

# MPLS over VP Tunnels

Document ID: 10476

---

## Introduction

### Prerequisites

Requirements

Conventions

### Configure

Network Diagram

Configurations

### Verify

### Related Information

---

## Introduction

A service provider normally gives you one or more virtual path (VP) tunnels to connect your devices together instead of a point-to-point physical link. This document explains the steps necessary to configure Multiprotocol Label Switching (MPLS) when you use VP tunnels.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Conventions

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

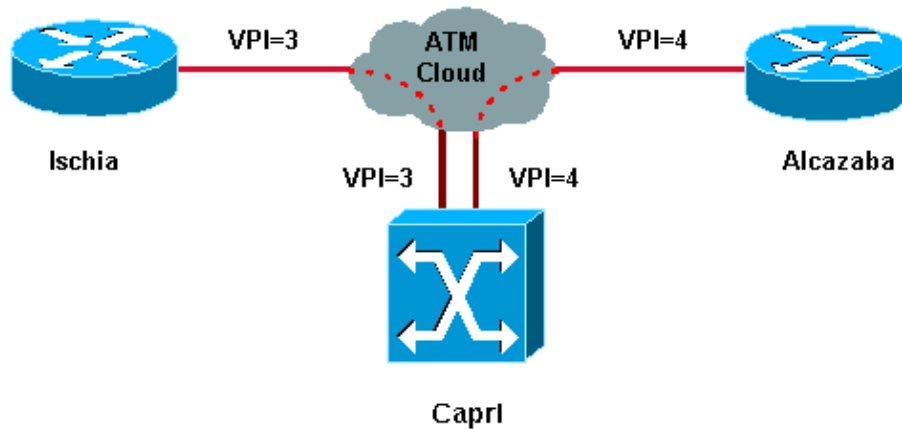
## Configure

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

**Note:** Use the Command Lookup Tool ( registered customers only) to find more information on the commands used in this document.

### Network Diagram

This document uses this network setup:



In this setup, the service provider has furnished two VP tunnels:

- One between Ischia and Capri with VPI = 3 (virtual path identifier)
- One between Alcazaba and Capri with VPI = 4

Ischia and Alcazaba are two Cisco 7200 routers that run Cisco IOS® Software Release 12.1(3a)E. Capri is a Catalyst 8540 Multiservice Switch Router (MSR) that runs release 12.0(10)W5(18c). Capri is a Tag Distribution Protocol (TDP) neighbor of Alcazaba and Ischia.

**Note:** You must run release 12.0(3)T or higher in order to configure this feature.

The configurations used here are for a Catalyst 8500 MSR, or LightStream 1010, and a router.

## Configurations

This document uses these configurations:

Ischia
<pre>ip cef ! interface Loopback0  ip address 1.1.1.1 255.255.255.0 ! interface ATM2/0.3 tag-switching  ip address 3.0.0.1 255.255.255.0  tag-switching atm vp-tunnel 3  tag-switching ip ! router ospf 6  log-adjacency-changes  network 1.1.1.1 0.0.0.0 area 0  network 3.0.0.0 0.0.0.255 area 0</pre>

Alcazaba
<pre>ip cef ! interface Loopback0  ip address 2.2.2.2 255.255.255.0 ! interface ATM4/0.4 tag-switching</pre>

```

ip address 4.0.0.1 255.255.255.0
tag-switching atm vp-tunnel 4
tag-switching ip
!
router ospf 6
log-adjacency-changes
network 2.2.2.2 0.0.0.0 area 0
network 4.0.0.0 0.0.0.255 area 0

```

### Capri

```

interface ATM3/1/1
no ip address
no ip directed-broadcast
no ip mroute-cache
no atm ilmi-keepalive
atm pvp 3
atm pvp 4
!
interface ATM3/1/1.3 point-to-point
ip address 3.0.0.2 255.255.255.0
no ip directed-broadcast
no atm ilmi-keepalive
tag-switching ip
!
interface ATM3/1/1.4 point-to-point
ip address 4.0.0.2 255.255.255.0
no ip directed-broadcast
no atm ilmi-keepalive
tag-switching ip

```

**Note:** This configuration is similar to standard router configurations you can find here. The only difference is that you have to specify to the router that you use a VP tunnel. You can do this with the **tag-switching atm vp-tunnel vpi** command, where vpi is the **VPI** value that is associated with the tunnel that ends on this router.

**Note:** For the LightStream 1010 and Catalyst 8500 MSR, you need to configure one or more permanent virtual paths (PVPs) for each VP tunnel with the **atm pvp vpi** command. See here for a sample configuration. A subinterface is associated with each of these tunnels. For instance, the atm 3/1/1.3 interface is associated with PVP=3. You must configure this subinterface with tag-switching, as you do on the main interface.

## Verify

Use these tag-switching show commands to test that your network operates properly:

- **show tag-switching tdp neighbor**
- **show tag-switching atm-tdp bindings** This shows dynamic ATM tag information.
- **show tag-switching forwarding-table** This shows the Tag Forwarding Information Base (TFIB).
- **show tag-switching interfaces atm [int number] detail** This shows detailed tag switching information for each interface.

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

This output is a result of these commands entered on the devices shown in the network diagram.

```

Ischia#show tag-switching tdp neighbor
Peer TDP Ident: 10.200.10.57:1; Local TDP Ident 1.1.1.1:1
    TCP connection: 3.0.0.2.11001 - 3.0.0.1.711
    State: Oper; PIEs sent/rcvd: 92/93; ; Downstream on demand
    Up time: 01:16:52
    TDP discovery sources:
        ATM2/0.3

Ischia#show tag-switching atm-tdp bindings
Destination: 4.0.0.0/24
    Headend Router ATM2/0.3 (1 hop) 3/33 Active, VCD=127
Destination: 1.1.1.0/24
    Tailend Router ATM2/0.3 3/33 Active, VCD=127
Destination: 2.2.2.2/32
    Headend Router ATM2/0.3 (2 hops) 3/34 Active, VCD=128

Ischia#show tag-switching forwarding-table
Local  Outgoing  Prefix          Bytes tag  Outgoing  Next Hop
tag    tag or VC   or Tunnel Id    switched   interface
26     3/33       4.0.0.0/24     0          AT2/0.3   point2point
27     3/34       2.2.2.2/32     0          AT2/0.3   point2point

Ischia#show tag-switching interfaces detail
Interface ATM2/0.3:
    IP tagging enabled
    TSP Tunnel tagging not enabled
    Tagging operational
    Tagswitching turbo vector
    MTU = 4470
    ATM tagging:
        Tag VPI = 3 (VP Tunnel)
        Tag VCI range = 33 - 65535
        Control VC = 3/32

Capri#show tag-switching atm-tdp bindings
Destination: 4.0.0.0/24
    Tailend Switch ATM3/1/1.3 3/33 Active -> Terminating Active
Destination: 1.1.1.1/32
    Transit ATM3/1/1.4 4/33 Active -> ATM3/1/1.3 3/33 Active
Destination: 3.0.0.0/24
    Tailend Switch ATM3/1/1.4 4/34 Active -> Terminating Active
Destination: 2.2.2.2/32
    Transit ATM3/1/1.3 3/34 Active -> ATM3/1/1.4 4/33 Active

Capri#show tag-switching tdp neighbor
Peer TDP Ident: 1.1.1.1:1; Local TDP Ident 10.200.10.57:1
    TCP connection: 3.0.0.1.711 - 3.0.0.2.11001
    State: Oper; PIEs sent/rcvd: 95/94; ; Downstream on demand
    Up time: 01:18:49
    TDP discovery sources:
        ATM3/1/1.3
Peer TDP Ident: 2.2.2.2:1; Local TDP Ident 10.200.10.57:2
    TCP connection: 4.0.0.1.711 - 4.0.0.2.11002
    State: Oper; PIEs sent/rcvd: 93/95; ; Downstream on demand
    Up time: 01:18:22
    TDP discovery sources:
        ATM3/1/1.4

Capri#show tag-switching interfaces detail
Interface ATM3/1/1.3:
    IP tagging enabled
    TSP Tunnel tagging not enabled
    Tagging operational
    MTU = 4470

```

```
      ATM tagging: Tag VPI = 3, Control VC = 3/32
Interface ATM3/1/1.4:
      IP tagging enabled
      TSP Tunnel tagging not enabled
      Tagging operational
      MTU = 4470
      ATM tagging: Tag VPI = 4, Control VC = 4/32
```

This output is similar to standard tag-switching output, but one important difference is that it points to the VP tunnel interface.

---

## Related Information

- [MPLS over ATM without VC-Merge](#)
  - [Understanding Session Establishment and Route Exchange in an MPLS-Enabled ATM Core](#)
  - [MPLS Label Imposition in an ATM Environment](#)
  - [ATM Technology Support Pages](#)
  - [Technical Support & Documentation – Cisco Systems](#)
- 

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

---

Updated: Jan 03, 2007

Document ID: 10476

---