

ILMI Address Registration Problems: %LANE-3-NOREGILMI

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Introduction

This document explains how to troubleshoot Interim Local Management Interface (ILMI) address registration problems on Cisco devices when using LAN emulation (LANE).

The ILMI protocol uses Simple Network Management Protocol (SNMP) format packets across the User-Network Interface (UNI) to access an ILMI Management Information Base (MIB) associated with the link within each node. The ILMI protocol facilitates network-wide auto configuration by allowing adjacent nodes to determine each other's characteristics. Examples of these characteristics are the size of each other's connection space, the type of signaling used (UNI or NNI), type of link (public or private) and hooks for network management autodiscovery.

ILMI is also used for address registration.

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 the Cisco Technical Tips Conventions.

Associated Error Message

Address resolution problems are usually associated with the following error message:

```
%LANE-3-NOREGILMI: [chars] [chars] cannot register [ATM address] with ILM
```

For example:

```
%LANE-3-NOREGILMI: ATM2/0/0.1 LEC cannot register  
47.00918100000000603E5A4501.00D0069A7C40.01 with ILM
```

This error message can be reported by one of the following:

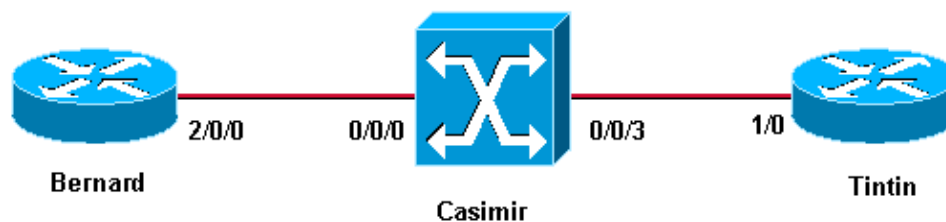
- LAN Emulation Configuration Server (LECS)
- LAN Emulation Server (LES) or broadcast and unknown server (BUS)
- LAN Emulation Client (LEC)

Although this document looks at the address registration problems encountered by a LEC, the explanations are also valid for registration problems with the LECS and LES/BUS.

Configure

Network Diagram

This setup illustrates the problem:



This setup uses:

- Bernard is a Cisco 7500 router running Cisco IOS® software release 12.1(4).
- Casimir is a LightStream 1010 running Cisco IOS software release 12.0(13)W5(19b)
- Tintin is a Cisco 7000 router running Cisco IOS software release 11.2(22)P.

This setup uses LANE, and the LECS and LES/BUS are located on the LightStream 1010.

Note: The configuration used here does not give the best LANE performances; it is simply being used for illustration. For design recommendations regarding LANE services, refer to the LANE Design Recommendations.

Configurations

Both Bernard and Tintin are configured with a LEC:

```

Bernard
interface ATM2/0/0

  pvc 0/16 ilmi
  !
  pvc 0/5 qsaal
  !
interface ATM2/0/0.1 multipoint
  description *** ILMI addr. registr. test ***
  lane client ethernet ilmi-test

```

```

Tintin
interface ATM1/0

  atm pvc 1 0 5 qsaal
  atm pvc 2 0 16 ilmi
  !
interface ATM1/0.1 multipoint
  description *** ILMI addr. registr. test ***
  lane client ethernet ilmi-test

```

Checking ILMI

ILMI Status

The first thing to check in the case of address registration problems through ILMI is whether the ILMI permanent virtual circuit (PVC) is up using these **show** commands:

- On a router, issue the **show atm vc** command.
- On a LightStream 1010, issue the **show atm vc interface atm x/y/z** command.

```
bernard# show atm vc
          VCD /
Interface  Name      VPI  VCI  Type  Encaps  SC  Peak  Avg/Min  Burst  Sts
2/0/0     9             0    5   PVC   SAAL    UBR 149760
2/0/0     1             0   16   PVC   ILMI    UBR 149760

```

!--- Output suppressed.

```
Casimir# show atm vc interface atm 0/0/0
Interface      VPI  VCI  Type  X-Interface      X-VPI  X-VCI  Encap  Status
ATM0/0/0       0    5   PVC   ATM2/0/0         0     47   QSAAL  UP
ATM0/0/0       0    16   PVC   ATM2/0/0         0     35   ILMI   UP

```

!--- Output suppressed.

If the ILMI PVC is up, then you must check which ILMI state the router and the atm switch are in. Do this by issuing the **show atm ilmi-status** command.

```
bernard# show atm ilmi-status

Interface : ATM2/0/0 Interface Type : Private UNI (User-side)

```

```

ILMI VCC : (0, 16) ILMI Keepalive : Disabled
ILMI State:          UpAndNormal
Peer IP Addr:       10.200.10.12      Peer IF Name:      ATM0/0/0
Peer MaxVPIbits:   8                  Peer MaxVCIBits:  14
Active Prefix(s) :
47.0091.8100.0000.0060.3e5a.4501

```

```
Casimir# show atm ilmi-status atm 0/0/0
```

```

Interface : ATM0/0/0 Interface Type : Private UNI (Network-side)
ILMI VCC : (0, 16) ILMI Keepalive : Enabled (5 Sec 4 Retries)
ILMI State:          UpAndNormal
Peer IP Addr:       15.1.1.1          Peer IF Name:      ATM2/0/0
Peer MaxVPIbits:   8                  Peer MaxVCIBits:  16
Configured Prefix(s) :
47.0091.8100.0000.0060.3e5a.4501

```

The correct state is **UpAndNormal**. If the router or the LightStream 1010 are not in the proper ILMI state, check if there is a misconfiguration using the instructions given later in this document.

When ILMI is Disabled on the Switch Interface

You can check whether or not ILMI is disabled on the switch interface by issuing these **show** commands:

- **show run interface atm x/y/z**
- **show atm ilmi-status atm z/y/z**

```
Casimir# show run interface atm 0/0/0
Building configuration...
```

```
Current configuration:
!
```

```

interface ATM0/0/0

no ip address
no ip directed-broadcast
logging event subif-link-status
atm ilmi-keepalive
no atm ilmi-enable

```

```
bernard# show atm ilmi-status atm 2/0/0
```

```

Interface : ATM2/0/0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 16) ILMI Keepalive : Disabled
ILMI State:          UpAndNormal
Peer IP Addr:       0.0.0.0
Peer MaxVPIbits:   8                  Peer MaxVCIBits:  14

```

```
bernard# show lane default-atm-addresses interface atm 2/0/0
```

```

LANE Client:       ...000000000002.**
LANE Server:       ...000000000003.**
LANE Bus:          ...000000000004.**
LANE Config Server: ...000000000005.00
note: ** is the subinterface number byte in hex

```

```
Casimir#
```

In this case, as ILMI has been disabled on the interface by issuing the **no atm ilmi-enable** command, the prefix is not sent to the router and hence, no address registration can occur.

Access List Configuration Problems or ILMI Community Configured as Read-Only

Access List configuration problems can occur if one of the workarounds proposed in this security advisory is wrongly applied to the LightStream 1010 or the router. If you have added these lines to the switch configuration, ILMI (and PNNI) stop working on the switch:

```
access-list deny any
snmp community ILMI view *ilmi RW
```

This has the following result:

```
bernard# show atm ilmi-st
Interface : ATM2/0/0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 16) ILMI Keepalive : Disabled
ILMI State: WaitDevType
```

As you can see, the ILMI-status on the router stays in WaitDevType and address registration does not occur.

Adding the following configuration on the router or the switch will also cause ILMI to stay in WaitDevType and thus prevent any address registration:

```
access-list <x> [permit|deny] a.b.c.d
snmp-server community ILMI RO <x>
```

If the router and the switch are in a correct states, then you must check whether cells are being sent and received on the VC 0/16. You can do this issuing the commands described in the introduction of this document. You can verify this on a router by issuing these **show** commands:

- **show atm pvc 0/16**
- **show atm vc vcd**

On a LightStream 1010 or Catalyst 8500 MSR, issue these **show** commands:

- **show atm vc interface atm x/y/z 0 16**
- **show atm vc traffic interface atm x/y/z 0 16**

```
bernard# show atm pvc 0/16
ATM2/0/0: VCD: 1, VPI: 0, VCI: 16
UBR, PeakRate: 149760
AAL5-ILMI, etype:0x0, Flags: 0xC27, 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
Transmit priority 4
InPkts: 255, OutPkts: 309, InBytes: 18842, OutBytes: 22657
InPRoc: 269, OutPRoc: 319, Broadcasts: 0
```

!--- Output suppressed.

```
Casimir# show atm vc traffic interface atm 0/0/0 0 16
Interface      VPI  VCI  Type      rx-cell-cnts  tx-cell-cnts
ATM0/0/0       0    16   PVC       308            316
```

If you see only the sent or received counter incrementing, it may mean that cells are being stuck on the backplane causing ILMI to be stuck. Try issuing a **shut/no shut** command on the interface. If that does not help, contact Cisco Technical Support for further troubleshooting. If both counters are incrementing, then the ILMI PVC is transmitting cells properly.

Known Caveats

There are also some known bugs which can explain why ILMI is not coming up properly. These are Cisco bug IDs CSCdt47492 (registered customers only) , CSCdm26756 (registered customers only) and CSCdr28332 (registered customers only) .

The rest of this document assumes that the ILMI PVC is UP and carrying cells and that the ILMI status is correct on all the devices. Then, the possible causes for address registration failures via ILMI are:

- The switch already knows the NSAP address
- Configuration problem

If the Switch Knows the NSAP Address

These are scenarios in which the switch already knows the NSAP address.

When the NSAP Address Is Configured Statically on the Switch

On the router Bernard, you can see this message:

```
1w1d: %LANE-3-NOREGILMI: ATM2/0/0.1 LEC cannot register
47.00918100000000603E5A4501.00D0069A7C40.01 with ILMI
```

When looking on the switch for the NSAP address 47.00918100000000603E5A4501.00D0069A7C40.01, you can see this information:

```
Casimir# show atm route 47.0091.8100.0000.0060.3e5a.4501.00d0.069a.7c40.01
Codes: I - internal prefix, E - exterior prefix
E 47.0091.8100.0000.0060.3e5a.4501.00d0.069a.7c40/152
   Advertised in PTSE ID 3 IG IX 0 by node-index 1
   Node 1: Port ATM0/0/3, by atm-static, 00:00:39, uni scope 15
           adv_trig 0x2, src_mask 0x1, node-index 0, rtaddr_index 1
```

```
Casimir# 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	47.0091.8100.0000.0010.1f2d.6801/104
P	SI	1 0	UP	0	47.0091.8100.0000.0060.3e5a.4501/104
R	I	1 ATM0/0/3	UP	0	47.0091.8100.0000.0060.3e5a.4501.0000.0c0e.09e7/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4501/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4502/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4503/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4504/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4505/152
S	E	1 ATM0/0/3	UP	0	47.0091.8100.0000.0060.3e5a.4501.00d0.069a.7c40/152
R	I	1 ATM2/0/0	UP	0	47.0091.8100.0000.0060.3e5a.4501.4000.0c/128

```
Casimir# show running-config
```

Building configuration...

Current configuration:

```
!  
! Last configuration change at 12:28:24 UTC Mon Apr 2 2001  
! NVRAM config last updated at 12:28:25 UTC Mon Apr 2 2001  
!  
version 12.0
```

!--- Output suppressed.

```
atm route 47.0091.8100.0000.0060.3e5a.4501.00d0.069a.7c40... ATM0/0/3
```

As shown above, the NSAP address has been statically configured on the switch and in this case even points to a different interface from the one where it should be located.

When the NSAP Address Is Registered via ILMI by Another Device

To simulate this scenario, Tintin and Bernard are configured with the same MAC address.

Bernard
<pre>interface ATM2/0/0 mac-address 0000.0000.0001 pvc 0/16 ilmi ! pvc 0/5 qsaal</pre>

Tintin
<pre>interface ATM1/0 mac-address 0000.0000.0001 no ip address atm pvc 1 0 5 qsaal atm pvc 2 0 16 ilmi</pre>

Because they are both connected to the same switch, the NSAP address associated to the LECs configured on the sub-interfaces atm 2/0/0.1 and atm 1/0.1 is the same:

```
47.00918100000000603E5A4501.000000000001.01.
```

Tintin interface atm 1/0.1 has been brought up before atm 2/0/0.1 on Bernard. Therefore, Tintin is the first one to register the NSAP address 47.00918100000000603E5A4501.000000000001.01 via ILMI. As soon as the interface atm 2/0/0.1 is brought up on Bernard, this message is displayed:

```
1w1d: %LANE-3-NOREGILMI: ATM2/0/0.1 LEC cannot register  
47.00918100000000603E5A4501.000000000001.01 with ILMI
```

If you look at Tintin, you can see that Tintin is already using that NSAP address and has registered it on Casimir:

```
Tintin# show lane client  
LE Client ATM1/0.1 ELAN name: ilmi-test Admin: up State: operational  
Client ID: 2 LEC up for 39 seconds  
Join Attempt: 4  
HW Address: 0000.0000.0001 Type: ethernet Max Frame Size: 1516  
ATM Address: 47.00918100000000603E5A4501.000000000001.01
```

```
VCD rxFrames txFrames Type ATM Address
```

```

0      0      0  configure  47.00918100000000603E5A4501.00603E5A4505.00
14     1      2  direct    47.00918100000000603E5A4501.00603E5A4503.01
15     1      0  distribute 47.00918100000000603E5A4501.00603E5A4503.01
16     0      1  send      47.00918100000000603E5A4501.00603E5A4504.01
17     2      0  forward   47.00918100000000603E5A4501.00603E5A4504.01

```

If you look at Casimir, you can see that this address has already been registered:

```

Casimir# show atm route 47.00918100000000603E5A4501.00000000001.01
Codes: I - internal prefix, E - exterior prefix
I 47.0091.8100.0000.0060.3e5a.4501.0000.0000.0001/152
    Node 1: Port ATM0/0/3, by routing-control, 00:01:06, uni scope 15
            adv_trig 0x2, src_mask 0x2, node-index 0, rtaddr_index 1

Casimir# 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  47.0091.8100.0000.0010.1f2d.6801/104
P  SI 1     0      UP 0  47.0091.8100.0000.0060.3e5a.4501/104
R  I 1  ATM0/0/3  UP 0  47.0091.8100.0000.0060.3e5a.4501.0000.0000.0001/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4501/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4502/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4503/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4504/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4505/152
S  E 1  ATM0/0/3  UP 0  47.0091.8100.0000.0060.3e5a.4501.00d0.069a.7c40/152
R  I 1  ATM2/0/0  UP 0  47.0091.8100.0000.0060.3e5a.4501.4000.0c/128

```

This means that Bernard is not able to register its address via ILMI, since it is a duplicate. When the **debug atm ilmi atm x/y/z** command is issued on Bernard and Casimir, these debugs can be seen:

Bernard:

```

!--- Output suppressed.

lwld: ILMI(ATM2/0/0): Registration local validation attempt for
47.0091.8100.0000.0060.3e5a.4501.0000.0000.0001.01
lwld: ILMI(ATM2/0/0): Sent Out. Will be added on confirmation
lwld: ILMI(ATM2/0/0):Sending out Request 930
lwld: ILMI(ATM2/0/0):Response received for request 929
lwld: ILMI(ATM2/0/0): Errored response <General Error> Function Type = ilmiReqOther
lwld: ILMI(ATM2/0/0): Errored or no response received
lwld: ILMI(ATM2/0/0): ES database update not done
lwld: ILMI(ATM2/0/0):Updating ES Database with
7.0091.8100.0000.0060.3e5a.4501.0060.3e5a.4502.00
lwld:   Reg Status :- Delete in progress - False, Add in progress - True
lwld: ILMI(ATM2/0/0):Response received for request 930
lwld: ILMI(ATM2/0/0): Errored response <General Error> Function Type = ilmiReqOther
lwld: ILMI(ATM2/0/0): Errored or no response received
lwld: ILMI(ATM2/0/0): ES database update not done
lwld: ILMI(ATM2/0/0):Updating ES Database with
47.0091.8100.0000.0060.3e5a.4501.0000.0000.0001.01
lwld:   Reg Status :- Delete in progress - False, Add in progress - True

lwld: %LANE-3-NOREGILMI: ATM2/0/0.1 LEC cannot register
47.00918100000000603E5A4501.00000000001.01 with ILMI

```


!--- Output suppressed.

Casimir:

!--- Output suppressed.

Apr 2 13:10:06.800: ILMI: Validating address 47.0091.8100.0000.0060.3e5a.4501.0000.0000.00

Apr 2 13:10:06.800: ILMI: Address rejected by Client identified as pnni(ATM0/0/0)

!--- Output suppressed.

Note: The situation described in this section can often be encountered in the following scenario. If LECS services are configured on Cisco devices and other vendor devices at the same time and all these LECS are listening to the well-known address and advertising it, this message can be displayed:

```
1w2d: %LANE-3-NOREGILMI: ATM2/0/0 LECS cannot register
47.00790000000000000000000000000000.00A03E000001.00 with ILMI
```

As LECS are configured on non-Cisco devices as well as Cisco devices, you cannot use SSRP or Fast-SSRP. The purpose of these redundancy protocols is that one LECS is elected as Master LECS (the others being backup LECS). The master LECS is the only one allowed to advertise the well-known address if it is being used. In this case, since you cannot configure a redundancy protocol, there is no Master LECS election. Hence, all the LECS try to advertise the well-known address, but only one succeeds.

To illustrate this, the configurations have been modified as shown:

Bernard
<pre>lane database test name ilmi-test server-atm-address 47.00918100000000603E5A4501.00603E5A4503.01 ! interface ATM2/0/0 no ip address no ip route-cache distributed no atm ilmi-keepalive pvc 0/16 ilmi ! pvc 0/5 qsaal ! lane config fixed-config-atm-address lane config database test</pre>

Tintin
<pre>lane database test name ilmi-test server-atm-address 47.00918100000000603E5A4501.00603E5A4503.01 ! interface ATM2/0/0 no ip address no ip directed-broadcast logging event subif-link-status lane config fixed-config-atm-address lane config database test</pre>

With this new configuration, a LECS has been configured on Bernard and Casimir, and no LECS address database has been configured on Casimir. This means that SSRP is not enabled. To illustrate the error message, the Bernard atm 2/0/0 interface is shut down before it is configured, and the Casimir configuration is modified first. In this situation, Casimir advertises the well-known address via ILMI, thus preventing Bernard from doing so. As soon as the Bernard atm 2/0/0 interface is brought up, this message is displayed:

```
1w2d: %LANE-3-NOREGILMI: ATM2/0/0 LECS cannot register
47.0079000000000000000000000000.00A03E000001.00 with ILMI
```

Configuration Problems

Another possible cause of failure of the address registration is a problem with the configuration on the LightStream 1010.

```
interface ATM0/0/0

no ip address

no ip directed-broadcast

logging event subif-link-status

atm ilmi-keepalive

no atm address-registration
```

The command above prevents any address registration via ILMI which, in this case, prevents the router from receiving its prefix, and thus also advertising its address to the switch:

```
bernard# show lane default-atm-addresses interface atm 2/0/0
LANE Client:      ...000000000002.**
LANE Server:      ...000000000003.**
LANE Bus:         ...000000000004.**
LANE Config Server: ...000000000005.00
note: ** is the subinterface number byte in hex

bernard# show atm ilmi-status atm 2/0/0

Interface : ATM2/0/0 Interface Type : Private UNI (User-side)
ILMI VCC : (0, 16) ILMI Keepalive : Disabled
ILMI State:      UpAndNormal
Peer IP Addr:    10.200.10.12      Peer IF Name:      ATM0/0/0
Peer MaxVPIbits: 8                Peer MaxVCIBits:  14
```

The router does not receive its prefix and hence no address-registration can occur.

When enabling **debug atm ilmi atm 0/0/0** on the LightStream 1010, this can be seen when the atm 0/0/0 interface is brought up:

!--- Output suppressed.

```
Apr  2 12:42:11.792: ILMI: My Device type is set to Node (ATM0/0/0)
Apr  2 12:42:11.792: ILMI(ATM0/0/0): From NodeConfigComplete To UpAndNormal <ilmi_proce
Apr  2 12:42:11.792: ILMI(ATM0/0/0): Keep Alive enabled
Apr  2 12:42:11.792: ILMI(ATM0/0/0) Address Registration disabled. Prefix not sent
```

!--- Output suppressed.

The solution is to re-enable **atm address-registration** and do a **shut/no shut** on the atm interface to restart ILMI.

Related Information

- [LANE Design Recommendations](#)
 - [FSSRP Sample Configuration](#)
 - [Configuring LANE](#)
 - [Troubleshooting ATM LAN Emulation Networks](#)
 - [LANE Technology Support](#)
 - [Technical Support & Documentation – Cisco Systems](#)
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