Introduction

Your Internet Service Provider (ISP) has assigned a static public IP address to your Cisco Digital Subscriber Line (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.

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
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 the global Point-to-Point Protocol over Ethernet (PPPoE) parameters.

   ```
   Router# configure terminal
   Router(config)# vpdn enable
   Router(config)# no vpdn logging
   Router(config)# vpdn-group pppoe
   Router(config-pppd)# request-dialin
   Router(config-pppd)# protocol pppoe
   Router(config-pppd)# end
   ```

5. 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 tcp adjust-mss 1452
   Router(config-if)# ip address <ip address> <subnet mask>
   ```

   **For NAT:**

   ```
   Router(config-if)# ip nat inside
   Router(config-if)# no shut
   ```
6. Configure the ATM interface of your Cisco DSL Router with an ATM permanent virtual circuit (PVC), encapsulation type, and dialer pool.

Router#configure terminal
Router(config)#interface atm 0
Router(config-if)#pvc <vpi/vci>
Router(config-if-atm-vc)#pppoe-client dial-pool-number 1
Router(config-if-atm-vc)#no shut
Router(config-if-atm-vc)#end

7. Configure the Dialer interface of your Cisco DSL Router for PPPoE with a static IP address.

For NAT: (Optional) Enable NAT outside on the Dialer interface.

Router#configure terminal
Router(config)#interface dialer 1
Router(config-if)#mtu 1492
Router(config-if)#ip <ip address> <subnet mask>
Router(config-if)#no ip directed-broadcast

!--- For NAT:

Router(config-if)#ip nat outside
Router(config-if)#encapsulation ppp
Router(config-if)#dialer pool 1
Router(config-if)#ppp chap hostname <username>
Router(config-if)#ppp chap password <password>
Router(config-if)#ppp pap sent-username <username> password <password>
Router(config-if)#end

8. Configure a default route using Dialer1 as the outbound interface.

Router#configure terminal
Router(config)#ip route 0.0.0.0 0.0.0.0 dialer1
Router(config)#end

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

Router#configure terminal
Router(config)#ip nat inside source list 1 interface Dialer1 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 dialer1 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

10. 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.
11. 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
Building configuration... [OK]

Configuration

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

--- Comments contain explanations and additional information.

```
service timestamps debug datetime msec
service timestamps log datetime msec
vpdn enable
no vpdn logging
vpdn-group pppoe
request-dialin
protocol pppoe
!
!
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 primary dns server>
!
interface Ethernet0
    no shut
    ip address <ip address> <subnet mask>
ip tcp adjust-mss 1452

!--- If the ip tcp adjust-mss 1452 command is not supported, try this
!--- configuration statement: ip adjust-mss 1452. If this command is not
!--- supported in your current Cisco DSL Router software release, upgrade to the
!--- latest Cisco DSL Router software or follow the procedure in
!--- Possible Required Configuration Steps on the PC.

!--- For NAT:

ip nat inside
```
no ip directed-broadcast
!
interface atm0
no ip address
bundle-enable
dsl operating-mode auto
!
interface atm0.1 point-to-point
no ip address
no ip directed-broadcast
no atm ilmi-keepalive
pvc <vpi/vci>
  pppoe-client dial-pool-number 1

!--- Common PVC values supported by ISPs are 0/35 or 8/35.
!--- Confirm your PVC values with your ISP.
!
!
interface dialer1
  ip address <ip address> <subnet mask>
  mtu 1492

!--- For NAT:

  ip nat outside
    encapsulation ppp
dialer pool 1
  ppp chap hostname <username>
  ppp chap password <password>
  ppp pap sent-username <username> password <password>
!

!--- For NAT:

  ip nat inside source list 1 interface dialer1 overload

!--- If you have a pool (a range) of public IP addresses provided
!--- by your ISP, you can use a NAT Pool. Replace
!--- 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 interface dialer1

!--- For NAT:

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

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.

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 PPPoE if your ADSL service does not work properly.

Related Information

- Cisco DSL Router Acting as a PPPoE Client with a Static IP Address
- Cisco DSL Router Configuration and Troubleshooting Guide
- Technical Support & Documentation – Cisco Systems