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## VoATM Overview

Voice over ATM (VoATM) enables a router to carry voice traffic (for example, telephone calls and faxes) over an ATM network. An ATM network is a cell-switching and multiplexing technology that combines the benefits of circuit switching (constant transmission delay and guaranteed capacity) and packet switching (flexibility and efficiency for intermittent traffic).

All traffic to or from an ATM network is prefaced with a virtual path identifier (VPI) and virtual channel identifier (VCI). A VPI-VCI pair is seen as identifying a single virtual circuit. Each virtual circuit is a private connection to another node on the ATM network. Each virtual circuit is treated as a point-to-point mechanism to another router or host and is capable of supporting bidirectional traffic.

Each ATM node establishes a separate connection to every other node in the ATM network with which it must communicate. All such connections are established by means of a permanent virtual circuit (PVC) or a switched virtual circuit (SVC) with an ATM signaling mechanism. This signaling is based on the ATM Forum User-Network Interface (UNI) Specification version 3.0.

Each virtual circuit is considered a complete and separate link to a destination node. Data can be encapsulated as needed across the connection, and the ATM network disregards the contents of the data. The only requirement is that data be sent to the ATM processor card of the router in a manner that follows the specific ATM adaptation layer (AAL) format.

An ATM connection transfers raw bits of information to a destination router or host. The ATM router takes the common part convergence sublayer (CPCS) frame, carves it up into 53-byte cells, and sends the cells to the destination router or host for reassembly. In AAL5 format, 48 bytes of each cell are used for the CPCS data, and the remaining 5 bytes are used for cell routing. The 5-byte cell header contains the destination VPI-VCI pair, payload type, cell loss priority (CLP), and header error control (HEC) information.

## Check the ATM Connection

To check for problems with the ATM configuration, perform the following tasks:

### SUMMARY STEPS

1. **show dial-peer voice**
2. **show interface**
3. **no shutdown**

### DETAILED STEPS

1. Use the **show dial-peer voice** command on the local and remote concentrators to verify that the data is configured correctly on both.
2. Use the **show interface** command to verify that the ATM interface is up.
3. Ensure that the voice port, serial port, and controller T1 0 is set to **no shutdown**.

 **Note:** ATM defaults to Interim Local Management Interface (ILMI). If the carrier is using LMI, be sure to configure LMI support on the router.

## Verify the Voice Connection

Verify that the voice connection is working by performing the following steps:

### SUMMARY STEPS

1. Verify dial tone.
2. Verify that a call attempt is successful.
3. **show dial-peer voice**
4. **show voice port**
5. **show voice call**
6. **show voice dsp**

### DETAILED STEPS

1. Pick up the handset on a telephone connected to the configuration and verify that there is dial tone.
2. Make a call from the local telephone to a configured dial peer to verify the connection.
3. If there are relatively few dial peers configured, use the **show dial-peer voice** command to verify that the data configured is correct.
4. To show the status of the voice ports, use the **show voice port** command.
5. To show the call status for all voice ports, use the **show voice call** command.
6. To show the current status of all DSP voice channels, use the **show voice dsp** command.

## Troubleshooting Tips

If a call does not connect, resolve the problem by performing the following tasks:

- Verify dial peer configuration by using the **show dial-peer voice** command on the local and remote concentrators.
- Verify that ATM interface 0 is up by using the **show interface** command.
- Ensure that the voice port, serial port, and controller T1 0 are set to **no shutdown**.

## ATM Interface Configuration Verification

To verify the ATM interface configuration, perform the following tasks:

- Enter the privileged EXEC **show atm vc** command to view the SVC (data only) and PVC set.

 **Note:** VoATM SVCs are not supported since Cisco IOS Release 12.0(7)XK. ATM SVCs for data are still supported.

The following is sample output:

```
Router# show atm vc
VCD /
Interface      Name          VPI   VCI   Type  Encaps  Peak  Avg/Min Burst  Cells  Sts
0              1             0     5     PVC   SAAL    UBR   0              0      UP
0              2             0     16    PVC   ILMI    UBR   0              0      UP
0              379           0     60    SVC   SNAP    UBR   0              0      UP
0              986           0     84    SVC   SNAP    UBR   0              0      UP
0              14            0     133   SVC   VOICE   VBR   64            16    10    UP
0              15            0     134   SVC   VOICE   VBR   64            16    10    UP
0              16            0     135   SVC   VOICE   VBR   64            16    10    UP
0              17            0     136   SVC   VOICE   VBR   64            16    10    UP
0              18            0     137   SVC   VOICE   VBR   64            16    10    UP
0              19            0     138   SVC   VOICE   VBR   64            16    10    UP
0              20            0     139   SVC   VOICE   VBR   64            16    10    UP
0              21            0     140   SVC   VOICE   VBR   64            16    10    UP
0              22            0     141   SVC   VOICE   VBR   64            16    10    UP
0              23            0     142   SVC   VOICE   VBR   64            16    10    UP
0              24            0     143   SVC   VOICE   VBR   64            16    10    UP
0              25            0     144   SVC   VOICE   VBR   64            16    10    UP
0              26            0     145   SVC   VOICE   VBR   64            16    10    UP
0              27            0     146   SVC   VOICE   VBR   64            16    10    UP
0              28            0     147   SVC   VOICE   VBR   64            16    10    UP
```

- Enter the **show atm pvc** command with the VPI/VCI specified to view the PVCs that are set up for ILMI management and Q.SAAL signaling. The following is sample output:

```
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
```

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```
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 frequenc
y: 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
```

- Enter the **show atm interface** command in privileged EXEC mode and specify ATM 0 to display the ATM interface. The following is sample output from the command:

```
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
```

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- Enter the **show atm video-voice address** privileged EXEC command to display the ATM interface address and confirm the ILMI status (ILMI PVC is set up to enable SVC management). The ATM interface is assigned automatically with the **atm voice aesa** command. The following is a sample output:

```
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
```