Netopia R7100 Application Note

Part Number 6190002-00-01

Copper Edge 200 and Redback Configuration Using RFC1483

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This application note describes how to configure a Netopia R7100 router to connect to a Copper Mountain CE200 DSLAM and Redback router using RFC1483 bridged encapsulation.

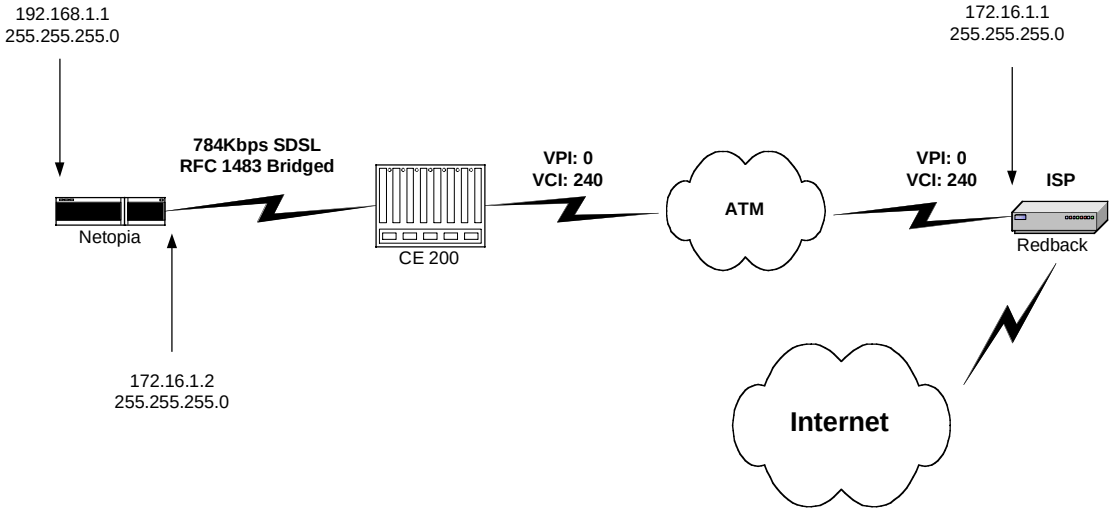
Introduction

The Netopia R7100 is a Copper Mountain CE200-compatible multi-protocol SDSL router capable of using several types of data link protocols, including PPP, RFC1483, and Frame Relay. The purpose of this document is to outline the procedures for configuring a Netopia R7100 router, Copper Mountain CE200 DSLAM, and Redback SMS 1800 router on an SDSL link using bridged RFC1483 as the data link encapsulation.

Note: This application note is meant to be used for reference purposes only, and will most likely have to be modified to suit individual user's needs. A general working knowledge of the equipment described below is assumed for this application note. For more specific information about the Netopia R7100, please see the Netopia R7100 Reference Manual available on the Netopia CustomerCare CD or online at http://www.netopia.com/support.

Network Diagram

This diagram illustrates the network topology and IP addressing schemes used in this application note:



Prerequisites

This application note assumes you are using the following equipment and configurations:

Hardware	Notes
Netopia R7100 Router	Must be running firmware version 4.3.8 or above.
Redback Router	Must be running AOS software release 3.1 or above.
Copper Mountain CE200	Must have an SDSL line card installed and be running firmware version 2.0 or above.

Configuration

Configuration of the R7100

WAN Setup

This section describes how to set up the SDSL interface on the Netopia R7100 router to use RFC 1483 bridged encapsulation.

1. From the Main Menu of the Netopia user interface, select **Easy Setup** and press Enter. You will be presented with the SDSL Line Configuration screen.

An example of the SDSL Line Configuration screen is shown in Figure 1 below:

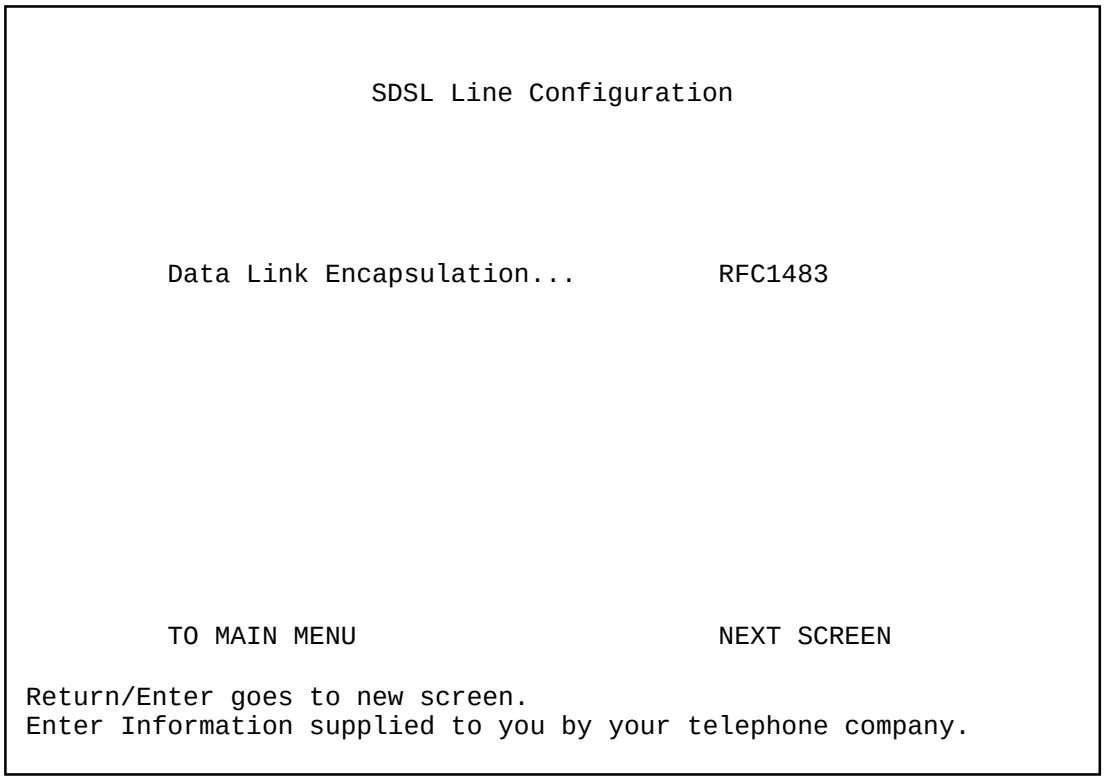


Figure 1: Netopia SDSL Line Configuration screen

The default Data Link Encapsulation Value is RFC1483 and should not be changed.

2. Select **Next Screen** at the bottom of the menu and press Enter. You will be presented with the Connection Profile 1 screen.

An example of the Connection Profile 1 screen is shown in Figure 2 below:

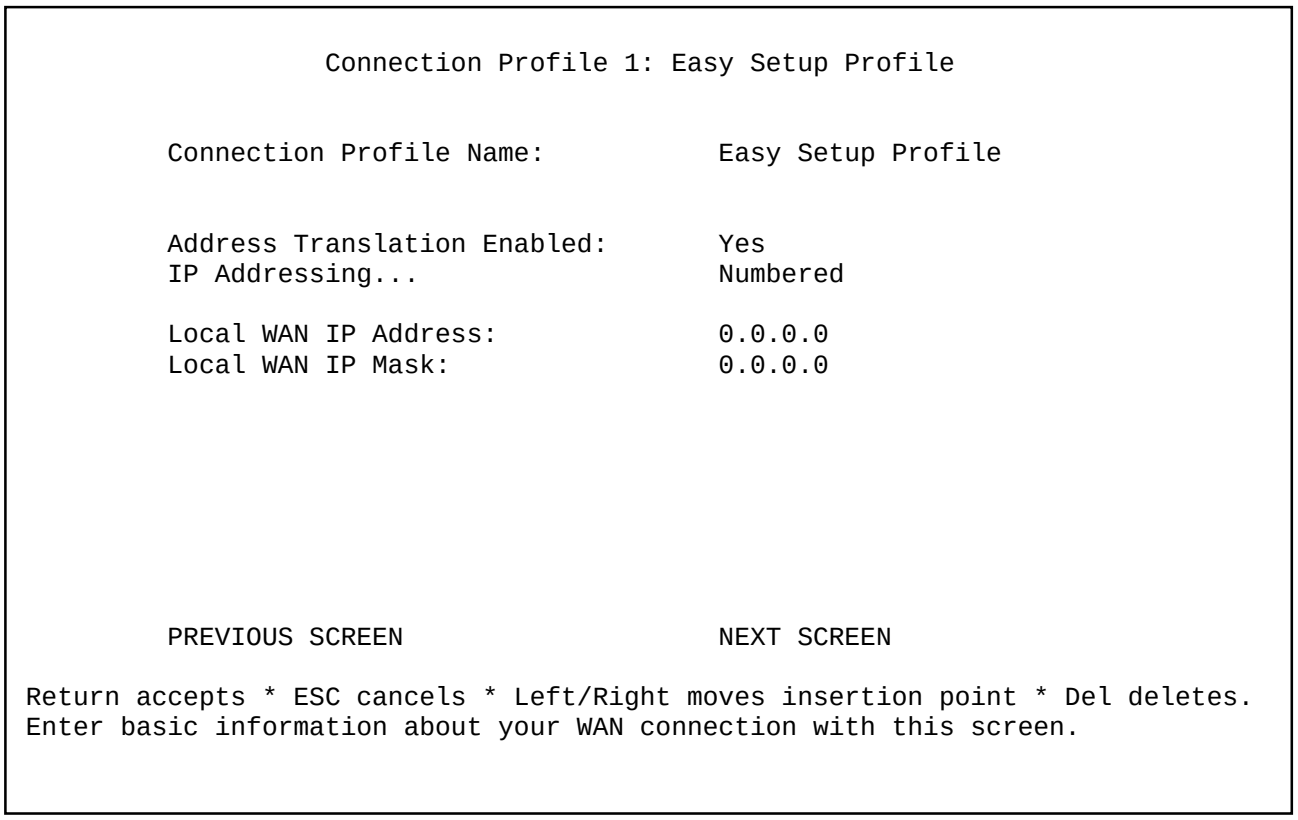


Figure 2: Connection Profile 1 screen

3. Based on the IP addressing scheme in the network diagram on Page 1, the values of the Connection Profile 1 menu items should be as follows:

Connection Profile Name:	Easy Setup Profile	The default value is correct. It can be changed to any name.
Address Translation Enabled:	Yes	Since we are using private, non-routable IP addresses on the LAN, the value would be Yes.
IP Addressing:	Numbered	Since there is an IP address on the WAN side of the Netopia Router, the value would be Numbered.
Local WAN IP Address:	172.16.1.2	Based on the network diagram on Page 1.
Local WAN IP Mask:	255.255.255.0	Based on the network diagram on Page 1.

4. Select **Next Screen** at the bottom of the menu screen and press Enter. You will be presented with the IP Easy Setup screen.

An example of the IP Easy Setup screen is shown below in Figure 3:

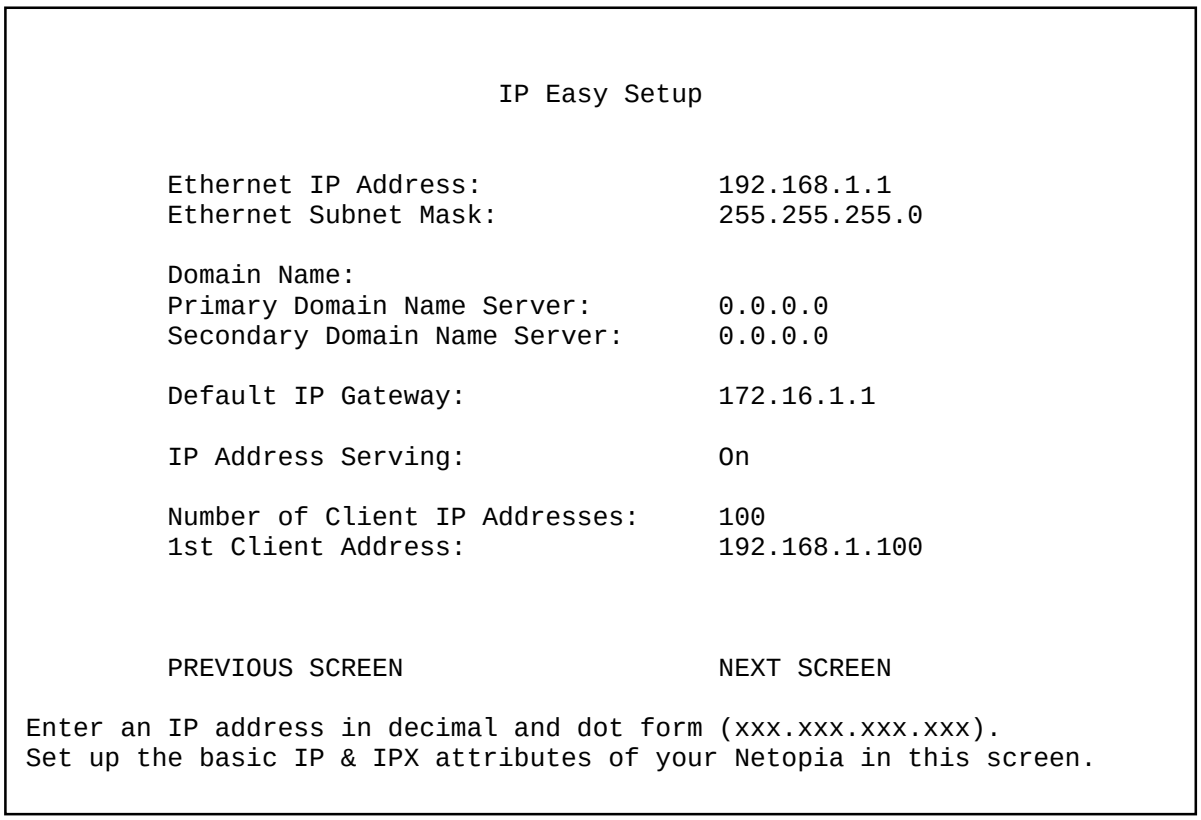


Figure 3: IP Easy Setup screen

5. Based on the IP addressing scheme in the network diagram on Page 1, the values of the IP Easy Setup menu items should be as follows:

Ethernet IP Address:	192.168.1.1	Based on the network diagram on Page 1. This is also the default value.
Ethernet Subnet Mask:	255.255.255.0	Based on the network diagram on Page 1. This is also the default value.
Domain Name:	<supplied by the ISP>	
Primary Domain Name Server:	<supplied by the ISP>	
Secondary Domain Name Server:	<supplied by the ISP>	
Default IP Gateway:	172.16.1.1	The Default IP Gateway of the Netopia Router will be the IP address of the Redback router.
IP Address Serving:	Off	The default value is On. When On, the Netopia Router will serve out 100 IP addresses on the LAN via DHCP.

6. Select **Next Screen** at the bottom of the menu and press Enter. You will be presented with the Easy Setup Security Configuration screen.

An example of the Easy Setup Security Configuration screen is shown below in Figure 4:

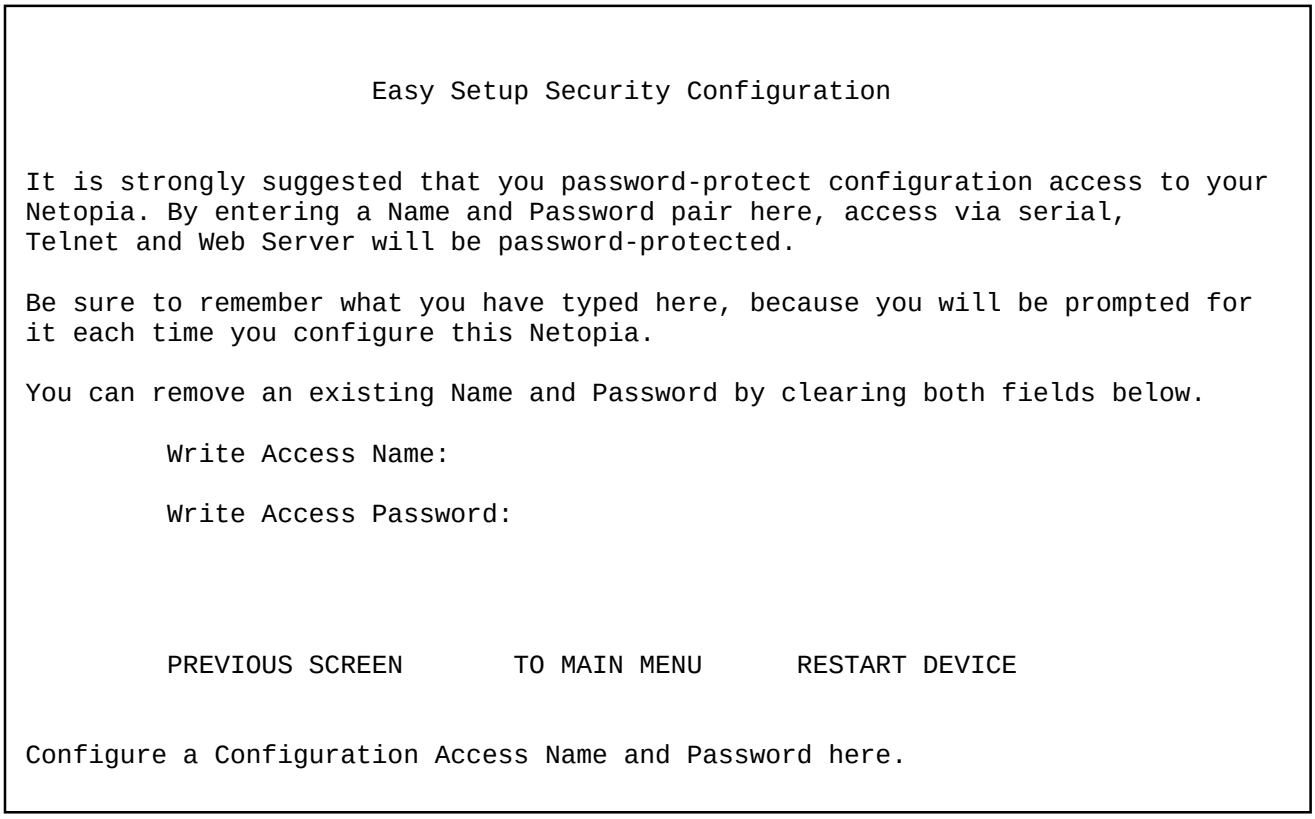


Figure 4: Easy Setup Security Configuration screen

7. If you choose to set a Write Access name and password, you can do so here. For this example, we will not. Select **Restart Device** at the bottom of the screen and press Enter. You will be presented with a choice to cancel or continue restarting the device. Select **Continue** and press Enter. The Netopia Router will restart and no additional configuration should be necessary.

Copper Edge 200 DSLAM Configuration

For this example, we will use Port 1.7.4 on the SDSL line card in Slot 1.7 of the DSLAM. The DS3 Connection between the DSLAM and Redback router will come off of Port 1.4 on the DSLAM and use an ATM VPI of 0 and an ATM VCI of 240. We will also be using the Copper Craft command line tool for configuration functions.

1. Log in to the DSLAM Copper Craft command line.

2. Create and configure the ATM PVC between the DSLAM and the Redback by issuing the following command:

```
Set cmATMVcl [1.4.1.240] RowStatus=create vpi=0 vci=240
AdminStatus=up
```

3. Issue the following command which sets the proper network model, encapsulation type, and destination permanent instance identifier for the CPE port:

```
set cmif [1.7.4] netmodel=vwan encapsulation=rfc1483
destpii=1.4.1.240
```

4. Issue the following command which sets the proper network model and encapsulation type for this port:

```
set cmif [1.4.1.240] netmodel=vwan encaps=rfc1483
```

The DSLAM has various network models which depend on the type of CPE connection being made. The value for this example is VWAN. The encapsulation type for the connection between the DSLAM and Netopia Router is rfc1483 bridged. The destination permanent instance identifier is the connection to the ISP that will be mapped to the port that the Netopia Router is connected to.

5. Press Enter. The words "Set Successful" should be displayed on the screen. If you do not see these words or receive an error message, please refer to the Copper Mountain CE200 User guide.

6. The default data rate on a Copper Mountain CE200 SDSL port is 784 Kbps. For this example, we will not change that value. If you wish to change the value to 1568 Kbps, for instance, you would issue the following command:

```
set cmhdslmodem [1.7.4] datarate=1568
```

Note: The Netopia Router does not need to be configured with a data rate value. The rate will be negotiated between the DSLAM and the Netopia Router automatically.

7. Issue the following command to make sure that the ATM PVC between the CE200 and Redback router is active:

```
get cmatmvcl [1.4.1.240]
```

The output of this command should look similar to the following:

```
Group: cmAtmVclTable
Instance: [1.4.1.240]
PII                  =  1.4.1.240
Vpi                  =  0
Vci                  =  240
AdminStatus          =  Up
OperStatus           =  Up
LastChange           =  0 day 0 hour 0 min 0.0 sec (1999/12/30-
16:08:44)
AalType              =  Aal5
Aal5CpcsTransmitSduS =  1600
Aal5CpcsReceiveSduSi =  1600
RowStatus            =  Active
```

8. Issue the following command to verify that the configuration changes have taken effect:

```
get cmif [1.7.4
```

The output of this command should look similar to the following:

```
Group: cmIfaceTable
Instance: [1.7.4.0]
PII                  =  1.7.4.0
IfIndex              =  1.7.4.0
Name                 =  Netopia Test Port
GroupName            =  ""
```

```
AdditionalInfo       =  ""
NetModel             =  VWAN
IpAddr               =  0.0.0.0
NetMask              =  0.0.0.0
MacAddr              =  ff.ff.ff.ff.ff.ff
BurnedInMacAddr      =  0.0.0.0.0.0
FarEndAddr           =  0.0.0.0
DestPII              =  1.4.1.240
CMCPCompatible       =  Yes
EncapsulationType    =  rfc1483
FwdMode              =  VWAN-point-to-point or VWAN-bridge
Pix                  =  30
ServiceClass         =  D
```

9. Issue the same command for the DSLAM-to-Redback port:

```
get cmif [1.4.1.240]
```

The output of this command should look similar to the following:

```
Group: cmIfaceTable
Instance: [1.4.1.240]
PII                  =  1.4.1.240
IfIndex              =  1.4.1.240
Name                 =  ""
GroupName            =  ""
AdditionalInfo       =  ""
NetModel             =  VWAN
IpAddr               =  0.0.0.0
NetMask              =  0.0.0.0
MacAddr              =  ff.ff.ff.ff.ff.ff
BurnedInMacAddr      =  ff.ff.ff.ff.ff.ff
FarEndAddr           =  0.0.0.0
DestPII              =  1.7.4.0
CMCPCompatible       =  No
EncapsulationType    =  rfc1483
FwdMode              =  VWAN-point-to-point
Pix                  =  541
ServiceClass         =  None
```

At this point, the SDSL line is ready to be plugged into WAN port 1 on the Netopia Router.

Verifying The Connection

The configuration of the CE 200 and Netopia R7100 routers are now complete. Be sure the Netopia R7100 router is trained with the CE200, as indicated by the Ready and Channel 1 LEDs being solid green.

Redback SMS 1800 Configuration

For this example we will be using the second ATM DS-3 interface in slot 3 of the Redback router. This interface will be referred to as ATM port 3/1. We will also be using only one context called "local". For more information on contexts, please refer to the Redback AOS Configuration guide.

1. Log into the AOS command line and enter local context configuration mode by issuing the following commands:

```
[local]redback#config
Enter configuration commands, one per line, 'end' to exit
[local]redback(config)#context local
[local]redback(config-ctx)#
```

2. Because this is a bridged interface configuration, assign the ATM port itself an IP address by issuing the following commands:

```
[local]redback(config-ctx)#interface atm31
[local]redback(config-if)#ip address 172.16.1.1 255.255.255.0
[local]redback(config-if)#exit
```

3. Each SDSL connection into this ATM interface must have a separate subscriber record that can be bound to the virtual path. To create a subscriber record for this connection, issue the following command:

```
[local]netopiaq(config-ctx)#subscriber name test
```

   This subscriber record must also have an IP address associated with it. Based on the network diagram on Page 1, issue the following commands to assign an IP address to the subscriber record:

```
[local]redback(config-sub)#ip address 172.16.1.2
[local]redback(config-sub)#exit
[local]redback(config-ctx)#exit
```

4. Next, an ATM profile that contains shaping and service class definitions must be created by issuing the following command:

```
[local]redback(config)#atm profile sdsl
```

   For this example, we will use an unspecified bit rate (UBR) on the profile. To set the profile to use UBR, issue the following commands:

```
[local]redback(config-atmpro)#shaping ubr
[local]redback(config-atmpro)#exit
```

5. Create an ATM PVC with Bridged 1483 encapsulation using VPI and VCI values of 0 and 240 respectively by issuing the following commands:

```
[local]redback(config)#port atm 3/1
[local]redback(config-port)#atm pvc 0 240 profile sdsl encapsulation
bridge1483
```

6. Now, the subscriber record created in Step 3 must be bound to this ATM PVC by issuing the following command:

```
[local]redback(config-pvc)#bind subscriber test
[local]redback(config-pvc)#end
```

Testing the Connection

At this point, there should be full IP connectivity between the Netopia R7100 router and the Redback router. To test this connection, access the command line of the Redback router and ping the Netopia Router's WAN IP address. The results should be as follows:

```
[local]redback#ping 172.16.1.2

Sending 5, 100-byte ICMP echoes to 172.16.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 160/198/304
ms
```

A successful connection is indicated by PING replies. If the PING test fails, or if the SDSL line does not train, consult the CE200, Redback router, and Netopia R7100 router's reference guides for troubleshooting information.