virtual IP address with the option for Proxy ARP. As is usual for the iSeries - the default for a new configuration option is the old (V5R1) value - that is, no Proxy ARP for Virtual IP addresses.

Question 4: Does the PING still work?

Yes it does. In fact, with the -t option causing your Windows 2000 client to issue the ICMP Echo Request about once a second - you should not even notice a missing ICMP Echo Response coming from the iSeries Virtual IP address.

Question 5: What MAC address is now associated with your team's virtual IP address?

It should be the 'other' one.

Question 6: Did the associated MAC address change again?

Yes. The only that can cause a failure would be if all the physical (and logical) interfaces to your iSeries broken at the same time. Or, if the power went out... (smile).

Lab 2. Multilink PPP configuration

Question 7: What are the two Communication Resource names that you will be using to make the originating calls from <System_1> to <System_2>?

The first port on the #2761 has been assigned the Communications Resource name of CMN07. From this port a telephone line is connected to port 4 on the PBX.

The second port on the #2761 has been assigned the Communications Resource name of CMN08. From this port a telephone line is connected to port 5 on the PBX.

Question 8: What are the two phone numbers that <System_1> must call to connect to <System_2>?

The Remote phone numbers specified in the Originator profile on **<System_1>** should be 106 and 107.

Question 9: Why should you *not* select Allow remote system to initiate a call from this system?

Because we are configuring all the links to be originated from <System_1>.

Question 10: Why should you *not* select Enable bandwidth utilization monitoring?

We are defining a fault-tolerant solution with multiline. In this case it is better to have all the links establish a connection right away in case one or more of the links fail. As we are starting all the links (and configuring the links to dynamically recover in the case of failure) we do not need to enable the BUM protocol.

Question 11: What are the two Communication Resource names that you will be using to receive the calls on <System_2>?

Port 6 (extension 106) on the PBX is connected to the first port on the #2761 which has been assigned the Communications Resource name of CMN05.

Port 7 (extension 107) on the PBX is connected to the second port on the #2761 which has been assigned the Communications Resource name of CMN06.

Question 12: Should you enable Require bandwidth allocation protocol for this profile?

You will not enable Require bandwidth allocation protocol for tthis profile. This is because the originator profile you are using supports BAP and therefore there was no reason to require it to be used. You would enable this option if you wanted to allow only BAP enabled connections. If you have both BAP and non-BAP clients connecting to the same profile, you would not enable this.

Lab 3. Dynamic resource sharing scenario

Question 13: How many line descriptions will you be creating to support the Originator and Receiver profiles?

Just one. In the properties for this one line description you will enable sharing for dynamic resource sharing.

Lab 4. DHCP Proxy Client

Question 14: Why is this called a DHCP WAN Client?

Because the DHCP WAN Client will act as a proxy for the PPP client that will be connecting to your system. As a proxy, it will act as a DHCP client and connect

directly with the configured DHCP server or indirectly through a DHCP relay agent.

Question 15: What is the Communication Resource name that you will be using to receive the incoming calls on <System_1>?

Port number 2 (extension 102) on the PBX is connected to the third port on the iSeries #2761. This port has been assigned a Communications Resource of CMN09.