

Troubleshooting Router Interfaces and Modules Issues

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Introduction

This document helps troubleshoot router interfaces and modules. The document also discusses the causes of the problems, as well as basic procedures to troubleshoot, identify, and solve the problems.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on the Cisco 2600, 2800, 3600, 3700, 3800, and 7200 Series routers.

The information in this document was created from the devices in a specific lab environment. All 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

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

Background Information

Most of the Cisco routers are modular access devices that contain a number of slots to connect the various network modules. These are the common issues with the router modules:

- The module is not recognized.
- The router crashes.
- The router does not boot.
- The router hangs.

In this document, you can see basic steps to troubleshoot, identify, and isolate the module issues. You can also see the most common issues and their solutions.

Basic Troubleshooting Steps

Modules Not Recognized

One of the common issues with the router interfaces and modules is that they are not recognized by the router. These simple steps can help identify and resolve the module issues:

- In order to verify hardware information for the network device, use the **show diag** command in EXEC or privileged EXEC mode.

```
Router# show diag
3725 Backplane EEPROM:
    PCB Serial Number       : JAE0821JA9S
    Processor type          : 61
    Top Assy. Part Number   : 800-16147-02
    Board Revision          : D0
    Fab Part Number         : 28-4226-06
    Deviation Number        : 65535-65535
    Manufacturing Test Data  : FF FF FF FF FF FF FF FF
    RMA Number              : 255-255-255-255
    RMA Test History        : FF
    RMA History             : FF
    Chassis Serial Number   : JMX0836L10L
    Chassis MAC Address     : 0011.218d.dd30
    MAC Address block size  : 48
    Field Diagnostics Data  : FF FF FF FF FF FF FF FF
    Hardware Revision       : 0.1
    Number of Slots        : 2
    EEPROM format version 4
    EEPROM contents (hex):
    0x00: 04 FF C1 8B 4A 41 45 30 38 32 31 4A 41 39 53 09
    0x10: 61 40 02 59 C0 46 03 20 00 3F 13 02 42 44 30 85
    0x20: 1C 10 82 06 80 FF FF FF FF C4 08 FF FF FF FF FF
    0x30: FF FF FF 81 FF FF FF FF 03 FF 04 FF C2 8B 4A 4D
    0x40: 58 30 38 33 36 4C 31 30 4C C3 06 00 11 21 8D DD
    0x50: 30 43 00 30 C5 08 FF FF FF FF FF FF FF FF 41 00
    0x60: 01 01 02 FF FF FF FF FF FF FF FF FF FF FF FF FF
    0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

slot 0:
    C3725 Mother board 2FE(TX)-3W Port adapter, 4 ports
    Port adapter is analyzed
```

Port adapter insertion time unknown
EEPROM contents at hardware discovery:
PCB Serial Number : JAE0821JA9S
Processor type : 61
Top Assy. Part Number : 800-16147-02
Board Revision : D0
Fab Part Number : 28-4226-06
Deviation Number : 65535-65535
Manufacturing Test Data : FF FF FF FF FF FF FF FF
RMA Number : 255-255-255-255
RMA Test History : FF
RMA History : FF
Chassis Serial Number : JMX0836L10L
Chassis MAC Address : 0011.218d.dd30
MAC Address block size : 48
Field Diagnostics Data : FF FF FF FF FF FF FF FF
Hardware Revision : 0.1
Number of Slots : 2
Product (FRU) Number : C3725-2FE
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF C1 8B 4A 41 45 30 38 32 31 4A 41 39 53 09
0x10: 61 40 02 59 C0 46 03 20 00 3F 13 02 42 44 30 85
0x20: 1C 10 82 06 80 FF FF FF FF C4 08 FF FF FF FF FF
0x30: FF FF FF 81 FF FF FF FF 03 FF 04 FF C2 8B 4A 4D
0x40: 58 30 38 33 36 4C 31 30 4C C3 06 00 11 21 8D DD
0x50: 30 43 00 30 C5 08 FF FF FF FF FF FF FF FF FF FF
0x60: 01 01 02 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

WIC Slot 1:

Unknown WAN daughter card
WIC module not supported/disabled in this slot
Hardware Revision : 3.0
Part Number : 73-5797-03
Board Revision : A0
Deviation Number : 0-0
Fab Version : 02
PCB Serial Number : FOC07160WZ2
RMA Test History : 00
RMA Number : 0-0-0-0
RMA History : 00
Top Assy. Part Number : 800-09311-03
Connector Type : 01
Chassis MAC Address : 0004.dd0d.798c
MAC Address block size : 1
Product (FRU) Number : PA-A2-4T1C-T3ATM=
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 00 39 41 03 00 82 49 16 A5 03 42 41 30
0x10: 80 00 00 00 00 02 02 C1 8B 46 4F 43 30 37 31 36
0x20: 30 57 5A 32 03 00 81 00 00 00 00 04 00 C0 46 03
0x30: 20 00 24 5F 03 05 01 C3 06 00 04 DD 0D 79 8C 43
0x40: 00 01 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

WIC Slot 2:

T1 (2 port) Multi-Flex Trunk (Drop&Insert) WAN daughter card
Hardware revision 1.0 Board revision B0
Serial number 22688207 Part number 800-04614-02
FRU Part Number VWIC-2MFT-T1-DI=
Test history 0x0 RMA number 00-00-00
Connector type PCI
EEPROM format version 1

EEPROM contents (hex):
0x20: 01 24 01 00 01 5A 31 CF 50 12 06 02 00 00 00 00
0x30: 58 00 00 00 01 01 18 00 FF FF FF FF FF FF FF FF

Slot 1:

High Density Voice Port adapter
Port adapter is disabled
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision : 1.1
Top Assy. Part Number : 800-03567-01
Board Revision : G0
Deviation Number : 0-31106
Fab Version : 02
PCB Serial Number : JAB0613089J
RMA Test History : 00
RMA Number : 0-0-0-0
RMA History : 00
Product (FRU) Number : NM-HDV=
EEPROM format version 4

EEPROM contents (hex):
0x00: 04 FF 40 00 CC 41 01 01 C0 46 03 20 00 0D EF 01
0x10: 42 47 30 80 00 00 79 82 02 02 C1 8B 4A 41 42 30
0x20: 36 31 33 30 38 39 4A 03 00 81 00 00 00 00 04 00
0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

HDV SIMMs: Product (FRU) Number: PVDM-12=

SIMM slot 0: Empty.
SIMM slot 1: Empty.
SIMM slot 2: Empty.
SIMM slot 3: Empty.
SIMM slot 4: Empty.

Slot 2:

4 PORT Voice PM for MARs Port adapter
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware revision 1.1 Board revision B0
Serial number 10379472 Part number 800-02491-02
FRU Part Number NM-2V=
Test history 0x0 RMA number 00-00-00
EEPROM format version 1

EEPROM contents (hex):
0x00: 01 65 01 01 00 9E 60 D0 50 09 BB 02 00 00 00 00
0x10: 58 00 00 00 98 09 13 17 FF FF FF FF FF FF FF FF
0x20: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF

VIC Slot 0:

FXS Voice daughter card (2 port)
Hardware revision 1.1 Board revision F0
Serial number 16172601 Part number 800-02493-01
FRU Part Number VIC-2FXS=
Test history 0x0 RMA number 00-00-00
Connector type Wan Module
EEPROM format version 1

EEPROM contents (hex):
0x20: 01 0E 01 01 00 F6 C6 39 50 09 BD 01 00 00 00 00
0x30: 78 0E F2 00 99 10 11 01 FF FF FF FF FF FF FF FF

VIC Slot 1:

```

FXO Voice daughter card (2 port)
Hardware revision 1.1          Board revision K0
Serial number 27584010        Part number 800-02495-01
FRU Part Number VIC-2FXO=
Test history 0x0              RMA number 00-00-00
Connector type Wan Module
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 0D 01 01 01 A4 E6 0A 50 09 BF 01 00 00 00 00
0x30: A0 00 00 00 02 05 09 01 FF FF FF FF FF FF FF FF

```

- If the module's hardware information is not shown in the **show diag**, reseal the hardware module. You can also install the module in a different slot. Some modules are not hot swappable; reload the router after you install the module.
- If the module's hardware information is shown in the **show diag** but you are not able to see the module interfaces in the show run or show IP interface brief output, check the hardware installation documentation. Some modules need router configuration after the installation.
- In the **show diag** output, note the error message under the WIC 0 in the Slot 0. It is displayed as "Unknown WAN daughter card" "WIC module not supported/disabled in this slot." This could be an incompatible hardware issue. Check the Routers and Supported Modules section to make sure that the module is supported by the router; also check the supported IOS version for that module.

Note: When you cold reboot the router, Cisco recommends that you wait at least 20 seconds before you turn on the device.

Routers and Supported Modules

These links show the relevant interfaces and modules that are supported by the routers. The supported IOS versions are also mentioned in the data sheet of the relevant interfaces and modules.

- Cisco 3800 Series Integrated Services Routers
- Cisco 2800 Series Integrated Services Routers
- Cisco 7200 Series Routers
- Cisco 7600 Series Routers
- Cisco 3700 Series Multiservice Access Routers
- Cisco 3600 Series Multiservice Platforms
- Cisco 2600 Series Multiservice Platforms
- Cisco 1800 Series Integrated Services Routers

Advanced Integration Modules

Three different types of AIMs are available for Cisco Modular access routers. These AIM modules supplement the broad portfolio of Cisco Voice & Security solutions and allow enterprises and service providers to implement ATM, Security, and Voice solutions on the routers.

- ATM AIM called AIM-ATM: The AIM-ATM provides asynchronous transfer mode (ATM) services to the WAN.
- Voice AIM called AIM-VOICE-30: The AIM-VOICE-30 provides digital signal processor (DSP) services, which can support up to 30 medium-complexity or 16 high-complexity voice channels.
- Voice + ATM AIM called AIM-ATM-VOICE-30: The AIM-ATM-VOICE-30 combines the features from the AIM-ATM and AIM-VOICE-30 modules onto a single AIM module
- Voice Mail AIM called AIM-CUE: The AIM-CUE provides the Cisco Unity Express Voice Mailboxes for the users.

- VPN and SSL AIM called AIM-VPN/SSL-2 or AIM-VPN/SSL-3: The AIM-VPN/SSL optimizes the Cisco Integrated Services Router platforms for virtual private networks in both IP Security (IPSec) and Secure Sockets Layer (SSL) Web and VPN deployments.

In this section, you will see some of the common issues related to the voice modules and interface cards. One of the important steps in order to isolate the issue between the router modules and the line is to run the Loopback test. Read the Loopback Tests for T1/56K Lines to test the circuit with the loopback test.

Note: The minimum IOS feature set required by AIM-ATM is IOS Plus. See the requirements and support in the AIM-ATM, AIM-VOICE-30, and AIM-ATM-VOICE-30 modules.

Note: Compact flash can be installed only into an AIM-VPN module and not into an AIM-ATM card.

AIM Slots Clock Source Issues

Cisco 2691, 3660, 3700, and 3800 routers have two AIM slots. When you create two IMA groups, you cannot use two different clock sources because of the hardware limitation. Both of the AIM slots are in the same clock domain as per the hardware design. This example shows that the ports 0/2/0 and 0/2/1 are configured in IMA group 0, and the ports 0/3/0 and 0/3/1 are configured in IMA group 1. You can also see that the ports in IMA group 0 (AIM slot 0) are configured to source the clock internally, and the ports in IMA group 1 (AIM slot 1) are configured to source the clock from line. Because of the hardware limitation, the interface ATM0/IMA1 will not come up.

```

Router# configure terminal
Router(config)# controller T1 0/2/0
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal

Router(config)# controller T1 0/2/1
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal

Router(config)# controller T1 0/3/0
Router(config-controller)# mode atm aim 1
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source line primary

Router(config)# controller T1 0/3/1
Router(config-controller)# mode atm aim 1
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source line primary

Router# show ima int br
Interface ATM0/IMA1 is down
  Group index is 11
  Ne state is insufficientLinks, failure status is insufficientLinksNe
  IMA Group Current Configuration:
    Tx/Rx minimum required links 1/1
    Maximum allowed diff delay is 25ms, Tx frame length 128
    Ne Tx clock mode CTC, configured timing reference link ATM0/0
    Test pattern procedure is disabled
  IMA Group Total Counters (time elapsed 0 seconds):
    0 Tx cells, 0 Rx cells
    4 Ne Failures, 6 Fe Failures, 1735406 Unavail Secs
  IMA link Information:

```

Link	Physical Status	NearEnd Rx Status
----	-----	-----
ATM0/3/0	up	active
ATM0/3/1	up	active

In order to resolve this issue, configure the router to derive the clock from one source. If the service provider furnishes the clocking, configure all the ports to source the clock from the line. In the case of ATM point-to-point, the service provider will not furnish the clocking. In this case, configure one end to source the clock internally, and configure the other end to source the clock from line.

```

Router(config)# controller T1 0/2/0
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal
!
Router(config)# controller T1 0/2/1
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal
!
Router(config)# controller T1 0/3/0
Router(config-controller)# mode atm aim 1
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal
!
Router(config)# controller T1 0/3/1
Router(config-controller)# mode atm aim 1
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
Router(config-controller)# clock source internal

```

AIM-VPN/SSL Not Recognised

On Cisco series routers with an installed AIM-VPN/SSL module, encryption can still be performed by the main processor instead of the AIM. It could lead to a high CPU utilization on the routers. The reason for this can be a hardware and software incompatibility issue, badly seated AIM, faulty AIM, or hardware failure on the backplane.

The output of the **show crypto engine config** command is useful to determine the cause of the problem.

This is an example of the **show crypto engine config** command output with the incorrect Cisco IOS® Software installed:

```

Router#show crypto engine config

crypto engine name: unknown
crypto engine type: software
serial number: 59E1C9F9
crypto engine state: installed
crypto engine in slot: N/A

```

This is an example of a poorly seated AIM (all configuration hex values show 0):

```

Router#show crypto engine config

crypto engine name: Virtual Private Network (VPN) Module
crypto engine type: hardware

```

```

Configuration: 0x000000000000000000000000
: 0x000000000000000000000000
: 0x000000000000000000000000
: 0x000000000000000000000000
CryptIC Version: 000.000
CGX Version: 000.000
CGX Reserved: 0x0000
PCDB info: 0x0000 0x0000 0x0000
Serial Number: 0x0000000000
: 0x0000000000
DSP firmware version: 000.000
DSP Bootstrap Version: 000.000
DSP Bootstrap Info: 0x0000

```

```

Compression: No
3 DES: Yes
Privileged Mode: 0x0000
Maximum buffer length: 4096
Maximum DH index: 0470
Maximum SA index: 0940
Maximum Flow index: 1880
Maximum RSA key size: 0000

```

This step-by-step procedure can help to resolve the issue:

- Refer to the Software Support for Hardware [\(registered customers only\)](#) section of the Software Advisor [\(registered customers only\)](#) to ensure that the Cisco IOS Software version is compatible with the AIM. Also check whether a Data Encryption Standard (DES) or a Triple Data Encryption Standard (3DES) image is loaded. The image name will include either "56i" for DES or "k9" for 3DES. This is an example of a DES image; c2600-js56i-mz.121-5.T9.bin is a DES image.
- Try to reseal the AIM. For complete installation instructions, refer to AIM Installation Quick Start Guide: Cisco 2600, 3600, and 3700 Series.
- In order to verify that the card is now correctly detected, issue the **show crypto engine config** command. The **crypto engine type** line will read hardware, and the configuration field will contain valid hexadecimal numbers. This is a sample command output for an AIM:

```

router#show crypto engine config

crypto engine name: Virtual Private Network (VPN) Module
crypto engine type
: hardware

Configuration: 0x000109010F00F00784000000
: 0xA2112AB1AB68BA9C3992D377
: 0x295801AF4A12EFD108000300
: 0x00000000D78312B12546464B
CryptIC Version: 001.000
CGX Version: 001.009
CGX Reserved: 0x000F
PCDB info: 0x07F0 0x0084 0x0000
Serial Number: 0x11A2B12A68AB9CBA9239
: 0x77D35829AF01124AD1EF
DSP firmware version: 000.008
DSP Bootstrap Version: 000.003
DSP Bootstrap Info: 0x0000
Compression: No
3 DES: Yes
Privileged Mode: 0x0000
Maximum buffer length: 4096
Maximum DH index: 0470
Maximum SA index: 0940
Maximum Flow index: 1880
Maximum RSA key size: 0000

```

Crypto Adjacency Counts:

Lock Count: 0

Unlock Count: 0

- If the values in the Configuration field still show 0s, either the AIM module or the motherboard is faulty and needs to be replaced.

IMA Minimum Link Not Working

After you group the T1 ports into an IMA group, the entire ATM0/IMA0 interface will go down if any one of the ports is down. You can also configure the router with the command **ima active–minimum–links X**, where X is the number of T1 ports, such that the ATM0/IMA0 interface goes down only when X number of links are down. For example, when you configure **ima active–minimum–links 3**, the ATM0/IMA0 interface will go down if three T1 ports are down. A Cisco router that runs 12.3 mainline software can experience interoperability issues with some third–party ATM switches. In these cases, even though you configure **ima active–minimum–links 3**, the ATM0/IMA0 interface will go down if one of the three T1 ports goes down. This issue is documented in the bug CSCeg09359 (registered customers only) and can be resolved if you upgrade the Cisco IOS to the release mentioned in the bug.

IMA Interface Flaps

ATM Advanced Integration Module (AIM) modules installed in 2600/3600/3700 routers require some unique clocking configuration to allow them to function properly. Failure to configure them properly results in errors on the T1/E1 controller and Inverse Multiplexing (IMA) links, as well as in groups that flap continuously.

Typically, you see log messages which indicate that the interface and Permanent Virtual Circuit (PVC) has flapped, as shown.

```
%ATM-5-UPDOWN: Interface ATM0/IMA0.1, Changing autovc 1/90 to PVC deactivated.  
%ATM-5-UPDOWN: Interface ATM0/IMA0.1, Changing autovc 1/90 to PVC activated.
```

Errors that report **Slip Secs** can be seen if you issue the **show controllers T1** or **show controllers E1** command.

This is a sample output from the **show controllers E1** command:

```
E1 0/1 is up.  
  Applique type is Channelized E1 - balanced  
  No alarms detected.  
  alarm-trigger is not set  
  Version info Firmware: 20020812, FPGA: 11  
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.  
  Data in current interval (363 seconds elapsed):  
    0 Line Code Violations, 0 Path Code Violations  
    85 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins  
    85 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs  
  Total Data (last 88 15 minute intervals):  
    1 Line Code Violations, 2536 Path Code Violations,  
    18319 Slip Secs, 86 Fr Loss Secs, 1 Line Err Secs, 0 Degraded Mins,  
    18319 Errored Secs, 1 Bursty Err Secs, 0 Severely Err Secs, 87 Unavail Secs
```

In order to resolve this issue, configure a network clock source and participation for each WIC and AIM module that is installed. Packet voice and video are sensitive to time delays. In order to prevent mismatches and data slips, synchronize data flows to a single clock source, known as the network clock. When a network clock is configured on a gateway, the router externally clocks one T1 or E1 port, and then passes that clock signal across the backplane to another T1 or E1 port on another WIC or network module slot. Use of a network clock on a gateway is configured if you name the network modules and interface cards that

participate in network clocking, and then select a controller to act as the source of timing for the network clock.

The network clock provides timing from the source through the controller to the AIM, and then out to all the router slots that participate. The Cisco 2600 series routers support one internal AIM slot, and the Cisco 3660 routers support two internal AIM slots. An AIM slot connects to both the main system bus and a secondary time-division multiplexing (TDM) bus that runs between the network module slots and, on the Cisco 2600 series, to the WAN interface card (WIC) slots.

For example, on a 2600 series switch with an AIM-ATM module and two VWICs used for IMA, configure this way:

```
network-clock-participate wic 0
network-clock-participate wic 1
network-clock-select 1 T1 0/0
```

On the 2611, 2621, and 2651, the `network-clock-participate aim 0` is not required or supported because these routers have only one AIM slot. On the 2691, 3600, or 3700, you must also include the **`network-clock-participate aim X`** command for each installed AIM-ATM module. For more information, refer to AIM-ATM, AIM-VOICE-30, and AIM-ATM-VOICE-30 for the Cisco 2600 Series and Cisco 3660.

Multiflex Trunk Voice and WAN Interface Cards

VWIC-1MFT-T1, VWIC-2MFT-T1 Hardware Installation

The Cisco 1- and 2-port T1/E1 Multiflex Voice/WAN Interface Cards ("Multiflex VWICs") support voice and data applications in Cisco 2600, 2800, 3600, 3700, and 3800 multiservice routers. The common issue is that you cannot see the router interfaces, such as ATMx/y or Serial 0/0:0 in the **`show running-configuration`** or in the **`show interfaces`** output. This is normal behavior. After you install this card on the router, you can see the Controller T0, T1, etc. interfaces in the router configuration file. These interface cards can be used for different purposes. Configure these cards for their specific usage. VWIC cards can be used in the same way as this configuration example:

- It can be used as a standard WAN interface card like other Serial interface cards.

```
Router# configure terminal
Router(config)#controller T1 0/0
Router(config-controller)# channel-group 0 timeslots 1-24 speed 64 [64 | 56]

*Oct 20 13:11:45.230: %LINK-3-UPDOWN: Interface Serial0/0:0, changed state to do
wn
*Oct 20 13:11:46.230: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0:
0, changed state to down

Router(config-controller)# framing esf {sf | esf}
Router(config-controller)# linecode b8sz {ami | b8zs}
Router(config-controller)# clock source {line | internal}
Router(config-controller)# no shutdown
Router(config-controller)# end
Router# write

Router# configure terminal
Router(config)# interface Serial0/0:0
Router(config-if)# ip address 192.168.1.2 255.255.255.0
Router(config-if)# encapsulation hdlc [ppp | frame-relay]
Router(config-if)# no shutdown
Router(config-if)# end
```

```
Router# write
```

- It can be used as part of the ATM IMA group. In this case, VWIC cards work with the AIM-ATM hardware module.

```
Router(config)# controller T1 0/0
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
!
Router(config)# controller T1 0/1
Router(config-controller)# mode atm aim 0
Router(config-controller)# framing esf
Router(config-controller)# linecode b8zs
!
Router(config)# interface ATM0/0
Router(config-if)# ima-group 1
!
Router(config)#interface ATM0/1
Router(config-if)# ima-group 1
!
Router(config)# interface ATM0/IMA1
Router(config-if)# bandwidth 4500
Router(config-if)# no ip address
Router(config-if)# atm vc-per-vp 1024
Router(config-if)# no atm ilmi-keepalive
!
Router(config)# interface ATM0/IMA1.100 point-to-point
Router(config-if)# bandwidth 4500
Router(config-if)# ip address 172.19.18.26 255.255.255.252
```

- It can be used as a Voice interface card. In this case, VWIC cards work with the High Density Voice Network Modules (NM-HDV). Note the configuration example in the IP Communications High-Density Digital Voice/Fax Network Module.

VWIC2-1MFT-T1/E1, VWIC2-2MFT-T1/E1 Hardware Installation

Once you install the second generation 1- and 2-Port T1/E1 Multiflex Trunk Voice/WAN Interface cards, the hardware information of the module is displayed in the output of the **show diag** command. The interfaces of the module do not display in the output of the **show running-config** or **show ip interface brief** commands. These modules need extra configuration after their installation. You need to issue the **card type {t1 | e1}** command to configure the router in order to recognize the card. Refer to the configuration examples for Second-Generation 1- and 2-Port T1/E1 Multiflex Trunk Voice/WAN Interface Cards for more information.

LCV and PCV Errors

When you use VWIC-2MFT and VWIC-1MFT, you can see massive line and path code violation error messages in the controller interface.

```
Router# show controllers t1
T1 0/0/0 is up.
Applique type is Channelized T1
Cablelength is long gain36 0db
Description:
No alarms detected.
alarm-trigger is not set
Version info Firmware: 20041023, FPGA: 16, spm_count = 0
Framing is ESF, Line Code is B8ZS, Clock Source is Line.
CRC Threshold is 320. Reported from firmware is 320.
Data in current interval (571 seconds elapsed):
  46797 Line Code Violations, 9926 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 228 Line Err Secs, 8 Degraded Mins
  136 Errored Secs, 108 Bursty Err Secs, 105 Severely Err Secs, 0 Unavail Secs
```

These steps can help you resolve the issue:

1. Run the Loopback Test to isolate the issue between the router module and the line.
2. Have the service provider test the line.
3. Verify that your IOS version does not hit the current bug CSCsb00129 (registered customers only) .

Network Modules

NM-1T3/E3 Installation Issues (DS3 Card)

By default, the T3 controller does not show up in the **show running-config** output. Use **show version** or **show diag** in order to see the card, which does not show up in the **show run** or **show interfaces** output.

```
Router-3745#show version
Cisco Internetwork Operating System Software
IOS (tm) 3700 Software (C3745-IK9S-M), Version 12.3(12b), RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Thu 31-Mar-05 18:07 by jfeldhou
Image text-base: 0x60008AF4, data-base: 0x61E20000

ROM: System Bootstrap, Version 12.2(8r)T2, RELEASE SOFTWARE (fc1)
ROM: 3700 Software (C3745-IK9S-M), Version 12.3(12b), RELEASE SOFTWARE (fc2)

D-R4745-9A uptime is 18 minutes
System returned to ROM by reload
System image file is "flash:c3745-ik9s-mz.123-12b.bin"
```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wvl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

```
cisco 3745 (R7000) processor (revision 0.0) with 249856K/12288K bytes of memory.
Processor board ID
R7000 CPU at 350MHz, Implementation 39, Rev 3.3, 256KB L2, 2048KB L3 Cache
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
2 FastEthernet/IEEE 802.3 interface(s)
1 Subrate T3/E3 ports(s)
DRAM configuration is 64 bits wide with parity disabled.
151K bytes of non-volatile configuration memory.
62592K bytes of ATA System CompactFlash (Read/Write)

Configuration register is 0x2102
```

```
Router-3745#show ip interface brief
Interface                IP-Address      OK? Method Status  Prot
ocol
FastEthernet0/0          10.10.50.25     YES NVRAM  up      up
```

```
FastEthernet0/1          unassigned          YES NVRAM  administratively down down
```

You need to configure the router in order to recognize the card. This configuration example shows you how to configure the NM-1T3/E3 card. Refer to the hardware installation guide *Configure the Card Type and Controller for T3* for detailed configuration information.

```
Router-3745(config)# card type t3 1
Router-3745(config)# exit
*Mar  1 00:24:20.031: %LINK-3-UPDOWN: Interface Serial1/0, changed state to down
*Mar  1 00:24:21.031: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0,
  changed state to down
```

```
Router-3745# show ip interface brief
Interface                IP-Address      OK? Method Status      Prot
ocol
FastEthernet0/0          10.10.50.25    YES NVRAM  up          up
FastEthernet0/1          unassigned      YES NVRAM  administratively down down
Serial1/0                 unassigned      YES unset  down        down
```

Ethernet Switching Network Modules

Inline Power Issues

The new Cisco EtherSwitch service modules (NME-16ES-1G-P, NME-X-23ES-1G-P, NME-XD-24ES-1S-P, and NME-XD-48ES-2S-P only) provide both Cisco pre-standard and IEEE 802.3af Power over Ethernet (PoE) support when inserted in Cisco 2800 Series or 3800 Series Integrated Services Routers. (It requires an upgrade to an AC-IP power supply.) The 802.3af is the IEEE standard in the delivery of power to Ethernet ports. After the 802.3af Etherswitch modules have been added, you cannot configure PoE.

This occurs because the Inline Power Supply is required to provide PoE capabilities in these routers. The external power supply option cannot be used with the Cisco 2800 or 3800 Series. The internal router power supply can be swapped out for a new power supply with PoE capabilities if PoE is required. Examples of PoE enabled power supplies include PWR-2811-AC-IP=, PWR-2821-51-AC-IP=, PWR-3825-AC-IP=, and PWR-3845-AC-IP=. For detailed explanations and requirements, read the *Cisco EtherSwitch Network Modules*.

The *Hardware Installation* guide shows how to replace the power supply in the Cisco 2800 and 3800 Series Routers.

- [Installing and Upgrading Internal Modules in Cisco 2800 Series Routers – Replacing the Power Supply](#)
- [Installing a Power Supply in a Cisco 3825 Router](#)
- [Installing a Power Supply in a Cisco 3845 Router](#)

Troubleshooting Serial Interfaces

This is a list of references to help troubleshoot serial interfaces:

- [T1 Troubleshooting](#)
- [Troubleshooting Serial Line Problems](#)
- [Loopback Tests for T1/56K Lines](#)

Related Information

- [Hardware Troubleshooting Index Page](#)
 - [Troubleshooting Bus Error Crashes](#)
 - [Troubleshooting Router Crashes](#)
 - [Troubleshooting Router Hangs](#)
 - [Cisco Interfaces and Modules Product Support](#)
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