

# Why Am I Unable to Ping the ATM Interface?

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## Introduction

This document illustrates the need to configure a virtual path identifier (VPI) and virtual channel identifier (VCI) on a local ATM interface in order to ping it successfully.

Applying an IP address to an ATM interface simply configures the interface to be a routed IP interface. For pings to work, also configure a permanent virtual circuit (PVC), so the router knows through which virtual circuit (VC) to send the ATM cells. Without a VC, the router reports an encapsulation failure if **debug** commands are enabled. By encapsulation, the router is referring to the Layer 2 (L2) header that wraps around the ping packet.

When you ping a local interface, the ATM cells actually are sent out on the physical wire. If the end-to-end circuit is active, the ping cells travel to the remote router end and then loop back. Alternately, configure a hardware or software loopback somewhere along the path, including at the local interface itself. Use the **loopback diagnostic** command to configure a software loopback.

Since ATM VCs are point-to-point, consider the following points about the type of interface on which you are configuring VCs:

- **Main interface** Supports multiple VCs. Each VC needs to either a static or dynamic mapping that matches the local PVC values to the remote IP address. Without a mapping, the router will report an `encapsulation failed` error message with debugs enabled.
- **Multipoint subinterface** Supports multiple VCs. Each VC needs to either a static or dynamic mapping that matches the local PVC values to the remote IP address. Without a mapping, the router will report an `encapsulation failed` error message with debugs enabled.
- **Point-to-point subinterface** Supports a single VC. Since the router assumes by definition that there is a single device at the other end of the VC, no explicit mapping is required. Instead, the router forwards packets out the VC based on a routing decision. In other words, the routing table tells the router that the next hop for the IP packet is the remote end of the VC.

## Prerequisites

### Requirements

There are no specific requirements for this document.

## Components Used

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

## Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

## Main Interface

The following tables illustrate the necessary configuration commands for pinging the local interface depending on whether it is point-to-point or multipoint.

### Configure an IP Address Only and No VPI/VCI on The Main ATM Interface

```
!  
interface ATM4/0  
 ip address 10.1.1.1 255.255.255.0  
 no ip directed-broadcast  
 no atm ilmi-keepalive  
!  
cs-7204-15a#show atm vc  
                VCD /  
Interface      Name          VPI   VCI   Type   Encaps   Peak Avg/Min Burst  
                Kbps   Kbps   Cells Sts  
cs-7204-15a#show atm map  
  
cs-7204-15a#ping 10.1.1.1  
  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:  
  
4w2d: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending  
4w2d: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, encapsulation failed  
  
!--- Router reports encapsulation failure messages because there is no VPI/VCI  
!--- on which to send the packet.
```

### Configure a PVC on The Main ATM Interface

```
interface ATM4/0  
 ip address 10.1.1.1 255.255.255.0  
 no ip directed-broadcast  
 no atm ilmi-keepalive  
 pvc 1/32  
 encapsulation aal5snap  
cs-7204-15a#show atm vc  
                VCD /  
Interface      Name          VPI   VCI   Type   Encaps   Peak Avg/Min Burst  
                Kbps   Kbps   Cells Sts  
4/0            4              1     32   PVC    SNAP     149760                UP  
cs-7204-15a#show atm map  
cs-7204-15a#  
debug ip packet  
  
IP packet debugging is on  
cs-7204-15a#ping 10.1.1.1  
  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
```

```
4w2d: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending
4w2d: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, encapsulation failed
```

```
!--- Although this configures a PVC, either a dynamic or
!--- static mapping is still needed between the L2 and Layer 3 (L3) addresses.
```

### Configure a Static Map Statement on The PVC

```
interface ATM4/0
 ip address 10.1.1.1 255.255.255.0
 no ip directed-broadcast
 no atm ilmi-keepalive
 pvc 1/32
 protocol ip 10.1.1.1
```

```
!--- This configures a static map back to the local interface.
!--- Normally, the map statement points to the remote IP address.
```

```
 encapsulation aal5snap
cs-7204-15a#show atm map
Map list ATM4/0pvc4 : PERMANENT
ip 10.1.1.1 maps to VC 4, VPI 1, VCI 32, ATM4/0
cs-7204-15a#ping 10.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending.
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending.

!--- The router now sends the packets. However, since there is not a
!--- remote end in the lab setup, the pings fail.
```

### Configure Loopback Diagnostic on The Main Interface

```
interface ATM4/0
 ip address 10.1.1.1 255.255.255.0
 no ip directed-broadcast
 loopback diagnostic
```

```
!--- This configures a software loopback with the loopback diag command.
```

```
 no atm ilmi-keepalive
 pvc 1/32
 protocol ip 10.1.1.1
 encapsulation aal5snap
cs-7204-15a#show atm map
```

```
Map list ATM4/0pvc4 : PERMANENT
ip 10.1.1.1 maps to VC 4, VPI 1, VCI 32, ATM4/0
cs-7204-15a#ping 10.1.1.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
cs-7204-15a#
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending
5wld: IP: s=10.1.1.1 (ATM4/0), d=10.1.1.1 (ATM4/0), len 100, rcvd 3
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0), len 100, sending
5wld: IP: s=10.1.1.1 (ATM4/0), d=10.1.1.1 (ATM4/0), len 100, rcvd 3
```

```
!--- The pings are successful. Note that the local interface both
!--- receives its own Internet Control Message Protocol (ICMP) echo and echo-reply.
```

# Multipoint Subinterface

## Configure an ATM Multipoint Interface

```
interface ATM4/0
  no ip address
  no ip directed-broadcast
  loopback diagnostic
  no atm ilmi-keepalive
!
interface ATM4/0.1 multipoint
  ip address 10.1.1.1 255.255.255.0
  no ip directed-broadcast
  pvc 1/32
    protocol ip 10.1.1.1

!--- This configures a static map or use inverse Address Resolution Protocol (ARP) on a multipoint
    encapsulation aal5snap
cs-7204-15a#show atm map

Map list ATM4/0.1pvc5 : PERMANENT
ip 10.1.1.1 maps to VC 5, VPI 1, VCI 32, ATM4/0.1
cs-7204-15a#ping 10.1.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
cs-7204-15a#
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0.1), len 100, sending
5wld: IP: s=10.1.1.1 (ATM4/0.1), d=10.1.1.1 (ATM4/0.1), len 100, rcvd 3
5wld: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0.1), len 100, sending
5wld: IP: s=10.1.1.1 (ATM4/0.1), d=10.1.1.1 (ATM4/0.1), len 100, rcvd 3
```

# Point-to-Point Subinterface

## Point-to-Point Subinterface

```
interface ATM4/0
  no ip address
  no ip directed-broadcast
  loopback diagnostic

!--- Use the loopback diagnostic command if
!--- the PVC is not configured end to end.

  no atm ilmi-keepalive
!
interface ATM4/0.2 point-to-point
  ip address 10.1.1.1 255.255.255.0
  no ip directed-broadcast
  pvc 1/32
    encapsulation aal5snap

!--- Point-to-point interfaces do not need a static mapping or inverse ARP.

cs-7204-15a#show atm map

cs-7204-15a#ping 10.1.1.1

Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
cs-7204-15a#
00:11:03: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0.2), len 100, sending
00:11:03: IP: s=10.1.1.1 (ATM4/0.2), d=10.1.1.1 (ATM4/0.2), len 100, rcvd 3
00:11:03: IP: s=10.1.1.1 (local), d=10.1.1.1 (ATM4/0.2), len 100, sending
00:11:03: IP: s=10.1.1.1 (ATM4/0.2), d=10.1.1.1 (ATM4/0.2), len 100, rcvd 3
```

## Related Information

- **Multiple Routed Protocols Over ATM PVCs Using LLC Encapsulation**
- **Multiple Routed Protocols Over ATM PVCs Using VC Multiplexing**
- **Basic PVC Configuration Using Bridged RFC 1483**
- **Bridged PVC Connection Between a Router and a Catalyst Switch**
- **ATM (Asynchronous Transfer Mode) Technical Support**
- **More ATM Information**
- **Technical Support – Cisco Systems**

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