

Table of Contents

<u>Configuring IDSL on a Cisco 802/804 Router With mux–ppp, a 6160 DSLAM, Terminating on a 6400 UAC With NAT</u>	1
<u>Document ID: 12873</u>	1
<u>Introduction</u>	1
<u>Prerequisites</u>	1
<u>Requirements</u>	1
<u>Components Used</u>	2
<u>Conventions</u>	2
<u>Configure</u>	2
<u>Network Diagram</u>	2
<u>Configurations</u>	2
<u>Verify</u>	5
<u>Cisco DSLAM Commands</u>	5
<u>Cisco 6400 NRP Commands</u>	6
<u>Troubleshoot</u>	6
<u>Troubleshooting Commands</u>	6
<u>Related Information</u>	7

Configuring IDSL on a Cisco 802/804 Router With mux-ppp, a 6160 DSLAM, Terminating on a 6400 UAC With NAT

Document ID: 12873

Introduction

Prerequisites

- Requirements
- Components Used
- Conventions

Configure

- Network Diagram
- Configurations

Verify

- Cisco DSLAM Commands
- Cisco 6400 NRP Commands

Troubleshoot

- Troubleshooting Commands

Related Information

Introduction

The Cisco 802 and 804 routers support ISDN Digital Subscriber Line (IDSL). IDSL offers high-speed digital connections over an ISDN infrastructure. For customers outside the DSL range for the service provider, or for those who are unable to qualify for DSL connections, IDSL significantly expands the reach of DSL connectivity.

IDSL is a leased ISDN line that uses 2B1Q line modulation with speeds of 56, 64, 128, and 144 Kbps.

This sample configuration shows a Cisco 802/804 IDSL router that connects to a Cisco 6160 DSLAM with an 8-port IDSL ITUC card that terminates on a Cisco 6400 Universal Access Concentrator (UAC) with mux-ppp encapsulation.

The ISP dynamically assigns the subscriber one IP address in the 192.168.1.X address space. IP address "10.0.0.1" is manually configured on the Ethernet interface of the Cisco 802/804. The 10.0.0.X address space that remains is used for the private network, assigned to a Dynamic Host Configuration Protocol (DHCP) pool, and leased to local LAN devices attached to the Ethernet network of the Cisco 802/804. Network Address Translation (NAT) is used in order to enable all devices in the private network to access the Internet.

Note: IDSL supports data only. Voice is not supported.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco 802/804 Customer Premises Equipment (CPE) IOS® Software Release 12.0(7)T
- Cisco 6400 UAC Node Route Processor (NRP) IOS Software Release 12.0(7)DC
- Cisco 6400 UAC Node Switch Processor (NSP) IOS Software Release 12.0(4)DB
- Cisco 6130 DSLAM–NI2 IOS Software Release 12.1(1)DA

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

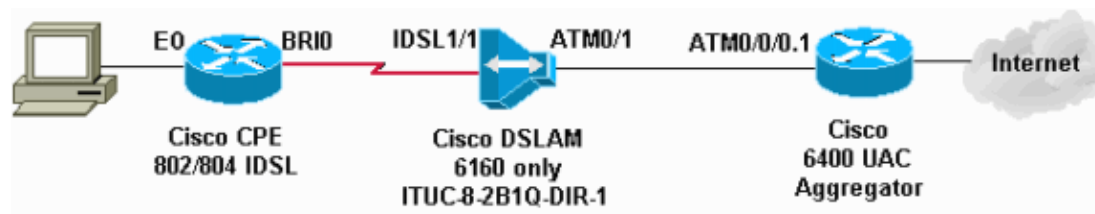
Configure

In this section, you are presented with the information in order to configure the features described in this document.

Note: In order to find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses this network setup.



Configurations

This document uses these configurations.

- Cisco 802/804
- Cisco 6160
- Cisco 6400 NSP
- Cisco 6400 NRP

Cisco 802/804
<pre>ip dhcp excluded-address 10.0.0.1 !--- The DHCP pool does not lease this address. !--- It is used by interface E0.</pre>

```

!
ip dhcp pool <pool name>
network 10.0.0.0 255.0.0.0

!--- Adjust this for your range of addresses.

default-router 10.0.0.1

!--- The default gateway is assigned to local devices.

interface Ethernet0
ip address 10.0.0.1 255.255.255.0
ip nat inside

!
isdn leased-line BRI0 144

!--- This command configures the BRI interface for IDSL at 144 Kbps.
!--- Make sure this IDSL bandwidth matches the bandwidth
!--- set on the Cisco 6160 DSLAM.

!
!
interface BRI0
no shutdown
ip address negotiated
encapsulation ppp
ip nat outside
ppp authentication chap callin
ppp chap hostname <hostname>
ppp chap password <password>

!--- The IP address negotiated command specifies that the 802/804
!--- is dynamically assigned an IP address from the 6400.
!--- These ppp chap commands are used to authenticate for service
!--- with the 6400 UAC.

!
ip classless
ip route 0.0.0.0 0.0.0.0 BRI0

!--- This command specifies interface BRI0
!--- to be the default gateway in order to output data.

ip nat inside source list 101 interface BRI0 overload
access-list 101 permit ip 10.0.0.0 0.0.0.255 any

!--- This command sets the router to do NAT
!--- for all the 10.0.0.X private network address space.

```

Cisco 6160

```

hostname 6160A
!
boot system flash ni2-dsl-mz.121-5.DA.bin

!--- This command configures the DSLAM to boot
!--- from image "ni2-dsl-mz.121-5.DA.bin:" (stored in Flash).

slot 1 ITUC-1-8IDSL
slot 2 ITUC-1-8IDSL

```

```

!--- This command configures the DSLAM to recognize
!--- the IDSL cards in slots 1 and 2.

dsl-profile Platinum
idsl bitrate 144
idsl encapsulation mux-ppp

!--- The idsl bitrate command sets the bitrate for the IDSL connection.
!--- The idsl encapsulation command sets the encapsulation type
!--- used for IDSL.

interface IDSL1/1
 no ip address
 no keepalive
 dsl profile Platinum
 ppp pvc interface ATM0/1 3 110

!--- The ppp traffic is forwarded to interface ATM0/1
!--- (DSLAM uplink to 6400) with a VPI=3 and VCI=110.

```

Cisco 6400 NSP

```

interface ATM8/1/1
 atm pvp 3 interface ATM3/0/0 3

!--- This command cross-connects any Permanent Virtual Path (PVP)
!--- equal to 3 to interface ATM3/0/0 (to an NRP of the 6400)
!--- with a Permanent Virtual Path (PVP) equal to 3.

```

Cisco 6400 NRP

```

username <username> password <password>

!--- Username and password used to authenticate
!--- the Cisco 802/804 for service.

interface Loopback0
 ip address 192.168.1.1 255.255.255.255

interface ATM0/0/0.1 point-to-point
 no ip mroute-cache
 pvc 3/110
 encapsulation aal5mux ppp Virtual-Templat1

!--- DSLAM traffic with network side VPI=3,
!--- VCI=110 connects with the use of this PVC.
!--- The configuration for pvc 3/110
!--- is bound to virtual-template 1.

interface Virtual-Templat1
 ip unnumbered Loopback0
 peer default ip address pool IDSL
 ppp authentication chap
!
 ip local pool IDSL 192.168.1.2 192.168.1.X

!--- This pool of addresses is used in order to
!--- assign an IP address to the Cisco 802/804.

```

Verify

This section provides information you can use in order to confirm your configuration works properly.

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

For an active connection the **show users** command looks like this output:

```
Router#show users
  Line      User      Host(s)      Idle      Location
*  0 con 0          idle        00:00:00

Interface  User      Mode      Idle      Peer Address
BR0        IDSLuser Sync PPP   00:00:03  192.168.1.1
```

Note: Do not use the **show isdn status** command. There is no D-channel so the command is irrelevant. Issue a **show int bri[#]** command as you would for a serial interface, and follow the rules of a serial interface in terms of line protocol and line status.

Cisco DSLAM Commands

On the DSLAM, these commands show IDSL statistics and connection statistics.

```
6160A#show dsl interface ids1 1/1
Port Status:
Subscriber Name:      Circuit ID:
IOS admin: UP oper: UP      Card status: ITUC-1-8IDSL
Last Change: 00 days, 00 hrs, 24 min, 26 sec No. of changes: 17

Loopback: none

Firmware version: 969581010

BERT is NOT currently active on this interface
Last BERT executed : 2d00h
Test duration : 1 minute(s)
Total bits received : 0
Bit errors : 0
Sync count : 0
Total sync time : 00:00:00
Configured:
Profile Name: Platinum
Alarms Enabled: NO

IDSL profile parameters
  Bitrate:      144 kbit/sec
Encapsulation: mux-ppp
Frame Relay parameters:
  UPC intent:   pass
  Bc default:   32768 bytes
  LMI type:     cisco
  lmi-n392dce: 2 events
  lmi-n393dce: 2 events
  lmi-t392dce: 15 seconds

Performance Statistics:
Physical layer
```

```

Coding violations : 47
Errored seconds : 2
Severely errored seconds : 2
Physical layer (far end)
Coding violations : 1
Errored seconds : 1
Severely errored seconds : 0
HDLC layer
Coding violations : 303
Aborts : 0
Aligns : 303
Shorts : 464
Longs : 0
Discards : 0

```

Alarm Status: NONE

Cisco 6400 NRP Commands

On the Cisco 6400 NRP, these commands show PPP information in the appropriate ATM interface that terminates the subscriber.

show atm vc This command checks whether the appropriate interface is up and uses the right encapsulation type.

```

6400-2-NRP-2#show atm vc
Interface Name VPI VCI Type Encaps SC Kbps Kbps Cells Sts
0/0/0.1 9 40 40 PVC-D MUX UBR 155000 UP

```

show ip interface brief This command checks whether the appropriate ATM subinterface is up and up.

```

6400-2-NRP-2#show ip int brief
Interface IP-Address OK? Method Status
Protocol
ATM0/0/0 unassigned YES NVRAM up up
ATM0/0/0.1 unassigned YES unset up up

```

show users In order to verify end-to-end connectivity, you must create a virtual-access interface for the specific subscriber you try to troubleshoot. In this case, the name of the user is IDSLuser and Virtual-Access 2 is created. The IP address assigned to IDSLuser is 192.168.1.2.

```

6400-2-NRP-2#show users
Line User Host(s) Idle Location
* 0 con 0 cisco idle 00:00:00
Vi2 IDSLuser Virtual PPP (ATM) 00:00:03 192.168.1.2

```

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

Troubleshooting Commands

Troubleshooting an IDSL PPP connection is the same as troubleshooting a serial interface connection. Issue these **debug** commands.

Note: Before you issue **debug** commands, refer to Important Information on Debug Commands.

- **debug ppp negotiation**
 - **debug ppp authentication**
 - **debug ppp error**
 - **service timestamps debug datetime msec (global configuration)**
 - **service timestamps log datetime msec (global configuration)**
-

Related Information

- **DSL Technical Support**
 - **Product Support**
 - **Technical Support – Cisco Systems**
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