Cisco DSL Router Configuration and Troubleshooting Guide – Step–by–Step Configuration of PPPoA with a Dynamic IP Address

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Introduction

Your Internet Service Provider (ISP) has assigned a dynamic 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.

Configure
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 Digital Subscriber Line (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. From the Connect To window, click Cancel.
   c. From the File menu, click Properties.
   d. From the Properties window, in the Connect Using list, 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 screen.

Clear Existing Configurations on the Cisco DSL Router

Complete these steps:

1. Type enable at the router prompt 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 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.

```ruby
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 to suppress console messages that may be triggered while you are configuring the router.

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

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

```ruby
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 NAT:** (Optional) Enable NAT inside on the Ethernet interface.

```ruby
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 an ATM permanent virtual circuit (PVC), encapsulation type, and Dialer pool.

```ruby
Router# configure terminal
Router(config)# interface atm 0
Router(config-if)# pvc <vpi/vci>
Router(config-if-atm-vc)# encapsulation aal5mux ppp dialer
Router(config-if-atm-vc)# dialer pool-member 1
Router(config-if-atm-vc)# no shut
Router(config-if-atm-vc)# end
```

6. Configure the Dialer interface of your Cisco DSL Router for Point-to-Point Protocol over ATM
(PPPoA) to enable a dynamic IP address to be assigned.

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

```
Router#configure terminal
Router(config)#interface dialer 1
Router(config-if)#ip address negotiated
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>
```

7. 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
```

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

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
```

9. For 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 the logging console on the Cisco DSL Router, and 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 results after you complete the procedures in this document.

<table>
<thead>
<tr>
<th>Cisco DSL Router with a Dynamic IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>!--- Comments contain explanations and additional information.</td>
</tr>
<tr>
<td>service timestamps debug datetime msec</td>
</tr>
<tr>
<td>service timestamps log datetime msec</td>
</tr>
<tr>
<td>ip subnet-zero</td>
</tr>
<tr>
<td>!--- For DHCP:</td>
</tr>
<tr>
<td>ip dhcp excluded-address &lt;ip address of ethernet0&gt;</td>
</tr>
<tr>
<td>ip dhcp pool &lt;dhcp pool name&gt;</td>
</tr>
<tr>
<td>network &lt;ip network address of ethernet0&gt; &lt;subnet mask&gt;</td>
</tr>
<tr>
<td>default-router &lt;ip address of ethernet0&gt;</td>
</tr>
<tr>
<td>dns-server &lt;ip address of dns server&gt;</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>interface ethernet0</td>
</tr>
<tr>
<td>no shut</td>
</tr>
<tr>
<td>ip address &lt;ip address&gt; &lt;subnet mask&gt;</td>
</tr>
<tr>
<td>ip nat inside</td>
</tr>
<tr>
<td>no ip directed-broadcast</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>interface atm0</td>
</tr>
<tr>
<td>no shut</td>
</tr>
<tr>
<td>no ip address</td>
</tr>
<tr>
<td>no ip directed-broadcast</td>
</tr>
<tr>
<td>no ip mroute-cache</td>
</tr>
<tr>
<td>pvc &lt;vpi/vci&gt;</td>
</tr>
<tr>
<td>encapsulation aal5mux ppp dialer</td>
</tr>
<tr>
<td>dialer pool-member 1</td>
</tr>
<tr>
<td>!--- Common PVC values supported by ISPs are 0/35 or 8/35.</td>
</tr>
<tr>
<td>!--- Confirm your PVC values with your ISP.</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>interface dialer1</td>
</tr>
<tr>
<td>ip address negotiated</td>
</tr>
<tr>
<td>no ip directed-broadcast</td>
</tr>
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<td>!--- For NAT:</td>
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<td>ip nat outside</td>
</tr>
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<td>encapsulation ppp</td>
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<tr>
<td>dialer pool 1</td>
</tr>
<tr>
<td>ppp chap hostname &lt;username&gt;</td>
</tr>
<tr>
<td>ppp chap password &lt;password&gt;</td>
</tr>
<tr>
<td>ppp pap sent-username &lt;username&gt; password &lt;password&gt;</td>
</tr>
</tbody>
</table>
Verify

Your Cisco DSL Router should now be 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

If your ADSL service does not work properly, refer to Troubleshooting PPPoA.
Related Information

- Cisco DSL Router Configuration and Troubleshooting Guide – Cisco DSL Router – PPPoA with a Dynamic IP Address
- Cisco DSL Router Configuration and Troubleshooting Guide
- Technical Support & Documentation – Cisco Systems