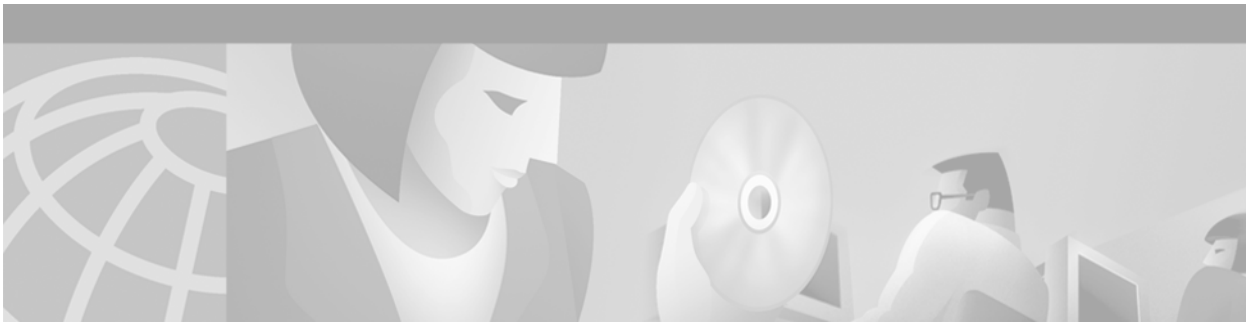


# Configuring Video Support on the Cisco MC3810

This chapter describes how to configure the Cisco MC3810 for video support. This chapter contains the following sections:

- Video Support Overview
- Video Support Configuration Task List
- Configuring Video in Pass-Through Mode
- Configuring Video over ATM AAL1
- Configuring Video over ATM PVCs and SVCs
- Configuration Examples

**Note** This chapter does not describe how to configure Multimedia Conference Manager (MCM); for more information, see the "Configuring Multimedia Conference Manager" chapter.

## Video Support Overview

The Cisco MC3810 supports video traffic within a data stream in the following ways:

- Video in pass-through mode—Using this method, video traffic received from a video codec connected to a universal I/O serial port can be transported on a dedicated time slot between systems using the time-division multiplexing (TDM) functionality of the T1/E1 trunk.
- Video over ATM AAL1—A serial stream from a video codec connected to a Cisco MC3810 on serial port 0 or 1 can be converted to ATM and transported across an ATM network using ATM Adaptation Layer 1 (AAL1) Circuit Emulation Services (CES) encapsulation.
- Video over ATM Permanent Virtual Circuits (PVCs) and Switched Virtual Circuits (SVCs)—A serial stream from a video codec connected to a Cisco MC3810 using the plug-in video dialing module (VDM) can be converted to ATM and transported across an ATM network using AAL1 Circuit Emulation Services (CES) encapsulation.

**Note** Only V.35 cable is supported for video traffic over serial port 0 or 1.

Before you can configure your Cisco MC3810 to support video traffic, you must first configure the clock source for the Cisco MC3810 interfaces. For more information, refer to the "Configuring Synchronous Clocking" appendix.

# Video Support Configuration Task List

Video support on the Cisco MC3810 requires different tasks. To configure video support, perform one of the following tasks:

- Configuring Video in Pass-Through Mode
- Configuring Video over ATM AAL1
- Configuring Video over ATM PVCs and SVCs

# Configuring Video in Pass-Through Mode

To configure support for video in pass-through mode, use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config)# network-clock base-rate {56k \| 64k}` | Configures the network clock base rate. The default is 56 kbps. |
| **Step 2** | `Router(config)# interface serial number {multipoint \| point-to-point}` | Enters serial interface configuration mode for either serial port 0 or 1.<br>If the video connection will be over a point-to-point network, specify the **point-to-point** option. The default option, **multipoint**, assumes you have a fully meshed network. |
| **Step 3** | `Router(config-if)# encapsulation clear-channel` | Configures the serial interface to be in clear-channel mode for pass-through traffic. |
| **Step 4** | `Router(config-if)# clock rate network-clock rate` | If the interface is in DCE mode, configures the network clock speed. The maximum rate supported is 2048 Mbps. |
| **Step 5** | `Router(config-if)# exit` | Exits interface configuration mode. |
| **Step 6** | `Router(config)# controller t1 0` | Enters controller configuration mode for controller T1 0. |
| **Step 7** | `Router(config-controller)# tdm-group tdm-group-no timeslot timeslot-list` | Configures a list of time slots for creating clear channel groups (pass-through) for TDM cross-connect. |
| **Step 8** | `Router(config-controller)# exit` | Exits controller configuration mode. |
| **Step 9** | `Router(config)# cross-connect id interface-serial controller tdm-group-no` | Configures cross-connect pass-through from the Universal I/O (UIO) serial port 0 or 1 to a controller. |

# Configuring Video over ATM AAL1

This section describes how to configure Video over ATM AAL1 PVCs using CES. This functionality does not use the VDM and SVCs are not supported. This section describes the video functionality supported on the Cisco MC3810 prior to Cisco IOS Release 12.0(7)T.

To configure support for video streaming data over ATM AAL1 encapsulation using CES, use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config)# network-clock base-rate 64k` | Configures the network clock base rate to 64 kbps. |
| **Step 2** | `Router(config)# controller {t1 \| e1} 0` | Selects T1/E1 controller 0. ATM is supported only on controller 0. |
| **Step 3** | `Router(config-controller)# mode atm` | Specifies that the controller will support ATM encapsulation, and create virtual ATM interface 0, which you will use to create the ATM PVCs. |
| **Step 4** | `Router(config-controller)# exit` | Exits controller configuration mode. |
| **Step 5** | `Router(config)# interface atm 0 {multipoint \| point-to-point}` | Enters interface configuration mode to configure ATM interface 0. |
| **Step 6** | `Router(config-if)# pvc vpi/vci` | Creates an ATM PVC and enter ATM PVC configuration mode. |
| **Step 7** | `Router(config-if-atm-pvc)# encapsulation aal1` | Sets the PVC to support AAL1 encapsulation for video. |
| **Step 8** | `Router(config-if-atm-pvc)# cbr rate` | Enables constant bit rate (CBR) calculation on the PVC. By default, the *rate* value used is the value configured with the **vc-class** command. The valid rate is from 56–10,000 kbps. The formula to calculate the CBR is 1.14 times the clock rate on the serial port. |
| **Step 9** | `Router(config-if-atm-pvc)# exit` | Exits ATM PVC configuration mode. |
| **Step 10** | `Router(config-if)# exit` | Exits interface configuration mode. |
| **Step 11** | `Router(config)# interface serial number {multipoint \| point-to-point}` | Enters interface configuration mode for either serial port 0 or 1. |
| **Step 12** | `Router(config-if)# clock rate network-clock rate` | Configures the network clock speed on the interface to support video traffic if the interface is in DCE mode. The maximum rate supported is 2048 Mb. The value must be a multiple of 64 kbps. |
| **Step 13** | `Router(config-if)# encapsulation atm-ces` | Configures the ATM encapsulation type to ATM-CES. |
| **Step 14** | `Router(config-if)# ces connect atm0 pvc [name \| [vpi/vci]` | Maps the CES service to the PVC. The ATM 0 interface must be specified, and the ATM PVC must be configured. |

# Tuning Circuit Emulation Services Settings

Video streaming traffic over AAL1 uses CES. The default CES settings are sufficient for most configurations. However, you can tune the CES settings as needed.

To change the CES settings, use the following commands beginning in interface configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config-if)# ces initial-delay` | Configures the maximum size of the CES circuit transmit buffer. The range is from 1–16,000 bytes, and the default is 4000. |
| **Step 2** | `Router(config-if)# ces partial-fill` *octets* | Configures the number of user octets per cell for CES. The default is 47. |

# Configuring Video over ATM PVCs and SVCs

Video over ATM SVCs enables the Cisco MC3810 multiservice access concentrator to provide dynamic and flexible video conferencing system support. Using a plug-in VDM to provide an EIA/TIA-366 dialing interface to an H.320 video codec, the Cisco MC3810 automatically accepts dial-out requests from the video system. The codec connects to one of the Cisco MC3810 serial ports and also to the Cisco MC3810 EIA/TIA-366 dialup port.

This feature permits PVC connections with automatic connection through a serial port. Each codec must place a call to the other video conferencing system prior to the expiration of the video codec timeout period (set on the codec, usually 1 minute). Using a video dial map, each system reconciles the dialed number with a PVC that has already been configured, allowing fast connectivity.

This section describes the video functionality supported on the Cisco MC3810 beginning with Cisco IOS Release 12.0(7)T, and includes the following sections:

- Configuring Network Clocks and Controllers
- Configuring Serial Interfaces to Support the Video Codec
- Configuring ATM Interfaces to Support Video over PVCs and SVCs
- Configuring Video Dial Peers
- Troubleshooting Video over ATM SVCs and PVCs

Service providers, educational organizations, and enterprises can concentrate streams for video with packet data on a single high-speed ATM link without a separate ATM access multiplexer. Here are some features of the Cisco ATM SVC implementation:

- Video traffic uses CES encapsulation and AAL1 so that multiple ATM SVCs can comprise a CBR virtual circuit to the destination.
- The implementation adheres to the required features of ATM Forum User-Network Interface (UNI) specification, version 4.0, simultaneously supporting permanent virtual circuits (PVCs) and SVCs.
- Video over ATM SVCs support codec speeds of 128, 384, 768, and 1152 kbps.
- The Cisco MC3810, responding to the design of many leading H.320-based video systems, receives the called-party information from the EIA/TIA-366 interface, then reconciles the dialed address with a standard 20-octet ATM network service access point (NSAP) address.

Figure 103 shows a sample ATM video application.

*Figure 103 Sample ATM Video Application*

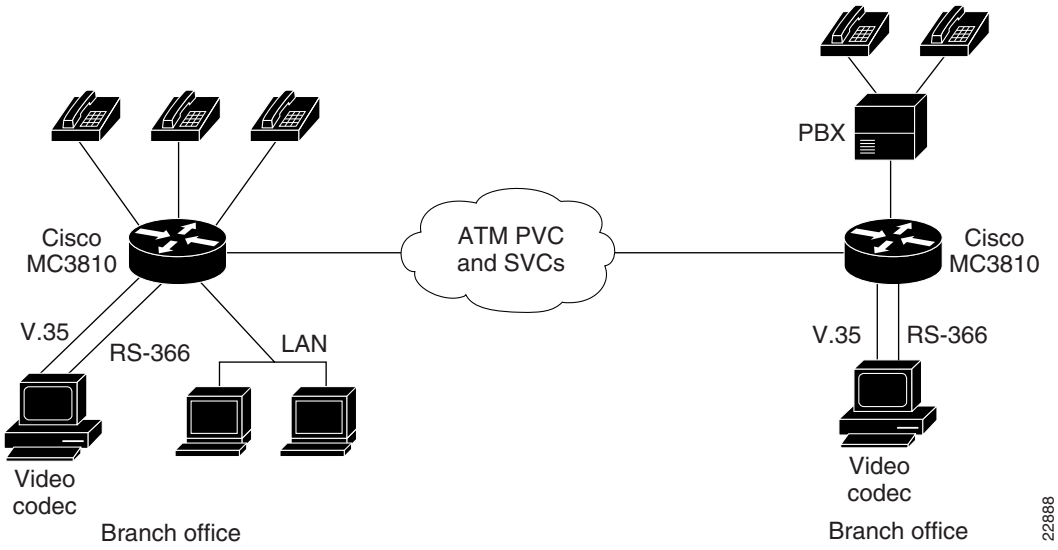
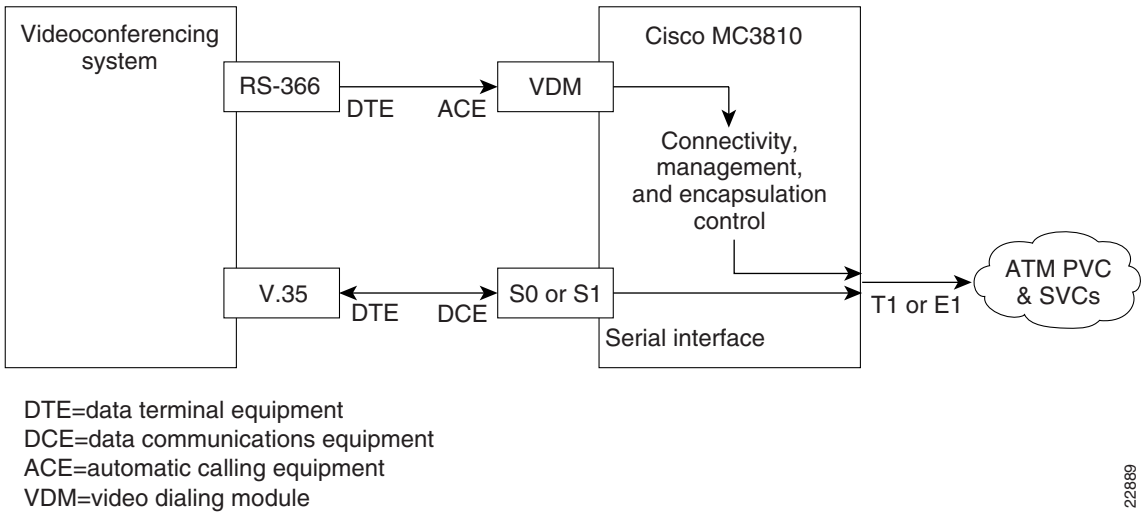



Figure 104 shows how the physical interfaces interact with software, the codec, and video data to handle connectivity and video functionality. The VDM Automatic Calling Equipment (ACE) provides the EIA/TIA-366 interface to the video codec, while one of the Cisco MC3810 serial interfaces connects to the video codec DTE interface. The Video Call Manager (ViCM) software manages video calls that travel over a T1 or E1 facility through the Cisco MC3810 Multiflex Trunk (MFT) interface.

*Figure 104 Physical Interfaces and Their Functions*




The following restrictions apply to video over ATM using SVCs:

- Point-to-point connectivity for ATM SVC video does not support tandem switching and network (local) hunting.
- You can connect only one video codec to a Cisco MC3810.
- For video SVCs, the ATM service class is not configurable. It is automatically set to CBR, which is the standard service class for video.

The following special hardware is required for this feature:

- A Cisco MC3810 video dialing module VDM and an MFT module for ATM network connectivity
- Two cables are required:
  - A new Cisco serial V.35 DCE cable (product number 72-1721-01) that includes a Ringing Indicator (RI) conductor. This cable carries the video stream between the Cisco MC3810 and the video equipment. Video conferencing equipment often uses the V.35 RI as the incoming call alerting signal. The Cisco standard serial V.35 cables do not include the RI conductor.
  - A Cisco EIA/TIA-366 ACE cable (product number 72-1722-01) to connect the VDM to the video conferencing equipment EIA/TIA-366 dial-up DTE port.

For additional information about installation and other hardware considerations, refer to the *Cisco MC3810 Multiservice Concentrator Hardware Installation*.

# Configuring Network Clocks and Controllers

Because real-time video communications require a continuous and tightly meshed data stream to avoid loss of information, you must synchronize source and destination devices to a single master clock. In the following example, the clock source is derived from a device attached to T1 controller 0; then it is distributed to the devices attached to the local Cisco MC3810 serial ports and to T1 controller 1. Clock source decisions should be based on the network configuration, and a hierarchy of clock sources can be set up, so that backup clock sources are available. For details, see the "Configuring Synchronized Clocking" appendix.

To configure network clocks and the controller to support real-time video, use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config)# controller {T1 \| E1} 0` | Enters controller configuration mode for controller T1/E1 0. ATM traffic is supported on controller T1/E1 0 only. |
| **Step 2** | `Router(config-controller)# clock source line` | Configures controller T1/E1 0 to obtain the Cisco MC3810 clock source from an attached network device. This is the default setting. |
| **Step 3** | `Router(config-controller)# no shutdown` | Activates the controller. |
| **Step 4** | `Router(config)# controller {T1 \| E1} 1` | Enters controller configuration mode for controller T1/E1 1. |
| **Step 5** | `Router(config-controller)# clock source internal` | Configures controller T1/E1 1 to obtain its clocking from the internal network clock Phase-Lock-Loop (PLL). Controller T1/E1 1 obtains clocking from the T1/E1 0 controller source, so that both controllers use the same clock source. |
| **Step 6** | `Router(config-controller)# no shutdown` | Activates the controller. |
| **Step 7** | `Router(config-controller)# exit` | Exits controller configuration mode. |

| | Command | Purpose |
|---|---|---|
| **Step 8** | `Router(config-controller)# framing esf`<br>or<br>`Router(config-controller)# framing crc4` | Sets the framing to Extended Superframe (ESF) format, which is required for ATM on T1. This setting is automatic for T1 when ATM mode is set.<br>Sets the framing to CRC4, which is required for ATM on E1. This setting is automatic for E1 when the ATM mode is set. |
| **Step 9** | `Router(config-controller)# linecode b8zs`<br>or<br>`Router(config-controller)# linecode hdb3` | Sets the line coding to binary 8-zero substitution (B8ZS), which is required for ATM on T1. This setting is automatic for T1 when the ATM mode is set.<br>Sets the line coding to HDB3, which is required for ATM on E1. This setting is automatic for E1 when the ATM mode is set.<br>**Note** When the E1 controller is specified, you must also configure scrambling on the ATM 0 interface. See Step 3 of the "Configuring ATM Interfaces to Support Video over PVCs and SVCs" section later in this chapter. |
| **Step 10** | `Router(config-controller)# mode atm` | Configures the controller for ATM traffic. This allows the controller to support ATM encapsulation and create virtual ATM interface 0 for SVCs and PVCs. Controller framing is automatically set to ESF on T1 and to CRC4 on E1. The line coding is automatically set to B8ZS on T1 and to HDB3 on E1. Channel groups, CAS groups, common channel signalling (CCS) groups or clear channels are not allowed on the trunk because ATM traffic occupies all the DS0s. |
| **Step 11** | `Router(config-controller)# exit` | Exits controller configuration mode. |
| **Step 12** | `Router(config)# network-clock base rate {56k \| 64k}` | Sets the network clock base rate for the serial ports. For video stream rates of 384, 768, 1.152, or 1.28 kbps (see Step 2), set the rate to 64 kbps. The default is 56 kbps.<br>**Note** At this point, you can also configure network protocol settings such as IP hosts. For more information, see the *Cisco IOS IP and IP Routing Configuration Guide*. |

## Verifying Network Clock and Controller Configuration

To verify the configuration of network clock sources and controller settings, complete the following steps:

**Step 1** Enter the **show network-clocks** privileged EXEC command to see the status of clock source settings. In this example, the "inactive config" clock setting is the current configuration:

```
router# show network-clocks

Priority 1 clock source(inactive config): T1 0
Priority 1 clock source(active config) : T1 0
Clock switch delay: 10
Clock restore delay: 10
T1 0 is clocking system bus for 9319 seconds.
Run Priority Queue: controller0
```

**Step 2** Enter the **show controllers t1** or **show controllers e1** privileged EXEC commands to see the status of T1 or E1 controllers, as in the following example:

```
router# show controller t1 1
T1 1 is up.
  Applique type is Channelized T1
  Cablelength is long gain36 0db
  No alarms detected.
  Slot 4 CSU Serial #07789650 Model TEB HWVersion 4.70 RX level = 0DB
  Framing is ESF, Line Code is B8ZS, Clock Source is Internal.
  Data in current interval (819 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 2:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  .
  .
  .
  Data in Interval 96:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours)
     0 Line Code Violations, 0 Path Code Violations,
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs

!
router# show controllers E1 1
E1 1 is up.
  Applique type is Channelized E1 - balanced
  No alarms detected.
  Slot 4 Serial #06868949 Model TEB HWVersion 3.80
  Framing is CRC4, Line Code is HDB3, Clock Source is Internal.
```

```
Data in current interval (292 seconds elapsed):
   0 Line Code Violations, 0 Path Code Violations
   0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
   0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
 .
 .
 .
Total Data (last 66 15 minute intervals):
   9 Line Code Violations, 0 Path Code Violations,
   1 Slip Secs, 0 Fr Loss Secs, 4 Line Err Secs, 0 Degraded Mins,
   5 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

# Configuring Serial Interfaces to Support the Video Codec

To configure serial interfaces to support the video codec, use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config)# interface serial {0 \| 1}` | Enters interface configuration mode either for serial 0 or serial 1, depending on where the video codec is connected. |
| **Step 2** | `Router(config-if)# clock rate network rate` | Configures the network clock speed for DCE mode, in bits per second (bps), corresponding to the video stream rate you are using. The rate must be a multiple of the value set with the **network-clock base-rate** command in Step 12. of "Configuring Network Clocks and Controllers" section. Make sure this setting is 384000, 768000, or 1152000. 768000 is a common setting. |
| **Step 3** | `Router(config-if)# encapsulation atm-ces` | Configures the interface for ATM encapsulation CES, which is required for video codec support. |
| **Step 4** | `Router(config-if)# serial restart-delay count` | Sets the amount of time that the router waits before trying to bring up a serial interface when the interface goes down. The router resets the hardware each time the restart timer expires. This command is often used with dial backup and with the **pulse-time** command, which sets the amount of time to wait before redialing when a DTR dialed device fails to connect.<br><br>The *count* argument is a value from 0 to 900 in seconds. This is the frequency at which the hardware is reset. A value of 0 means that the hardware is not reset when down. In this way, if the interface is used to answer a call, it does not cause DTR to drop, which can cause the modem to disconnect. |

## Verifying Serial Interface Configuration for Video Codecs

Enter the privileged EXEC command **show interfaces serial** command to see the status of all serial interfaces or of a specific serial interface, as shown in the example below. You can use this command to check the encapsulation, scrambling, and serial restart delay settings:

```
router# show interface serial0
Serial0 is down, line protocol is down
  Hardware is PQUICC Serial Trans
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 65/255, rxload 1/255
  Encapsulation CES-ATM, loopback not set
  Keepalive not set
  Scramble enabled
  Restart-Delay is 0 secs
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 5d13h
  Queueing strategy: fifo
  Output queue 0/100, 101 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     13452224 packets input, 1526136219 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     215189699 packets output, 1654453088 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
  Cable attached: V.35 (DCE)
  Hardware config: V.35; DCE; PLL nx64K;
  DSR = UP   DTR = DOWN   RTS = DOWN   CTS = DOWN   DCD = DOWN
```

# Configuring ATM Interfaces to Support Video over PVCs and SVCs

In this section, the ATM interface is set up, including PVCs to carry signalling for SVCs. The video NSAP addressing commands specify session target information for SVC video communications.

To configure ATM interfaces to support video over PVCs and SVC (including configuring a dial PVC for video conferencing), use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config-if)# interface atm 0 [.subinterface-number {multipoint \| point-to-point}]` | Enters interface configuration mode for ATM 0—the only interface that supports video over ATM.<br><br>Use the **multipoint** keyword when your network is fully meshed and you want to communicate with multiple routers. The **point-to-point** keyword configures the subinterface for communication with one router, as in a hard-wired connection. There is no default for this parameter. |
| **Step 2** | `Router(config-if)# ip address ip-address mask` | For IP protocol communications, assigns the IP address and subnet mask to the interface. |

| | Command | Purpose |
|---|---|---|
| **Step 3** | `Router(config-if)# atm scramble-enable` | (E1 configuration only) Helping to ensure reliability, scrambling randomizes the ATM cell payload frames to avoid continuous nonvariable bit patterns and improve the efficiency of ATM cell delineation algorithms. |
| **Step 4** | `Router(config-if)# atm video aesa {default \|esi-address}` | Sets the unique ATM end-station address (AESA) for an ATM video interface that is using SVC mode.<br>The **default** keyword automatically creates an NSAP address for the interface, based on a prefix from the ATM switch (26 hexadecimal characters), the MAC address (12 hexadecimal characters) as the end system identifier (ESI), and a selector byte (two hexadecimal characters).<br>The *esi-address* option requires that you enter 12 hexadecimal characters as the ESI. The ATM switch provides the prefix, and the video selector byte provides the remaining characters.<br>You can view the assigned address by using the **show atm video-voice address** command. |

| | Command | Purpose |
|---|---|---|
| **Step 5** | `Router(config-if)# pvc [name] vpi/vci ilmi` | Creates an ATM PVC for Interim Local Management Interface (ILMI) management purposes and enter PVC configuration mode.<br><br>The optional *name* is a unique label that can be up to 16 characters long. It identifies to the processor the virtual path identifier-virtual channel identifier (VPI-VCI) pair to use for a particular packet.<br><br>The ATM network VPI of this PVC is an 8-bit field in the header of the ATM cell. The *vpi* value is unique only on a single link, not throughout the ATM network, because it has local significance only. The *vpi* value must match that of the switch. Valid values are from 0–255, but the value is usually 0 for ILMI communications. If a value is not specified, the *vpi* value is set to 0.<br><br>You cannot set both *vpi* and *vci* to 0; if one is 0, the other cannot be 0.<br><br>For ILMI communications, this value is typically 16. The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network, because it has only local significance.<br><br>To set up communication with the ILMI, enter the **ilmi** keyword for ATM adaptation layer encapsulation; the associated *vpi* and *vci* values are ordinarily 0 and 16, respectively.<br><br>**Note** Typically, the low values 0–31 are reserved for specific traffic (for example, F4 OAM, SVC signalling, ILMI, and so on). Do not use them for other PVCs. |
| **Step 6** | `Router(config-if-atm-pvc)# pvc [name] vpi/vci qsaal` | See the explanations in Step 5 for the *name*, *vpi*, and *vci* values.<br><br>To enable the signalling for setup and tear-down of SVCs, specify the Q.SAAL (signalling ATM Adaptation Layer) encapsulation; the associated *vpi* and *vci* values are ordinarily 0 and 5, respectively. You cannot create this PVC on a subinterface. |

| | Command | Purpose |
|---|---|---|
| **Step 7** | `Router(config-if-atm-pvc)# pvc [name] vpi/vci` | Sets up a PVC for communications.<br>The optional *name* is a unique label that can be up to 16 characters long.<br>The ATM network VPI of this PVC is an 8-bit field in the header of the ATM cell. Valid values are from 0–255, but the values from 0–31 are usually reserved for particular services (such as ILMI).<br>You cannot set both *vpi* and *vci* to 0; if one is 0, the other cannot be 0.<br>The VCI is a 16-bit field in the header of the ATM cell. |
| **Step 8** | `Router(config-if-atm-pvc)# protocol protocol protocol-address [[no] broadcast]` | Maps a protocol address to the PVC. |
| **Step 9** | `Router(config-if-atm-pvc)# cbr rate` | Configures the constant bit rate (CBR) for the ATM for an ATM PVC. Real-time video requires CBR.<br>The valid range for the *rate* value is 56–10,000 kbps. To set the rate that corresponds to the desired video speed, use a value that is 17 percent higher than the rate set on the serial DCE interface (see Step 2. in the "Configuring Network Clocks and Controllers" section earlier in this chapter). For example, if you specify a DCE clock rate of 768 kbps, the result is 899 kbps:<br>768 x 1.17 = 899 kbps |
| **Step 10** | `Router(config-if-atm-pvc)# encapsulation aal1` | Configures AAL1 encapsulation necessary for video conferencing using PVCs. |
| **Step 11** | `Router(config-if-atm-pvc)# exit` | Returns to interface configuration mode. |

## Verifying ATM Interface Configuration for Video over PVCs and SVCs

To verify ATM interface configuration, complete the following steps:

**Step 1** Enter the **show atm pvc** command with the VPI/VCI specified to see the PVCs that are set up for ILMI management and Q.SAAL signalling, as in the following examples:

```
router# show atm pvc 0/5
ATM0: VCD: 2, VPI: 0, VCI: 5, Connection Name: SAAL
UBR, PeakRate: 56
AAL5-SAAL, etype:0x4, Flags: 0x26, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s), OAM retry frequency: 1
second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
ILMI VC state: Not Managed
InARP DISABLED
InPkts: 2044, OutPkts: 2064, InBytes: 20412, OutBytes: 20580
InPRoc: 2044, OutPRoc: 2064, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutRDI: 0
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutRDI: 0
OAM cell drops: 0
Compress: Disabled
Status: INACTIVE, State: NOT_IN_SERVICE
!
router# show atm pvc 0/16
ATM0: VCD: 1, VPI: 0, VCI: 16, Connection Name: ILMI
UBR, PeakRate: 56
AAL5-ILMI, etype:0x0, Flags: 0x27, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s), OAM retry frequency: 1
second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
ILMI VC state: Not Managed
InARP DISABLED
InPkts: 398, OutPkts: 421, InBytes: 30493, OutBytes: 27227
InPRoc: 398, OutPRoc: 421, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutRDI: 0
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutRDI: 0
OAM cell drops: 0
Compress: Disabled
Status: INACTIVE, State: NOT_IN_SERVICE
```

**Step 2** Enter the **show interface atm 0** privileged EXEC command to see information about the ATM interface, as in the following example:

```
router# show interface atm 0
ATM0 is up, line protocol is up
  Hardware is PQUICC Atom1
  Internet address is 9.1.1.6/8
  MTU 1500 bytes, sub MTU 1500, BW 1536 Kbit, DLY 20000 usec,
     reliability 255/255, txload 22/255, rxload 11/255
  NSAP address: 47.0091810000000002F26D4901.000011116666.06
  Encapsulation ATM
  292553397 packets input, -386762809 bytes
  164906758 packets output, 1937663833 bytes
  0 OAM cells input, 0 OAM cells output, loopback not set
  Keepalive not supported
  Encapsulation(s):, PVC mode
  1024 maximum active VCs, 28 current VCCs
  VC idle disconnect time: 300 seconds
  Signalling vc = 1, vpi = 0, vci = 5
  UNI Version = 4.0, Link Side = user
  Last input 00:00:00, output 2d05h, output hang never
  Last clearing of "show interface" counters never
  Input queue: -1902/75/0 (size/max/drops); Total output drops: 205
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
  5 minute input rate 67000 bits/sec, 273 packets/sec
  5 minute output rate 136000 bits/sec, 548 packets/sec
     76766014 packets input, 936995443 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     367264676 packets output, 3261882795 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

**Step 3** Enter the **show atm vc** privileged EXEC command to see how SVCs and PVCs are set up, as in the following example:

```
router# show atm vc
 VCD /                                        Peak  Avg/Min Burst
Interface   Name       VPI   VCI  Type   Encaps   SC   Kbps   Kbps   Cells  Sts
0           1           0     5   PVC    SAAL     UBR        56               UP
0           2           0    16   PVC    ILMI     UBR        56               UP
0           3           34   35   PVC    AAL1     CBR  768    768              UP
0           4           38   39   SVC     CES     CBR  768    768              UP
```

**Step 4** Enter the **show atm video-voice address** privileged EXEC command to see information about the ATM interface address, which is particularly helpful because the address is assigned automatically through the **atm voice aesa** command. The following example also confirms that the ILMI status is confirmed—the ILMI PVC is set up to allow SVC management:

```
router# show atm video-voice address
nsap address                                      type         ilmi status
47.0091810000000002F26D4901.00107B4832E1.FE   VOICE_AAL5   Confirmed
47.0091810000000002F26D4901.00107B4832E1.C8   VIDEO_AAL1   Confirmed
```

# Configuring Video Dial Peers

To configure video dial peers, use the following commands beginning in global configuration mode:

| | Command | Purpose |
|---|---|---|
| **Step 1** | `Router(config)# port signal slot/port` | Specifies the slot where the VDM is located and the port for the EIA/TIA-366 interface. The *slot* value is either 1 or 2. The Cisco MC3810 VDM has only one video port, so the *port* value is 0. |
| **Step 2** | `Router(config)# dial-peer video tag videoatm` | Defines a video ATM dial peer for the remote system and enter dial-peer configuration mode. Video dial peers are persistent and exist until they are specifically removed with the **no** form of the **dial-peer video** command.<br>The *tag* value identifies the dial peer and must be unique on the Cisco MC3810. Do not duplicate a specific tag number. Valid values are 1–10000. |
| **Step 3** | `Router(config-dial-peer)# destination-pattern string [T]` | Configures the dial peer destination pattern so that the system can reconcile dialed digits with the peer NSAP address. The string is a series of digits that specify the E.164 or private dialing plan telephone number. Valid entries are the digits 0–9 and the letters A–D. The plus symbol (+) is not valid. You can enter the following special characters:<br>• The star character (*) and the pound sign (#) that appear on standard touch-tone dial pads can appear in any dial string—but not as leading characters (for example, *650).<br>• The period (.) acts as a wildcard character.<br>• The comma (,) can be used only in prefixes and inserts a 1-second pause.<br>• The timer (T) character can be used to configure variable-length dial plans. |
| **Step 4** | `Router(config-dial-peer)# session target ATM0 {svc nsap address \| pvc [name \| vpi/vci}` | Configures the ATM session target for the dial peer. Make sure that you specify ATM 0 as the interface.<br>Through SVCs and a video map, dialed digits are reconciled with the remote ATM interface video NSAP address.<br>If you are using PVCs to send video data, you can also specify a PVC defined on the ATM interface as a session target by using a name or a VPI/VCI combination. |
| **Step 5** | `Router(config-dial-peer)# exit` | Completes the configuration of this dial peer. |

| | Command | Purpose |
|---|---|---|
| **Step 6** | `Router(config)# dial-peer video number videocodec` | Defines a video ATM dial peer for the local video codec.<br>The *number* value identifies the dial peer and must be unique on the Cisco MC3810. Do not duplicate a specific number tag. Valid values are from 1–10000. |
| **Step 7** | `Router(config-dial-peer)# destination-pattern string` | Configures the dial peer destination pattern. |
| **Step 8** | `Router(config-dial-peer)# port signal slot/port` | Specifies the slot where the VDM is located and the port for the EIA/TIA-366 interface. The *slot* value is either 1 or 2. The Cisco MC3810 has only one video port, so the *port* value is 0. |
| **Step 9** | `Router(config-dial-peer)# port media interface` | Specifies the serial interface by using the name Serial and a port of either 0 or 1, depending on where the local codec is connected. |
| **Step 10** | `Router(config-dial-peer)# nsap nsap-address` | Specifies the NSAP address for the codec. The *nsap-address* argument is a unique 40-digit hexadecimal number. |

## Verifying Video Dial-Peer Configuration

To verify the dial-peer configuration, enter the **show dial-peer video** privileged EXEC command. In the following example, note that the third dial peer uses a PVC specified with a VPI/VCI value while the second uses an SVC. The first dial peer is for the local codec.

```
router# show dial-peer video
Video Dial-Peer 1
      type = videocodec, destination-pattern = 111
      port signal = 1/0, port media = Serial1
      nsap = 47.0091810000000050E201B101.00107B09C6F2.C8
Video Dial-Peer 2
      type = videoatm,   destination-pattern = 222
      session-target = ATM0 svc nsap 47.0091810000000050E201B101.00E01E92ADC2.C8
Video Dial-Peer 3
      type = videoatm,   destination-pattern = 333
      session-target = ATM0 pvc 70/70
```

# Troubleshooting Video over ATM SVCs and PVCs

When problems occur with video over PVCs or SVCs, perform the following steps to look first for common problems before progressing to more complex possible issues:

**Note** If you are using dial PVCs (rather than SVCs) for video communications, ensure that both parties dial one another within the timeout period that is set on the codec. This timeout period is usually one minute.

**Step 1** Check the LEDs on the EIA/TIA-366 interface. If the green LED is not lit, there may be a hardware problem or the correct image may not be loaded. For more information, see *Cisco MC3810 Multiservice Concentrator Hardware Installation* publication.

**Step 2** Make sure that the ATM interface, serial ports, and controllers are set to **no shutdown**.

**Step 3** Check the serial interface configuration.

- If you are using dial PVCs for video, do not include the **ces connect** serial interface command because this command does not provide mapping to the ATM interface for PVCs (or SVCs) for the dial video feature. Instead, create dial PVCs under ATM interface configuration, as shown in the "Configuring ATM Interfaces to Support Video over PVCs and SVCs" section earlier in this chapter. If **ces connect** has been configured, it appears in **show running-config** command output under serial interface 0 or 1.
- Enter the **show interfaces serial** privileged EXEC command. Ensure that the serial interface communications circuitry is operational, as shown in the last line of the **show interfaces serial** command output:

```
DSR = UP   DTR = UP   RTS = UP   CTS = UP   DCD = UP
```

**Step 4** (For SVCs only) On both Cisco MC3810 multiservice access concentrators, make sure that ILMI and Q.SAAL PVCs are set up in order to allow SVC communications. The **show atm pvc** privileged EXEC command displays information about configured PVCs, including the ILMI and Q.SAAL PVCs.

```
router# show atm pvc
 VCD /                                        Peak  Avg/Min Burst
Interface   Name       VPI   VCI  Type   Encaps   SC   Kbps   Kbps   Cells  Sts
0           1           0     5   PVC    SAAL     UBR       56              UP
0           2           0    16   PVC    ILMI     UBR       56              UP
```

**Step 5** (For dial PVCs only) On both Cisco MC3810 multiservice access concentrators, make sure that PVCs are set up to allow dial PVC connections and that CBR is the configured service class (SC). In addition, the bit rate must correspond to the rate set on the serial interface. The **show atm pvc** privileged EXEC command displays information about configured PVCs.

```
router# show atm vc
 VCD /                                        Peak  Avg/Min Burst
Interface   Name       VPI   VCI  Type   Encaps   SC   Kbps   Kbps   Cells  Sts
0           3           38   35   PVC    AAL1     CBR  384    384             UP
```

**Step 6** (For SVCs only) Ensure that NSAP addresses are set up and confirmed as operational under the ATM interfaces of the Cisco MC3810 multiservice access concentrators on both sides of the communication. Enter the **show atm video-voice address** or **show atm ilmi-status** privileged EXEC commands, as shown in the following example. **show atm ilmi-status** provides more details about the ILMI PVC than does the **show atm video-voice address** command.

```
router# show atm video-voice address
nsap address                                      type         ilmi status
47.0091810000000002F26D4901.00107B4832E1.FE   VOICE_AAL5   Confirmed
47.0091810000000002F26D4901.00107B4832E1.C8   VIDEO_AAL1   Confirmed

router# show atm ilmi-status

Interface : ATM0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 16) ILMI Keepalive : Enabled (5 Sec 4 Retries)
ILMI State:       UpAndNormal
Peer IP Addr:     10.1.1.11       Peer IF Name:     ATM1/0/0
Peer MaxVPIbits:  8               Peer MaxVCIbits:  14
Active Prefix(s) :
47.0091.8100.0000.0002.f26d.4901
End-System Registered Address(s) :
47.0091.8100.0000.0002.f26d.4901.0000.1111.5555.05(Confirmed)
47.0091.8100.0000.0002.f26d.4901.0010.7b48.32e1.fe(Confirmed)
47.0091.8100.0000.0002.f26d.4901.0010.7b48.32e1.c8(Confirmed)
```

**Step 7** Check for clocking problems. Enter the privileged EXEC command **show controllers t1** or **show controllers e1** command to check for slip errors, as shown in the following excerpt from the command output:

```
 .
 .
 .
 Data in current interval (819 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 2:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 3:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
    .
    .
    .
```

A few slip errors may not indicate a problem with clocking. However, if there are numerous errors, especially incrementing numbers of errors, check the following possibilities:

- The network clocks are not set to the same clock rate. Enter the **show network-clocks** command on the devices to ensure that these clock rates match.
- The Cisco MC3810 multiservice access concentrators may not be using the same clock source. For example, if there are two back-to-back Cisco MC3810 multiservice access concentrators and one is using an internal clock source, the other must use the line clock source in order to obtain clocking from the same device. Enter the **show network-clocks** and **show controllers t1** or **show controllers e1** commands to see the clock source settings. For additional guidance, see the "Configuring Synchronized Clocking" appendix.

**Step 8** Check the functionality of the Service-Specific Connection-Oriented Protocol (SSCOP). Enter the **show sscop** privileged EXEC command. See the following excerpt from the command output:

```
router# show sscop
SSCOP details for interface ATM0
   Current State = Data Transfer Ready
```

Interpretation of the command output requires familiarity with SSCOP, so unless you are familiar with the protocol, just use the command to ensure that the protocol is in a state of readiness. If you need to make changes, see the *Cisco IOS Wide-Area Networking Configuration Guide*.



**Note** If you plan to adjust SSCOP parameters, you may wish to complete the rest of the troubleshooting steps before doing so.

**Step 9** Enter the **show dial-peer video** command on the local and remote concentrators to verify that each has been configured properly to communicate with the other:

```
router1# show dial-peer video
dial-peer video 111 videocodec
 nsap 47.0091810000000002F26D4901.00107B4832E1.C8
 port signal 1/0
 port media Serial0
 destination-pattern 121
!
dial-peer video 221 videoatm
 destination-pattern 221
 session target ATM0 svc nsap 47.0091810000000002F26D4901.00107B09C645.C8

router2# show dial-peer video
dial-peer video 111 videocodec
 nsap 47.0091810000000002F26D4901.00107B09C645.C8
 port signal 1/0
 port media Serial0
 destination-pattern 221
!
dial-peer video 121 videoatm
 destination-pattern 121
 session target ATM0 svc nsap 47.0091810000000002F26D4901.00107B4832E1.C8
```

**Step 10** Enter the **show video call summary** command to quickly check the status of calls on the local and remote multiservice access concentrators. "ViCM" is the internal video call manager.

When no call is in progress, the output looks like this:

```
router# show video call summary
Serial0:ViCM = Idle, Codec Ready
```

When a call is starting, the output looks like this:

```
router# show video call summary
Serial0:ViCM = Call Connected
```

When a call is disconnecting, the output looks like this:

```
router# show video call summary
Serial0:ViCM = Idle
```

**Step 11** Enter the privileged EXEC **show call history video record** command to see information about current and recent video calls, allowing analysis of possible problems:

```
router# show call history video record
CallId = 4
CalledNumber = 221
CallDuration = n/a - call is in progress
DisconnectText = n/a - call is in progress
SVC: call ID = 8598630
Remote NSAP = 47.0091810000000002F26D4901.00107B09C645.C8
Local NSAP = 47.0091810000000002F26D4901.00107B4832E1.C8
vcd = 414, vpi = 0, vci = 158
SerialPort = Serial0
VideoSlot = 1, VideoPort = 0


CallId = 3
CalledNumber = 221
CallDuration = 557 seconds
DisconnectText = local hangup
SVC: call ID = 8598581
Remote NSAP = 47.0091810000000002F26D4901.00107B09C645.C8
```

```
Local NSAP = 47.0091810000000002F26D4901.00107B4832E1.C8
vcd = 364, vpi = 0, vci = 108
SerialPort = Serial0
VideoSlot = 1, VideoPort = 0


CallId = 2
CalledNumber = n/a - incoming call
CallDuration = 125 seconds
DisconnectText = local hangup
SVC: call ID = 8598484
Remote NSAP = n/a
Local NSAP = 47.0091810000000002F26D4901.00107B4832E1.C8
vcd = 264, vpi = 0, vci = 273
SerialPort = Serial0
VideoSlot = 1, VideoPort = 0


CallId = 1
CalledNumber = n/a - incoming call
CallDuration = 171651 seconds
DisconnectText = remote hangup
SVC: call ID = 8594356
Remote NSAP = n/a
Local NSAP = 47.0091810000000002F26D4901.00107B4832E1.C8
vcd = 7, vpi = 0, vci = 39
SerialPort = Serial0
VideoSlot = 1, VideoPort = 0
```

**Step 12** Enter the **debug video vicm** command to follow in-progress calls carefully. Comments are framed in asterisks (*):

```
router# debug video vicm
Video ViCM FSM debugging is on

***** Starting Video call *****

router# SVC HANDLE in rcvd:0x80001B:

00:42:55:ViCM - current state = Idle, Codec Ready
00:42:55:ViCM - current event = SVC Setup
00:42:55:ViCM - new state = Call Connected

00:42:55:ViCM - current state = Call Connected
00:42:55:ViCM - current event = SVC Connect Ack
00:42:55:ViCM - new state = Call Connected

*****Video Call Disconnecting*****

router#
00:43:54:ViCM - current state = Call Connected
00:43:54:ViCM - current event = SVC Release
00:43:54:ViCM - new state = Remote Hangup

00:43:54:ViCM - current state = Remote Hangup
00:43:54:ViCM - current event = SVC Release Complete
00:43:54:ViCM - new state = Remote Hangup
mc3810_video_lw_periodic:Codec is not ready
mc3810_video_lw_periodic:sending message

00:43:55:ViCM - current state = Remote Hangup
00:43:55:ViCM - current event = DTR Deasserted
00:43:55:ViCM - new state = Idle
mc3810_video_lw_periodic:Codec is ready
```

```
mc3810_video_lw_periodic:sending message

00:43:55:ViCM - current state = Idle
00:43:55:ViCM - current event = DTR Asserted
00:43:55:ViCM - new state = Idle, Codec Ready
```

# Configuration Examples

This section provides the following configuration examples:

- CES Video Traffic Configuration Example
- Video over ATM PVCs and SVCs Configuration Examples

## CES Video Traffic Configuration Example

The following is an example for configuring video traffic over ATM AAL1 using Circuit Emulation Services (CES) on a Cisco MC3810:

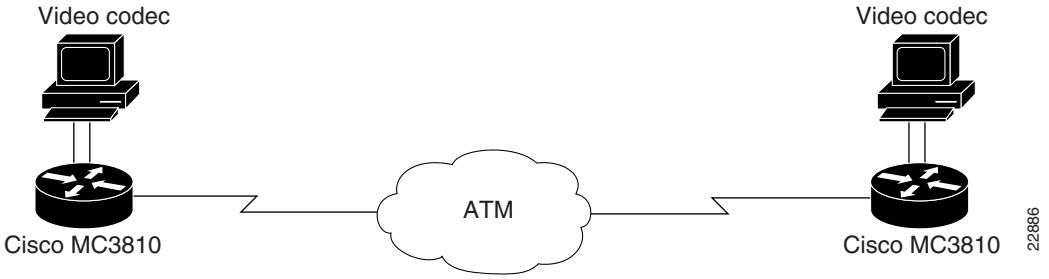
```
network-clock base-rate 64k

controller T1 0
 mode atm

interface Serial0 point-to-point
 no ip address
 encapsulation atm-ces
 clockrate network-clock 768000
 ces connect 25 atm0 pvc 25/100

interface ATM0 point-to-point
 ip address 223.223.224.229 255.255.255.0
 no ip mroute-cache
 no ip route-cache
 map-group atm1
 pvc 25 25 100
 encapsulation aal1
 cbr 870

no ip classless

map-list atm1
 ip 223.223.224.228 atm-vc 26 broadcast

line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
```

# Video over ATM PVCs and SVCs Configuration Examples

The configuration excerpts in this section illustrate how two Cisco MC3810 multiservice access concentrators communicate back to back as shown in Figure 105.

These examples do not show complete configurations but focus on the specific requirements of ATM video SVCs and PVCs, not on complete ATM setup.

***Figure 105 Sample Configuration: Two Cisco MC3810s using ATM SVCs and/or PVCs for Video Conferencing***




Initially, the network clocks are set up on each router so that video codecs can operate at a multiple of 64 kbps:

```
hostname MC3810A
!
network-clock base-rate 64k
ip subnet-zero
ip wccp version 2
ip host router 225.255.255.254
!
appletalk routing
ipx routing 1111.0045.0005
```

```
hostname MC3810B
!
network-clock base-rate 64k
ip subnet-zero
ip wccp version 2
ip host router 225.255.255.254
!
appletalk routing
ipx routing 1111.0045.0002
```

The following commands show the configuration of the T1 0 controller, which is for ATM service. ESF framing and B8ZS are required for ATM. The default clock source is line, and the default for the T1 1 controller automatically becomes internal.

```
controller T1 0
 framing esf
 linecode b8zs
 mode atm
!
```

```
controller T1 0
 framing esf
 linecode b8zs
 mode atm
!
```

Serial interface 0 connects to the local video codec. The restart delay is set to 0 minutes so that the hardware is not reset when it goes down. The clock rate of 384 kbps is the speed at which the video images are sent.

```
interface Serial0
 no ip address
 no ip directed-broadcast
 encapsulation atm-ces
 no ip route-cache
 no ip mroute-cache
 no keepalive
 serial restart-delay 0
 clockrate network 384000
```

```
interface Serial0
 no ip address
 no ip directed-broadcast
 encapsulation atm-ces
 no ip route-cache
 no ip mroute-cache
 no keepalive
 serial restart-delay 0
 clockrate network 384000
```

The following commands show how to configure the ATM interface and set up PVCs to supply Q.SAAL signalling and ILMI management for SVC communications. Note that you can also specify the NSAP address by using the **atm video aesa** command with an ESI value.

```
interface ATM0
 ip address 10.1.1.5 255.0.0.0
 no ip directed-broadcast
 no ip route-cache
 atm pvc 1 0 5 qsaal
 atm pvc 2 0 16 ilmi
 atm ilmi-keepalive
 atm video aesa default
```

```
interface ATM0
 ip address 10.1.1.6 255.0.0.0
 no ip directed-broadcast
 no ip route-cache
 atm pvc 1 0 5 qsaal
 atm pvc 2 0 16 ilmi
 atm ilmi-keepalive
 atm video aesa default
```

The following examples show dial PVCs for video communications. CBR is required for reliable video. The CBR speed is set at 117 percent of the video data rate of 384 kbps, which is configured on serial interface 0.

```
pvc 10 32 69
  cbr 449
  encapsulation aal1
```

```
pvc 11 33 70
  cbr 449
  encapsulation aal1
```

The following examples show dial peers set up for SVC video. Specify local peers through the **port signal** command, which indicates the slot location of the VDM and the port location of the EIA/TIA-366 interface. Enter the **port media** command to specify the serial interface for the codec connection. The two configurations are shown one after the other rather than side by side.

The commands are as follows for MC3810A:

```
dial-peer video 111 videocodec
 nsap 47.0091810000000002F26D4901.00107B4832E1.C8
 port signal 1/0
 port media Serial0
 destination-pattern 121
!
dial-peer video 221 videoatm
 destination-pattern 221
 session target ATM0 svc nsap 47.0091810000000002F26D4901.00107B09C645.C8
```

The commands are as follows for MC3810B:

```
dial-peer video 111 videocodec
 nsap 47.0091810000000002F26D4901.00107B09C645.C8
 port signal 1/0
 port media Serial0
 destination-pattern 221
!
dial-peer video 121 videoatm
 destination-pattern 121
 session target ATM0 svc nsap 47.0091810000000002F26D4901.00107B4832E1.C8
```