Configuring UTStarcom DSL Equipment

The UTStarcom DSLAM AN-2000 B820 consists of a chassis capable of holding up to 16 ADSL line cards. These line cards support ADSL, ADSL2, and ADSL2+ residential gateways (RGs). Each ADSL line card has 24 ADSL ports that can be used to connect to 24 RGs. Each line card must be configured separately.

In addition to the ADSL cards, the chassis also contains an ICM3 controller card, which controls the GE trunk ports as well as global chassis parameters, such as QoS and VLAN definitions.

A network management application, called Netman 4000, is used to configure the ICM3 and the ADSL line cards.

This chapter presents key details of configuring the UTStarcom DSL equipment as used in the solution, and presents the following topics:

- Provisioning the Netman 4000 Application to Manage the DSLAM, page D-2
- Configuring the ICM3 Ethernet Interface Line Card, page D-5
- Configuring the PCU Card on the DSLAM, page D-12
- Configuring the ADSL Profiles, page D-13
- Configuring the IPADSL3A Line Cards, page D-17

> **Note** UTStarcom DSL equipment was tested in this solution. This appendix does not provide detailed information about UTStarcom products. Refer to UTStarcom user documentation for further information.

> **Note** Numbers representing VLANs and IP addresses were derive from various phases of testing and are meant to be used for examples only. Replace these numbers with those required by your particular installation.

Provisioning the Netman 4000 Application to Manage the DSLAM

Do the following to configure the DSLAM IP addresses and use the Netman 4000 Network Management Application to recognize and provision the DSLAM.

- Configuring the DSLAM to Use the Netman 4000 Network Management Application
- Adding an AN-2000 B820 DSLAM Node to the Netman 4000 Network Management Application
- Configuring DSLAM Node Settings
- Configuring DSLAM Name and Contact Information (Optional)
- Configuring the DSLAM Node Address

Note For details, refer to the *UTStarcom AN-2000 B820 IP DSLAM Operations Manual, Release 2.4*.

Configuring the DSLAM to Use the Netman 4000 Network Management Application

Do the following to configure the DSLAM to use the Netman 4000 Network Management Application.

Step 1 Connect an Ethernet cable between Netman 4000 Dell PC laptop and the NMS In port on the back of the PCU module of the AN-2000 B820.

Step 2 Connect the PC's serial (DS9 connector) port to the ICM3's debug/console port.

Step 3 Start Hyperteminal session 9600/N/8/1.

Step 4 At the login prompt, login as **admin** with the password **AdMiN123**.

Step 5 Type **ip show ip** to check your current out-of-band IP configuration. The default IP address is 10.20.x.x.

Step 6 Set the IP address for the management system as follows.

    a. At the system prompt, enter the command as shown below.

```
AN2000_IB# ip management address 99.98.97.96, netmask 255.255.255.0
```

    b. When prompted to change the network address, answer **yes**.

    c. Wait 10 to 15 seconds, then use another PC to ping your LAN gateway to verify the connection.

Step 7 Set the IP address of the Netman 4000 Dell PC to **99.98.97.90**. You should then be able to telnet from the PC to the AN-2000 B820's address, 99.98.97.96.

Step 8 Using a console or telnet, telnet to AN-2000 B820. Configure the node as follows to allow SNMP access for your NMS, which is located at 99.98.97.90.

```
AN2000_IB# snmp netman-destination 99.98.97.90 primary
```

Step 9 Save the configuration.

```
AN2000_IB# save config
```

Adding an AN-2000 B820 DSLAM Node to the Netman 4000 Network Management Application

Do the following to add an AN-2000 B820 DSLAM node to the Netman 4000 Network Management Application.

Step 1   Start the Netman 4000 server by clicking the **StartNetmanLite** icon on the desktop of the Dell PC.

Step 2   To use the GUI interface of the Netman Application, launch Internet Explorer and type the following in the Address field:

http://99.98.97.90:9090

Step 3   Log in as user **root**, with password **public**.

The UTStarcom Network Management System window appears, indicating "NetmanLite 4000 version 2.4.6.15P7" at the bottom of the window.

Step 4   Click the **Please Click, Enter** message.

Step 5   Click the **Edit Lock** icon (the second icon from the top left of the window). Devices cannot be added unless this icon is selected (indicated by a dark gray background).

Step 6   Move the cursor to the window labeled **root** (right side of screen) and right click.

Step 7   Choose **Create NE** from the drop-down list. The Create NE window appears.

    a.   Under **NE Type**, choose **IP DSLAM**.

    b.   Under **NE Label**, enter a name for a new DSLAM (for example, **DSLAM_1**).

    c.   Under **IP Address**, enter the address of the new DSLAM (for example, **99.98.97.96**).

    d.   Click **OK** to close the window.

Note   If the device is added properly, the new DSLAM (named DSLAM_1) appears under "root" in the Physical View window (left side of screen). In addition, a red DSLAM icon labeled DSLAM_1 is displayed in the window labeled "root."

Step 8   Double-click **DSLAM_1**.

A new window labeled DSLAM_1 is displayed.

Step 9   Click the node on the left side of the window under the "root" icon to see the shelf (node) and all the cards in the chassis.

Configuring DSLAM Node Settings

Do the following to configure DSLAM node settings. A node refers to a UTStarcom DSLAM system.

Step 1   Click the newly configured node on left side of the screen.

Step 2   Click the **Configuration** tab at the top of the window.

Step 3   Choose the **Node ID** menu item.

Step 4 Give the DSLAM a node ID it can pass along for a PPPoE session, to identify the node uniquely. Enter **9876**.

Note The Node ID can be any string that identifies the UTStarcom DSLAM system uniquely.

Step 5 Click **Apply**.

Configuring DSLAM Name and Contact Information (Optional)

Do the following to configure the DSLAM name and contact information. (Though not required, this may be useful for network management.)

Step 1 Choose **Node > System**.

Step 2 Enter information about the **System Name**, **Location**, and **Contact**.

Step 3 Click **Apply**.

Step 4 Click the **Configuration** tab and choose **Save** from the drop-down menu.

Configuring the DSLAM Node Address

Do the following to configure the DSLAM node address.

Step 1 Choose **Node > IP Address**.

Step 2 Confirm the default or set the values shown below.

Area	Parameter	Setting
ICMP IP Address	Address	99.98.97.96
	Subnet Mask	255.255.255.0
IP Pool for Line Card	Starting IP Address	192.168.100.1
	Subnet Mask	255.255.255.0
	IP Pool Size	33
Trap Destination to Netman	Destination 1: 99.98.97.90	
	Destination 2: 0.0.0.0	
IP Pool for Standby IP Address	Address	192.168.200.1
	Subnet Mask	255.255.255.0
	IP Pool Size	2

Step 3 Choose **Node > NMP Access**.

Step 4 Confirm the default or set the values shown below.

Area	Parameter	Setting
Telnet	NMP access	Enabled

Configuring the ICM3 Ethernet Interface Line Card

The ICM3 card on the DSLAM controls the GE trunk ports that connect the DSLAM to the Cisco aggregation routers (ARs). It also controls QoS mapping of VLANs coming into the DSLAM, as well as the IGMP traffic entering the DSLAM from the trunks. This section presents the following tasks:

- Viewing the Hardware and Software Version of the ICM3 Line Card
- Enabling IGMP Snooping for the DSLAM System
- Displaying Multicast Group Information
- Using Default Settings for Other ICM3 Card Parameters
- Activating the Internal Ethernet Interfaces of the ADSL Line Cards
- Activating the External GE Trunk Ports
- Disabling RSTP on the DSLAM
- Defining VLANs on the DSLAM to Support Triple-Play Services
- Configuring QoS on the ICM3 Controller Card

Viewing the Hardware and Software Version of the ICM3 Line Card

Do the following to view the hardware and software versions of the ICM3 line card.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3**.

Step 2   Confirm the following hardware and software versions, which were tested in the solution.

Parameter	Setting
Hardware Version	2990082200
Software Version	2.3.1.11

Enabling IGMP Snooping for the DSLAM System

Do the following to enable IGMP snooping on the DSLAM system.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3**.

Step 2   Click the **IGMP** tab.

Step 3   Confirm or set the following as indicated.

Parameter	Setting
IGMP Snooping	Enabled
Unknown Group	Drop (do not forward groups that are not requested)
IGMP Router	Leave all items unchecked

Step 4   Click **Apply**.

Displaying Multicast Group Information

Do the following to display multicast group information.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3**.

Step 2   Click the **Multicast Group** tab.

Step 3   Do no configuration here. However, you can see the active multicast groups, the VLANs ID of the groups, and line card to which a group is forwarded.

Using Default Settings for Other ICM3 Card Parameters

Do the following to use default settings for other ICM3 card parameters.

Note   Redundancy features of the DSLAM were not used in solution testing.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3**.

Step 2   Click the **Switch** tab, and use the following default values.

Parameter	Setting
DFL Frames	Discard
Aging Timer	300
VLAN ID	1
Static Entries	None shown

Step 3   Click the **Mirror** tab and use the following default values.

Parameter	Setting
Mirror Port	None
Mirror Receive Port	None
Mirror Transport Port	None

Step 4   Click the **Trunk Port** tab and verify that there are no settings.

Step 5   Click the **Protection Link** tab and select **G1** and **G2**.

Step 6   Click the **Redundancy Support** and use the following default values.

Parameter	Setting
Standby ICM Status	Admin Prohibited
Standby ICM Redundancy Support	Prohibited

Activating the Internal Ethernet Interfaces of the ADSL Line Cards

Do the following to activate the internal Ethernet interfaces of the ADSL line cards.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3 > Ethernet Port**.

Step 2   Choose **Ethernet Port > Internal Ethernet Port**.

Step 3   Confirm that each IPADSL3A line card installed in the DSLAM is shown with the Operational Status of Enabled.

Activating the External GE Trunk Ports

Do the following to activate the external GE trunk ports.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3 > Ethernet Port**.

Step 2   Click the **External Ethernet Ports** tab.

Step 3   Double-click **G1** to select it, and configure it as follows.

Parameter	Setting
Port ID	G1
Administrative State	Unlocked (enabled)
Speed Duplex	N/A
Flow Control	On
Incoming Speed Limit	Disable
Outgoing Speed Limit	Disable
Broadcast Rate Threshold	300

Step 4   Click **Apply**.

Step 5   Choose G2 and configure it is as in Step 3. except change the **Port ID** to **G2**.

Step 6   Click **Apply**.

Disabling RSTP on the DSLAM

Do the following to disable RTSP on the DSLAM.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3 > RSTP**.

Step 2   Set **RSTP** to **Disable.** This is because of the use of dual GE links.

Step 3   Click **Apply**.

Defining VLANs on the DSLAM to Support Triple-Play Services

Do the following to define VLANs on the DSLAM to support triple-play services.

Note   You must first define VLANs under the **ICM3** menu, then assign them to individual DSL ports under the **Slot** configuration.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3 > VLAN**.

Step 2   Confirm or select the following.

Parameter	Setting
Unknown VLAN	Discard
Ingress Check	Enabled

Note   The internal ADSL line cards each have an associated internal Ethernet port that is used to pass traffic from the trunk port to the line card. ADSL Ethernet line cards are shown as l1, l2, l3, and so on. The line cards must be associated with the VLANs that carry data to them. VLANs remain tagged when passed from the trunk port to the line card, or from the line card to the trunk port and out to the AR.

Step 3   Create the new VLAN to be used for broadcast and VOD traffic. To do this, click the **Add** key and enter the following information.

Parameter	Setting
VLAN ID	100
VLAN Name	VideoVlan100
Tagged Port	l1, l2, l3, G1
Untagged Port	None

Step 4   Click **Apply**.

Step 5   Create the new VLAN to be used for voice traffic. To do this, select the **Add** key and enter the same information as in Step 3, except change **VLAN ID** to **200**.

Step 6   Click **Apply**.

✎
Note   In the hub-and-spoke topology, each DSL port (user) is assigned a unique VLAN to carry the data service. For testing in this release of the solution, VLANs 500–550 were reserved as the data VLANs. One unique VLAN must be defined per user. For test purposes, three data VLANs were defined. The VLANs are tagged when entering or exiting the line card or the G2 trunk port connecting the DSLAM to the AR.

Step 7   To create a unique data VLAN per user, where all data VLANs are assigned to DSLAM GE Port 2, do the following.

    a.   Click the **Add** key, and enter the following to define the first data VLAN.

Parameter	Setting
VLAN ID	500
VLAN Name	DataVlan500
Tagged Port	l1, G2
Untagged Port	None

    b.   Click **Apply**.

    c.   To define the second data VLAN, proceed as in Step 7a, but change **VLAN ID** to **501** and **VLAN Name** to **DataVlan501**.

    d.   Click **Apply**.

    e.   To define the third data VLAN, proceed as in Step 7a, but change **VLAN ID** to **502** and **VLAN Name** to **DataVlan502**.

    f.   Click **Apply**.

Step 8   Click the **Configuration** tab and choose **Save** from the drop-down menu.

Configuring QoS on the ICM3 Controller Card

Do the following to configure QoS on the ICM3 controller card.

Step 1   Choose **Node > Shelf1 > SlotA:Active ICM3 > QoS**.

Step 2   Click the **Priority** tab.

Step 3   Click **l1** to highlight Line Card 1.

    a.   Click the **DSCP Priority** field (right column).

    b.   From the drop-down menu, choose **Map DSCP to 802.1p**.

    c.   Click **Apply**.

    d.   Repeat Step 3a through Step 3c for each line card shown in the menu.

Step 4   Click **G1** to highlight the port.

    a.   Click the **DSCP Priority** field.

b. If this feature is disabled, choose **Select Map DSCP to 802.1p** from the drop-down menu.

c. Click **Apply**.

Step 5 Select **G2** to highlight the port, then proceed as in Step 4 and click **Apply**.

Step 6 Click the **Configuration** tab and choose **Save** from the drop-down menu.

Step 7 Click the **DSCP Priority** tab. All the IEEE 802.1p Priority fields on the right side of the screen should be set to 0, by default.

a. Change the following DSCP values to map to the selected IEEE 802.1p Priority as shown below.

Tip To change the priority, click the DSCP value and click on the right side of the screen under IEEE 8021p Priority. Then select the priority from the drop-down menu, clicking **Apply** after each change.

Parameter	Setting
DSCP 0	Priority 0
DSCP 24	Priority 4
DSCP 34	Priority 4
DSCP 36	Priority 4
DSCP 46	Priority 7

Note The mapping of DSCP to 802.1p Priority, and the remapping of the 802.1p bits as described above, forces the DSLAM to use the correct downstream priority queue for each service when data is sent to the residential gateway. There are three queues available in the downstream direction. The following table explains how the voice, video, data services are mapped to the ATM queues on the DSLAM.

Triple-Play Service	DSCP Value	Remapped 802.1p Value	ATM Queue
High-speed data	0	0	0 (low)
Signaling for video	24	4	1 (medium)
VoD	34	4	
Multicast/broadcast video	36	4	
Voice	46	7	2 (high)

b. Click the **Configuration** tab and choose **Save** from the drop-down menu.

Step 8 Click the **Queue Mapping** tab and accept the default values, which should be as follows.

IEEE 802.1p Priority	CoS Traffic Class
0	2
1	0
2	1

IEEE 802.1p Priority	CoS Traffic Class
3	3
4	4
5	5
6	6
7	7

Step 9   Click the **L2 Scheduling** tab and use the default values, which should be as follows.

Parameter	Setting
Scheduling Method	Strict priority
Weighted Round Robin	Not selected

Configuring the PCU Card on the DSLAM

Do the following to configure the PCU card on the DSLAM.

> **Note**   The defaults are used to configure the PCU card.

Step 1   Click the **PCU** tab and confirm the following.

Parameter	Value
Hardware Version	1.3
Software Version	1.7

Step 2   Click the **Clock Source** tab and confirm that no external clock is selected.

Step 3   Click the **Alarm Indication** tab and confirm the following.

Parameter	Setting
Pin Label	Not configured
Severity	Warning
Level	Never Raise Alarm

Step 4   Click the **PDP** tab and confirm the following.

Parameter	Setting
PDP Collect Alarm from PDP	Disabled
Control Alarm from PDP	Disabled
Control Buzzer on PDP	Disabled

Configuring the ADSL Profiles

The DSLAM supports ADSL, ADSL2, and ADSL+ residential gateways. This section presents the following tasks:

- Creating an ADSL2+ Profile
- Creating an ADSL2 Profile

Creating an ADSL2+ Profile

This profile works for the Linksys WAG54GP2 RG and other RGs which support ADSL2+. Do the following to create an ADSL2+ profile.

Step 1   Using the Netman application, double-click a DSLAM to configure under the Physical View window.

Step 2   Click the **Provisioning** tab (lower left).

Step 3   In the window with the name of the node, click the **Profile** tab and choose **ADSL Line Profile** from the menu.

Step 4   Click **Add** at the bottom of the **ADSL Line Profile** window and confirm or enter the following settings:

Parameter	Setting
Profile Name	ADSL2+
Line Standard	ADSL2Plus/ADSL2/ReADSL2/G.dmt Annex A Automode
Annex Type	Annex A
Downstream Spectrum	Double
Upstream Spectrum	Single

Step 5   Click **Next**. The following should be set by default.

Parameter	Setting
Trellis Coding	On
Rate Mode	Adaptive at Runtime
Target Downstream SNR Margin (dB)	6
Downstream Upshift SNR Margin (dB)	9
Downstream Min Downshift Time (0–16383 s)	60
Downstream Bit Swapping	Enable
Target Upstream SNR Margin (dB)	6
Upstream Bit Swapping	Enable
Spectrum Mask	No mask
Transmission Mode	FDM
Max Downstream SNR Margin (dB)	31
Downstream Downshift SNR Margin (dB)	3
Downstream Min Upshift Time (0–16383 s)	60
Max Upstream SNR Margin (dB)	31
ATM Header Compression	Disable

Step 6 Click **Next**, then confirm or enter the following.

Parameter	Setting
Downstream Latency	Interleave
Downstream Interleave delay (ms)	8
Downstream Min Rate (kbps)	11000
Downstream Max Rate (kbps)	32736
Upstream Latency	Interleave
Upstream Interleave Delay (ms)	8
Upstream Min Rate (kbps)	980
Upstream Max Rate (kbps)	1536

Step 7 Click **Apply**.

Step 8 Click the **Configuration** tab and choose **Save** from the drop-down menu.

Creating an ADSL2 Profile

Do the following to create an ADSL2 profile.

✎ **Note** This profile can be used with the Ericsson HM340dp Residential Gateway, which supports ADSL2.

Step 1 In the Physical View window, double-click a DSLAM to configure.

Step 2 Click the **Provisioning** tab.

Step 3 In the window with the name of the node, click the **Profile** tab and choose **ADSL Line Profile** from the menu.

Step 4 Click **Add** at the bottom of the **ADSL Line Profile** window and confirm or enter the following settings:

Parameter	Setting
Profile Name	ADSL2
Line Standard	ADSL2/ReADSL2/G.dmt Annex A Automode
Annex Type	Annex A
Downstream Spectrum	Single
Upstream Spectrum	Single

Step 5   Click **Next**. The following should be set by default.

Parameter	Setting
Trellis Coding	On
Rate Mode	Adaptive at Runtime
Target Downstream SNR Margin (dB)	6
Downstream Upshift SNR Margin (dB)	9
Downstream Min Downshift Time (0–16383 s)	60
Downstream Bit Swapping	Enable
Target Upstream SNR Margin (dB)	6
Upstream Bit Swapping	Enable
Spectrum Mask	No mask
Transmission Mode	FDM
Max Downstream SNR Margin (dB)	31
Downstream Downshift SNR Margin (dB)	3
Downstream Min Upshift Time (0–16383 s)	60
Max Upstream SNR Margin (dB)	31
ATM Header Compression	Disable

Step 6   Click **Next**, then confirm or enter the following.

Parameter	Setting
Downstream Latency	Interleave
Downstream Interleave Delay (ms)	8
Downstream Min Rate (kbps)	8764
Downstream Max Rate (kbps)	12032
Upstream Latency	Interleave
Upstream Interleave Delay (ms)	8
Upstream Min Rate (kbps)	720
Upstream Max Rate (kbps)	1536

Step 7   Click **Apply**.

Step 8   Click the **Configuration** tab and choose **Save** from the drop-down menu.

Tip   After the RG has trained, do the following to see the actual upstream and downstream bandwidths for that ADSL line: Choose **Node > Shelf1 > Slot 1 > ADSL Port**, and click the **Port** tab. ADSL ports and their status are displayed.

Note   Both the ADSL and ADSL2+ ADSL line profile use Automode. This means the RG runs in its native mode, whether it is ADSL or ADSL2+.

Note   The default ADSL Profile applied by the DSLAM works with most CPEs, but it will run at lower upstream and downstream bandwidths than the ADSL2 configuration described above. The default profile, *Adslprof_def*, can support the maximum downstream rate of 8064 kbps and the maximum upstream rate of 864 kbps. This rate is only adequate enough to support one STB. If two STBs are to be supported, the ADSL2 or ADSL2+ profile should be selected for the ADSL Line Profile.

Configuring the IPADSL3A Line Cards

This section presents the following tasks:

- Configuring the AN-2000 B820 DSLAM Card Modules
- Verifying the WAN Port
- Configuring and Activating the ADSL Ports
- Configuring ATM PVCs and Assigning Them to ADSL Ports
- Configuring the Number of MAC Addresses Supported per Port
- Configuring the Port Label Used for DHCP Option 82
- Creating VLAN-to-PVC Mappings for Voice, Video, and Data
- Verifying the Access List Configuration on the DSLAM
- Configuring QoS for the IPADSL3A Line Cards
- Saving the Configuration

Configuring the AN-2000 B820 DSLAM Card Modules

Each DSL line card acts a separate DSLAM unit, and must be configured separately.

Do the following to configure the AN-2000 B820 DSLAM card modules.

Step 1   In the Physical View window, double-click a DSLAM to configure.

Step 2   Click the **Provisioning** tab.

Step 3   Choose **Node > Shelf1 > Slot1:IPADSL3A**, and check the IPADSL3A line card hardware and software version. The versions tested in the solution are shown below:

Parameter	Value
Hardware Revision	2990084000:B1
Software Version	5.2.1.8

Step 4   From the window on the right, click the **Customized Filter** tab and confirm or set values as shown below:

Parameter	Setting
Semi-Static Forwarding	Disabled
Gateway ARP Filter	Disabled
Gateway IP Address	0.0.0.0
Aging Timer	14400
Unknown LAN	N/A
Upstream Multicast Filter	Disabled
IGMP Last Query Interval	2
IGMP No Response Leave	2
ARP Tracking	Disabled
NetBIOS Filter	Uplink Only or Disabled
DHCP Filter	Disabled
DFL Counter	10
IGMP Snooping	Enabled, Discard Unknown
DHCP Option 82	Enabled
IGMP Last Query Count	1
IGMP No Response Leave Query Count	1

Step 5   Click **Apply**.

> **Note**   If IGMP Snooping is enabled but Forward Unknown is also enabled, the broadcast will continue to be forwarded to devices that did not request it, causing multicast flooding and macroblocking to be displayed on attached STBs.

Step 6   Click the **PPPoE Intermediate Agent** tab (top right) and choose **Enabled**.

Step 7   Click **Apply**.

> **Note**   The PPPoE Intermediate Agent Enable field allows the DSLAM node ID and port information to be added to any PPPoE request.

Step 8   (Optional) If DHCP Option 82 is to be used, click the **Packet Policing** tab (at the top of the right menu).

   a.   For each port that will use DHCP, click the port to select it.

> **Tip**   To select multiple ports, click the first port, hold the shift key down, and click the last port.

   b.   Click the **DHCP** check box under IP Address Assignment. Do not click any other fields.

   c.   Click **Apply**.

Step 9   Click the **Configuration** tab and choose **Save** from the drop-down menu. The configuration is saved in the DSLAM's flash memory.

Verifying the WAN Port

Each IPADSL3A card has an integrated WAN port. This port is enabled automatically.

Do the following to verify that the WAN port is up and running.

Step 1   Choose **Node > Shelf1 > Slot1 > WAN Port**.

Verify the following:

Parameter	Setting
Administrative State	Unlocked
Operational State	Enabled
Actual Speed	100 Mbps
Duplex	Full

> **Note**   If the Administrative State is Locked, or if the Operational State is Disabled, the card may not be installed properly in the chassis, or it may be defective.

Configuring and Activating the ADSL Ports

ASDL2, and ADSL2+ line profiles must be created before they can be assigned to an ADSL line. (See Creating an ADSL2+ Profile, page D-13, and Creating an ADSL2 Profile, page D-15.) The profile *adslprof_def* has default values and is always available. It works well with one STB, but does not allow enough bandwidth to support two broadcast video streams.

Do the following to configure and activate the ADSL ports.

Step 1   Attach a configured RG to the ADSL line. (For an RG configuration, see Configuring Ericsson DSL Equipment, page C-1.)

Step 2   Choose **Node > Shelf1 > Slot1:IPADSL Port**, and click the **ADSL Port** tab.

Step 3   Click **Assign Profile** (bottom of screen).

Step 4   From the menu, choose **Profile ADSL2** for the Ericsson 340dp RG, or **ADSL2+** for the Linksys WAG54GP2 RG or another ADSL2+ RG.

Step 5   Click **OK**.

Note   ADSL line configuration cannot be changed unless the port is locked (deactivated). After changes are made, the port needs to be unlocked in order to activate it.

Step 6   Click the ADSL line again to highlight it, then click to unlock and activate the port.

Note   The DSL or Link light on the ADSL RG should light up and stay on. Also, the Port LED on the IPADSL3A card should light up, to show that the line is active. To see the downstream and upstream bit rates once the port is activated, choose the **ADSL Port** menu.

Configuring ATM PVCs and Assigning Them to ADSL Ports

You need to create three permanent virtual circuits (PVCs) and assign to them to ADSL ports (DSL lines). A PVC pair must be created for each service: voice, video, and data.

Do the following to create ATM PVCs and assign them to ADSL ports.

Step 1   Create the PVC to be used for the video service.

a.   In the Physical View window, double-click a DSLAM to configure.

b.   Click the **Provisioning** tab.

c.   Choose **Node > Shelf1 > Slot1 > ATM VC**.

The ATM VC window appears.

d.   Click the **Add** button at the bottom of the window.

e.   From the list, select the ports to which to assign the PVC.

Tip   To select multiple ports, click the first port, hold the shift key down, and click the last port.

f. Confirm or enter the following:

Parameter	Setting
VPI	8
VCI	59
CoS	N/A[1]
Connection Type	PVC
PPPoA to PPPoE Conversion	Disabled
Multiplex Method	LLC

1. Not applicable to UTStarcom AN-2000 B820 (not ATM).

g. Click **Apply**.

Step 2   Create the data PVC and assign it to a DSL line.

a. Choose **Node > Shelf1 > Slot1 > ATM VC**.

The ATM VC window appears.

b. Click the **Add** button at the bottom of the window.

c. From the list, select the ports to which to assign the PVC.

d. Confirm or enter the following:

Parameter	Setting
VPI	8
VCI	35
CoS	N/A[1]
Connection Type	PVC
PPPoA to PPPoE Conversion	Disabled
Multiplex Method	LLC

1. Not applicable to UTStarcom AN-2000 B820 (not ATM).

e. Click **Apply**.

Step 3   Create the voice PVC and assign it to a DSL line.

a. Choose **Node > Shelf1 > Slot1 > ATM VC**.

The ATM VC window appears.

b. Click the **Add** button (bottom).

c. From the list, select the ports to which to assign the PVC.

d. Confirm or enter the following:

Parameter	Setting
VPI	0
VCI	51
CoS	N/A[1]
Connection Type	PVC
PPPoA to PPPoE Conversion	Disabled
Multiplex Method	LLC

1. Not applicable to UTStarcom AN-2000 B820 (not ATM).

e. Click **Apply**.

Step 4 Click the **Configuration** tab and choose **Save** from the drop-down menu.

Note CoS (UBR, CBR, VBR) does not apply to this DSLAM. Instead, Ethernet QoS must be used.

Note The PVCs created on the DSLAM match the PVCs created on the RGs (residential gateways, ADSL modems, or home access gateways). (For an RG configuration, see Configuring Ericsson DSL Equipment, page C-1.)

Tip In order to view the amount of data received by each PVC, and whether any data is being dropped, choose **Node > Shelf1 > Slot1** and click the **Performance** tab (bottom of screen). Then click the **Bridge** tab (top of screen).

Configuring the Number of MAC Addresses Supported per Port

Do the following to configure the number of MAC addresses that can be supported by a specific PVC on a line port.

Step 1   Click the **Provisioning** tab.

Step 2   Choose **Node > Shelf1 > Slot1 > ADSL Port**.

Step 3   Click the **MAC Address Per Port** tab.

Step 4   Choose the number of MAC addresses for each PVC/ADSL line port.

Step 5   Click the port to be configured.

Step 6   Click **Modify**.

Step 7   From the drop-down list, choose four MAC addresses per port.

Step 8   Click **Apply**.

Configuring the Port Label Used for DHCP Option 82

If DHCP Option 82 is used to add client information to the DHCP request, you must assign each port a port label that is a unique identifier.

Do the following to configure the port label used for DHCP Option 82.

Step 1   Click the **Provisioning** tab.

Step 2   Choose **Node > Shelf1 > Slot1 > ADSL Port**.

Step 3   Click the **Port Label** tab.

Step 4   Choose **Port 1**, then click **Modify**.

Step 5   Enter a label that identifies the DSLAM, Slot, and ADSL Port Number.

Note   You can enter any string for the port label. The port label is used by the DHCP server to identify the port and user uniquely.

Step 6   Click **Apply**.

Step 7   Choose the next port, then proceed as in Step 2 through Step 6.

Step 8   Repeat Step 7 for each port.

Step 9   Click the **Configuration** tab and choose **Save** from the drop-down menu.

Creating VLAN-to-PVC Mappings for Voice, Video, and Data

Each VLAN that enters the DSLAM through the GE trunk ports must be mapped to a PVC in order for the data to be sent over the ADSL port to the RG. Conversely, PVCs that carry voice, video, and data traffic from the RG to the DSLAM must be mapped to VLANs before the data can be sent out the GE ports of the DSLAM to the AR.

Do the following to create VLAN-to-PVC mappings for voice, video, and data.

Step 1   Create the VLAN-to-PVC mapping for the video service.

   a.   Click the **Provisioning** tab.

   b.   Choose **Node > Shelf1 > Slot1 > VLANs**.

   c.   Click the **VLAN** tab.

   d.   Click **Add** and confirm or enter the following:

Parameter	Setting
VLAN ID	100
User Isolation	Disabled
VLAN Name	VideoVlan100
Tagged Ports	WAN Only
Untagged Ports	01:08:59, 02:08:59, 03:08:59, and so on[1]

1. Select the PVC port pairs that apply for that VLAN.

   e.   Click **Apply**.

Step 2   Create the VLAN-to-PVC mapping for the voice service.

   a.   Proceed as in Step 1a through Step 1c, but make the following changes:

     Set **VLAN ID** to **200**.

     Set **VLAN Name** to **VoiceVlan200**.

     Set **Untagged Ports** to **01:00:51**. (Select the PVC port pairs that apply for that VLAN.)

     Set **Tagged Ports** to **WAN**.

   b.   Click **Apply**.

Step 3   Create a VLAN-to-PVC mapping for the data service. In this case, a unique VLAN is assigned to each ADSL port (user) for the data PVC, which is 8:35.

   a.   Create a data VLAN for User 1. Proceed as in Step 1a through Step 1c, but make the following changes:

     Set **VLAN ID** to **500**.

     Set **VLAN Name** to **DataVlan500**.

     Set **Untagged Ports** to **01:08:35**. (Select the PVC port pairs that apply for that VLAN.)

   b.   Click **Apply**.

c.   Create a data VLAN for User 2. Proceed as in Step 3a through Step 3b, but make the following changes:

Set **VLAN ID** to **501**.

Set **VLAN Name** to **DataVlan501**.

Set **Untagged Ports** to **02:08:35**.

d.   Click **Apply**.

e.   Create a data VLAN for User 3. Proceed as in Step 3a through Step 3b, but make the following changes:

Set **VLAN ID** to **502**.

Set **VLAN Name** to **DataVlan502**.

Set **Untagged Ports** to **03:08:35**. (Select the PVC port pairs that apply for that VLAN.)

f.   Click **Apply**.

> ✎
> **Note**   The hub-and-spoke topology calls for a unique data VLAN per ADSL port line (user or subscriber). The valid VLAN range for the test bed was 500–1000. For the purpose of testing, a unique user VLAN was configured per user, as shown above. However, in an actual customer deployment, these configurations can be automated by means of a script.

Step 4   Check the ingress rules for the VLANs.

a.   Choose **Node > Shelf1 > Slot1 > VLANs**.

b.   Click the **Ingress Rule** tab.

c.   Confirm that **Admit All VLANs** is shown for each port.

> ✎
> **Note**   If **Admit All VLANs** is not selected, then the STB was unable to get a DHCP address. UTStarcom recommends that Select All VLANs be used, as this is the default.

Step 5   Check the VLAN untag settings.

a.   Choose **Node > Shelf1 > Slot1 > VLANs**.

b.   Click the **VLAN Untag** tab.

All port VLAN pairs should be shown. This is because communication over the DSL line is VLAN untagged.

> ⚠
> **Caution**   Do not change the default configuration.

> ✎
> **Note**   If VLAN tagging is enabled and an Ericsson HAG is being used with an Amino STB, the video service cannot initiate.

Verifying the Access List Configuration on the DSLAM

Do the following to verify the configuration of access lists on the DSLAM.

Step 1 Click the **Provisioning** tab.

Step 2 Choose **Node > Shelf1 > Slot1 > Access List**.

Step 3 Confirm that all line card DSL ports and PVCs defined for those ports are shown. The Inbound and Outbound Rules column should be blank.

> **Note** No inbound or outbound rules were defined for solution testing.

Configuring QoS for the IPADSL3A Line Cards

Do the following to configure QoS for the IPADSL3A line cards.

Step 1 Configure packet priority.

  a. Click the **Provisioning** tab.

  b. Choose **Node > Shelf1 > Slot1 > QoS**.

  c. Click **Packet Priority** tab.

  d. Confirm that all of the Port and PVCs numbers are shown on the left side of the screen, and that the Assigned rule Index field on the right side of the screen is blank.

Step 2 Configure port-based priority.

  a. Choose **Node > Shelf1 > Slot1 > QoS**.

  b. Click the **Port-Based Priority** tab.

  c. Assign priority based on the service. Available priorities are 7–0, with 7 being the highest.

Step 3 Assign a priority to the voice service.

  a. Click **1-0-51**. (This number translates to DSL line number 1, voice ADSL port/PVC pair.)

  b. Click **Edit**.

  c. From the drop-down menu, select priority **7**.

  d. Click **OK**.

  e. Repeat Step 3a through Step 3d for each voice ADSL port/ PVC pair, making changes as noted below.

Parameter	Setting
2-0-51[1]	Priority 7
3-0-51[2]	

1. DSL line 2 voice/PVC pair.
2. DSL line 3 voice/PVC pair.

Step 4   Assign a priority to the video service.

a. Repeat Step 3a through Step 3d for each video ADSL port/ PVC pair, making changes as noted below.

Parameter	Setting
1-8-59[1]	Priority 4
2-8-59[2]	
3-8-59[3]	

1. DSL line 1 video/PVC pair.

2. DSL line 2 video/PVC pair.

3. DSL line 3 video/PVC pair.

Step 5   Assign a priority to the data service.

a. Repeat Step 3a through Step 3d for each data ADSL port/ PVC pair, making changes as noted below.

Parameter	Setting
1-8-35[1]	Priority 0
2-8-35[2]	
3-8-35[3]	

1. DSL line 1 data/PVC pair.

2. DSL line 2 data/PVC pair.

3. DSL line 3 data/PVC pair.

Step 6   Click the **Configuration** tab and choose **Save** from the drop-down menu.

Step 7   Confirm that 802.1p tags are not regenerated (re-marked).

a. Choose **Node > Shelf1 > Slot1 > QoS**.

b. Click the **802.1p** tab.

c. Confirm that **Regenerate 802.1p Tag for WAN Port** is **Disabled**.

Note   The aggregation router connects to the GE trunk ports from the DSLAM, and re-marks the 802.1p values for any data exiting the DSLAM. Therefore, it is not necessary for the DSLAM itself to re-mark 802.1p values.

Saving the Configuration

Do the following to save all configuration changes.

Step 1   Click the **Configuration** tab and choose **Save** from the drop-down menu.