

PPPoA Session Termination: xDSL to 7x00 Using aal5mux

Document ID: 12870

Introduction

Prerequisites

- Requirements
- Components Used
- Conventions

Configure

- Network Diagram
- Configurations

Verify

Troubleshoot

- Troubleshooting Commands

NetPro Discussion Forums – Featured Conversations

Related Information

Introduction

This document provides a sample configuration for a PC that connects to a Cisco 675 asymmetric digital subscriber line (ADSL) router. The configuration enables the PC to connect via a Cisco 6100 advanced DSL access multiplexer (ADSLAM) and Cisco LightStream 1010 to a Cisco 7x00 series router with use of PPP over ATM (PPPoA).

The configuration allows for the route of data to the Internet or other services. The specific equipment that this configuration uses is not necessary. For example, you can replace the Cisco 675 with a Cisco 677 or a Cisco 678. Also, the LightStream 1010 is an additional piece of equipment that is not necessary. If you remove the LightStream 1010 and connect the ADSLAM directly to the Cisco 7x00 series router, the result is the same. This sample configuration uses ATM adaptation layer 5 (AAL5) multiplex (MUX), which is an industry standard for PPP. A similar document, PPPoA Session Termination: xDSL to 7x00 Using aal5ciscopp, uses AAL5CISCOPPP, which is a proprietary version of PPP.

A few features with enablement on the Cisco 675 in this configuration are common to an ADSL rollout. These features are Network Address Translation (NAT), Port Address Translation (PAT), and DHCP. These features allow for a *cookie cutter* rollout. Because all the boxes have the same configuration, there is a significant reduction in the cost of rollout and documentation.

You can copy and paste the code for the Cisco IOS® Software–based routers and switches to your configurations. However, the 675 router uses the Cisco Broadband Operating System (CBOS) and you cannot copy and paste this code. This sample configuration also includes the commands to configure the router.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The configuration in this document requires these services and software and hardware versions:

- PC or workstation
- Cisco 675 ADSL customer premises equipment (CPE)
- ADSL service from your local telephone company (telco)
- Cisco 6100 ADSLAM with SCM, NI-1, CAP ATU-C
- Cisco LightStream 1010 that runs
- Cisco 7x00 series router that runs
- Cisco IOS Software Release 12.0(3c)W5(9) for LightStream 1010
- Cisco IOS Software Release 12.0(7)T for Cisco 7x00 series router
- CBOS release 2.3.0.053 for Cisco 675 ADSL router
- Viewrunner 2.4.1
- Sytem software 2.4.10 for Cisco 6100 ADSLAM

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.

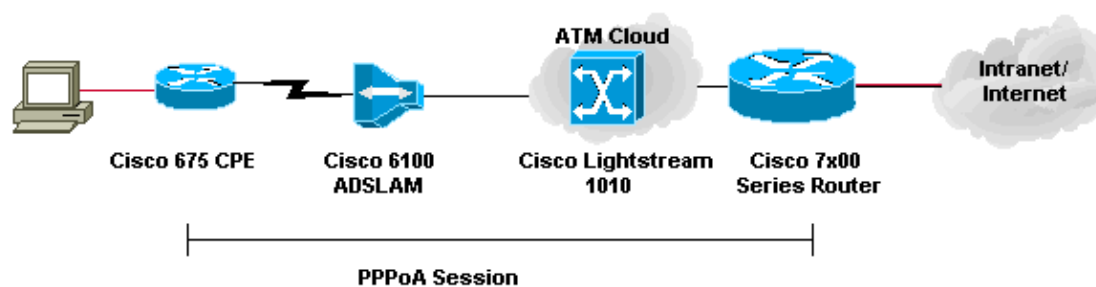
Configure

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

Note: 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

Configuration Notes

You must configure a permanent virtual connection (PVC) on the Cisco 6100 ADSLAM which allows the *test* subscriber to connect. Record the virtual path identifier/virtual channel identifier (VPI/VCI) configuration for

Cisco – PPPoA Session Termination: xDSL to 7x00 Using aal5mux

use on the Cisco 7x00 series router when you terminate the PPP session and create the permanent virtual path (PVP) on the LightStream 1010.

This sample configuration shows a virtual path on the LightStream 1010. This path allows the LightStream 1010 to pass through the cells from the ADSLAM to the terminating router, or to another ATM switch.

The Cisco 675 CPE in this example uses default values for the VPI/VCI pair for communication with the Cisco 6100. The VPI/VCI values of the Cisco 675 and the Cisco 6100 must match. *Contact your Internet service provider (ISP) to obtain the correct VPI/VCI values.* For more information about how to change VPI/VCI values, refer to the document Displaying and Changing VPI/VCI Values on the Cisco 675 CPE.

This document uses these configurations:

- PC Configuration
- Cisco 675 CPE
- Commands to Issue to the Cisco 675 CPE
- Cisco LightStream 1010 (Optional)
- Cisco 7x00 Series Router

PC Configuration

1. Set IP addressing to obtain an IP address automatically.
2. Set WINS to use DHCP for WINS resolution.
3. Ensure that no default gateway is set.

Note: If DHCP cannot pass this information, you need to set a domain name.

Cisco 675 CPE

```
[[ PPP Device Driver = Section Start ]]  
PPP Port User Name = 00, <username>  
PPP Port User Password = 00, <password>  
PPP Port Option = 00, IPCP,IP Address,3,Auto,Negotiation Not Required,Negotiable  
,IP,0.0.0.0  
[[ IP Routing = Section Start ]]  
IP NAT = enabled  
[[ DHCP = Section Start ]]  
DHCP Server = enabled  
[[ CBOS = Section Start ]]  
NSOS Remote Restart = enabled  
NSOS Serial More = 20
```

Commands to Issue to the Cisco 675 CPE

```
cbos> enable  
Password:  
  
cbos# set nat enable  
NAT is now enabled  
You must use "write" then reboot for changes to take effect.  
  
cbos# set ppp wan0-0 login user_name  
  
User name for wan0-0 has been set to testcpe.
```

```

cbos# set ppp wan0-0 password password

Password for wan0-0 has been set to cisco.

cbos# set ppp wan0-0 ipcp 0.0.0.0
PPP wan0-0 IPCP Address set to 0.0.0.0

cbos# set int eth0 address 172.22.10.254
eth0 ip address changed from 10.0.0.1 to 172.22.10.254

cbos# set int eth0 netmask 255.255.255.0
eth0 netmask changed from 255.255.255.0 to 255.255.255.0

cbos# set dhcp server enable
DHCP Server enabled

cbos# set dhcp server pool 0 ip 172.22.10.0
Pool 0 IP parameter is now 172.22.10.0

cbos# set dhcp server pool 0 netmask 255.255.255.0
Pool 0 netmask parameter is now 255.255.255.0

cbos# set dhcp server pool 0 gateway 172.22.10.254
Pool 0 gateway parameter is now 172.22.10.254

cbos# set password exec password a

Exec Password Change Successful!

cbos# set password enable password b

Enable Password Change Successful!

cbos# write
NVRAM written.

```

Cisco LightStream 1010 (Optional)

```

interface ATM 0/1/2
 no ip address
 no ip directed-broadcast
 no atm ilmi-keepalive
 atm pvp 1 interface ATM 0/0/2 1

```

Cisco 7x00 Series Router

```

aaa new-model
aaa authentication ppp default local
!
!
username <username> password <password>
!
!
interface ATM 2/0.1 multipoint
 no ip directed-broadcast
 pvc 1/36
  encapsulation aal5mux ppp Virtual-Template 2
!
!
interface FastEthernet 4/0
 ip address 172.22.32.1 255.255.255.0
 no ip directed-broadcast
!

```

```
!  
interface Virtual-Template 2  
  ip unnumbered FastEthernet 4/0  
  no ip directed-broadcast  
  peer default ip address pool <pool name>  
  ppp authentication pap  
!  
!  
ip local pool <pool name> 172.22.40.10 172.22.40.25
```

Verify

This section provides information you can use 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.

Use this command on the Cisco 7x00 series router:

- **show atm pvc** Shows whether the correct PVC is established

Use these commands on the Cisco 675 CPE:

- **show interface wan0** Shows trained up speed for the ADSL link
- **show interface wan0-0** Shows PPP session information
- **show dhcp server pool 0** Shows DHCP information at the client site

Troubleshoot

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

Troubleshooting Commands

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

Use these commands on the Cisco 7x00 series router:

- **debug ppp negotiation** Shows PPP negotiation debug messages
- **debug ppp authentication** Shows if a client passes authentication
- **debug ppp error** Displays protocol errors and error statistics with relation to PPP connection negotiation and operation

For **debug** commands and commands with common use on the CBOS, refer to Using the Command Line Interface.

For the Cisco 675, information is also available at Running Debugs on the Cisco 675 CPE.

NetPro Discussion Forums – Featured Conversations

Networking Professionals Connection is a forum for networking professionals to share questions, suggestions, and information about networking solutions, products, and technologies. The featured links are some of the most recent conversations available in this technology.

Cisco – PPPoA Session Termination: xDSL to 7x00 Using aal5mux

NetPro Discussion Forums – Featured Conversations for DSL

Network Infrastructure: Remote Access

Service Providers: VPN Service Architectures

Related Information

- **Asymmetric Digital Subscriber Line Technology Support**
 - **Product Support Information**
 - **Technical Support & Documentation**
-

All contents are Copyright © 1992–2006 Cisco Systems, Inc. All rights reserved. Important Notices and Privacy Statement.

Updated: Aug 09, 2006

Document ID: 12870
