

Configuring RFC 1483 ATM SVCs Without ILMI for Address Registration

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Introduction

This document provides a sample configuration for ATM switched virtual circuits (SVCs) between two router endpoints without using Integrated Local Management Interface (ILMI) messages to exchange and register ATM addresses on network switches. This document complements Configuring ATM SVCs With Static Map Statements, which uses ILMI for ATM address exchange and registration.

Typically, at a User–Network Interface (UNI) connecting a router ATM interface and a switch ATM interface, the two ATM devices exchange ILMI messages. The purpose of these messages varies with the user or network side. This table lists the configuration differences between using and not using ILMI.

	ILMI Function	Configuration Steps With ILMI	Configuration Steps Without ILMI
User Side (Router)	<ul style="list-style-type: none"> • Receive high–order portion of ATM address from the switch. • Register routers full ATM address with the switch. 	<ul style="list-style-type: none"> • Must configure a special control VC with ILMI encapsulation, by issuing the pvc 0/16 ilmi command on the main interface only. • Must issue the esi–address or nsap–address 	<ul style="list-style-type: none"> • Must configure the full ATM address, by issuing the NSAP–address command. Cannot use the esi–address command. • Must configure the UNI version, by issuing the atm uni version command.

		commands.	
Network Side (Switch)	<ul style="list-style-type: none"> • Send high-order portion of ATM address. • Receive complete ATM address from the router • Register and install an ATM route to the router 	<ul style="list-style-type: none"> • Must configure a special control VC with ILMI encapsulation. Configured by default on the Cisco LightStream 1010 and Cisco Catalyst 8500 series. 	<ul style="list-style-type: none"> • Must configure a static ATM route to the router, by issuing the atm route command. • Must configure the UNI version by issuing the atm uni version command.

ATM interfaces create SVCs when they send call signaling messages to establish VCs on demand. All devices on the end-to-end path need a special control permanent virtual circuit (PVC) with Q.2931 Signaling ATM Adaptation Layer (QSAAL) encapsulation. This PVC carries the call signaling messages. Cisco router ATM interfaces support the ATM Forum's UNI 3.0, 3.1 and 4.0 signaling protocol specifications. For more information, refer to ATM UNI Signaling Support on Cisco Routers and Switches.

Disable ILMI auto-configuration first by issuing the **no atm auto-configuration** command.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

Conventions

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

Configure

Call Routing and Address Resolution Procedures

In this section, you are presented with the information to configure the features described in this document.

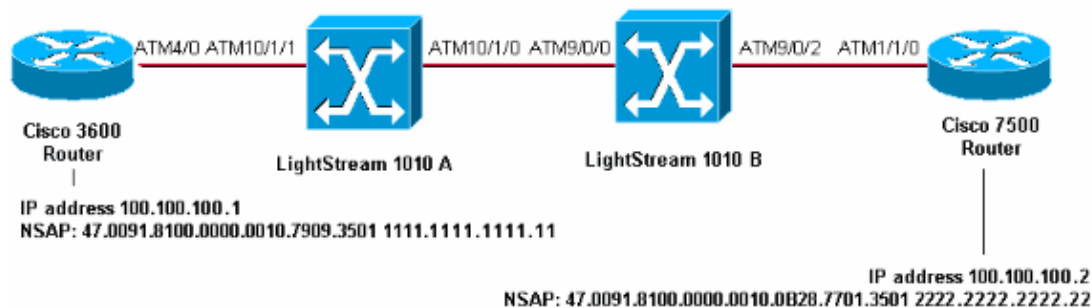
The router needs to know the ATM address that matches to the destination IP address. This sample configuration uses static map commands, which are a Cisco IOS® Software feature that offer an alternative to the dynamic address-resolution mechanisms defined in RFC 1577 .

In addition, the ATM switches need to know the ATM route that defines the path to the destination. Switches consult an ATM routing table that uses ATM addresses. With ILMI, the routers register their ATM address with the directly connected switch. Without ILMI, the ATM switches need static ATM route statements.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses this network setup:



Configuration Steps and show Commands

The following tables illustrate how to configure ATM SVCs without ILMI to exchange and register ATM addressing information. SVCs are supported on main interfaces and on multipoint subinterfaces only. They are not supported on point-to-point subinterfaces.

The following procedures need to take place for an SVC to be established between two router endpoints:

1. When IP data needs to be forwarded to the destination, the router signals a call setup message and inserts the destination router's ATM address in the message.
2. The directly connected ATM switch receives the call setup message, looks up the destination address in the ATM routing table, and forwards the message out the appropriate switch port.
3. If the destination router accepts the call, the SVC is established. Data then flows over the SVC.

The router endpoints and network switches tear down the SVC if one of the routers disconnects or the SVC times out after going unused for a configurable period.

Step 1 Configure an IP Address and Static Map Statement

```
interface ATM2/0
 ip address 100.100.100.1 255.255.255.0
 atm nsap-address 47.009181000000001079093501.111111111111.00
 atm uni-version 4.0
 no atm ilmi-keepalive
 pvc 0/5 qsaal
```

```

!
svc nsap 47.00918100000000100B287701.222222222222.00
  protocol ip 100.100.100.2 broadcast
  encapsulation aal5snap

C3600#show atm ilmi-status

Interface : ATM2/0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 0) ILMI Keepalive : Disabled
ILMI State:      Restarting

!--- ILMI is not configured.

C3600#show atm map
Map list ATM2/0svc2 : PERMANENT
ip 100.100.100.2 maps to
NSAP 47.00918100000000100B287701.222222222222.00
    , broadcast

!--- The static map statement creates a "PERMANENT" match between the
!--- destination IP address and its ATM address.

C3600#show atm vc

          VCD /
Interface  Name  VPI  VCI  Type Encaps SC   Kbps   Peak   Avg/Min  Burst
          /   /   /   /   /   /   /   /     /      /     /
2/0        2    0    5   PVC  SAAL  UBR  15000  Kbps   Cells   Sts
                                     UP

!--- The VC table lists the signaling (QSAAL) VC only.

C3600#ping 100.100.100.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 100.100.100.2, timeout is 2 seconds:

05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:0)
API - alloc_connection_id 2
05:46:24: ATMSIG: Called len 20
05:46:24: ATMSIG: Calling len 20
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:0)
build Setup msg, Null(U0) state
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:0)
API - from sig-client ATM_OWNER_SMAP
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:9)
Input event : Req Setup in Null(U0)
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:9)
Output Setup msg(XferAndTx), Null(U0) state
05:46:24: ATMSIG: Called Party Addr:
47.00918100000000100B287701.222222222222.00
05:46:24: ATMSIG: Calling Party Addr:
47.009181000000001079093501.111111111111.00
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:9)
Null(U0) -> Call Initiated(U1)
05:46:24: E164 NOT Converted
05:46:24: ATMSIG(ATM2/0 0,0 - 0002/00): (vcnum:9)
Input event : Rcvd Call Proceeding in Call Initiated(U1)
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)
Call Initiated(U1) -> Outgoing Call Proceeding(U3)
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)
Input event : Rcvd Connect in Outgoing Call Proceeding(U3)
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)
Input event : Req Connect Ack in Outgoing Call Proceeding(U3)
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)
Output Connect Ack msg, Outgoing Call Proceeding(U3) state
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)
Outgoing Call Proceeding(U3) -> Active(U10)
05:46:24: ATMSIG(ATM2/0 0,40 - 0002/00): (vcnum:9)

```

API - notifying Connect event to client ATM2/0

.!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 1/2/4 ms

!--- The output of debug atm sig-events command captures

!--- the exchange of call setup messages.

C3600#show atm vc

Interface	VCD / Name	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
2/0	2	0	5	PVC	SAAL	UBR	155000			UP
2/0	9	0	40	SVC	SNAP	UBR	155000			UP

!--- The SVC is up, and the router has added the SVC's information

!--- to its VC table.

Step 2 Configure a Static ATM Route and the Version of the UNI Signaling Protocol

```
interface ATM10/1/2
no ip address
no ip directed-broadcast
no atm auto-configuration
atm uni version 4.0
```

!--- UNI version is configured and matches the configuration

!--- on the attached router.

!

```
atm route 47.0091.8100.0000.0010.7909.3501.1111.1111.1111... ATM10/1/2
```

!--- Configure a static route that points to the router interface's

!--- ATM address.

cs-c5500asp-13a#show atm route

Codes: P - installing Protocol (S - Static, P - PNNI, R - Routing control),
T - Type (I - Internal prefix, E - Exterior prefix,
SE - Summary Exterior prefix, SI - Summary Internal prefix,
ZE - Suppress Summary Exterior, ZI - Suppress Summary Internal)

P	T	Node/Port	St	Lev	Prefix
~	~	~	~	~	~
P	I	9 0	UP	0	47.0091.8100.0000.0010.0b28.7701/104
P	E	9 0	UP	0	47.0091.8100.0000.0010.0b28.7701.2222.2222/152
P	SI	1 0	UP	0	47.0091.8100.0000.0010.7909.3501/104
R	I	1 ATM13/0/0	UP	0	47.0091.8100.0000.0010.7909.3501.0010.7909.3501/152
S	E	1 ATM10/1/2	UP	0	47.0091.8100.0000.0010.7909.3501.1111.1111.1111/152
R	I	1 ATM13/0/0	UP	0	47.0091.8100.0000.0010.7909.3501.4000.0c/128
P	I	11 0	UP	0	47.0091.8100.0000.0050.5308.2401/104
P	I	10 0	UP	0	47.0091.8100.0000.0050.537e.1401/104

!--- Confirm the switch installed the ATM route and points to

!--- the correct interface.

LS1010A#show atm vc int atm10/1/2

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM10/1/2	0	40	SVC	ATM10/1/0	0	66		UP

!--- The SVC is built and cross-connects data from the router-facing

!--- interface to the interface that connects to the next ATM switch.

Step 3 Configure ATM UNI Version and Static ATM Route to the Attached Router ATM Interface

```
interface ATM9/0/2
no ip address
no ip directed-broadcast
no atm auto-configuration
no atm ilmi-keepalive
atm uni version 4.0

!--- UNI version is configured and matches the configuration
!--- on the attached router.

!
atm route 47.0091.8100.0000.0010.0b28.7701.2222.2222.2222... ATM9/0/2

!--- Configure a static route that points to the router interface's
!--- ATM address.

cs-c5500asp-14a#show atm route

Codes: P - installing Protocol (S - Static, P - PNNI, R - Routing control),
       T - Type (I - Internal prefix, E - Exterior prefix,
       SE - Summary Exterior prefix, SI - Summary Internal prefix,
       ZE - Suppress Summary Exterior, ZI - Suppress Summary Internal)

P  T Node/Port          St Lev Prefix
~  ~ ~~~~~
P SI 1 0                UP 0 47.0091.8100.0000.0010.0b28.7701/104
R I 1 ATM13/0/0         UP 0 47.0091.8100.0000.0010.0b28.7701.0010.0b28.7701/152
S E 1 ATM9/0/2        UP 0 47.0091.8100.0000.0010.0b28.7701.2222.2222/152
R I 1 ATM13/0/0         UP 0 47.0091.8100.0000.0010.0b28.7701.4000.0c/128
P I 9 0                 UP 0 47.0091.8100.0000.0010.7909.3501/104
P E 9 0                 UP 0 47.0091.8100.0000.0010.7909.3501.1111.1111.1111/152
P I 11 0                UP 0 47.0091.8100.0000.0050.5308.2401/104
P I 10 0                UP 0 47.0091.8100.0000.0050.537e.1401/104

!---The configured static route appears in the ATM routing table.

LS1010B#show atm vc int atm9/0/2
Interface  VPI  VCI  Type  X-Interface  X-VPI  X-VCI  Encap  Status
ATM9/0/2   0    41   SVC   ATM9/0/0     0      66     66     UP

!--- The SVC is built from the port connecting the router to the port
!--- connecting the other ATM switch.
```

Step 4 Configure an IP Address and SVC Static Mapping on the Main Interface

```
interface ATM1/1/0
ip address 100.100.100.2 255.255.255.0
no ip mroute-cache
logging event subif-link-status
atm nsap-address 47.00918100000000100B287701.222222222222.00
atm uni-version 4.0
no atm ilmi-keepalive
pvc 0/5 qsaal
!
svc nsap 47.009181000000001079093501.111111111111.00
protocol ip 100.100.100.1 broadcast
encapsulation aal5snap
C7500#show atm ilmi-status

Interface : ATM1/1/0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 0) ILMI Keepalive : Disabled
```

ILMI State: Restarting

!---ILMI is not configured.

C7500#show atm map

Map list ATM1/1/0svc2 : PERMANENT
ip 100.100.100.1 maps to NSAP 47.009181000000001079093501.111111111111.00
, broadcast, connection up, VC 58, VPI 0, VCI 39, ATM1/1/0

*!--- The static map statement creates a "PERMANENT" match between the
!--- destination IP address and its ATM address.*

C7500#show atm vc

Interface	VCD / Name	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
1/1/0	2	0	5	PVC	SAAL	UBR	155000			UP

!--- The VC table lists the signaling (QSAAL) VC only.

C7500#ping 100.100.100.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 100.100.100.1, timeout is 2 seconds:

```
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:0)
API - alloc_connection_id 35
2w4d: ATMSIG: Called len 20
2w4d: ATMSIG: Calling len 20
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:0)
build Setup msg, Null(U0) state
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:0)
API - from sig-client ATM_OWNER_SMAP
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:60)
Input event : Req Setup in Null(U0)
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:60)
Output Setup msg(XferAndTx), Null(U0) state
2w4d: ATMSIG: Called Party Addr:
47.009181000000001079093501.111111111111.00
2w4d: ATMSIG: Calling Party Addr:
47.00918100000000100B287701.222222222222.00
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:60)
Null(U0) -> Call Initiated(U1)
2w4d: E164 NOT Converted
2w4d: ATMSIG(ATM1/1/0 0,0 - 0053/00): (vcnum:60)
Input event : Rcvd Call Proceeding in Call Initiated(U1)
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
Call Initiated(U1) -> Outgoing Call Proceeding(U3)
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
Input event : Rcvd Connect in Outgoing Call Proceeding(U3)
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
Input event : Req Connect Ack in Outgoing Call Proceeding(U3)
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
Output Connect Ack msg, Outgoing Call Proceeding(U3) state
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
Outgoing Call Proceeding(U3) -> Active(U10)
2w4d: ATMSIG(ATM1/1/0 0,41 - 0053/00): (vcnum:60)
API - notifying Connect event to client ATM1/1/0
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/2/4 ms
```

*!--- The output of debug atm sig-events command
!--- captures the exchange of call setup messages.*

C7500#show atm vc

Interface	VCD / Name	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst Cells	Sts
1/1/0	2	0	5	PVC	SAAL	UBR	155000			UP

```
1/1/0      2      0      5   PVC   SAAL   UBR  155000      UP
1/1/0      60     0     41   SVC   SNAP   UBR  155000      UP
```

```
!--- The SVC is up, and the router has added the SVC's information
!--- to its VC table.
```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- [Understanding ATM Addresses with Cisco Devices](#)
- [Understanding and Troubleshooting ATM UNI Signaling](#)
- [Understanding ILMI on ATM Interfaces](#)
- [ATM \(Asynchronous Transfer Mode\) Technical Support](#)
- [More ATM Information](#)
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