Cisco DSL Router Configuration and Troubleshooting Guide − Step−by−Step Configuration of RFC1483 Routing with a Single Static IP Address

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Contents

Introduction
Prerequisites
Requirements
Components Used
Conventions
Configuration Procedures
Connect the Cisco DSL Router and Your PC
Start and Set Up HyperTerminal
Clear Existing Configurations on the Cisco DSL Router
Configure the Cisco DSL Router
Configuration
Verify
Troubleshoot
Related Information

Introduction

Your Internet Service Provider (ISP) has assigned a single static public IP address to your Cisco DSL Router.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Configuration Procedures

Important: Before you begin, close all programs on the PC that might be monitoring your COM port. Devices such as PDAs and digital cameras often place programs in the system tray that render your COM port unusable for the configuration of your Cisco DSL Router.

Connect the Cisco DSL Router and Your PC

A console connection is made with a rolled cable and connects the console port of the Cisco DSL Router to a COM port on a PC. The console cable that is included with the Cisco DSL Router is a flat light blue cable. For more information on the pinouts of a rolled cable, or the pinouts of an RJ−45 to DB9 converter, refer to Cabling Guide for Console and AUX Ports.

1. Connect the RJ−45 connector on one end of a Cisco console cable to the console port of the Cisco DSL Router.
2. Connect the RJ−45 connector at the other end of the console cable to an RJ−45 to DB9 converter.
3. Connect the DB9 connector to an open COM port on your PC.

Start and Set Up HyperTerminal

Complete these steps:

1. Start the HyperTerminal program on the PC.
2. Set up your HyperTerminal session.
    a. Assign a name to your session and click **OK**.
    b. In the Connect To window, click **Cancel**.
    c. Choose **File** > **Properties**.
    d. From the Properties window, go to the Connect Using list and select the COM port where you connect the DB9 end of the console cable.
    e. From the Properties window click **Configure** and fill in these values:
        ◊ Bits per second: **9600**
        ◊ Data bits: **8**
        ◊ Parity: **None**
        ◊ Stop bits: **1**
        ◊ Flow Control: **None**
    f. Click **OK**.
    g. From the Call menu, click **Disconnect**.
    h. From the Call menu, click **Call**.
    i. Press **Enter** until you see a router prompt on your HyperTerminal window.

Clear Existing Configurations on the Cisco DSL Router

Complete these steps:

1. Type **enable** at the router prompt in order to enter privileged mode.

```
Router>enable
Router#

!--- The # symbol indicates that you are in privileged mode.
```

2. Clear existing configurations on the router.

```
Router#write erase
```

3. Reload the router so that it boots with a blank startup configuration.

```
Router#reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]yes
```

```
!--- The router reload can take a few minutes.
```

4. After the router has reloaded, enter enable mode again.

```
Router>enable
Router#
```

Configure the Cisco DSL Router

Complete these steps.

1. Configure **service timestamp** to properly log and display **debug** output in the troubleshooting section.

```
Router#configure terminal
Router(config)#service timestamps debug datetime msec
Router(config)#service timestamps log datetime msec
Router(config)#end
```

2. Disable the logging console on your Cisco DSL Router in order to suppress console messages that might be triggered while you configure the router.

```
Router#configure terminal
      Router(config)#no logging console
      Router(config)#end
```

3. Configure **ip routing**, **ip subnet−zero**, and **ip classless** in order to provide flexibility in routing configuration options.

```
Router#configure terminal
Router(config)#ip routing
Router(config)#ip subnet-zero
Router(config)#ip classless
Router(config)#end
```

4. Configure an IP address and subnet mask on the Cisco DSL Router Ethernet interface.

   For Network Address Translation (NAT): (Optional) Enable NAT inside on the Ethernet interface.

```
Router#configure terminal
Router(config)#interface ethernet 0
Router(config-if)#ip address <ip address> <subnet mask>

!--- For NAT:

Router(config-if)#ip nat inside
Router(config-if)#no shut
Router(config-if)#end
```

5. Configure the ATM interface of your Cisco DSL Router with the **no shut** command in order to bring up the interface.

```
Router#configure terminal
Router(config)#interface atm 0
Router(config-if)#no shut
Router(config-if)#end
```

6. Configure the ATM subinterface of your Cisco DSL Router with an ATM permanent virtual circuit (PVC) and encapsulation type.

```
Router#configure terminal
Router(config)#interface atm 0.1 point-to-point
Router(config-subif)#
Router(config-if)#ip address <ip address> <subnet mask>
```

```
!--- For NAT:

Router(config-if)#ip nat outside
Router(config-subif)#pvc <vpi/vci>
Router(config-subif-atm-vc)#encapsulation aal5snap
Router(config-subif-atm-vc)#end
```

7. Configure a default route using ATM0.1 as the outbound interface.

```
Router#configure terminal
Router(config)#ip route 0.0.0.0 0.0.0.0 atm0.1
Router(config)#end
```

8. **For NAT:** Configure global NAT commands on the Cisco DSL Router to allow sharing of the static public IP address of the Dialer interface.

```
Router#configure terminal
Router(config)#ip nat inside source list 1 interface atm0.1 overload
Router(config)#access-list 1 permit <ip network address of ethernet0>
 <wildcard mask>
Router(config)#end
```

Optional Configurations

NAT Pool, if additional IP addresses have been provided by your ISP.

```
Router(config)#ip nat inside source list 1 interface atm0.1 overload
Router(config)#ip nat pool <nat pool name> <first ip address>
 <last ip address> netmask <subnet mask>
Router(config)#end
```

Static NAT, if Internet users require access to internal servers.

```
Router(config)#ip nat inside source static tcp <inside ip address of server>
 {80 or 25} <outside well-known ip address of server> {80 or 25} extendable
Router(config)#end
```

9. **For Dynamic Host Configuration Protocol (DHCP):** (Optional) Configure the Cisco DSL Router as a DHCP server with a pool of IP addresses to assign to hosts connected to the Ethernet interface of the Cisco DSL Router. The DHCP server dynamically assigns an IP address, Domain Name Server (DNS), and the default gateway IP address to your hosts.

```
Router#configure terminal
Router(config)#ip dhcp excluded-address <ip address of ethernet0>
Router(config)#ip dhcp pool <dhcp pool name>
Router(dhcp-config)#network <ip network address of ethernet0> <subnet mask>
Router(dhcp-config)#default-router <ip address of ethernet0>
Router(dhcp-config)#dns-server <ip address of primary dns server>
 <ip address of secondary dns server>
Router(dhcp-config)#end
```

10. Enable logging console on the Cisco DSL Router, and then write all the changes to memory.

```
Router#configure terminal
Router(config)#logging console
Router(config)#end
*Jan 1 00:00:00.100: %SYS-5-CONFIG_I: Configured from console by console
Router#write memory
Building configuration... [OK]
Router#
```

Configuration

This is the configuration that is built after you have completed the procedures in the Configuration Procedures section of this document.

Cisco DSL Router with a Single Static IP Address

```
!--- Comments contain explanations and additional information.


service timestamps debug datetime msec
service timestamps log datetime msec
ip subnet-zero
!

!--- For DHCP:

ip dhcp excluded-address <ip address of ethernet0>
ip dhcp pool <dhcp pool name>
 network <ip network address of ethernet0> <subnet mask>
 default-router <ip address of ethernet0>
 dns-server <ip address of dns server>
!
interface ethernet0
 no shut
 ip address <ip address> <subnet mask>

!--- For NAT:

 ip nat inside
 no ip directed-broadcast
!
interface atm0
 no shut
 no ip address
 no ip directed-broadcast
 no atm ilmi-keepalive
!
interface atm0.1 point-to-point
 ip address <ip address> <subnet mask>

!--- For NAT:

 ip nat outside
 pvc <vpi/vci>
  encapsulation aal5snap

!--- Common PVC values supported by ISPs are 0/35 or 8/35.
 !--- Confirm your PVC values with your ISP.

 !
!

!--- For NAT:

ip nat inside source list 1 interface atm0.1 overload

!--- If you have a pool (a range) of public IP addresses provided
!--- by your ISP, you can use a NAT Pool. Replace
!--- ip nat inside source list 1 interface atm0.1 overload



!--- with these two configuration statements:
```

```
!--- ip nat inside source list 1 pool <nat pool name> overload
!--- ip nat pool <nat pool name> <first ip address> <last ip address>
!---  netmask <subnet mask>



!--- If Internet users require access to an internal server, you can
!--- add this static NAT configuration statement:
!--- ip nat inside source static tcp <inside ip address of server> {80 or 25}
!--- <outside well-known ip address of server> {80 or 25} extendable
!--- Note: TCP port 80 (HTTP/web) and TCP port 25 (SMTP/mail) are used
!--- for this example. You can open other TCP or UDP ports, if needed.

!
ip classless
ip route 0.0.0.0 0.0.0.0 <default gateway to isp>

!--- For NAT:

access-list 1 permit <ip network address of ethernet0> <wildcard mask>

!--- In this configuration, access-list 1 defines a standard access list
!--- that permits the addresses that NAT translates. For example, if
!--- your private IP network is 10.10.10.0, configure
!--- access-list 1 permit 10.10.10.0 0.0.0.255 in order to allow NAT to translate
!--- packets with source addresses between 10.10.10.0 and 10.10.10.255.

!
end
```

Verify

Your Cisco DSL Router is now operational for Asymmetric Digital Subscriber Line (ADSL) service. You can issue a **show run** command in order to see the configuration.

```
Router#show run
Building configuration...
```

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

Troubleshoot

Refer to Troubleshooting RFC1483 Routing if your ADSL service does not work properly.

Related Information

- **RFC1483 Routing with a Single Static IP Address**
- **Cisco DSL Router Configuration and Troubleshooting Guide**
- **Technical Support & Documentation − Cisco Systems**

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