C H A P T E R 6

Using the ATM SBus Adapter Utility

The Cisco ATM SBus Adapter utility provides an interface for configuring, testing, and maintaining the Cisco ATM SBus adapter and for displaying LAN configuration statistics.

The ATM SBus Adapter utility is shipped with open user permissions allowing any user logged into the host to use it. The ATM SBus Adapter utility allows the user to create or delete VLANs, set the IP address for a VLAN, and to set VLAN operating parameters. If the network administrator wants to restrict access to this powerful utility, the access permissions must be changed to the appropriate level for the local network environment.

If a message indicating that your access is denied appears when you attempt to log into the utility, contact your local network administrator.

To access the option, you do not need to log in as superuser. Simply change your current directory to the /bin directory and issue the **atmstat** command:

```
root@SYS1%cd /bin
root@SYS1%atmstat
```

The Cisco ATM SBus Adapter utility main menu appears, as shown in Figure 6-1. The utility contains the following options:

- AAL (ATM Adaptation Layers)—Provides further options for running AAL diagnostics to test the Cisco ATM SBus Adapter to check statistics.

- VLAN (Virtual LAN)—Provides further options for configuring one or more virtual LAN(s).

- Save—Provides further options that allow you to save VLAN configuration information to disk.

- Adapter Configuration—Provides further options that allow you to display adapter configuration information or configure the adapter transmission mode.

- Exit—Quits the Cisco ATM SBus Adapter utility and returns to the UNIX system prompt.

The AAL, VLAN, Save, and Adapter Configuration options are described in this chapter. The Exit option is used to close the Cisco ATM SBus Adapter utility and return to the UNIX system prompt.

Figure 6-1   **ATM SBus Adapter Utility Main Menu**
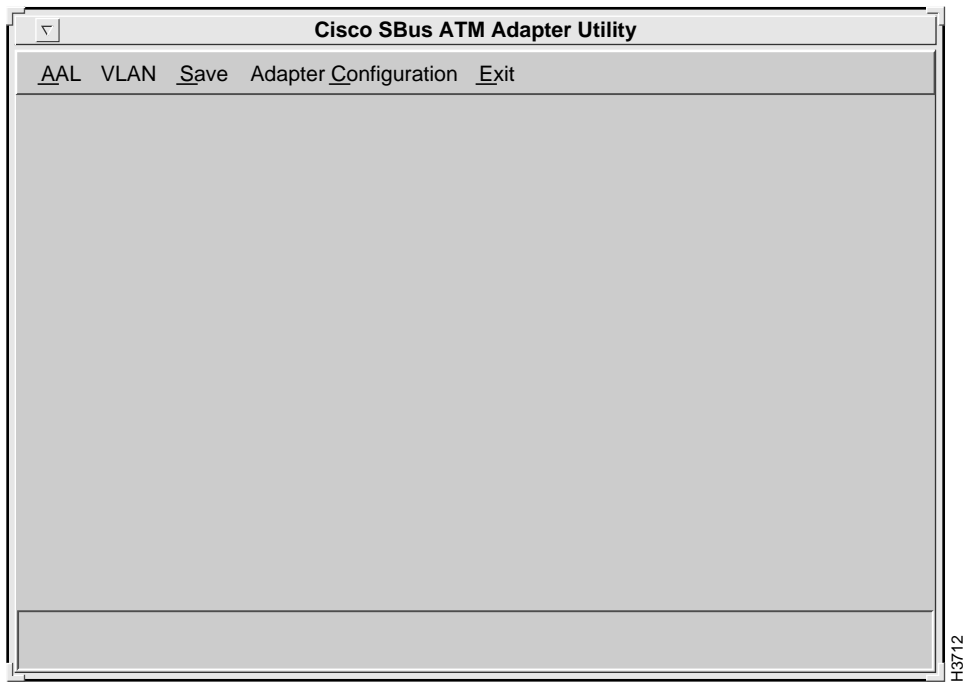
AAL (ATM Adaption Layers)

The AAL menu contains the following two options:

- Diagnostic/Data Activity
- Driver Statistics

The following sections explain the use of these options.

Diagnostics/Data Activity

To choose from the available test options, select the Diagnostics/Data Activity option from the AAL menu. The Diagnostics/Data Activity menu displays several options for the available diagnostic tests as follows:

- Run All Tests—Performs all diagnostic tests.
- Transmit Packet Test—Transmits ATM packets from the local system to identify faults.
- Receive Packet Test—Receives ATM packets from an external VC. This test receives data from another network adapter.
- Internal Loopback Test—Transmits ATM packets between the local system and the Cisco ATM SBus adapter. This test identifies transmission faults.
- External Loopback Test—Transmits and receives ATM packets through the local ATM interface connector. This text identifies communication faults.

Test Setup Window

All tests require the same parameters to be specified. Upon selection of any of the options available from the Diagnostics/Data Activity menu, the Test Setup window appears. Figure 6-2 shows an example of a Test Setup window for running all tests.

Figure 6-2   Test Setup Window
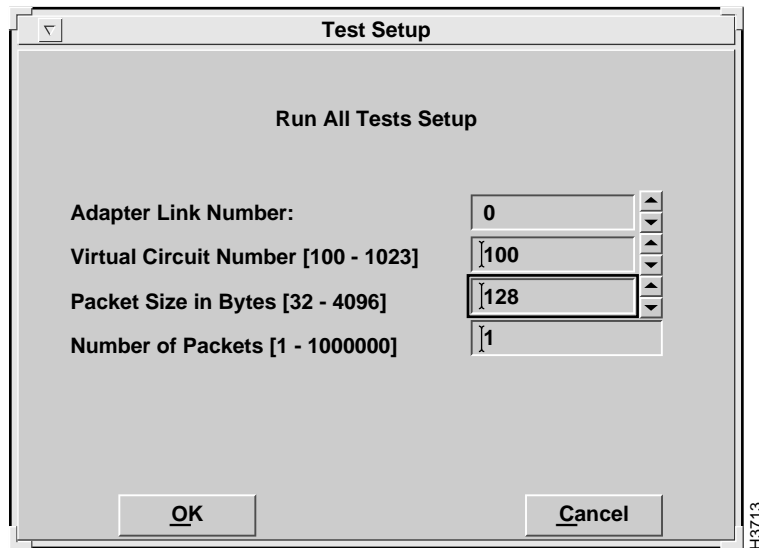
Refer to the following information when setting up any of the tests on the Diagnostics menu:

- Adapter Link Number—The number of the adapter card, from 0 through 3. If only one adapter card is installed, this field contains the number 0 and is not changeable.

- Virtual Circuit Number—The virtual circuit number must be between 100 and 1023. The default value is 1000.

- Packet Size in Bytes—The size of the test packet must be between 32 and 4096 bytes. The default value is 128.

- Number of Packets—The number of packets must be between 1 and 1,000,000. The default value is 1.

Run All Tests

Select the Run All Tests option to initiate all tests displayed on the Diagnostics/Data Activity menu. The Test Setup window appears, as shown in Figure 6-2. Set up the test parameters, using the information provided in the "Test Setup Window" section. To run all tests, you must first confirm that a loopback cable has been connected and later check that another system is transmitting information over the same virtual circuit at the appropriate time. Refer to Figure 6-5 and Figure 6-8 for examples of the confirmation windows that appear.

After the parameters have been set and the test has been run, the results appear in the All Tests Display window, as shown in Figure 6-3. The All Tests Display window shows the specified test parameters and the test status. If an error occurs or packets are not received, a message box is displayed.
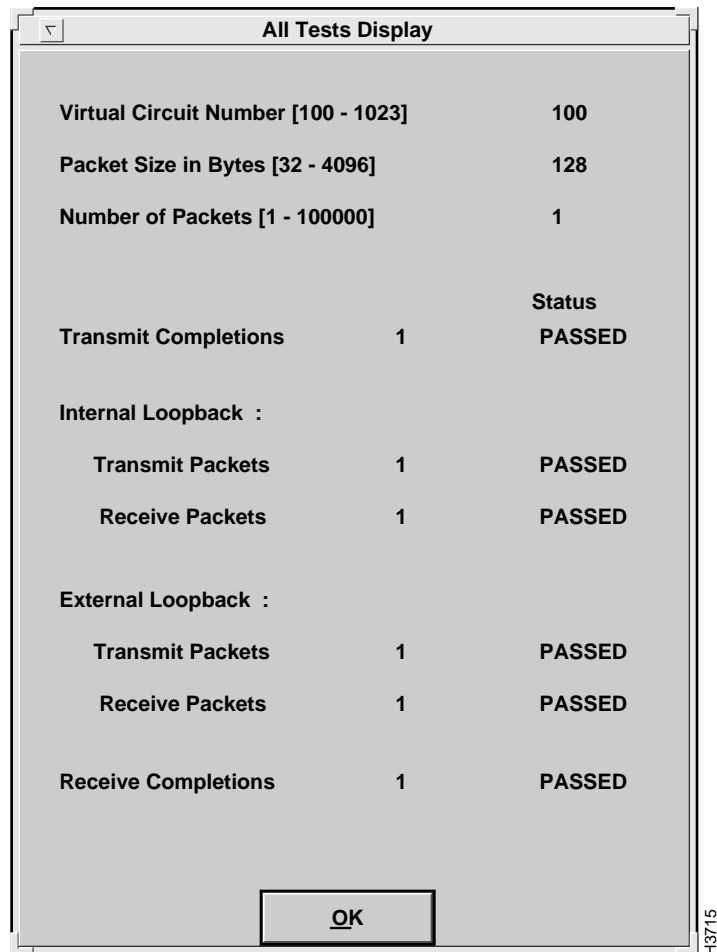
The receive test requires that another node be transmitting packets on the same VC. If another system is not sending data to the system, the test times out in 20 seconds and a message box is displayed.

While a test is being performed, RUNNING is displayed in the Status column of the Display window. If a test is completed successfully, "PASSED" is displayed in the Status column of the Display window.

If an error occurs during the chosen test, FAILED is displayed in the Status column of the Display window. When you cancel a test from the Run All Tests Setup window, ABORTED appears in the Status column of the Results window. A message box may also be displayed, identifying the nature of the error. If this happens, either modify the parameters in the Test Setup Window or refer to the "Installing the Cisco ATM SBus Adapter Software" chapter to ensure that all steps have been properly performed. If an inexplicable problem persists, refer to Appendix D, "Troubleshooting."

To view cumulative statistical test information, refer to the "Driver Statistics" section later in this chapter.

Figure 6-3   All Tests Display

| All Tests Display		
Virtual Circuit Number [100 - 1023]		100
Packet Size in Bytes [32 - 4096]		128
Number of Packets [1 - 100000]		1
		Status
Transmit Completions	1	PASSED
Internal Loopback :		
Transmit Packets	1	PASSED
Receive Packets	1	PASSED
External Loopback :		
Transmit Packets	1	PASSED
Receive Packets	1	PASSED
Receive Completions	1	PASSED

OK

H3715

Transmit Packet Test

The Transmit Packet test transmits ATM packets from the local system. No network connection is required. Select the Transmit Packet Test option to initiate the Transmit Packet test. The Transmit Packets Test Setup window is displayed, similar to the one shown in Figure 6-2. Set up the test parameters, using the information provided in the "Test Setup Window" section.

After the parameters have been set and the test has been run, the results appear in the Transmit Packet Test display, as shown in Figure 6-4.

Figure 6-4   Transmit Packet Test Display
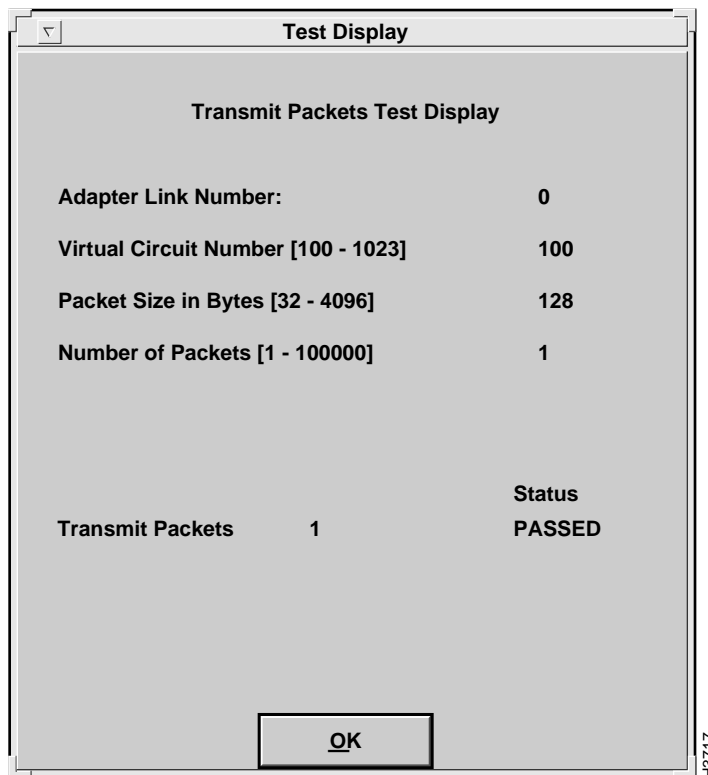
Receive Packet Test

The Receive Packet test receives ATM packets from an external VC. An active network connection is required. The receive test requires that another node transmit packets over the same virtual circuit. If another system is not sending data to the system, the test times out in 20 seconds.

Select the Receive Packet Test option to initiate the Receive Packet test. The Receive Packets Test Setup window is displayed, similar to the window shown in Figure 6-2. Set up the test parameters, using the information provided in the "Test Setup Window" section earlier in this chapter.

A confirmation window appears, as shown in Figure 6-5. Verify that another system is transmitting data and select OK. After the parameters have been set and the test has been run, the results appear in the Receive Packet Test display, as shown in Figure 6-6.

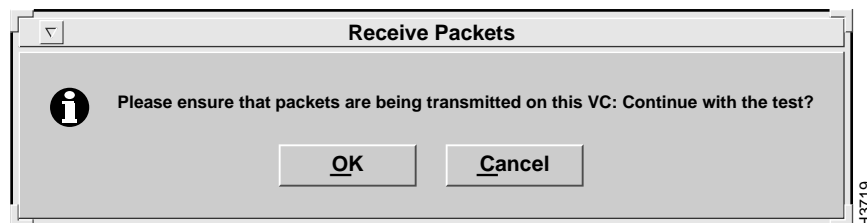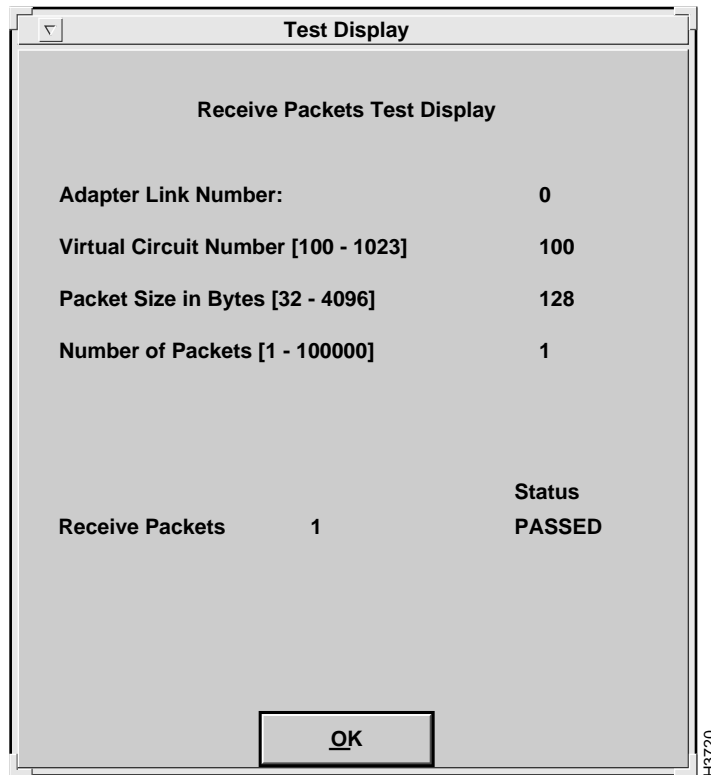**Figure 6-5   Confirmation Window for Receive Packet Test**

Figure 6-6   Receive Packet Test Display

```
┌─────────────────────────────────────────────────┐
│ ▽ │              Test Display                     │
├─────────────────────────────────────────────────┤
│                                                   │
│              Receive Packets Test Display         │
│                                                   │
│                                                   │
│   Adapter Link Number:                    0       │
│                                                   │
│   Virtual Circuit Number [100 - 1023]     100     │
│                                                   │
│   Packet Size in Bytes [32 - 4096]        128     │
│                                                   │
│   Number of Packets [1 - 100000]          1       │
│                                                   │
│                                                   │
│                                                   │
│                                        Status     │
│   Receive Packets          1           PASSED     │
│                                                   │
│                                                   │
│                                                   │
│              ┌──────────────────┐                 │
│              │        OK        │                 │
│              └──────────────────┘                 │
└─────────────────────────────────────────────────┘
```

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Internal Loopback Test

The Internal Loopback test transmits ATM packets between the local system and the Cisco ATM SBus adapter. No loopback cable is required.

Select the Internal Loopback Test option to initiate the Internal Loopback test. The Internal Loopback Test Setup window is displayed, similar to the screen shown in Figure 6-2. Set up the test parameters, using the information provided in the "Test Setup Window" section.

After the parameters have been set and the test has been run, the results appear in the Internal Loopback Test display, as shown in Figure 6-7.

External Loopback Test

The External Loopback test transmits and receives ATM packets through the local ATM interface connector. A loopback cable is required. If an error occurs during a test or a timeout occurs, a message box indicates the problem.

Select the External Loopback Test option to initiate the External Loopback test. The External Loopback Test Setup window is displayed, similar to the one shown in Figure 6-2. Set up the test parameters, using the information provided in the "Test Setup Window" section.

After the parameters have been set, the Test Confirmation window shown in Figure 6-8 appears. Verify that a loopback cable is connected and select OK.

After the test runs, results appear in the External Loopback Test display, as shown in Figure 6-9.

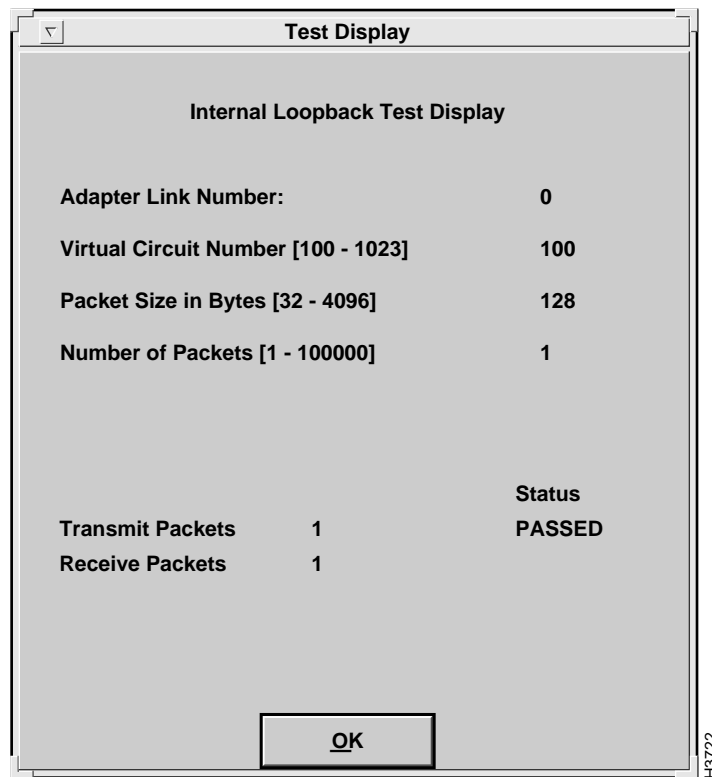**Figure 6-7**   **Internal Loopback Test Display**

```
┌─────────────────────────────────────────────────────────────┐
│ ▽            Test Display                                     │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│                Internal Loopback Test Display                 │
│                                                               │
│                                                               │
│   Adapter Link Number:                          0             │
│                                                               │
│   Virtual Circuit Number [100 - 1023]          100            │
│                                                               │
│   Packet Size in Bytes [32 - 4096]             128            │
│                                                               │
│   Number of Packets [1 - 100000]                1             │
│                                                               │
│                                                               │
│                                                               │
│                                              Status           │
│                                                               │
│   Transmit Packets        1                  PASSED           │
│   Receive Packets         1                                   │
│                                                               │
│                                                               │
│                                                               │
│                      ┌──────────────┐                         │
│                      │      OK       │                         │
│                      └──────────────┘                         │
│                                                               │
└─────────────────────────────────────────────────────────────┘
                                                        H3722
```

Figure 6-8   **External Loopback Test Confirmation**

```
┌─────────────────────────────────────────────────────────────┐
│ ▽               Receive Packets                               │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│   ( i )  Please ensure that a loopback cable is connected: Continue with the test? │
│                                                               │
│          ┌──────────┐      ┌──────────┐                       │
│          │    OK    │      │  Cancel  │                       │
│          └──────────┘      └──────────┘                       │
│                                                               │
└─────────────────────────────────────────────────────────────┘
                                                        H3724
```
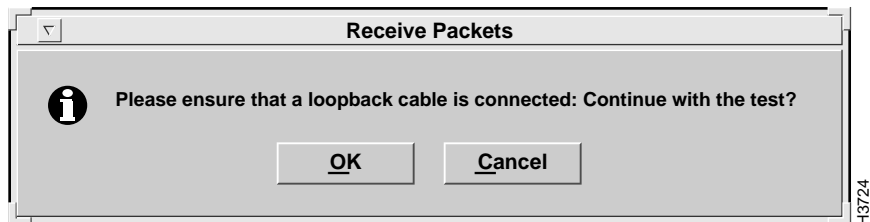
Figure 6-9   External Loopback Test Display

```
┌─────────────────────────────────────────────────┐
│  ▽ │            Test Display                     │
├─────────────────────────────────────────────────┤
│                                                   │
│           External Loopback Test Display          │
│                                                   │
│                                                   │
│   Adapter Link Number:                  0         │
│                                                   │
│   Virtual Circuit Number [100 - 1023]   100       │
│                                                   │
│   Packet Size in Bytes [32 - 4096]      128       │
│                                                   │
│   Number of Packets [1 - 100000]        1         │
│                                                   │
│                                                   │
│                                                   │
│                                       Status      │
│   Transmit Packets      1             PASSED      │
│   Receive Packets       1                         │
│                                                   │
│                                                   │
│              ┌──────────────────┐                 │
│              │       OK         │                 │
│              └──────────────────┘                 │
└─────────────────────────────────────────────────┘
```

H3592
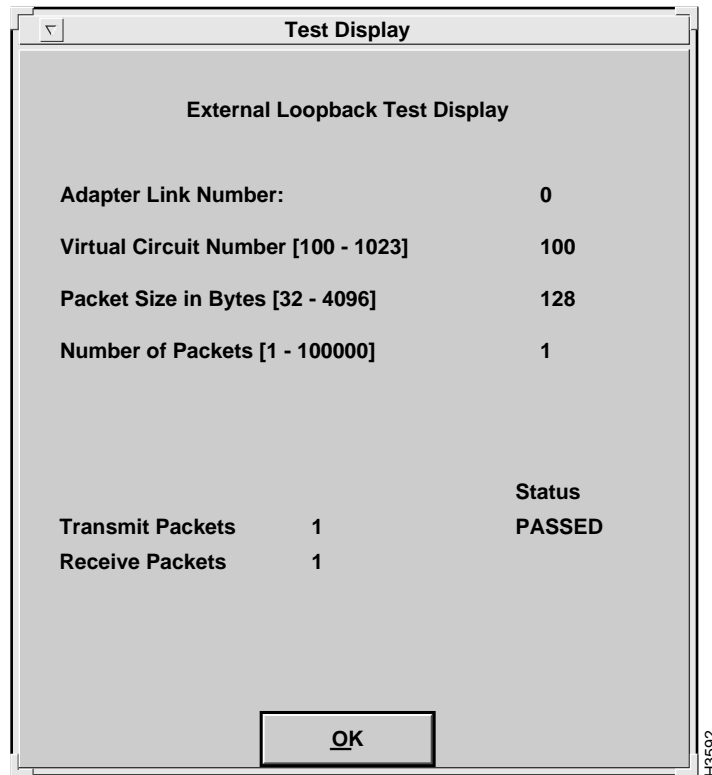
Driver Statistics

The Driver Statistics menu provides options for displaying statistical information for the adapter. Select the Driver Statistics option from the AAL menu.

Display Global Statistics

The Display Global Statistics option displays the results of all attributes for the adapter. Cumulative session statistics from all previous transmit and receive tests since the last reset are listed in the display. Any errors that have occurred as a result of testing will also be displayed on this screen. Test results are periodically updated to reflect previous test activity.

To display global statistics, select the Display Global Statistics option from the Driver Statistics submenu. The Cumulative Statistics window appears, as shown in Figure 6-10.

Global Reset

Select the Global Reset option to reset all cumulative session statistics to 0.

Display Individual VC Statistics

The Display Individual VC Statistics option displays the results of all attributes of individual VC statistics. Cumulative VC statistics are listed in the display.

To display these statistics, select the Display Individual VC Statistics option from the Driver Statistics submenu. Enter the update interval to identify how often the test results should update to show previous test results. After the specified number of seconds, the test results are updated to reflect the previous seconds of test activity.

The Individual VC Statistics window appears, as shown in Figure 6-11.

Figure 6-10   Cumulative Statistics

		Update Interval (secs) :	5
TRANSMIT			
Packets Queued :	4500	Packets Completed :	4499
Bytes Transmitted :	129083		
RECEIVE			
Total Packets Received :	2263	Total Bytes Received :	29284
Raw Cells Received :	0	Receive Buffers Underflows :	0
Receive FIFO Overruns :	0	Rx Max. Length Violations :	0
Receive Length Violations :	0	Receive CRC Errors :	0
Receive User Aborts :	0	Receive T1 Errors :	0
Receive Deactivation :	0	Receive Total Errors :	0
Rx Packets Dropped in Host :	0		

OK   Global Reset

H3725

Figure 6-11   Individual VC Statistics Display

VPI	VCI	Pkts Txed	Pkts Rcvd	Errors on Recv.
0	1	0	0	0
0	5	4969	4967	0
0	200	13	13	0
0	16	4988	0	0
0	34	12	12	0
0	33	8	8	0
0	32	11	10	0

Individual VC Statistics

Update Interval (secs) :   5

OK   Reset

H3832

Reset Individual VC Statistics

Select the Reset option to reset all cumulative individual VC statistics to 0. The Reset Individual VC Statistics window appears, as shown in Figure 6-12.

Figure 6-12   Reset Individual Statistics

RESET INDIVIDUAL VC STATISTICS

CHANNEL VPI NUMBER :   0

CHANNEL VCI NUMBER :   32

OK   Cancel

H3833

Descriptions of the fields follow:

- CHANNEL VPI NUMBER—Virtual path identifier number.
- CHANNEL VCI NUMBER—Virtual circuit identifier number.

Enter the appropriate values and select the OK option to reset statistics for an individual virtual circuit.

VLAN Configuration

Virtual LANs (VLANs) and VLAN tables can be configured using the Virtual LAN menu option in the Cisco ATM SBus Adapter utility. These parameters can also be configured by manually modifying the catmlancfg.db file using a text editor, for example vi. For information about manually editing the catmlancfg.db file, refer to the "VLAN Configuration File" appendix.

For information about VLAN parameters that must be considered when setting up VLANs, refer to the "VLAN Considerations" appendix.

VLAN Configuration Task List

Use the options in Cisco ATM SBus Adapter utility to configure the host for ATM communication as follows:

Step 1 Plan the network. Determine the number of VLANs, their associated VLAN numbers, the IP address assignments, and the location of one ATM ARP server for each VLAN.

Step 2 Initialize each VLAN that terminates on the host. Refer to the "Adding a VLAN" section for details.

Step 3 Configure the default VLAN parameters other than ARP table entries or PVC connections. Refer to the "Configuration" section (describes the Virtual LAN configuration window) later in this chapter.

Step 4 Create the appropriate VLAN tables. If the host has an active ATM ARP server table, make any required entries to the ATM ARP server table. Refer to the "VLAN Tables" section later in this chapter for details.

Step 5 Set up any PVC connections. Refer to the "PVC Entries" section later in this chapter for details.

Step 6 Save the configuration of all hosts. Refer to the "Save All Configuration Settings" section later in this chapter for details.

Step 7 Repeat Step 2 through Step 6 for each host with a Cisco ATM SBus adapter.

To display the Virtual LAN Options window, select the VLAN option from the main menu.

The Virtual LAN Options window appears, as shown in Figure 6-13. This window provides access to the configuration and management facilities for virtual LANs. Choose a virtual LAN number.

Figure 6-13   Virtual LAN Options Window
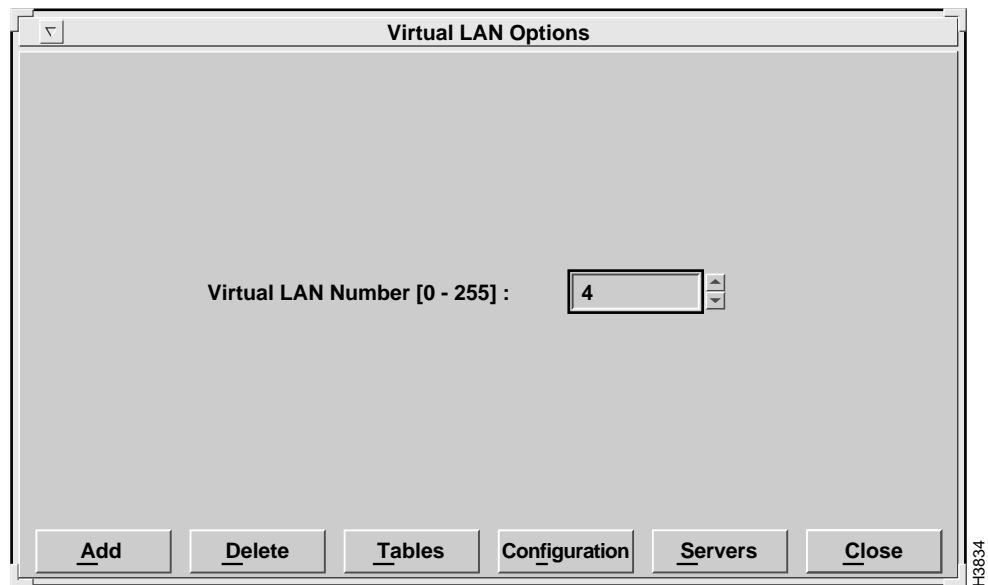
Adding a VLAN

After entering the VLAN number, select the Add option to set up a virtual LAN. The Initialize VLAN window appears, as shown in Figure 6-14. You choose a physical interface number and an associated VLAN type.

Note   Multiple VLANs can be initialized before setting configuration parameters. However, configuration parameters must be set before starting up the VLANs.

Figure 6-14   Initialize VLAN Window
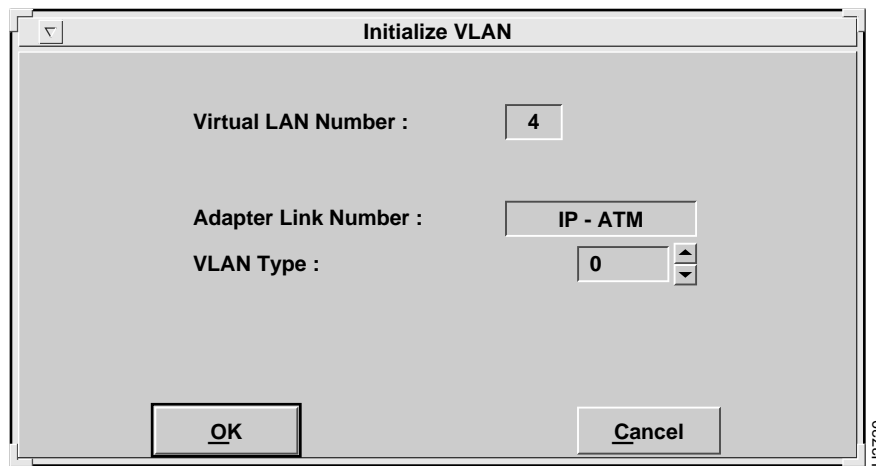
Descriptions of the fields follow:

- Virtual LAN Number—(read-only) A unique number by which the virtual LAN will be identified by the Cisco ATM SBus adapter. Up to 256 VLANs can be defined (0-255).

- Adapter Link Number—If multiple Cisco ATM SBus adapters are installed, enter the physical interface number (otherwise accept the default value of 0).

- VLAN Type—The current VLAN type is IP over ATM.

To initialize a VLAN, select the OK option from the Initialize VLAN window. If the Cisco ATM SBus adapter identifies a problem with the initialization, an error message will appear (for example, "Error in Initializing VLAN"). If an error message appears, check to see if you have already added the VLAN (for example, by selecting the Configuration option from the Virtual LAN Options window).

Deleting a VLAN

To delete an existing VLAN, select the Delete option from the Virtual LAN Options window. A Delete VLAN confirmation window appears, as shown in Figure 6-15. You must confirm removal of the specified VLAN number from the virtual LAN table before the VLAN is deleted.

Enter the number of the VLAN that you want to delete in the Virtual LAN Number field. Then select the OK option.

Figure 6-15   Delete VLAN Confirmation Window
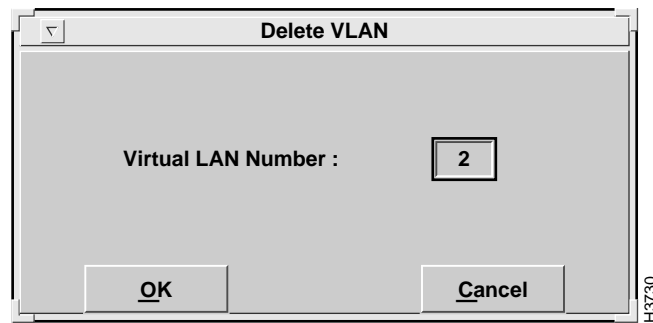
VLAN Tables

To access the various tables needed for VLAN configuration, select the Tables option from the Virtual LAN Options window. The VLAN Table Menu window appears, as shown in Figure 6-16.

Figure 6-16   VLAN Table Menu Window
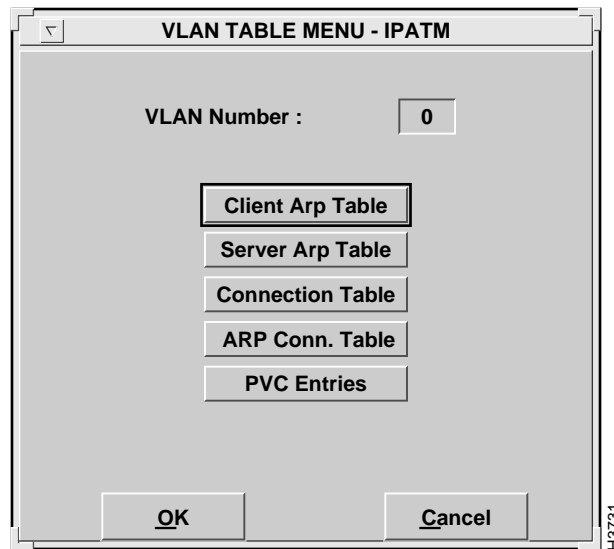
In general, you would set up the VLAN tables as follows:

- Client ARP Table—When an ATM ARP server is servicing the VLAN (equivalent to a logical IP subnetwork [LIS] for IP over ATM) and all end stations (hosts and routers) are included in the server's ATM ARP table, you only need to make client ARP table entries for PVC connections.

- Server ARP Table—The ATM ARP server table is only accessible on the host in the VLAN running the server function (one that indicates LOCAL in the ARP Server Information window, Figure 6-35. Manually create entries for only those end station clients that do not support an ATM ARP client and therefore do not automatically register their addresses in the ATM ARP server table.

- Connection Table—The connection table is used to check existing connections on the local host or to manually set up new PVC connections. Generally PVC connections are needed for only those cases where end stations or intermediate switches do not support SVC connections. You can set up PVC entries fairly easily using the PVC Entries window, as shown in Figure 6-32.

- ARP Connection Table—The ARP connection table combines the information of the client ARP table and the connection table into one table as an alternate way to monitor local ARP and connection information.

- PVC Entries—This selection is used to set up or remove PVC connections between the local host and other hosts in the ATM network.

Note   PVC connections or permanent ARP entries created using the Cisco ATM SBus Adapter utility cannot be saved in the configuration file. Persistent PVC connections must be entered directly by editing the configuration file, catmlancfg.db.

Choose the appropriate table to edit. Consult the "VLAN Considerations" appendix for additional information on what tables are necessary for your particular network configuration.

Client ARP Table

A client ARP table is located on each ATM client. After a virtual LAN is initialized, ARP table entries may be added or removed. There are two possible configurations:

- With an ARP server (normal case).

- Without an ARP server. In special cases, an ARP server is not used.

Client ARP Table With ARP Server

This section describes the use of the client ARP table when a server ARP table has been configured and SVC connections are being applied.

The client ARP table contains ATM addresses associated with IP addresses. Data contained in the client ARP table is built both dynamically and statically.

An entry is entered dynamically each time a request for an ATM address is returned from the server ARP table. After the connection between the client and the remote host is established, and information is transferred, the entry remains in the client ARP table. If the

connection has not been used for a period of time, the entry is automatically removed from the client ARP table. To keep the client ARP table from getting too large, inactive entries are removed after 20 minutes.

Entries can also be manually added to the client ARP table. These entries are permanently listed in the client ARP table.

Client ARP Table Without ARP Server

This section describes the use of the client ARP table for configurations that do not utilize an ARP server.

Before an application sends a query, you must manually add entries to the client ARP table. In this way, the application may query the client ARP table and find the ATM address of ATM clients. Manual entries in the client ARP table are not deleted, but are kept as permanent entries so they will not be lost.

Client ARP Table Access

To review the entries in the client ARP table, select Client ARP table from the VLAN Table menu. The Client ARP table for the specified VLAN appears, as shown in Figure 6-17.

Figure 6-17   Client ARP Table
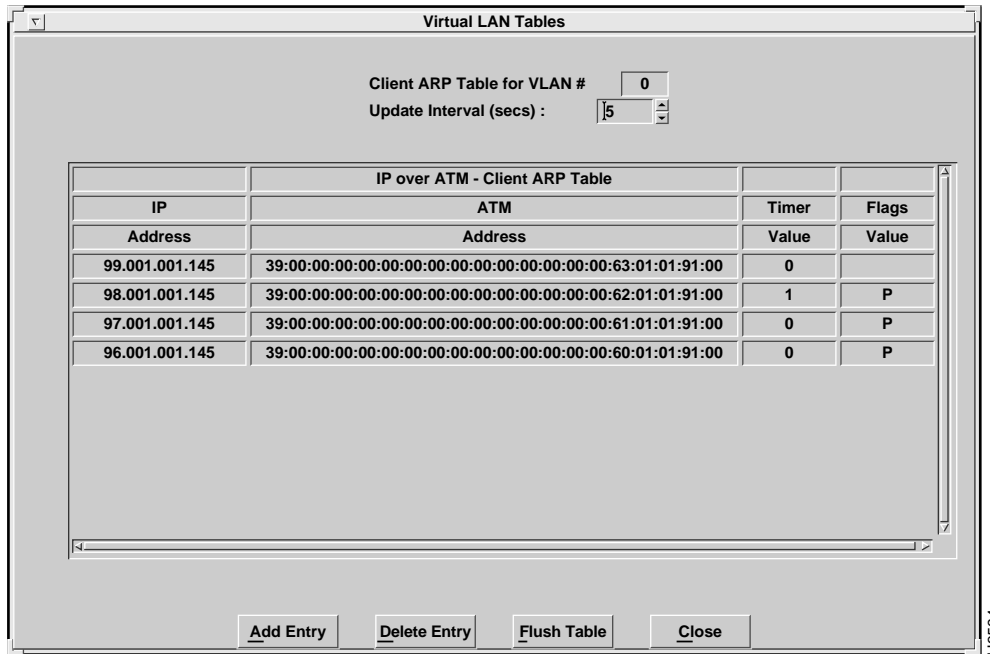
A description of each of the fields follows:

- Client ARP Table for VLAN #—This field contains the number of the VLAN.

- Update Interval—The number of seconds before the data displayed is updated.

- IP Address—The read-only value of the remote host to which the local system will connect. The value is expressed in dotted decimal notation.

- ATM Address—The read-only value of the remote host to which the local system will connect. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons.

- Timer Value—The read-only field displays the value of the timer.

- Flags Value—This read-only field displays a P to indicate that a PVC has been set up, or an I to indicate that this entry is incomplete.

Changing the Client ARP Table

You can add entries to and delete entries from the Client ARP table using the Add Entry and Delete Entry options. You can also delete all entries from the ARP table at one time uisng the Flush Table option. These options are explained in the following sections.

Add Entry Option

To add an entry to the client ARP table, select the Add Entry option. The Add Client ARP Table Entry window appears, as shown in Figure 6-18.

Figure 6-18   Add Client ARP Table Entry
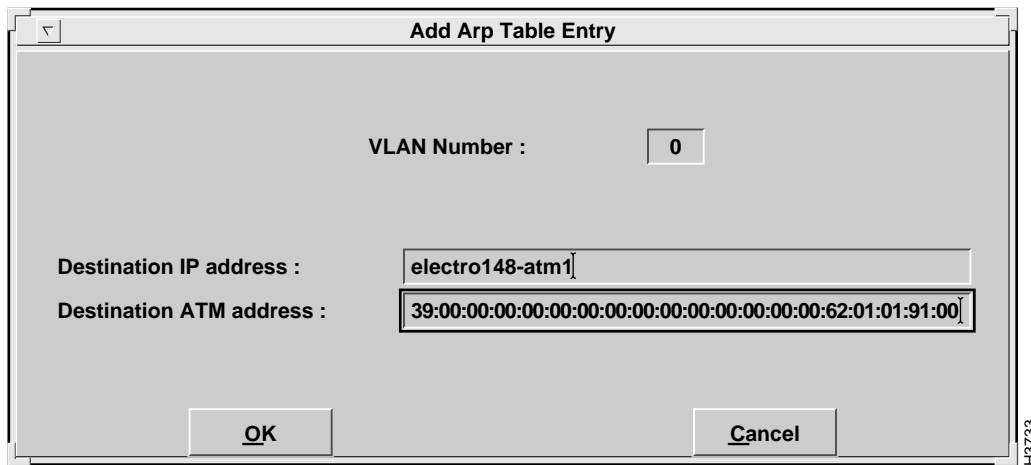
This screen allows entry of the following parameters:

- VLAN Number—The number of the VLAN.

- Destination IP Address—The value of the remote host to which the local system will connect. The value is expressed in dotted decimal notation or as a name, which has been entered in the /etc/hosts file of the domain name server.

- Destination ATM Address—This value is required to provide a connection from the local system to the target. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons (a picture mask assures proper entry).

Note Any errors in these addresses can cause network connectivity problems.

Delete Entry Option

To delete an entry from the client ARP table, select the Delete Entry option from the Client ARP Table window. The Delete ARP Table Entry window appears, as shown in Figure 6-19. Enter the IP address of the entry you want to delete and select OK. The specified IP entry is removed from the client ARP table for the specified VLAN number.

Figure 6-19   Delete ARP Table Entry
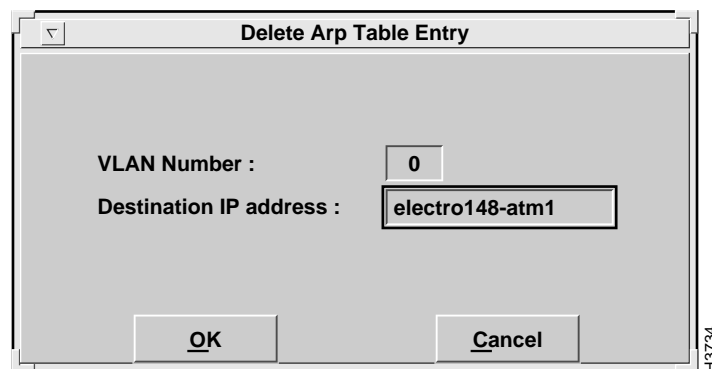
Flush Table Option

To delete all entries in the client ARP table, select the Flush Table option from the Client ARP Table window. The Flush Arp Table window appears, as shown in Figure 6-20. Enter the number of the VLAN from which you want all client ARP table entries removed, and select the OK option. All entries are removed from the client ARP table for the specified VLAN number.

Figure 6-20   Flush ARP Table
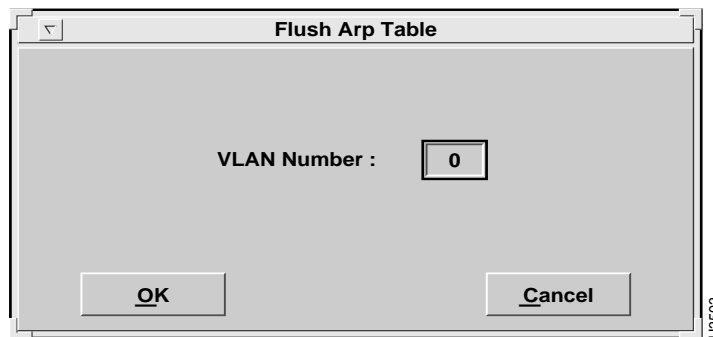
▽	**Flush Arp Table**

VLAN Number :   [0   ]

[OK]   [Cancel]

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⚠ **Caution**   Once all entries in the client ARP table have been deleted, all manual entries will need to be reentered.

Server ARP Table

The server ARP table is located on the ARP server (an ATM endstation with the server ARP table designated as "Local"). Refer to the Servers option to designate the location of the server ARP table.

When a client workstation session is started (for example, on boot-up of the system), it automatically contacts the ARP server and adds the IP address and the ATM address of its host adapter to the server ARP table.

When connection to an ATM client is desired, the driver software running on the host workstation first queries the client ARP table (located on the host workstation) to identify the target's ATM address. If the target IP address is not found in the client ARP table, the driver software queries the ARP server.

If an entry in the server ARP table matches the requested IP address, the following occurs:

- An entry is added to the client ARP table on the source endstation.

- The ATM address is used to set up an SVC connection to the requested target.

Upon each successful query of the server ARP table, an entry is added to the client ARP table. After the connection is established and information is transferred, the entry remains in the client ARP table to minimize redundant queries of the ARP server.

Entries in the server ARP table can only be viewed from the host running the ARP server. To review the entries in the server ARP table, select Server ARP Table from the VLAN Table menu. The server ARP table for the specified VLAN appears, as shown in Figure 6-21.

Descriptions of the fields follow:

- Server ARP Table for VLAN #—The number of the VLAN.

- Update Interval (secs)—The number of seconds before the data displayed is updated.

- IP address—The IP address of a host on this VLAN. The value is expressed in dotted decimal notation or as a name, which has been entered in the /etc/hosts file of the domain name server.

- ATM address—The ATM address for a host with the IP address provided in the previous field. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons (a picture mask assures proper entry).

- Timer Value—(read-only) This field displays the value of the timer.

- Flags Value—(read-only) This field displays a P to indicate that a permanent entry has been set up, and an I to indicate that this entry is incomplete.

Figure 6-21   Server ARP Table
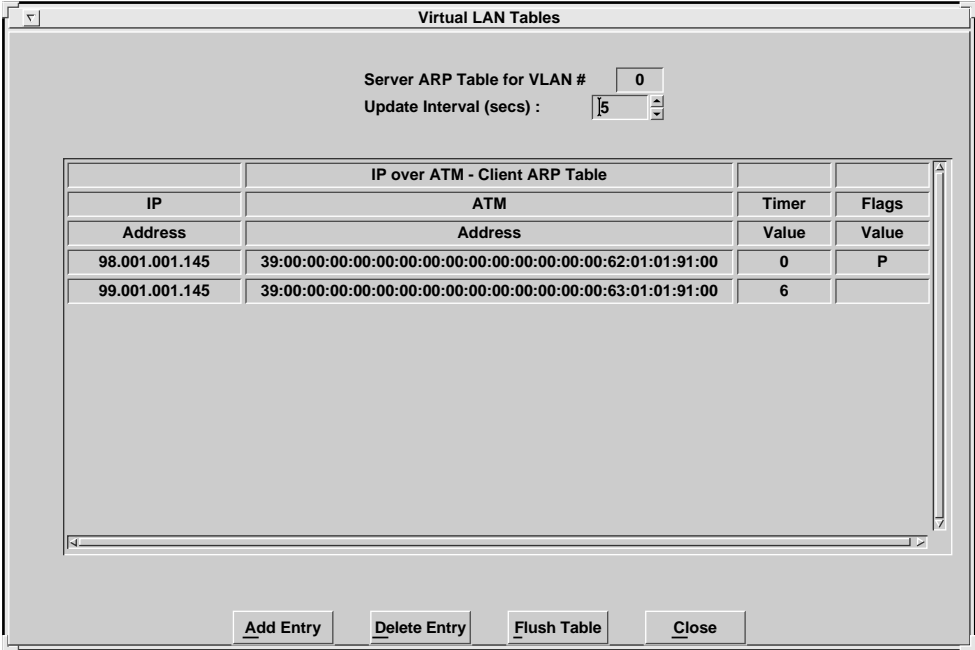
Changing the Server ARP Table

You can add entries to and delete entries from the Server ARP table using the Add Entry and Delete Entry options. You can also delete all entries from the Server ARP table at one time uisng the Flush Table option. These options are explained in the following sections.

Add Entry Option

To manually add an entry to the server ARP table, select the Add Entry option. The Add ARP Table Entry window appears, as shown in Figure 6-22.

Figure 6-22   Add Server ARP Table Entry

Enter the appropriate values in the fields. Descriptions of the fields follow:

- VLAN Number—The number of the VLAN.

- IP address—The IP network address of an end station on this VLAN. The value is expressed in dotted decimal notation (a picture mask assures proper entry).

- ATM address—The address of an endstation with the IP address provided in the previous field. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons (a picture mask assures proper entry).

  Enter a common network prefix (always the first 13 bytes) to identify a unique subnet. Use the remaining bytes to identify the target ATM endstation.

Delete Entry Option

To delete an entry from the server ARP table, select the Delete Entry option. The Delete ARP Table Entry window appears, as shown in Figure 6-23.

Figure 6-23   Delete ARP Table Entry
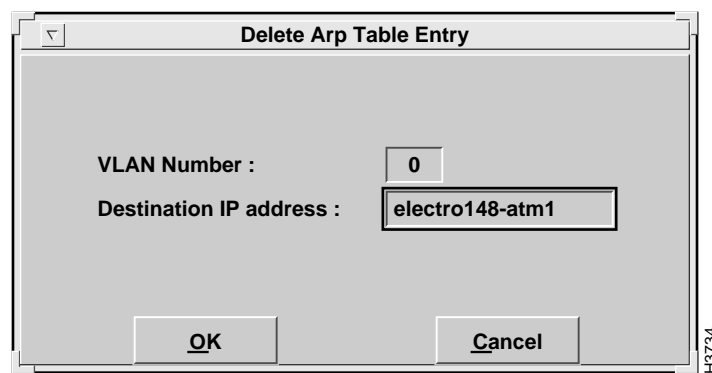
Enter the appropriate values in the fields. Descriptions of the fields follow:

- VLAN Number—The number of the VLAN.

- Destination IP address—The address of an end station on this VLAN. The value is expressed in dotted decimal notation (a picture mask assures proper entry).

The currently selected entry is removed from the server ARP table for the specified VLAN number.

Flush Table Option

To delete all entries in the server ARP table, select the Flush Table option from the Server ARP Table window. The Flush Arp Table window appears, as shown in Figure 6-24. Enter the number of the VLAN from which you want all server ARP table entries removed, and select the OK option. All entries are removed from the server ARP table for the specified VLAN number.

Figure 6-24   Flush ARP Table
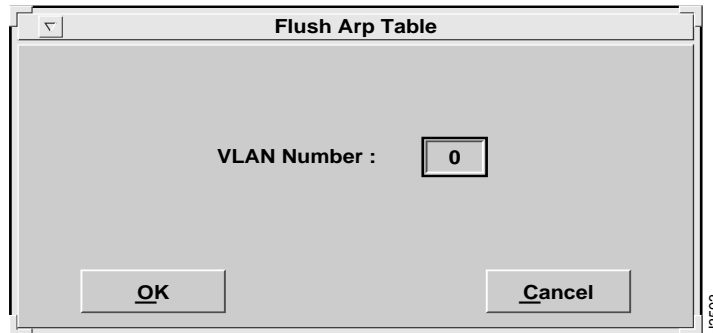
Caution   Once all entries in the client ARP table have been deleted, all manual entries will need to be reentered.

Connection Table

The connection table contains all information related to connections for this host over a particular VLAN. This table is used for monitoring connection status and for accumulating statistics. Both PVC and SVC entries are displayed in the table.

Each time an application program sets up a connection between ATM end points on a particular VLAN, an entry is added to the connection table.

To review the entries in the table, select Connection Table from the VLAN Table menu. The Connection Table window displays all connections for the specified VLAN number, as shown in Figure 6-25 and Figure 6-26.

Figure 6-25   Connection Table—Left Side of Screen

IP over ATM - Connection Table							
ATM	**Sig**	**Sig**	**Sig**	**AAL**	**.**	**.**	**V(**
Address	**Ref**	**Tmr**	**St**	**VPI**	**VCI**	**VCI**	**F**
39:00:00:00:00:00:00:00:00:00:00:00:00:00:00:62:01:01:91:00	0	24	C	O	48	.	
39:00:00:00:00:00:00:00:00:00:00:00:00:00:00:63:01:01:91:00	Ref	162	O	O	32	VCI	

Connection Table for VLAN #   0
Update Interval (secs) :   5

Add Entry   Delete Entry   Close

H3735
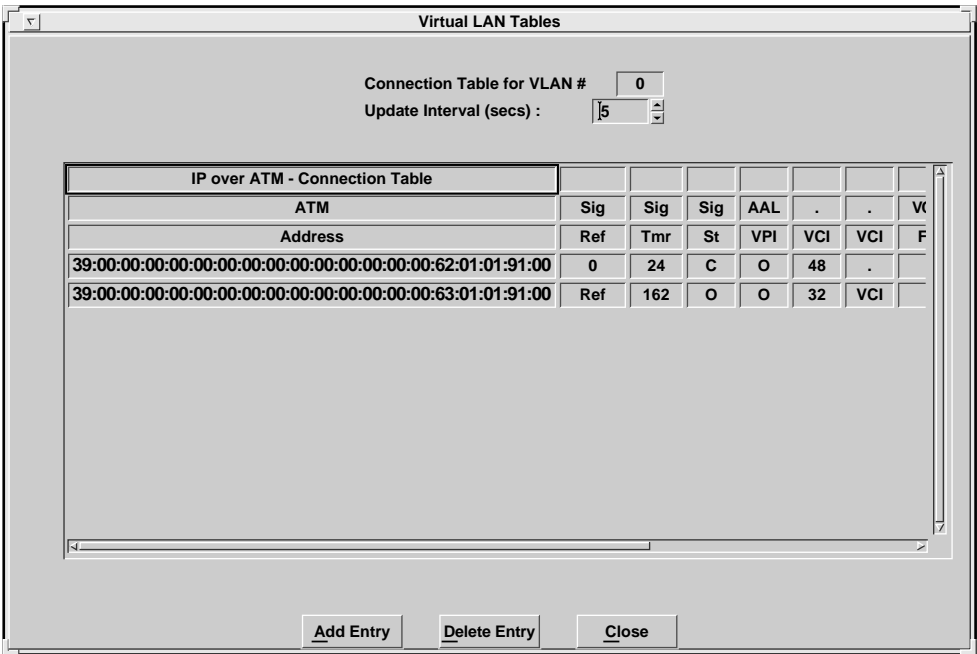
Figure 6-26   Connection Table—Right Side of Screen

		Virtual LAN Tables								
		Connection Table for VLAN #		**0**						
		Update Interval (secs) :		**5**						
	IP over ATM - Client ARP Table									
	Sig	Sig	Sig	AAL	.	.	VCType	Peak	Average	Burst
	Ref	Tmr	St	St	VPI	VCI	Flags	Rate	Rate	Cells
	0	24	C	O	0	48	S	136	136	20
	80046900	162	O	O	0	32	S	0	0	0

Close

H3860
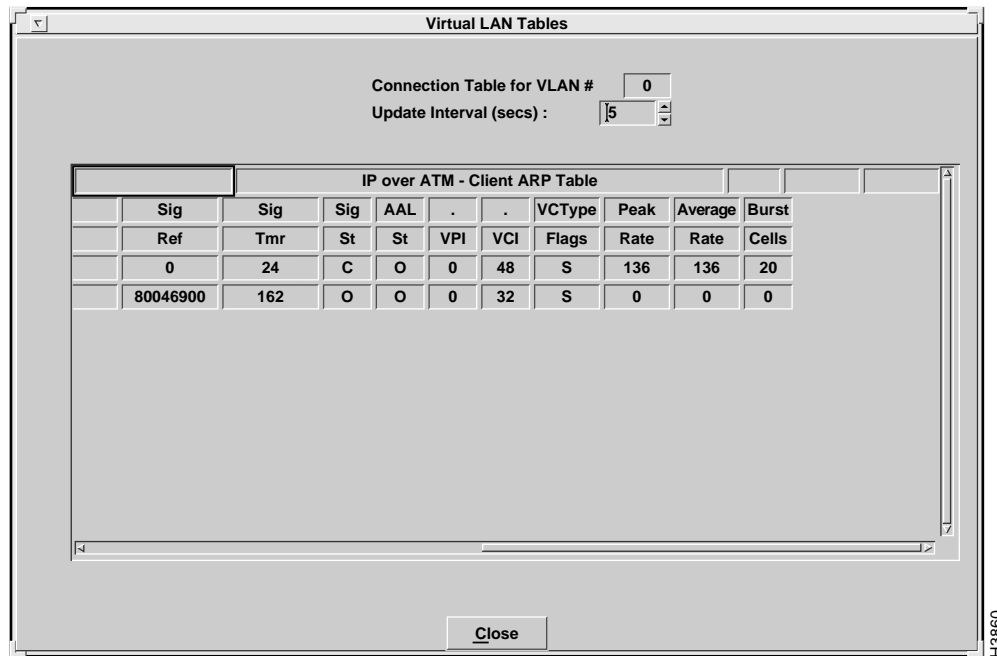
Descriptions of the fields follows:

- Connection Table for VLAN #—The number of the VLAN to which the Connection Table applies.

- Update Interval (secs)—The number of seconds before the data displayed is updated.

- IP Address—The address of the remote host to which the local system is connected. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons.

- Sig Ref—(Signal Reference) Identifies the signalling the data relates to.

- Sig Tmr—(Signal Timer) Identifies the timer value of the signal.

- Sig St—(Signal State) Identifies the current state of the signal. This field displays one of the following possible state values:

  — C = Closed

  — O = Open

  — CP = Close Pending

  — CE = Connection Establishment (in progress)

- AAL St—Identifies the current state of the ATM Adaptation Layer (AAL). This field displays one of the following possible state values:

  — C = Closed

  — O = Open

  — P = Pending (in progress)

- VPI—Virtual Path Identifier.

- VCI—Virtual Circuit Identifier.

- VC Type Flags—Identifies the type of VC. This field displays one of the following possible type values:

  — P = PVC

  — S = SVC

- Peak Rate—Maximum data rate that can be supported by the connection (Peak Data Rate). This entry is expressed in megabits per second.

- Average Rate—Average data rate that can be sent. This value must be below the peak rate and is expressed in megabits per second.

- Burst Cells—Maximum number of cells that can be sent at the peak rate (Burst Cells at the Peak Rate). This entry is expressed in number of cells.

Note If the average rate equals the peak rate, the burst size is ignored.

Changing the Connection Table

You can add entries to and delete entries from the Connection table using the Add Entry and Delete Entry options. You can also delete all entries from the Connection table at one time uisng the Flush Table option. These options are explained in the following sections.

Add Entry Option

To set up a PVC entry or SVC connection and add an SVC entry to the connection table, select the Add Entry option from the Connection Table window. The Add Connection Table Entry window appears, as shown in Figure 6-27.

Figure 6-27   Add Connection Table Entry

Set the appropriate parameters. The Connection Table window reflects the addition of the entry.

Descriptions of the fields follow:

- Destination ATM Address—This value is required to provide a connection from the local system to the target. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons (a picture mask assures proper entry).

- Peak Data Rate—Maximum data rate that can be supported by the connection (Peak Data Rate). This value is expressed in megabits per second.

- Average Rate—Average data rate that can be sent (Average Data Rate). This value must be below the peak rate and is expressed in megabits per second.

- Burst at Peak Rate—Maximum number of cells that can be sent at the peak rate (Burst Cells at the Peak Rate). This entry is expressed in number of cells.

- Connection Type—(read only) Set to PVC.

- VPI Number—Virtual Path Identifier. This value is ignored if the connection type is not PVC.

- VCI Number—Virtual Circuit Identifier. This value is ignored if the connection type is SVC.

Note A PVC can also be set up as described in the "PVC Entries" section later in this chapter.

Delete Entry Option

To delete an entry from the connection table, select Delete Entry from the Connection Table window. The Delete Connection Table Entry window appears, as shown in Figure 6-28.

Figure 6-28   Delete Connection Table Entry
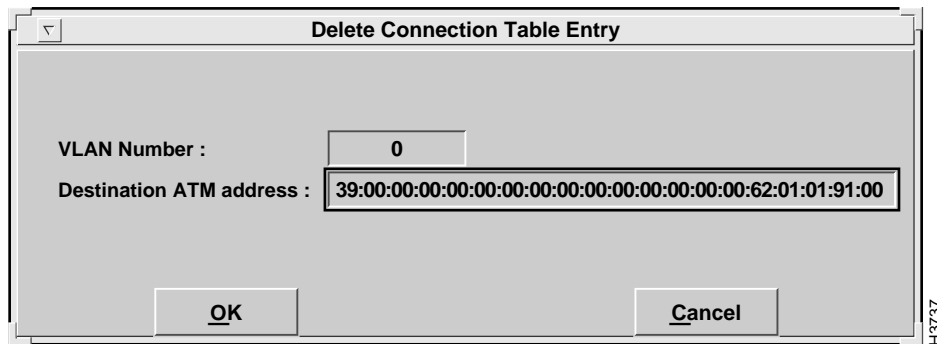
Enter the destination ATM address and select the OK option. The Connection Table window reflects that the entry has been removed.

ARP Connection Table

Selecting the ARP Conn. Table option from the VLAN Configuration menu presents the ARP Connection table. This table is not displayed on one screen. You must use the scroll bar at the bottom of the screen to view the right half of the table. Figure 6-29 shows the left half of the screen, and Figure 6-30 shows the right half of the screen.

Figure 6-29   ARP Connection Table—Left Side of Screen

		Virtual LAN Tables			

ARP Conn. Table for VLAN #   0
Update Interval (secs) :   5

	IP over ATM - Client ARP Table				
IP	**ATM**	**Timer**	**Flags**	**Sig**	
Address	**Address**	**Value**	**Value**	**Ref**	
99.001.001.145	39:00:00:00:00:00:00:00:00:00:00:00:00:00:00:63:01:01:91:00	18		80008800	
97.001.001.145	39:00:00:00:00:00:00:00:00:00:00:00:00:00:00:61:01:01:91:00	258	P	0	
98.001.001.145	00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00	46	P	0	

Close

H3836
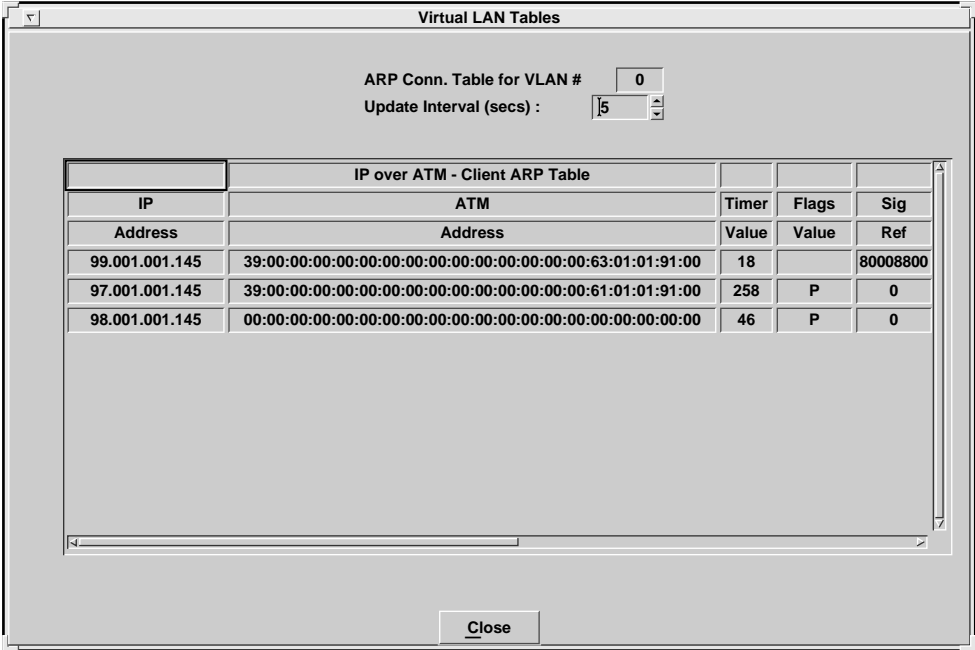
Figure 6-30   ARP Connection Table—Right Side of Screen

	Virtual LAN Tables									

Connection Table for VLAN #   0

Update Interval (secs) :   5

IP over ATM - Connection Table										
	Sig	Sig	Sig	AAL	.	.	VCType	Peak	Average	Burst
	Ref	Tmr	St	St	VPI	VCI	Flags	Rate	Rate	Cells
01:01:91:00	0	84	C	O	0	48	P	136	136	20
01:01:91:00	80046900	222	O	O	0	32	S	136	136	20

Add Entry	Delete Entry	Close

H3835
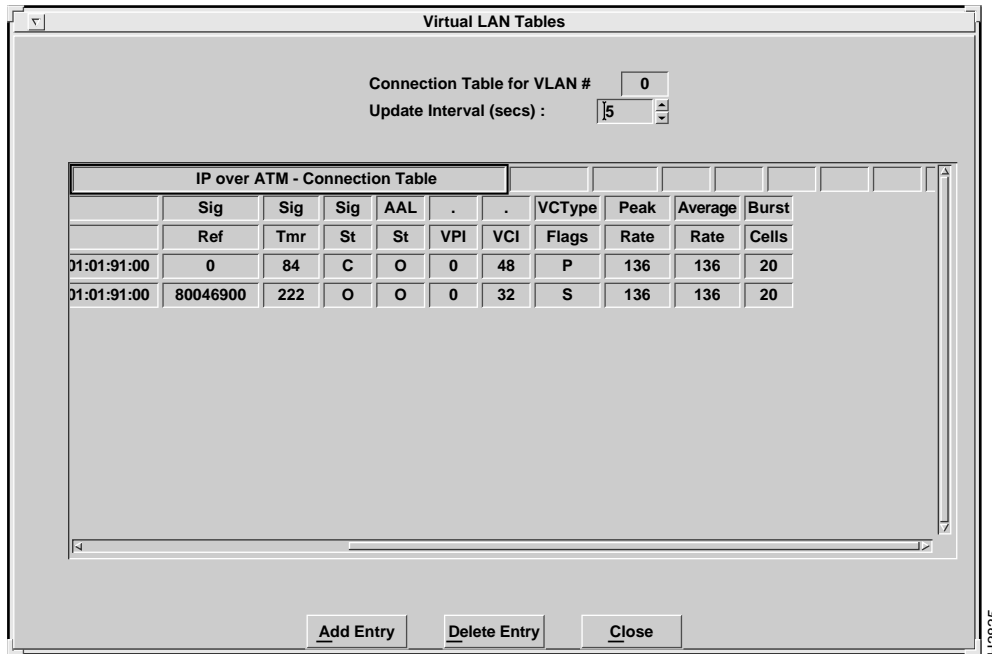
Descriptions of the fields follow:

- ARP Conn. Table for VLAN #—The number of the VLAN.

- Update Interval (secs)—The number of seconds before the data displayed is updated.

- IP address—The address of the remote host to which the local system will connect. The value is expressed in dotted decimal notation or as a name, which has been entered in the /etc/hosts file of the domain name server.

- ATM address—The address of the remote host to which the local system will connect. The value is 20 bytes expressed in hex nibbles, each byte delimited by colons (a picture mask assures proper entry).

- Timer Value—(read-only) This field displays the value of the timer.

- Flags Value—(read-only) This field displays a 'P' to indicate that a PVC has been set up, and an 'I' to indicate that this entry is incomplete.

- Sig Ref—(Signal Reference) Identifies the signalling the data relates to.

- Sig Tmr—(Signal Timer) Identifies the timer value of the signal.

- Sig St—(Signal State) Identifies the current state of the signal. This field displays one of the following possible state values:

  — C = Closed

  — O = Open

  — CP = Close Pending

  — CE = Connection Establishment (in progress)

- AAL VPI—Identifies the current state of the ATM Adaptation Layer (AAL). This field displays one of the following possible state values:

  — C = Closed

  — O = Open

  — P = Pending (in progress)

- VPI—Virtual Path Identifier.

- VCI—Virtual Channel Identifier.

- VC Type Flags—Identifies the type of VC. This field displays one of the following possible type values:

  — P = PVC

  — S = SVC

- Peak Rate—Maximum data rate in Mbits per second that can be supported by the connection (Peak Data Rate). This entry is expressed in megabits per second.

- Average Rate—Average data rate in Mbits per second that can be sent (Average Data Rate). This value must be below the peak rate and is expressed in megabits per second.

- Burst Cells—The maximum number of cells that can be sent at the peak rate (Burst Cells at the Peak Rate). This entry is expressed in number of cells.

PVC Entries

Selecting PVC Entry from the VLAN Configuration Menu presents the Configure PVC window, as shown in Figure 6-31.

Figure 6-31   Configure PVC
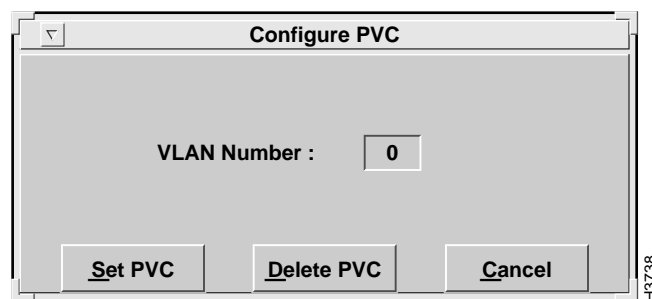
Changing PVC Entires

You can add and delete PVC connections using the Set PVC and Delete PVC options, respectively. These options are explained in the following sections.

Set PVC Option

To add a new PVC connection, select the Set PVC option. The Add PVC Entry window appears, as shown in Figure 6-32.

Figure 6-32   Add PVC Entry

A description of the fields follows:

VLAN Number—The number of the VLAN.

- Destination IP Address—The address of the remote host to which the local system will connect. The value is expressed in dotted decimal notation (a picture mask assures proper entry).

- PVC VPI number—Virtual Path Identifier.

- PVC VCI number—Virtual Circuit Identifier.

- Peak Data Rate—Maximum data rate that can be supported by the connection. This entry is expressed in megabits per second.

- Average Data Rate—Average data rate that can be sent (must be below the peak rate). This entry is expressed in megabits per second.

- Burst at the Peak Rate—Maximum number of cells that can be sent at the peak rate.

Select the OK option to add the specified PVC entry to the table.

Delete PVC Option

To delete a PVC connection, select the Delete PVC option from the Configure PVC window. The Delete PVC Table Entry window appears, as shown in Figure 6-33.

Figure 6-33   Delete PVC Table Entry

Enter the appropriate parameters. A description of the fields follows:

- VLAN Number—The number of the VLAN.

- PVC VPI Number—Virtual Path Identifier.

- PVC VCI Number—Virtual Channel Identifier.

Select the OK option to remove the specified PVC entry from the table.

Configuration

Configuration parameters for VLANs, such as information related to the external server services for IP over ATM protocol, can be set and modified using the Configure option.

To configure a virtual LAN, after it has been initialized, select the Configure option from the Virtual LAN Options window. The Virtual LAN Configuration window appears, as shown in Figure 6-34.

Figure 6-34   Virtual LAN Configuration Window
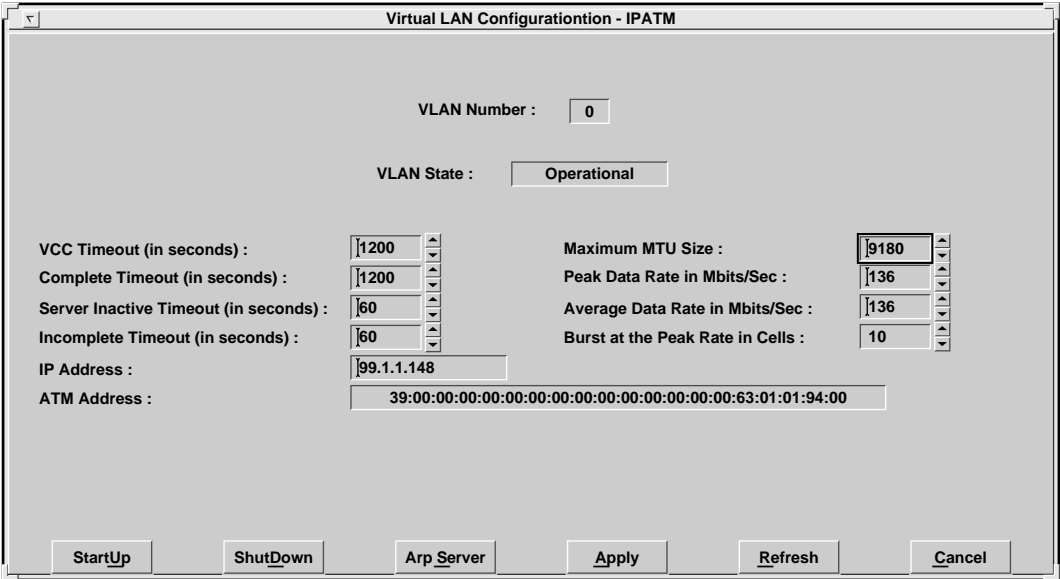
To set configuration parameters for a VLAN, enter the appropriate values in the desired fields.

Note   The parameters set in this window are default parameters for the VLAN. When different parameters are set for individual PVC connections, they override the default parameters for that connection.

A description of the fields follows:

- VLAN Number—(read-only) Identifies which VLAN number the data relates to.

- VLAN State—This read-only field will either display "Operational" if the system is functioning properly or "Shutdown" if there is an error or time out.

- VCC Timeout—Will delete a VCC entry from the connection table after a time out occurs.

- Complete Timeout—Forces the ARP table for the virtual LAN to verify the ATM address for each address in the table.

- Incomplete Timeout—Indicates that the request for a ATM address failed to get a response and is therefore unknown.

- IP Address—The address of the local host for this VLAN. The value is expressed in dotted decimal notation.

- ATM Address—The address of the local host for this VLAN (sent to ARP server for IP over ATM protocol only). Value is 20 bytes expressed in hex nibbles delimited by colons (a picture mask assures proper entry).

- Maximum MTU Size—Maximum size of a data packet. The MTU size should not exceed 9234 bytes.

- Server Inactive Timeout—Terminates the connection to the ARP server if connection is inactive for this period of time.

- Peak Data Rate—Maximum data rate in Mbits per second that can be supported by the connection.

- Average Data Rate—Average data rate in Mbits per second that can be sent (must be below the peak rate).

- Burst at the Peak Rate in Cells—Maximum number of cells that can be sent at the peak rate.

Note Traffic shaping parameters (peak, average, and burst settings) recognize discrete values (136/x). Thus, do not be alarmed if you notice that an entered value (for example, 50) is output as a different value (for example, 45) during a test.

Startup Option

To start up the specified VLAN, select the Startup option. The specified VLAN is launched. If an error occurs, review the values and select Startup again.

Shutdown Option

To shut down the specified VLAN, select the Shutdown option. Operation is terminated for the specified VLAN. An error may occur if the specified VLAN is not currently running.

ARP Server Option

To get quick access to ARP server information, select the ARP server option. Refer to the "ARP Server" section later in this chapter for information.

Apply Option

To confirm your entry of VLAN configuration parameters, select the Apply option. The VLAN configuration information is stored. The VLAN is not launched unless the Startup option is chosen.

⚠ **Caution**   If you want to save your configuration values, be sure to select Save from the main menu before exiting the Cisco ATM SBus Adapter utility.

Refresh Option

To refresh the selected VLAN, select the Refresh option.

Servers

An ATM ARP server table must be defined to collect and maintain information required for virtual LAN operation. This window controls how the connection to the ARP server is set up.

For systems not using a Cisco 7000 series router as an AIP-based server, at least one host must identify the location of the ARP server as local. All other hosts may then connect to the ARP server to identify the ATM address for other nodes on the same VLAN.

To identify the location of the server ARP table, select the Server option from the Virtual LAN Options window (or from the Virtual LAN Configuration window). The ARP Server Information window appears, as shown in Figure 6-35.

Figure 6-35   ARP Server Information Window

A description of the fields follows:

- VLAN Number—The number of the VLAN.

- Server Connection State—This read-only field will either display Operational if the system is functioning properly or Shutdown if there is an error or time out.

- Connection Type—This parameter specifies the VC. Select one of the following values:

  — PVC—The ARP server can be found through a PVC connection.

  — SVC—The ARP server can be found through an SVC connection.

  — LOC—The ARP server can be found on the local system directly.

Note Use the LOC selection on all hosts if no ATM ARP server is to be used.

- Current Inactive Timer Value—Period of inactivity, in seconds, after which the connection to the ARP server will be removed. Enter 0 to keep a permanent connection.

- ATM Address—Specify the ATM address of the local Cisco ATM SBus adapter. This value is used to enable the ARP server to provide the connection address of the associated physical interface to other network devices. (sent to ARP server for IP over ATM protocol only). Value is 20 bytes expressed in hex nibbles delimited by colons (a picture mask assures proper entry).

- VPI Number—Used in conjunction with the VCI number to determine the channel for communication with another network end point. For SVC connections, this value is always 0. For PVC connections, a unique VPI/VCI pair must be used.

- VCI Number—Used in conjunction with the VPI number to determine the channel for communication with another network endpoint. For SVC connections, this value is always 5. For PVC connections, a unique VPI/VCI pair must be used.

Startup Option

To start a VLAN, select the Startup option from the ARP Server Information Window, shown in Figure 6-33. The VLAN is initialized for operation.

Shutdown Option

To shut down a VLAN, select the Shutdown option from the ARP Server Information Window, shown in Figure 6-33. The VLAN is brought out of service.

VLAN Config Option

To get quick access to the VLAN Configuration window, select the VLAN Config option. Refer to the "Configuration" section earlier in this chapter for information.

Apply Option

To confirm your ARP server location entries, select the Apply option. The ARP server values are stored.

![caution triangle] **Caution**   If you want to save your configuration values, be sure to select Save from the main menu before exiting the Cisco ATM SBus Adapter utility.

Save All Configuration Settings

The Save option allows all configuration settings to be saved to disk. Upon selection of the Complete Configuration from the Save submenu, the Save To File window appears, as shown in Figure 6-36.

When you save an existing file, a confirmation window appears, similar to the one shown in Figure 6-36. Select the OK option to proceed with saving the configuration to a file.

Configuration changes made using the Cisco ATM SBus Adapter utility should be saved periodically. If you are confident that the changes are correct, you can save them directly to the catmlancfg.db file, which will be used to configure the VLANs when the system is rebooted. If this is an experimental configuration, it is better to save it to a different file name. It is also a good practice to keep a backup of various versions of the configuration file, catmlancfg.db, to allow you to easily remove the most recent changes. When started, the Cisco ATM SBus Adapter utility retrieves values from the active driver.

Figure 6-36   Save To File Window
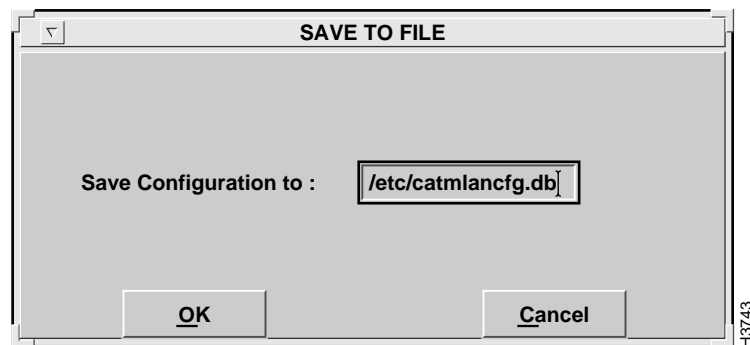
Adapter Configuration Information

To display basic configuration information about the adapter or to set the transmission mode, select the Adapter Configuration option from the Cisco ATM SBus Adapter utility main menu.

The Configure option contains the following two suboptions:

- Display
- Set Transmission Mode
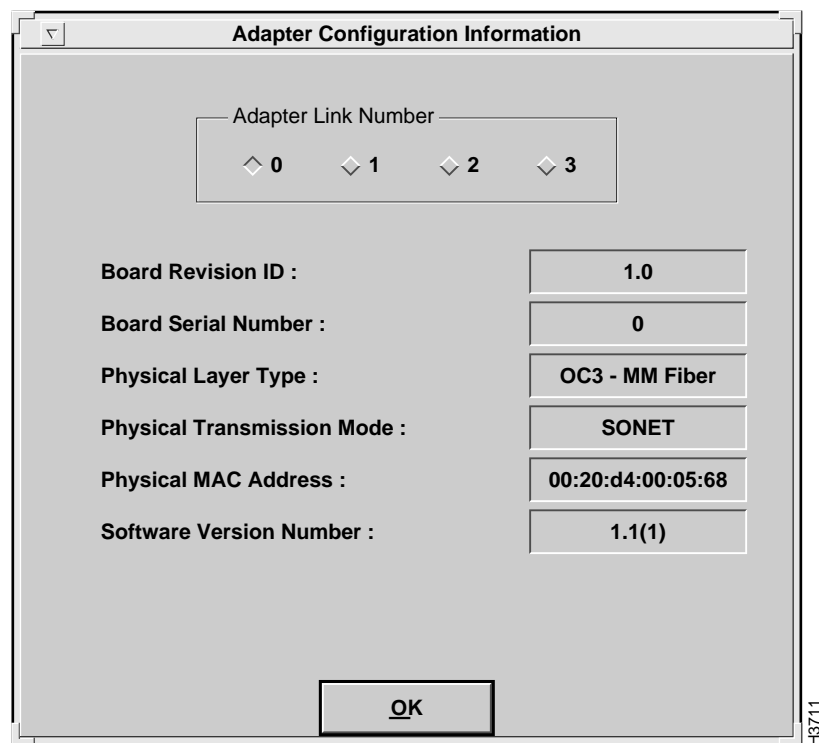
The following sections explain the use of these options.

Display

Select the Display command from the Adapter Configuration menu. The Adapter Configuration Information screen appears, as shown in Figure 6-37.

Figure 6-37   Adapter Configuration Information Screen

After selecting the desired link from the Adapter Link Number window, the configuration information is displayed in the fields. The fields are defined as follows:

- Board Revision ID—The hardware revision of the adapter.

- Board Serial Number—The serial number of the adapter.

- Physical Layer Type—The type of connection cable that can be attached to the card. This identifier signifies one of the following:

    — OC3 - MM Fiber identifies multimode fiber.

    — OC3 - UTP identifies copper.

- Physical Transmission Mode—The type of transmission mode. Valid modes are SONET (U.S. standard) or SDH (European standard).

- Physical MAC Address—The base MAC address assigned to the network adapter. This address is a unique attribute assigned to this adapter.

- Software Version Number–The version number of the currently running Cisco ATM SBus adapter driver software.

Set Transmission Mode

The physical transmission mode can only be set using this utility. It cannot be set using catmlancfg. To set the physical transmission mode, select the Set Transmission Mode option from the Configuration menu.

The Set Transmission Mode option contains the following two suboptions:

- SDH

- SONET

The following sections explain the use of these options.

SDH Mode

By default, the adapter is set to the U.S. standard SONET mode. To set the adapter to European standard SDH transmission mode, select the SDH option from the Set Transmission Mode menu. The physical transmission mode for the adapter is configured for SDH transmission.

SONET Mode

By default, the adapter is set to the U.S. standard SONET mode. However, if the adapter has been changed to SDH mode and you want to change it to SONET transmission mode, select the SONET option from the Set Transmission Mode menu. The physical transmission mode for the adapter is configured for SONET transmission.