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AM31/AM35 Network Element Configuration Guide

Document No. 0095-00004 Issue 2H



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PREFACE

Purpose

This guide provides the necessary information for an installer to configure the AM31/AM35 network elements at a field site and also later provision them on the Director. This guide also explains how using the Director, the installer can configure an ADSL profile on a subscriber's line and create an ATM cross-connect from the subscribers line into the core data network. For additional information on the setup procedures, refer to the user guides specified in the reference section at the end of this document.

Important note:

The router connected to the AM31/AM35 must be configured accordingly for the correct operation of the ADSL connection.

Where necessary, this guide refers to related product manuals. The table below shows other documentation available for the NEC Access solution.

Document Number	Document Title
ADOI-1137	AM31 Multi-Service Access Platform Access Subrack & Associated Units Installation & Operation Manual
ADOI-1142	AM31 Multi-Service Access Platform Filter Subrack & Associated Units Installation & Operation Manual (7.5 Rack Unit)
ADOI-1140	AM34 Multi-Service Access Platform Access Subrack & Associated Units Installation & Operation Manual
ADOI-1141	AM35 Multi-Service Access Platform Access Multiplexer Installation & Operation Manual
202-066-2-HA-03	Director Service Management System User's Guide Director Service Management System System Administrator's Guide
202-066-2-HA-04	Director Integrated Network Management System User's Guide Director Integrated Network Management System System Administrator's Guide

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Section 1

LCT Configuration of AM31/AM35 Network Elements

This section gives step-by-step instructions on how to configure the IP address of the AM31/AM35 network element so that they can be placed on a network.

Connecting to the Serial Port of an AM31/AM35

1. Using a serial cable, connect a laptop/PC via its serial port to the IGU/BEU cards.
2. Run a terminal emulation program such as Windows HyperTerminal on the laptop/PC. Configure HyperTerminal as follows:

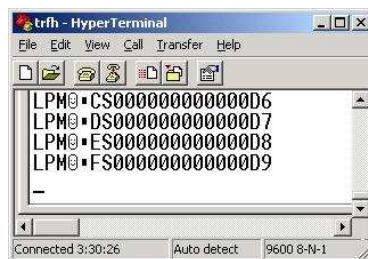
Port Settings	Value
Emulation	VT100
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

Configuring the Network Settings of an IGU-8E1-IMA/IGU-A155-X5 (AM31/AM35) – Inband Management

1. Connect a local PC to the serial port of the IGU-8E1-IMA/IGU-A155-X5 card and start a HyperTerminal session.
2. Once connected press **Enter** to display the “**Password:**” prompt.
3. Enter a valid password. The factory default password is: **adsligu**
4. The following message will then appear:
Welcome to the NEC CuproPlus Integrated Gateway Unit
5. Press **Enter** to see a full list of commands available.
6. Type the following commands on the following page to configure the IGU:

Note:

As you type in the commands below, there may be some messages that appear in the HyperTerminal session such as:



Ignore these messages and keep typing the commands.

router default_path=2	Configures the management to be Inband.
router atm_vcc=1/32,604	Configures Inband ATM VCC where 1 is the VPI, 32 is the VCI and 604 is the default Telstra inband management bandwidth in cells per second.
ip n.n.n.n	Configures the IP address of the IGU where n.n.n.n is the IP address of the AM31/AM35.
gateway n.n.n.n	Configures the Gateway for the IGU The Gateway default IP address n.n.n.n to configure is 255.255.255.255
router atm_mask=n.n.n.n	Configures the Subnet Mask where n.n.n.n is the subnet mask of the IP address. Default = 255.255.255.255 for the AM35 and, Default = 255.255.255.248 for the AM31.
router enet_mask=0.0.0.0	Disables Outband Ethernet port.
mib ext igu set trunk type 1 sdh	Configure IGU for SDH framing
router print	Confirm settings.
quit&restart_now!	A reboot is needed for changes to come into effect.

7. After rebooting, (you will need to press **Enter** and then enter in the password again) check the settings:
router print
8. Make sure that the connection is up by pinging the **INMS server**:
ping n.n.n.n
9. For **HUB** – If the ping command fails, check the ATM link from HUB to BRAS.
10. For **Subtended** system – If the ping fails, check the Cross-Connect from the HUB LTU to the Subtended IGU. Also check the HUB F4/F5 flow to BRAS.
11. A typical setup would look like:

Note:

When an **AM31** IGU is **replaced**, the IP Address does NOT need to be re-configured. The IP address will be retrieved from the memory in the subrack.

However, if an **AM35** unit is **replaced**, steps 1-8 must be repeated on the replacement AM35.

Configuring the Network Settings of a BEU (AM31)

1. Connect local PC to the serial port of the BEU and start a HyperTerminal session.
2. Once connected press **Enter** to display the “**Password:**” prompt.
3. Enter a valid password. The factory default password is: **adsligu**
4. The following message will then appear:
Welcome to the NEC Integrated Gateway Unit
5. Type ? <Enter> to see a full list of commands available.
6. Type the following commands to configure the BEU:

ip n.n.n.n	Configures the IP address of the BEU where n.n.n.n is the IP address of the AM31. The IP address should be on the same subnet as the IGU that is connected to this BEU.
shelf n	Configure the subrack number of the BEU. Valid numbers are from 2 – 5. Usual convention is that BEU connected to expansion bus connector “A” is Shelf Id 2, B – 3, C – 4 , D – 5.
quit&restart_now!	A reboot is needed for changes to come into effect.

7. After rebooting, (you will need to press Enter and then enter in the password again) check the settings:
ip <Enter>
shelf <Enter>
8. Make sure that the connection is up by pinging the INMS server:
ping n.n.n.n

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Section 2

Director Configuration of AM31/AM35 NE

This section gives step-by-step instructions on setting up the INMS client software so that it displays the network elements in the AM31/AM35 systems. This section also gives instructions on how to configure a subscribers line ADSL profile using the INMS client software.

DIRECTOR INTEGRATED NETWORK MANAGEMENT SYSTEM CLIENT

This section gives step-by-step instructions to setup the INMS client software. It also shows how to configure different network views.

Configuring Director INMS Client Software

The Director (INMS) Integrated Network Management System Client software provides centralized management of the Access Network and Server Management Network. Provision for Operation, Administration Maintenance and Provisioning (OAM&P) of the equipment including distribution switches and customer premises equipment is supported in the Director INMS.

Prior to INMS configuration, the Director INMS server processes must be running and there must be a network connection between the Director Client PC and Director Sun Server Workstation.

The following steps describe how to configure the Director-INMS Client software.

1. Start up the Director-INMS client software on the Director Client PC:
Start->Programs->Director-INMS->Director-INMS Client

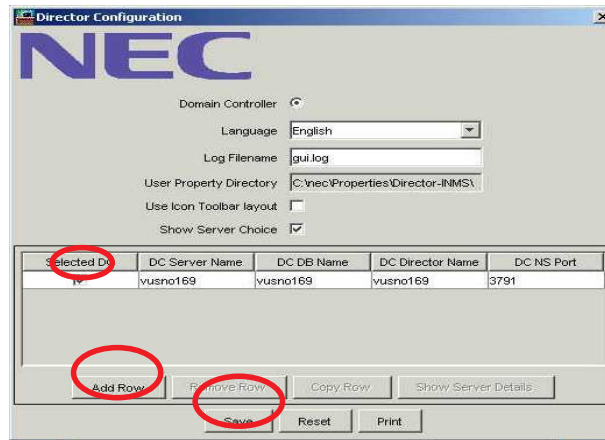


First time only. Click the **Configuration** button at the Login window to bring up the Configuration Window. Check the “Domain Controller” box and specify the Director-DC Server that you want to connect to then, click “Save”.

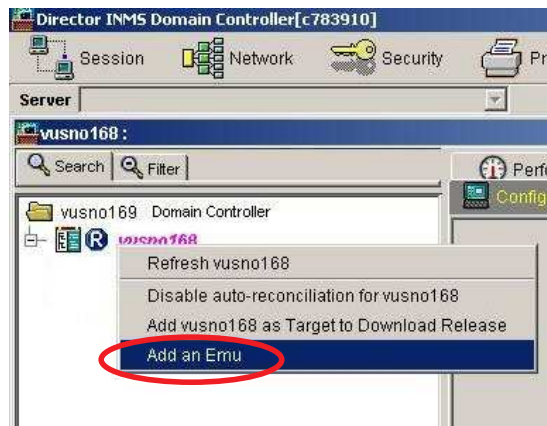
Note:

If additional Director-DC servers are required, click “Add Row” and configure another DC server.





2. Proceed to login screen and type in User Name and Password.
3. In the network browser section of Director-INMS, you will see the Director-Server name (in the screen shot below, the server name is *vusno168*). An Element Management Unit (EMU) needs to be added to the server. Right-Click on the server name and select “**Add an Emu**”. Give an appropriate name to the EMU for example: **NSW**. The **Location** and **Description** fields are optional. Click **Save** to save the settings.

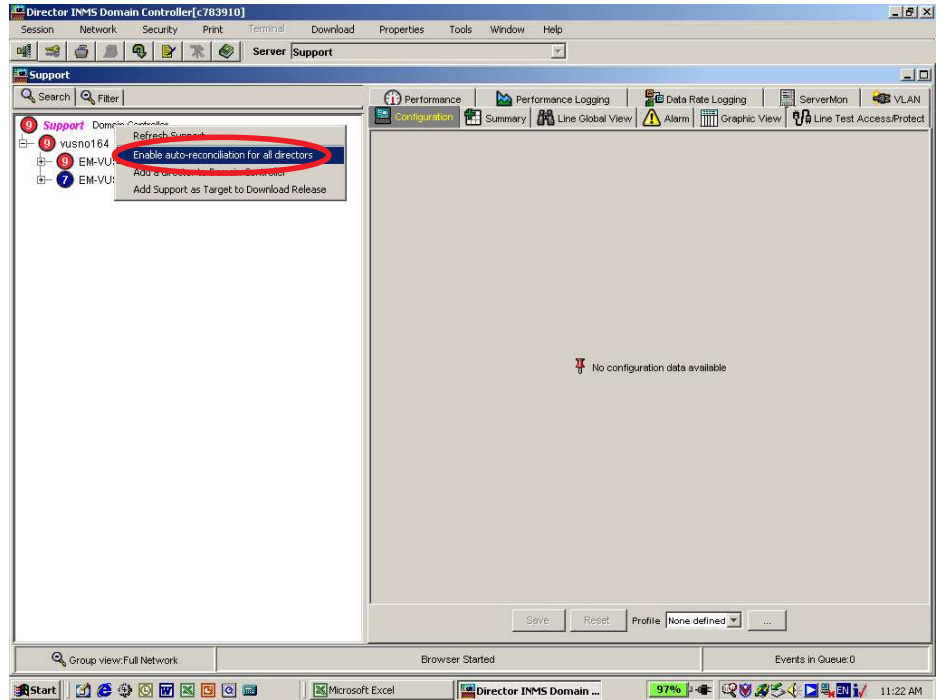


When adding an EM the following parameters need to be entered:

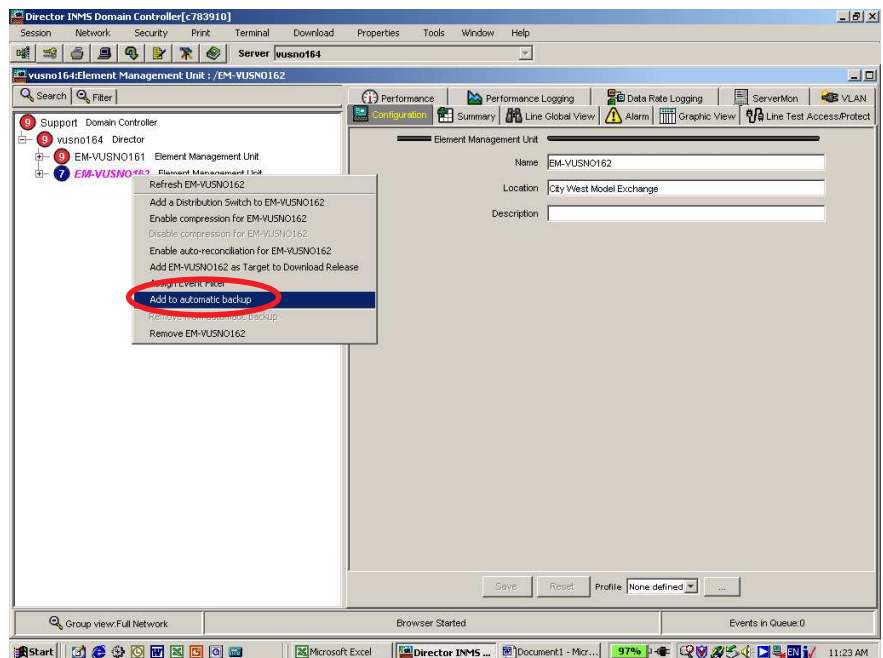
- Name:** A name describing the EM (Spaces are NOT allowed in the Name).
Follow the format of EM-vusnoXXX (server name)
- Location:** The location of the EM (Optional).
- Description:** Some more additional information about the EM.
This field only supports a maximum of 40 characters.

4. Enable auto-reconciliation for all Directors (once off).

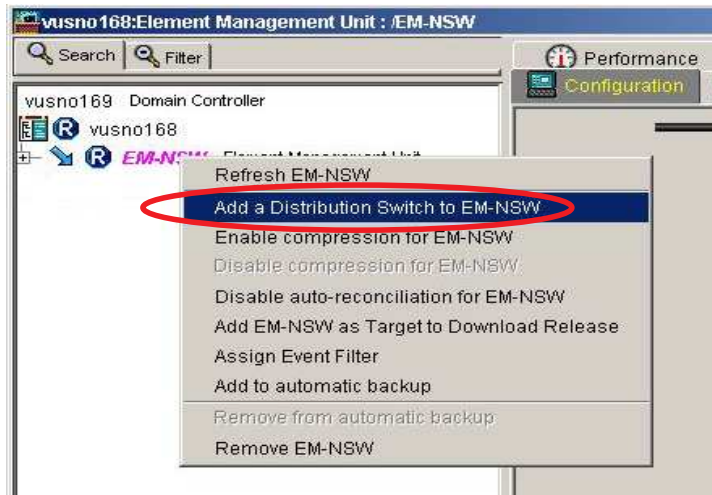
Right click on Domain Controller and select “Enable auto-reconciliation for all directors”



5. Enable Automatic backup for the EM.
Right-click on the EM and select the **Add to automatic backup** option.



6. A Distribution Switch (DS) will need to be added to the EMU. Right-Click on the EMU and select “**Add a Distribution Switch to EM-XXX**”. A DS can consist of 1 x IGU or it can have 1 x IGU and up to 4 BEU/Expansion Units.



Start Address	End Address	Start Port	End Port
10.5.40.18	10.5.40.18	161	161

When adding a DS the following parameters need to be entered:

Name:	A name describing the DS (Spaces are NOT allowed in the Name).
Location:	The location of the DS.
Description:	Some more additional information about the DS . If Subtended, enter the HUB details in this field, follow the format Sub QXXXXEXM SR-X UN-X IF-X,Y. This field only supports a maximum of 40 characters.
Start Address:	IP Address of the IGU.
End Address:	IP Address of the IGU “or” IP Address of the last BEU/Expansion Unit. A total of 5 IP addresses should be reserved for AM31.

AM35 start and end IP address are the same.

Start Port: Standard SNMP UDP Port number: 161.

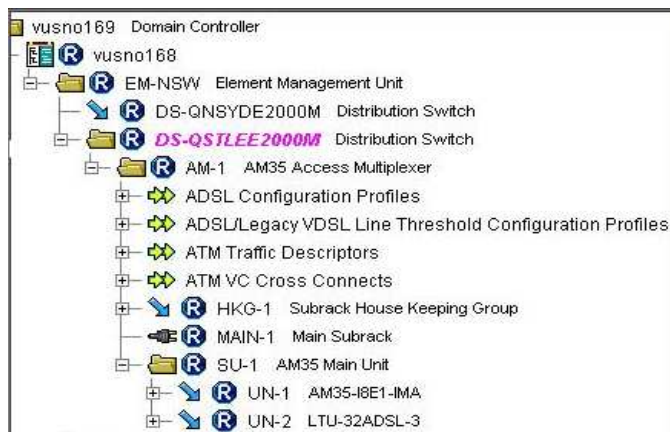
End Port: Standard SNMP UDP Port number: 161.

Click **Save** to save the settings.

7. For Subtended sites, an Inband management cross-connect needs to be created at the Hub site using SMS-SMC. The Sub will not be discovered unless this cross-connect is created. See Section 3 – “Create cross-connect at AM31 Hub IMA IGU for AM31/AM35 inband management” for more details.
8. After the DS is added, the discovery process needs to be started so that the Director can see all the units in the DS on the networks.
Right click on the DS and select “ Start Discovery of DS-XXX”.



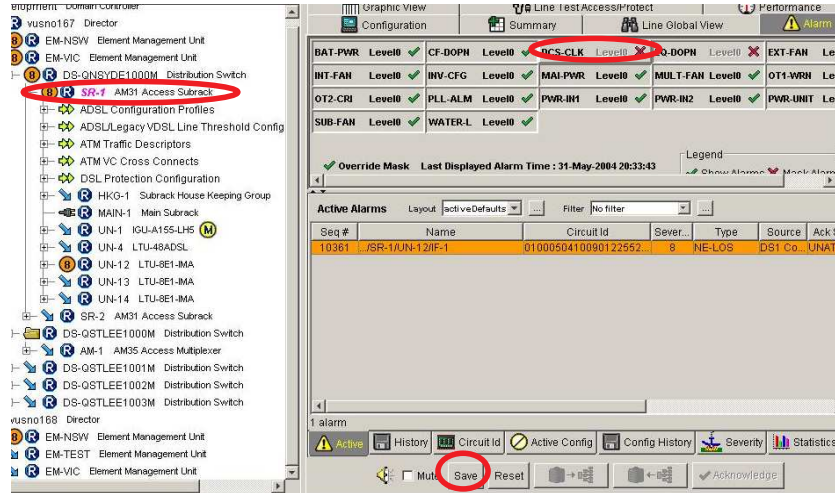
After the discovery process, all the elements (IGU/LTU cards) in the Subbracks can be seen in the Network Browser.



9. Check Firmware on NE. Refer to Section 7, Software Download section.

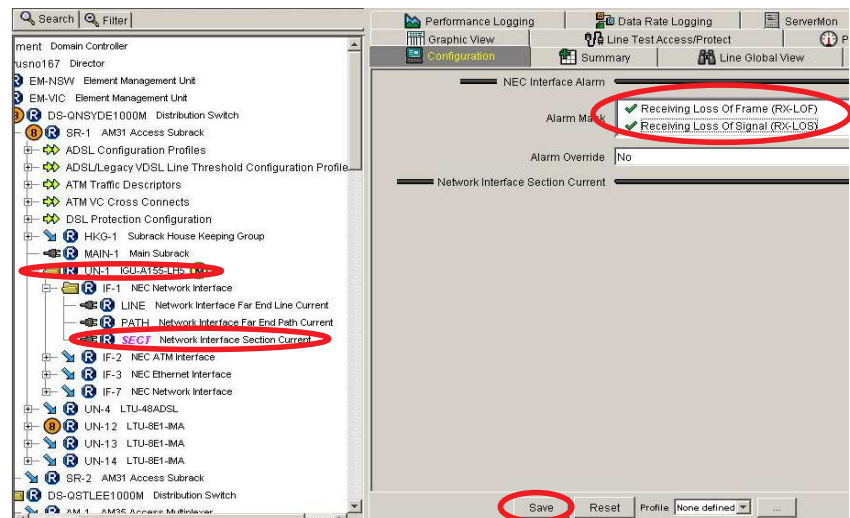
10. Masking the DCS Clock alarm.

Select **SR-1** and in the **Alarm Tab** select DCS-CLK and mask it
Press Save then Yes



11. Unmasking the Rx-LOF and Rx-LOS alarms.

Select **UN-1** expand it then select **IF-1 -> SECT**
Unmask **Rx-LOF** and **Rx-LOS** and click Save.



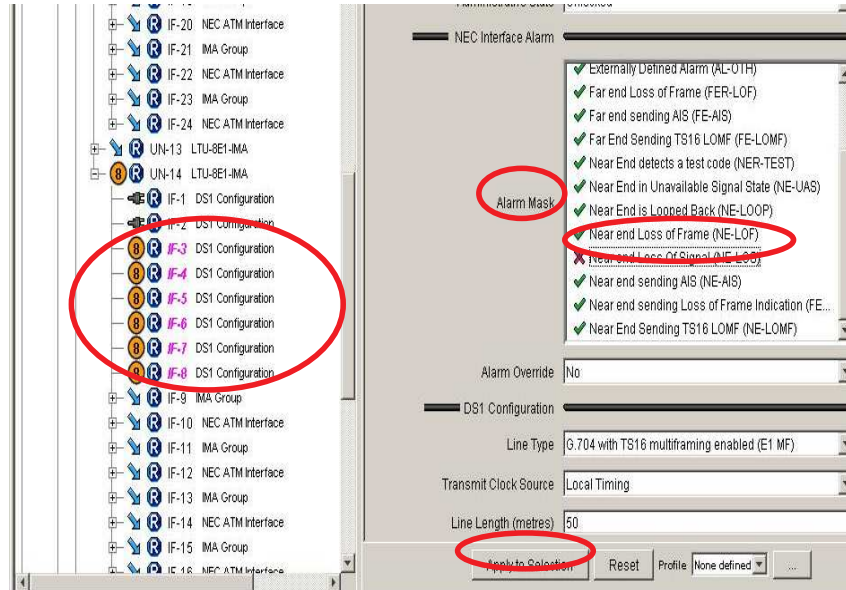
12. Masking NE-LOS alarms on unused IMA links.

Below is an example of how to mask the **NE-LOS** alarms on unused IMA Links of an LTU-8E1-IMA unit.

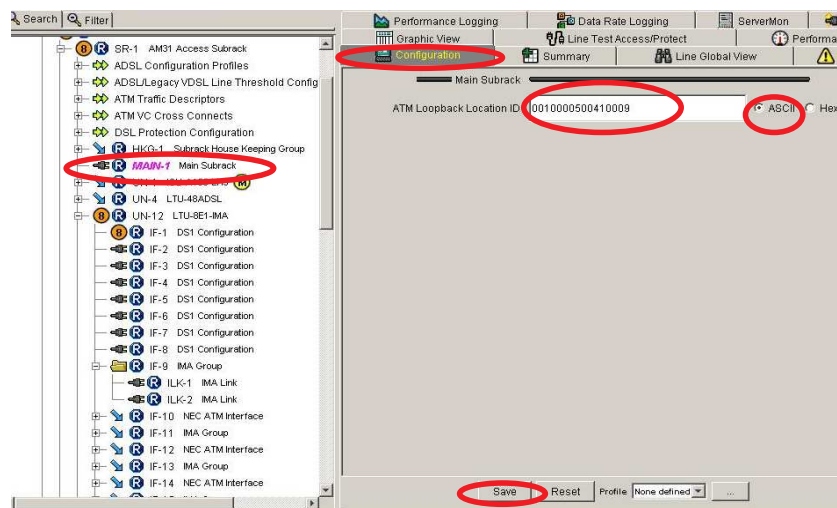
It is assumed that IMA Links 1 and 2 have no NE-LOS but IMA Links 3-8 have the NE-LOS alarm.

Choose Link 3-8 by holding the “Shift” key down to select IF-3 to IF-8.
In the Configuration Tab, select the “Near end Loss of Signal (NE-

LOS) in Alarm Mask window and click it so that it changes from ✓ to ✗. Then, click the “Apply to Selection” button to save the changes.

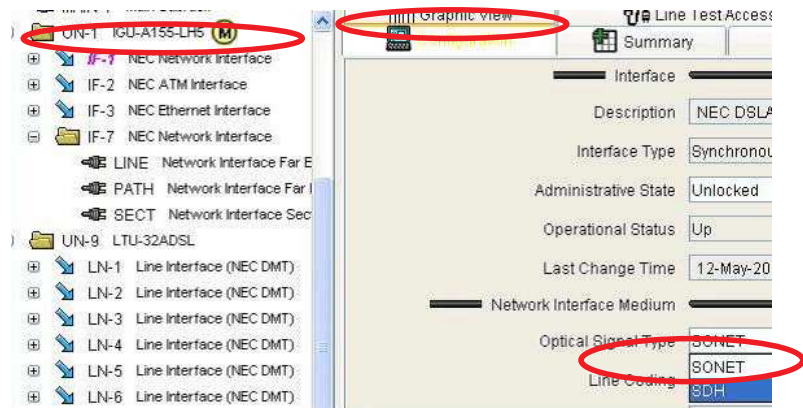


13. Set the ATM Loopback Location ID for Distribution Switch card.
In the network browser section of Director-INMS, click on the **MAIN-1** heading.
On the right-hand side, select the **Configuration** tab.
Select **ASCII** for the type of ATM Loopback Location ID.
Enter in the ATM Loopback Location ID. Pad the IP Address out to 4 bits ie. IP Address of NE is 10.5.41.9 will be 0010000500410009
Click the **Save** button at the bottom when finished.



14. Set the Network Interface Medium to **SDH** on IGU-A155-5.

By default, this is set to **SONET**. To set in to **SDH**, Under Network Browser, select IF-1 NEC Network Interface under UN-1 IGU-A155. In the configuration tab, select **Line Coding** to be **SDH**.

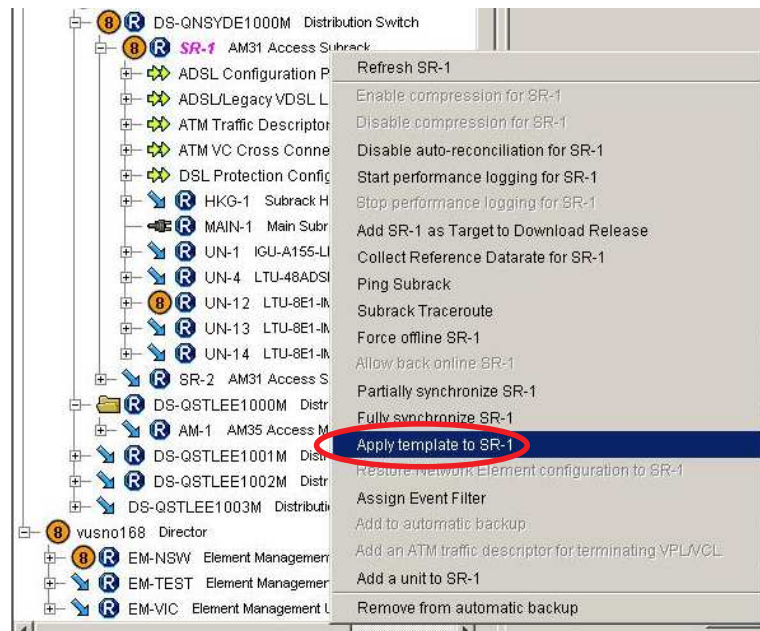


Applying line profile templates to Distribution Switches

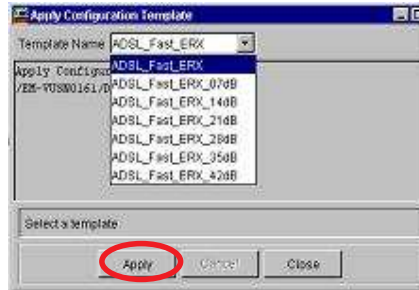
1. In the Director client software, under network browser select the Subrack, right click and select “Apply template to SR-1”. Select the appropriate profile template according to the NE type;

Dedicated HUB:	No profiles required as no ADSL services. Only used to subten
HUB:	Select ADSL_Fast_ERX_0dB
AM35:	Fibre Fed DA's use ADSL_Fast_ERX_0dB In Exchange Fed DA's apply template based on attenuation required ADSL_Fast_ERX_Xdb.

2. In the **destination** Distribution Switch, right-click on the Distribution Switch Subrack (AM31) or (AM35) and select “**Apply Template to SR-X**”, “**Apply Template to AM-1**” respectively.



3. Select the template created in Step 3 and then click the **Apply** button. The new Distribution Switch will now have the ADSL Line Profiles.

**Note:**

AM31 Dedicated HUBS – There are no profiles required to be downloaded.

Applying PSD Masks

The new start DSLAM AM31 or AM35 must only have one Mid point injection PSD mask profile built on the NE. this is applied to all DSL ports on the NE. The implementation of the PSD mask solution for managing mid point injection is based on a single PSD mask value for the NE and not based on PSD mask values per port. So if the planning Brief states a 35dB attenuation is required, the xxxxx_35dB profiles are loaded onto the NE by the CDO, similarly if 37dB attenuation is required the xxxxxx_42dB profiles are loaded onto the NE etc. No other attenuation profiles are required to be loaded.

AM31 HUBS – Download “ADSL_FAST_Porfiles_0dB” Template

AM35 – For Fibre Fed DA, download “ADSL_Fast_Profiles_0dB” Template.

- For exchange Fed DA apply Template applicable based on attenuation required
- If 7db required download “ADSL_Fast_ERX_07dB” Template.
- If 14db required download “ADSL_Fast_ERX_14dB” Template.
- If 21db required download “ADSL_Fast_ERX_21dB” Template.
- If 28db required download “ADSL_Fast_ERX_28dB” Template.
- If 35db required download “ADSL_Fast_ERX_35dB” Template.
- If 42db required download “ADSL_Fast_ERX_42dB” Template.

Configure Different Network Views on Director-INMS

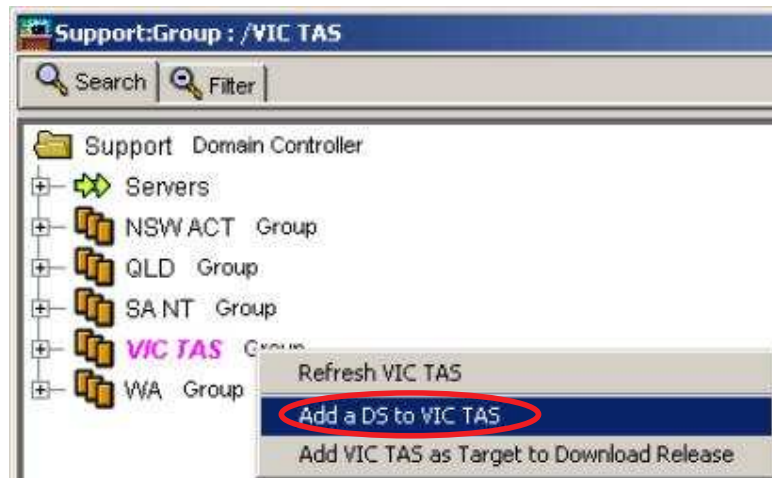
This section describes steps needed to provision different Network Views (i.e. Subtend View) on the Director-INMS. By default, Director-INMS is always on Full Network View.

Add DS to Subtend View

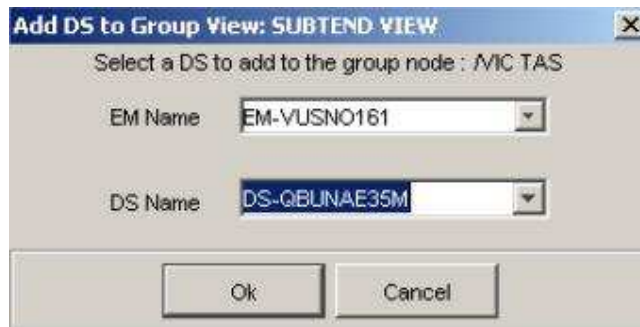
1. In the Network browser, select the director server and click Network -> Network Browser -> Subtend View. Subtend View window is displayed.



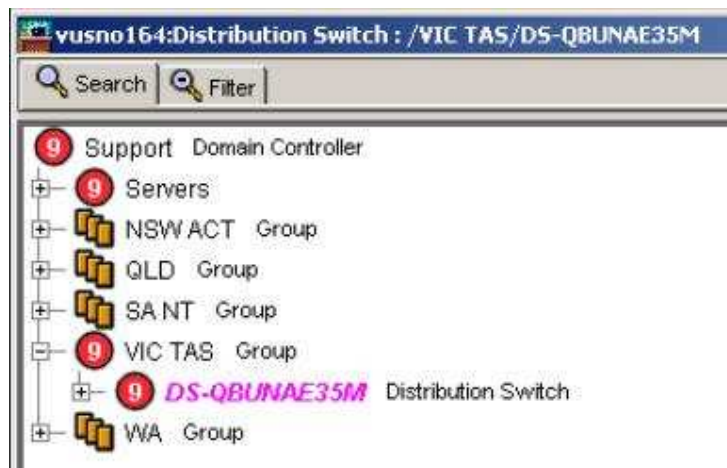
2. Select the Group. Right click and choose "Add a DS to XXX"..



3. Select the distribution switch (DS-), which will be added to the sub-group. Then, click "OK".



4. The DS will now be seen under the Group heading.



DIRECTOR SMS NETWORK RESOURCE CLIENT SOFTWARE

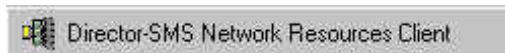
This section gives step-by-step instructions on how to configure the network elements using the SMS Network Resource client software.

Configuring Director-SMS Network Resource Client

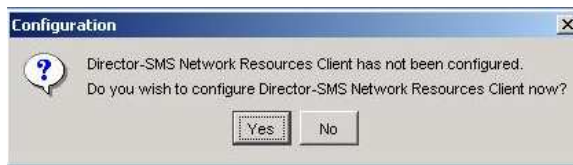
The Director SMS (Service Management System) Network Resource Client software is used to represent an overview of the network resources and an availability of its infrastructure in the DSLAM network.

The following steps describe how to configure the Director SMS Network resource Client software.

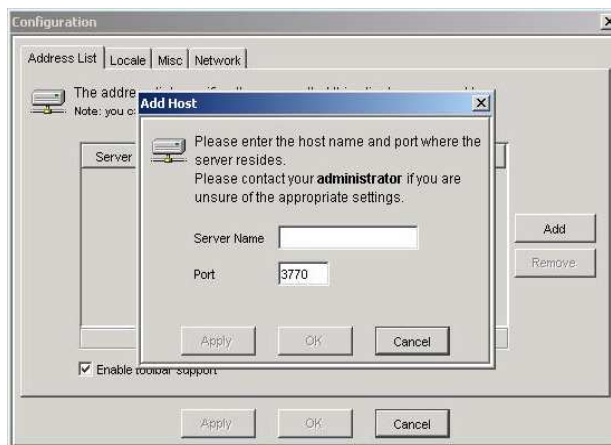
1. Start up the Director-SMS Network Resource client software on the Director Client PC:
Start->Programs->Director-SMS->Director-SMS Network Resources Client



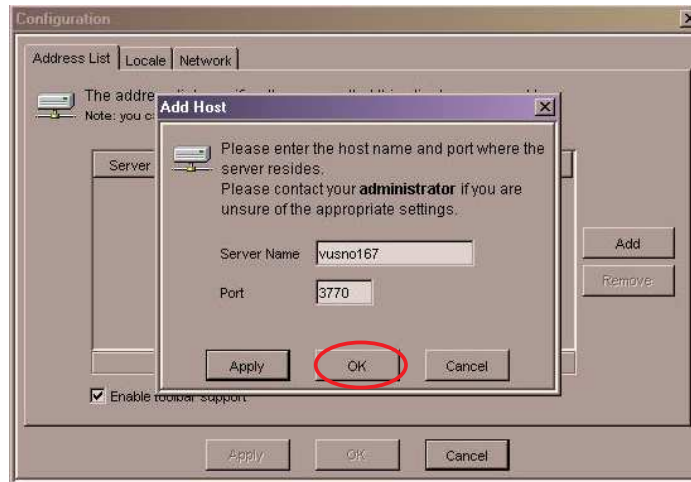
2. **First time only.** After start up the Director-SMS Network Resources Client, a message pop up asking you to configure the SMS client.



3. Click "Yes" and the "Configuration" window is displayed.



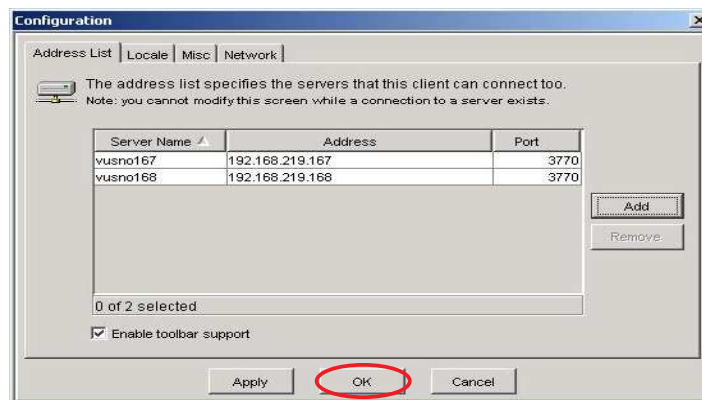
4. Enter in the Director Server name. The Port number is usually set to 3770 and click “OK”.



The server is added and click “OK”.

Note:

If other servers are required, click “Add” and enter another Server Name.



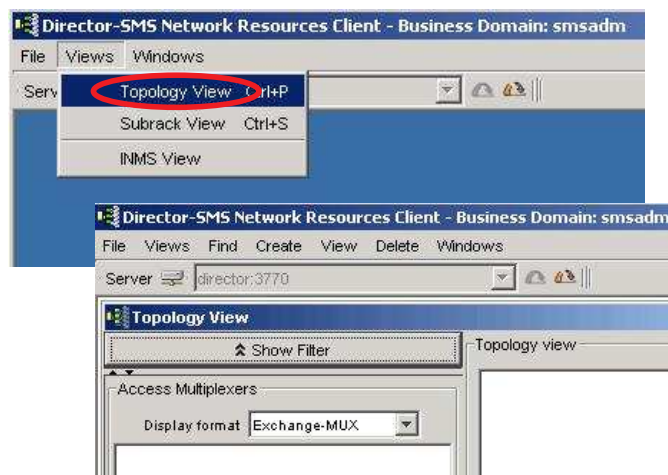
5. Click File-> Connect and proceed to login screen.



6. At the login screen, type in User Id and Password.

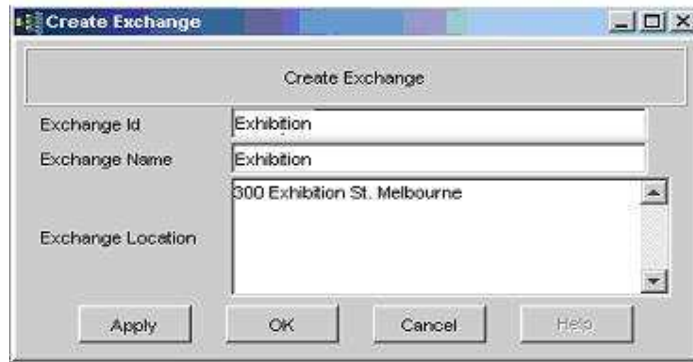


7. After the Director-SMS Network Resources Client application is displayed, click on Views->Topology View.
This will show a tree-type view of a particular DSLAM system.



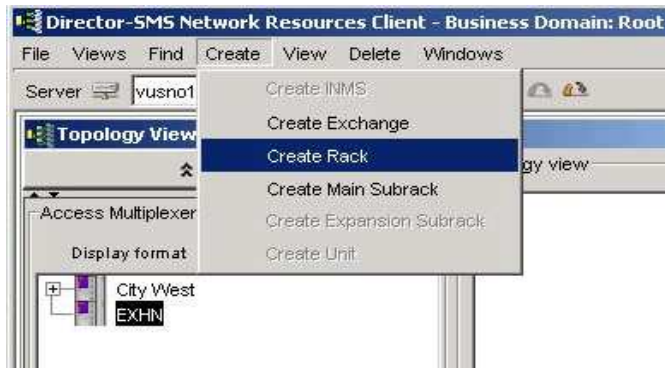
Creating an Exchange

1. From the top line menu, click on **Create-> Create Exchange**. This will create a logical exchange, which can consist of many DSLAM subracks. You will need to give the exchange an **Exchange ID**, **Exchange Name** and **Exchange Location**.

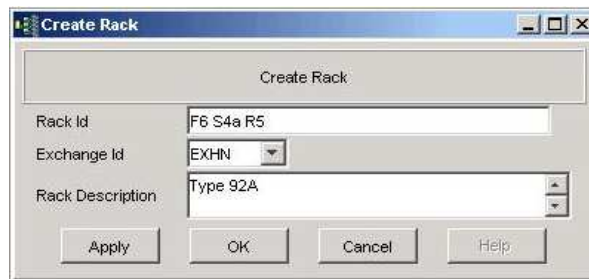


Creating a Rack (Optional)

1. Click on the exchange and select **Create->Rack** from the top line menu.



2. Give the Rack a **Rack ID**, select the **Exchange Id** where the Rack is located, and give a **description** of the Rack.

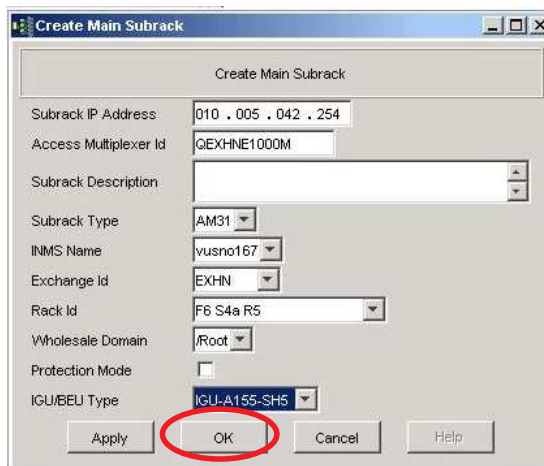
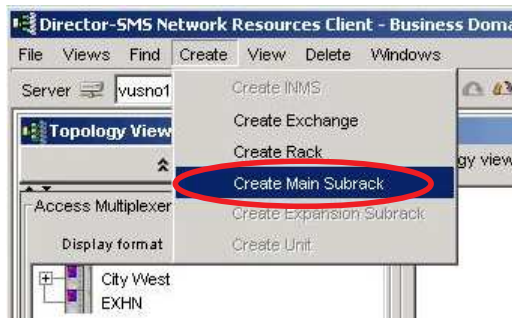


Creating and Activating a Main Subrack

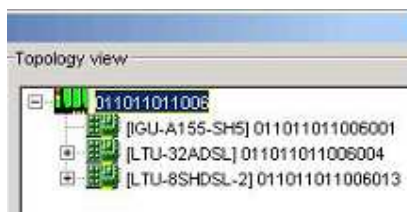
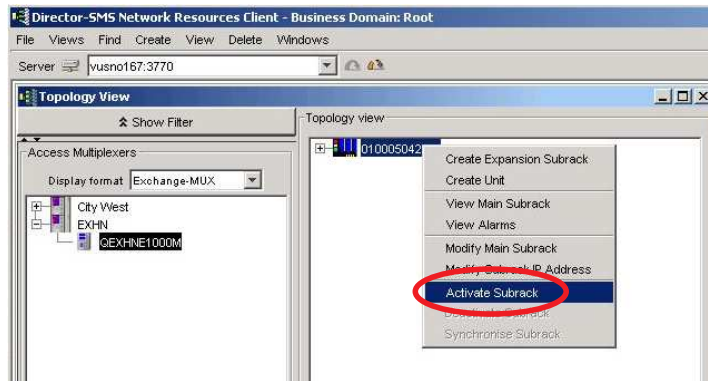
1. Click on the exchange and select **Create->Main Subrack** from the top line menu.

Enter in the following details:

Subrack IP Address:	The IP address configured in the IGU of the subrack.
Access Multiplexer Id:	This is the name of the Distribution Switch given to this particular DSLAM set in the Director-INMS software. This would be DS name given in Step 5 of section 2 - Configuring Director-INMS Client .
Subrack description:	More details about this particular subrack.
Subrack Type:	Select the type of subrack eg. AM31 Main, AM 35 Main.
INMS Name:	Name of the Director server.
Exchange Id:	Id of exchange, which the subrack belongs to.
Rack Id:	Id of rack.
Wholesale Domain:	Business domain.
Protection Mode:	For dual IGU/BEU (Telstra default is unchecked).
IGU/BEU Type:	Select the type of IGU or BEU eg. IGU-A155-SH-5.



2. On the right-hand side of the Topology View, Right-Click on the subrack and select “**Activate Subrack**”. The subrack should change colour from blue to green. The line cards in the subrack can also be seen.



DIRECTOR SMS SERVICE MANAGEMENT CLIENT SOFTWARE

This section gives step-by-step instructions to setup the SMS Service Management client software. This section also gives instructions to create template UBR services at different speeds. It also shows how to create a cross connect on a subscribers line.

Note:

This is normally done by XDM.

Configuring Director-SMS Service Management Client

The Director SMS (Service Management System) Service Management Client software is used to create ATM cross-connects from a subscribers line into the core data network.

The following steps describe how to configure Director SMS Service Management Client software.

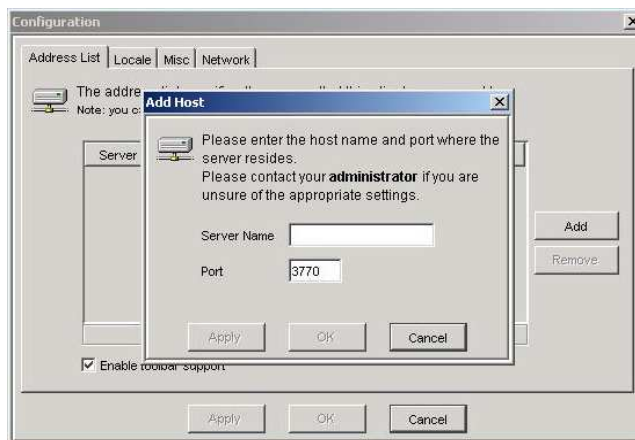
1. **Start up the Director-SMS Service Management client software on the Director Client PC:**
Start->Programs->Director-SMS->Director-SMS Service Management Client



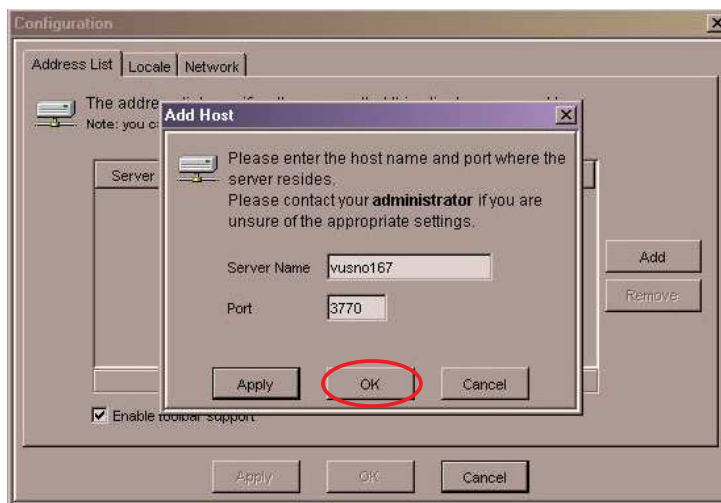
2. **First time only.** After start up the Director-SMS Network Resources Client, a message pop up asking you to configure the SMS client.



3. Click "Yes" and the "Configuration" window is displayed.



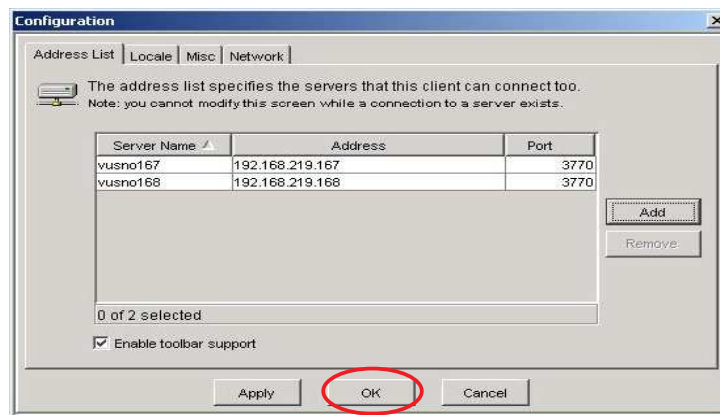
4. Enter in the Director Server name. The Port number is usually set to 3770 and click "OK".



5. The server is added and click "OK".

Note:

If other servers are required, click "Add" and enter another Server Name.



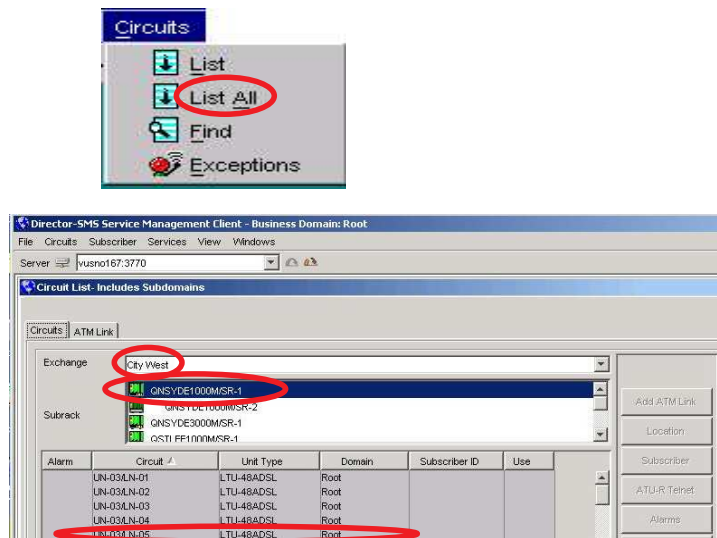
6. Click File-> Connect and proceed to login.



7. At the login screen, type in User Id and Password.



8. From the top line menu, click on **Circuits->List All**. This will list all the DSL lines in the current server:



9. From the “**Circuit List**” window, select an **Exchange**, and then click on a **Subrack** in that exchange. All the DSL lines in the subrack will be shown. The “**circuit**” column shows the slot number of the ADSL LTU card (eg. UN-03) and the line number of that card (eg. LN-05).

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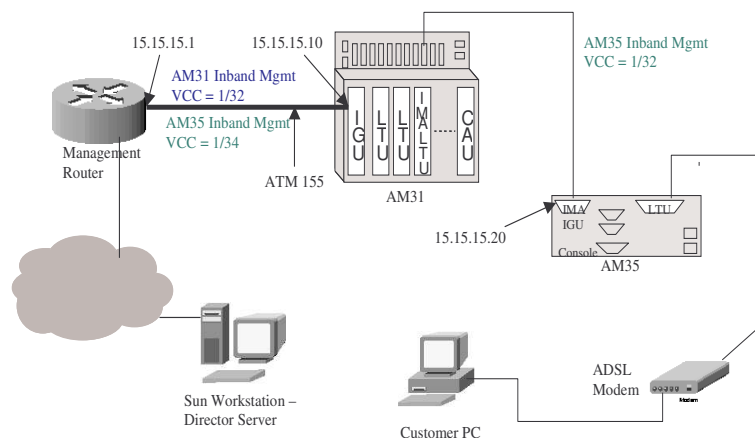
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Section 3

Adding a subtended AM31/AM35 with an IMA IGU

This section describes the steps needed to add a subtended AM31/AM35 with an IMA IGU. A typical connection of an AM31 with a subtended AM35 can be seen in Figure 1. As shown in the diagram, the AM31 ATM155 IGU has its own VCC for inband management on VPI/VC1 1/32. The AM35 IMA IGU uses a separate VCC (1/32 +2x, in increments of 2) for its inband management.

The **important** point is that the subtended AM35 (or AM31) management channel spans 2 ATM links: 1 from the Router to the AM31 and 1 from the AM31 to the AM35. So a **pvc** of 1/34 needs to be setup at the router **AND** a **cross connect** at the AM31 ATM155 IGU needs to be setup from the IGU (1/34) to the IMA LTU (1/32).



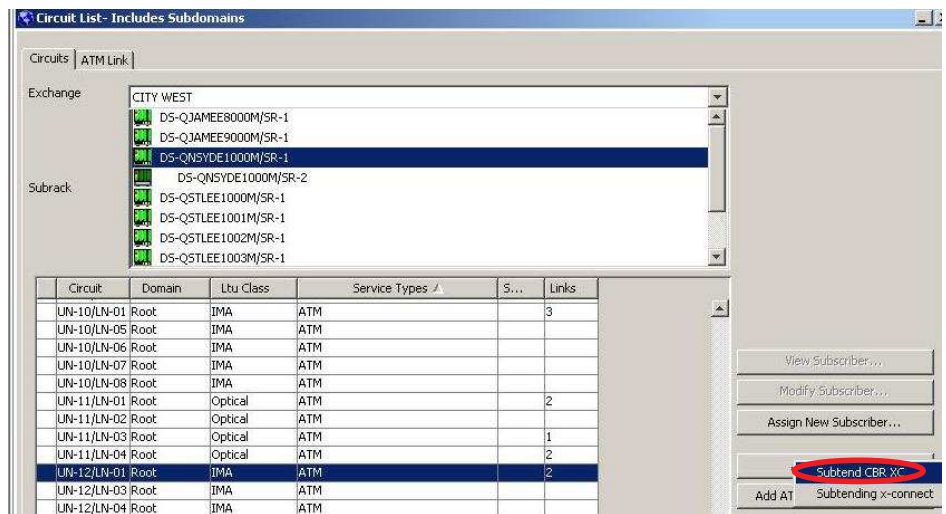
Example of a AM31 with a ATM155 IGU and IMA LTU which is connected to a subtended AM35 with IMA IGU and ADSL LTU.

The following assumptions are made with respect to configuring the subtended AM35:

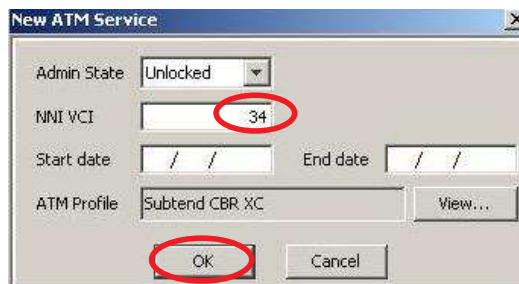
- All physical connections are made from the router to the AM31 to the AM35.
- The hub AM31 is already fully configured and can be seen in the Director software.
- Management for the AM35 is inband.
- The router is configured with a PVC for each core bandwidth VCC into the AM35.

Create cross-connect at AM31 Hub IMA IGU for AM31/AM35 inband management

1. Start up the Director-SMS Service Management client software as shown in Section 2, “Director SMS Service Management Client software”.
2. In the Circuit List, locate the LTU 8E1-IMA, which the AM31/AM35 Sub will be subtended from.
3. Select the first IMA link of an IMA Group on the LTU IMA, then click on the “Add ATM Link” button – choose “Subtend CBR XC”:

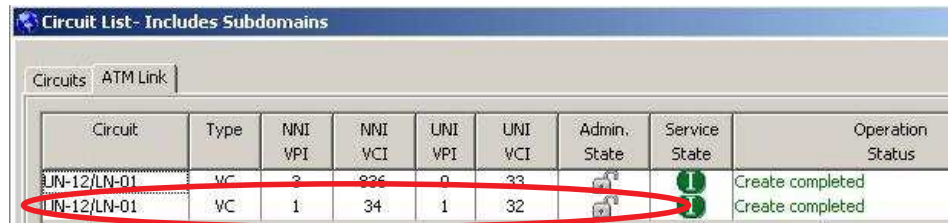


4. Enter in the NNI VCI for the management Cross Connect (the NNI VPI and UNI VPI/VCI is already configured). Click OK to create the cross-connect.



- From the “Circuit List” window, select the IMA link from the Circuit column and click on the “ATM Link” tab.

Make sure that the cross connect has been created successfully:



Circuit	Type	NNI VPI	NNI VCI	UNI VPI	UNI VCI	Admin. State	Service State	Operation Status
LN-12/LN-01	VC	3	336	0	33			Create completed
LN-12/LN-01	VC	1	34	1	32			Create completed

- Verify that the ATM End-to-End link is up by sending an end-to-end ATM Loopback cell. For instructions on how to do this, please go to **Section 9 – Troubleshooting**, Sub-section **ATM OAM Loopback – Director**.

Configure network settings of IMA IGU in the AM31/AM35 Sub via LCT

- Follow the steps in Section 1, “Configuring the Network settings of an IGU-8E1-IMA/IGU-A155-X5 (AM31/AM35) – Inband Management” to configure the IP address and inband management VCC of the IMA IGU in AM31/AM35 Sub.

Configure AM31/AM35 Sub NE via Director

- Follow the steps in Section 2, “Director-INMS Client software” to set up and discover the network elements in AM31/AM35 Sub on the Director-INMS client.
- Follow the steps in Section 2, “Director SMS Network Resource Client software” to set up and discover the network elements in AM31/AM35 Sub on the Director SMS-Network Resource Client.

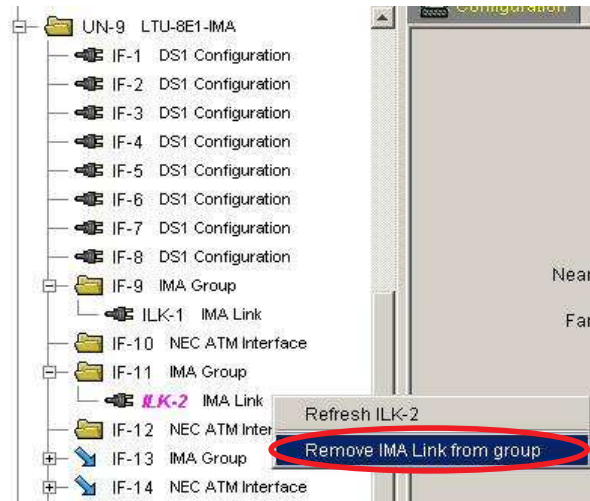
Configure IMA Group/Links on the IMA LTU in the AM31

- Start up the Director-INMS client software as shown in Section 2, “Director-INMS Client software”.
- In the network browser, locate the LTU-8E1-IMA card.
Underneath the card it will show the 8 E1 links titled IF-1 (IMA link 1) to IF-8 (IMA Link 8).
Underneath the 8 IMA Links will be 8 IMA Groups. Each IMA Group has an “IMA Group” and “NEC ATM Interface” section.
IMA Group 1 is titled IF-9, IMA Group 2 is titled IF-11 ... IMA Group 8 is titled IF-23.

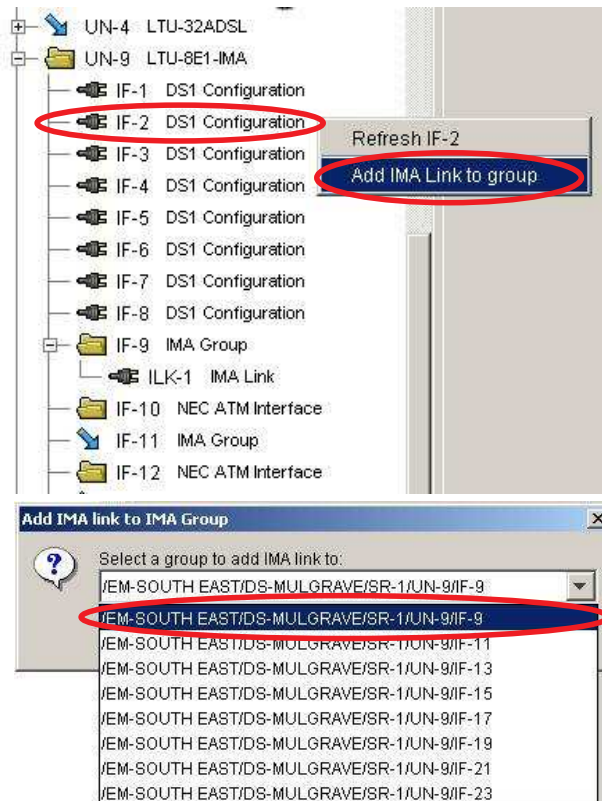
By default, 8 IMA Groups are configured and each Group has 1 IMA Link.

3. To configure an IMA Group to have more than 1 IMA Link, you need to delete an IMA Link from another IMA Group.

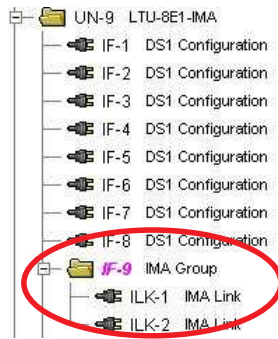
Select another IMA Group (eg. IMA Group 2 will be IF-11), right-click and select “**Remove IMA Link from group**”.



4. Select the IMA Link that was deleted (eg. IF-2), then right-click and select “**Add IMA Link to Group**”. Then select the IMA Group you want to add the link to – to add it to IMA Group 1 select “...IF-9”, for IMA Group 3 select “... IF-13”.



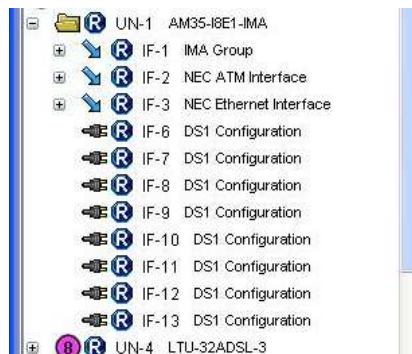
The network browser will now show the IMA Link in the new IMA Group:



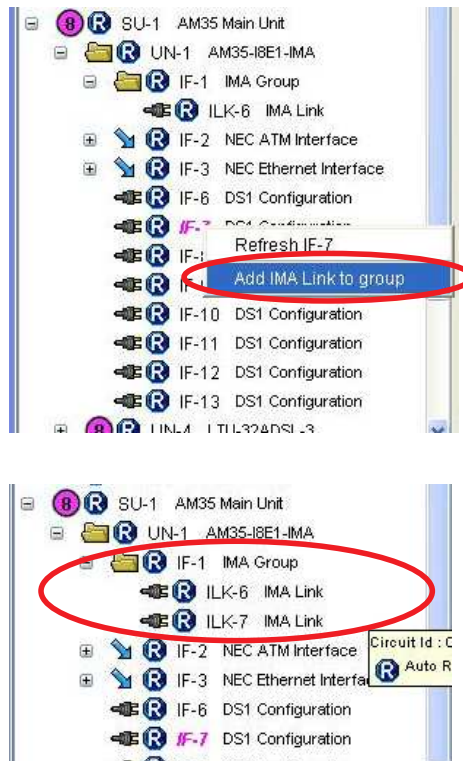
5. Repeat steps 3 and 4 to move other IMA Links between different IMA groups.

Configure IMA Group/Links on the IMA IGU in the AM31/AM35 Sub

1. Start up the Director-INMS client software as shown in Section 2, "Director-INMS Client software".
2. In the network browser, locate the IGU-8E1-IMA card on the AM31/AM35 Sub.
Underneath the card it will show the IMA Group titled IF-1.
Underneath the IMA Group, will be 8 E1 links titled IF-6 (IMA link 1) to IF-13 (IMA Link 8).



3. Select the IMA link to be added to the IMA Group and right-click to select "Add IMA link to group".
The network browser will now show the IMA link in the IMA Group.
By default, IF-6 already added to the IMA Group.



Repeat Step 3 to add additional IMA Link to the Group.

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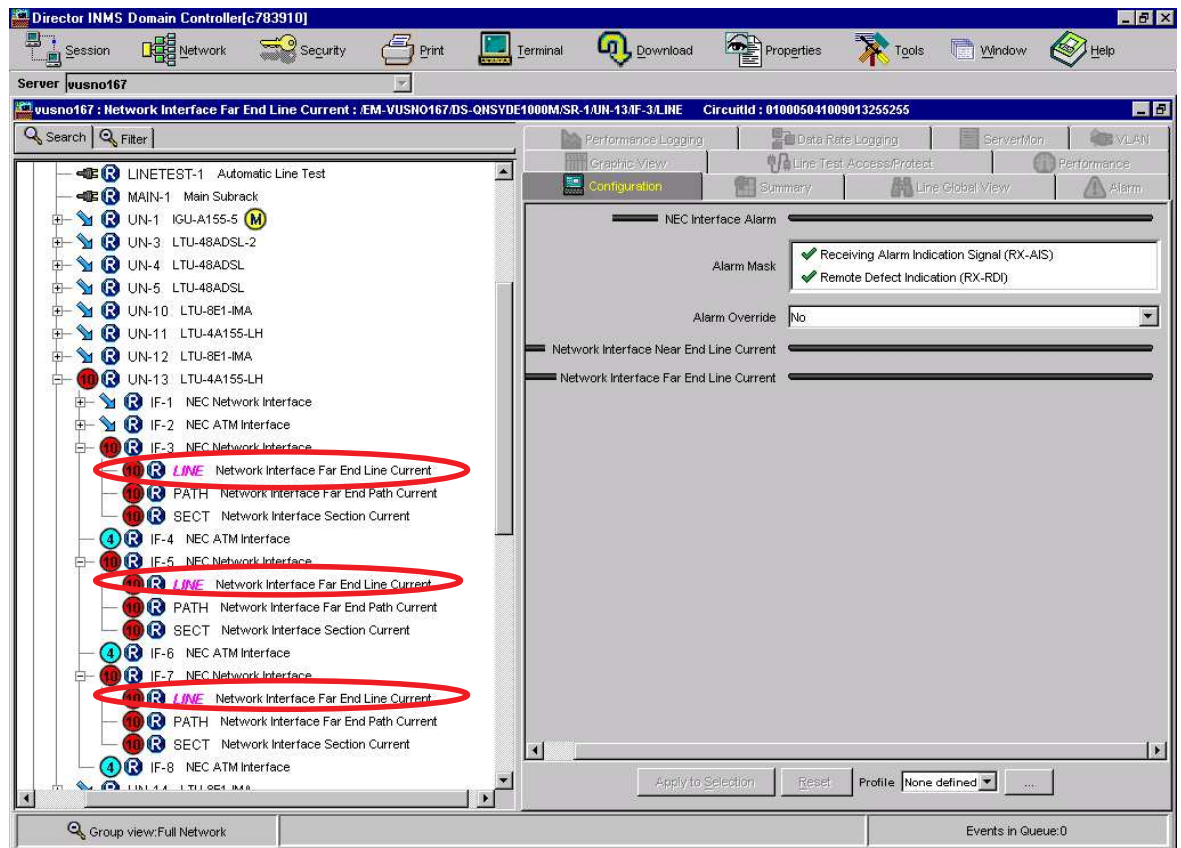
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Section 4

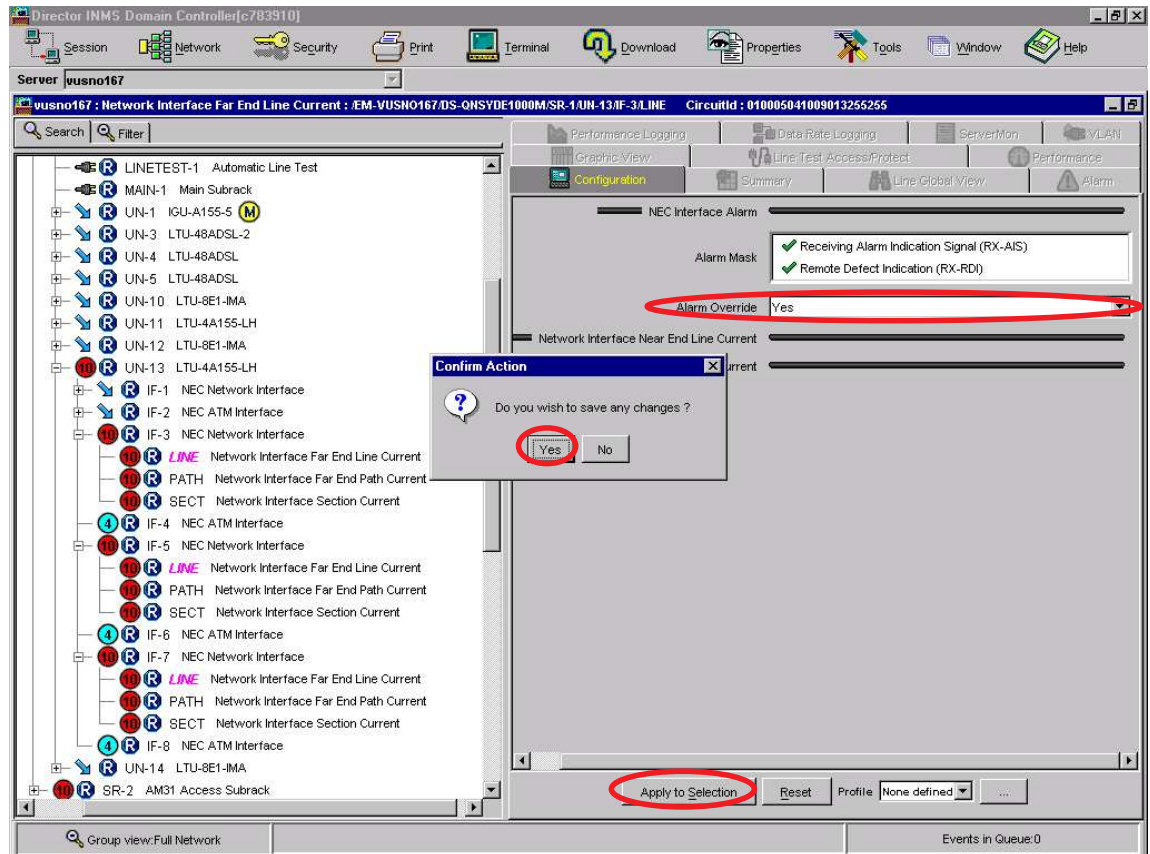
Adding a subtended AM31/AM35 with an STM1 IGU

Mask alarms at the LTU-4A155-LH card

1. Start up the Director-INMS client software as shown in Section 2.
2. Locate the LTU-4A155-LH card. Ports 2, 3 and 4 will have multiple alarms indicating no physical layer connectivity.
3. Click on “IF-3->Line”, then click CTRL + “IF-5->LINE”, then click CTRL + “IF-7->LINE” as shown below:

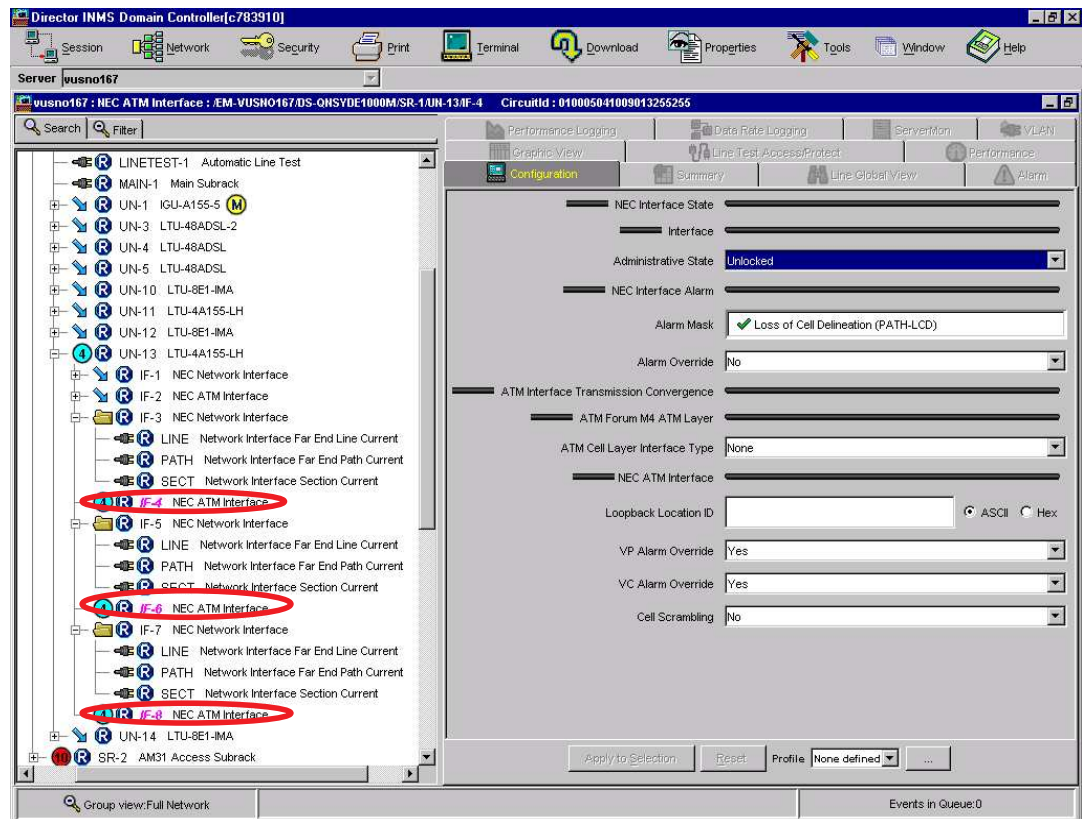


4. Change the “Alarm Override” value from No to “Yes”.
Then click the “Apply to Selection” button.
Then choose “Yes” to save the changes as shown below:

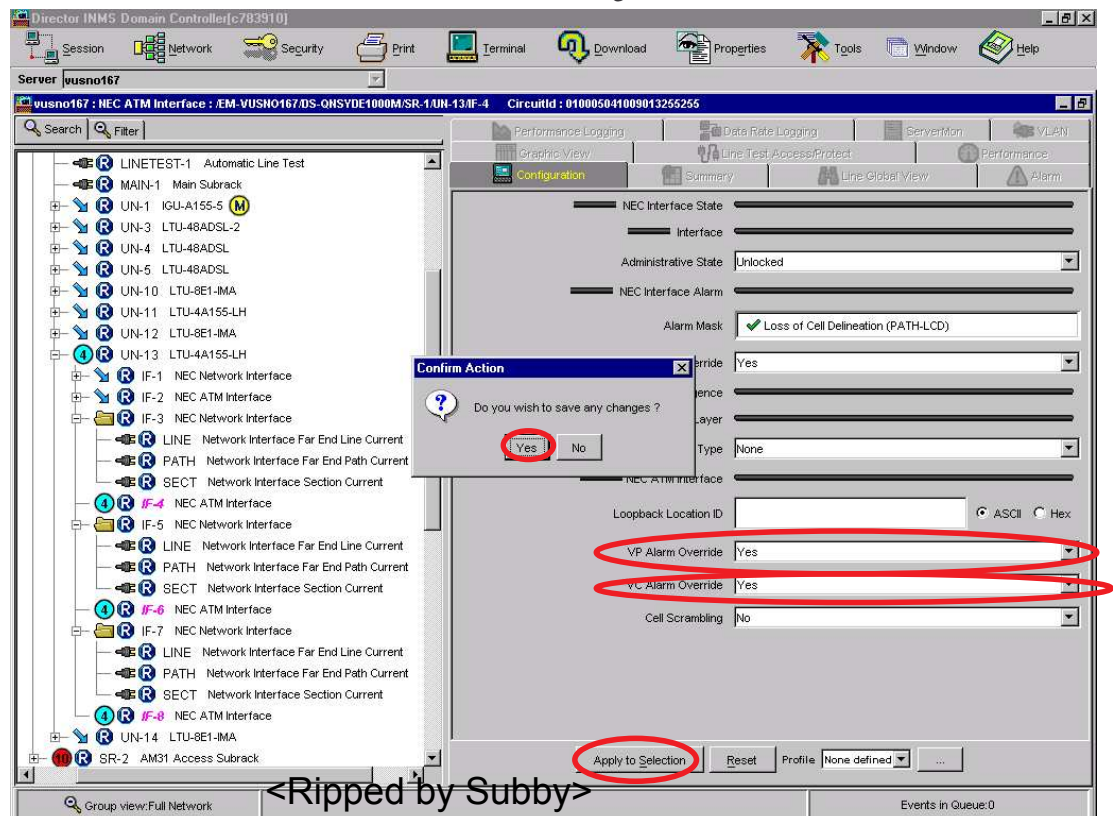


5. Repeat Steps 3 and 4 except select “PATH” instead of “LINE”.
6. Repeat Steps 3 and 4 except select “SECT” instead of “LINE”.

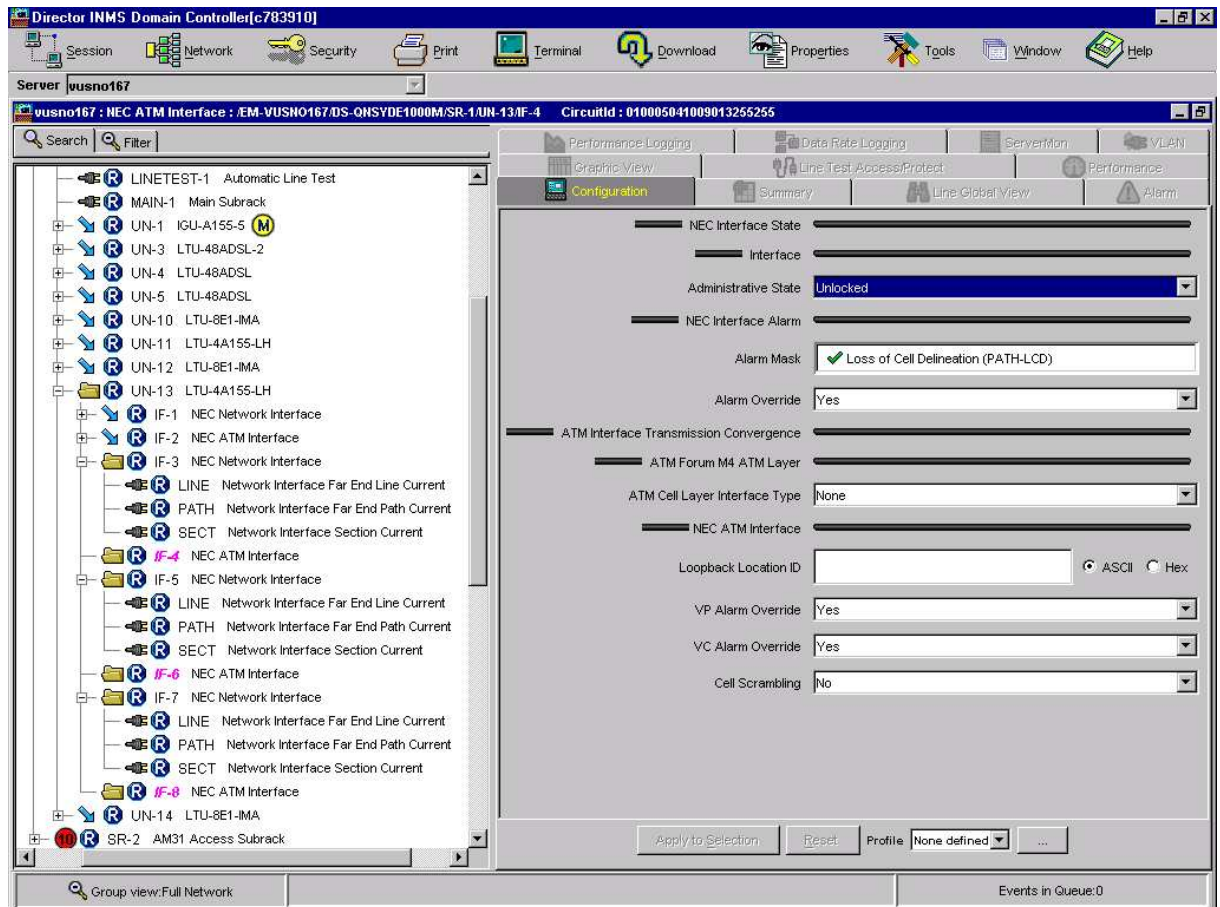
7. Click on “IF-4”, then click CTRL + “IF-6”, then click CTRL + “IF-8” as shown below:



8. Change the VP and VC “Alarm Override” value from No to “Yes”. Then click the “Apply to Selection” button. Then choose “Yes” to save the changes as shown below:

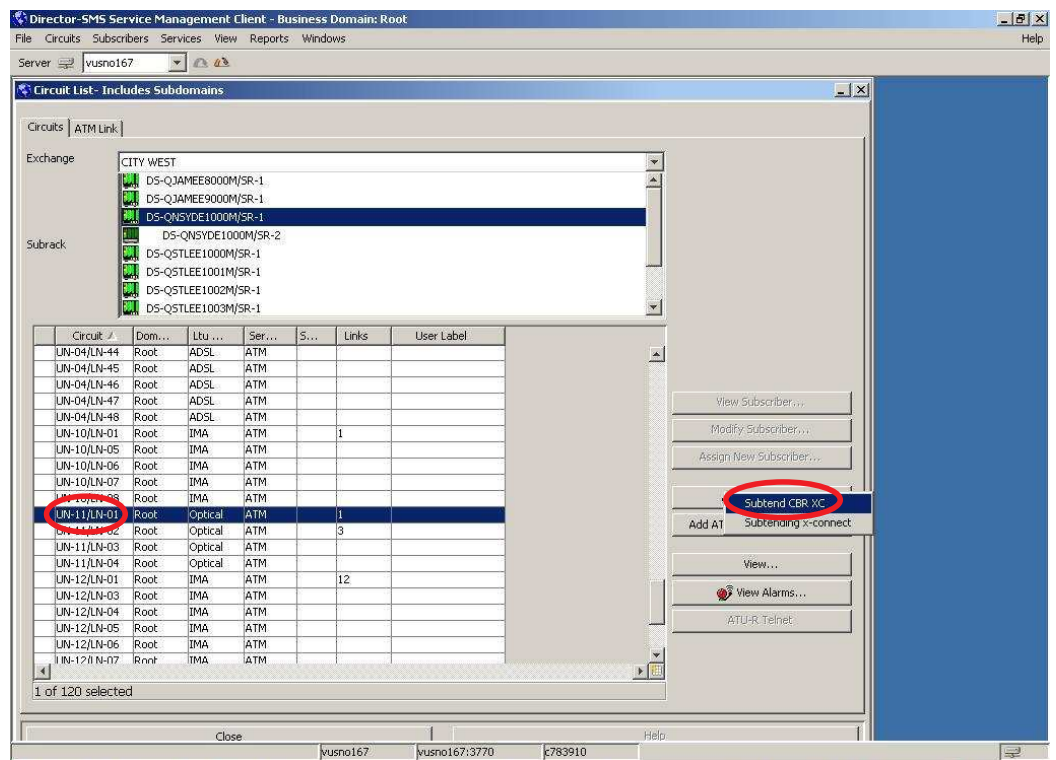


The LTU-4A155-LH card should now be alarm free:



Create cross-connect at AM31 Hub IGU for AM31/AM35 inband management

1. Start up the Director-SMS Service Management client software as shown in Section 2, “Director SMS Service Management Client software”.
2. In the Circuit List, locate the LTU-4A155-LH, which the AM31/AM35 Sub will be subtended from.
3. Select the first port of the LTU-4A155-LH card, then click on the “Add ATM Link” button – choose “Subtend CBR XC”:



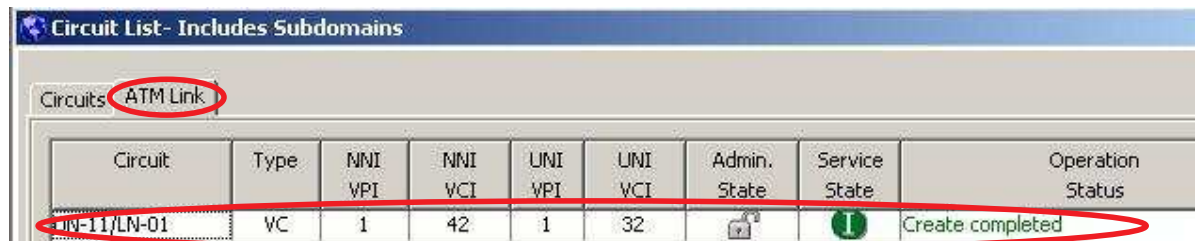
4. Make sure the details of the Subtending ATM Cross Connect are correct. Type in the Management VCI for the SUB. See screen shot below for an example. Click OK to create the cross-connect.



The 'New ATM Service' dialog box contains the following fields and controls:

- Admin State: A dropdown menu set to 'Unlocked'.
- NMI VCI: A text input field containing the value '42'.
- Start date: A date selection field showing '/ /'.
- End date: A date selection field showing '/ /'.
- ATM Profile: A dropdown menu set to 'Subtend CBR XC', with a 'View...' button to its right.
- OK and Cancel buttons at the bottom.

5. Select the "ATM Link" tab and verify that the "Operation Status" shows "Create Completed" for the newly added cross connect.



The 'Circuit List - Includes Subdomains' window shows a table of circuits. The 'ATM Link' tab is selected. The first row of data is circled in red.

Circuit	Type	NMI VPI	NMI VCI	UNI VPI	UNI VCI	Admin. State	Service State	Operation Status
IN-11/LN-01	VC	1	42	1	32			Create completed

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Section 5

Adding a BEU Expansion Subrack on AM31

Configure network settings of an BEU in the AM31

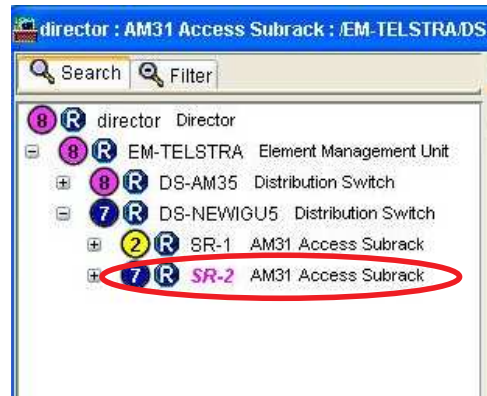
1. Follow the steps in Section 1, “Configuring the Network Settings of a BEU (AM31) to configure a BEU on the AM31.

Discover BEU Expansion Subrack on Director-INMS Client

1. Start up the Director-INMS client software on the Director Client PC: Start->Programs->Director-INMS->Director-INMS Client.

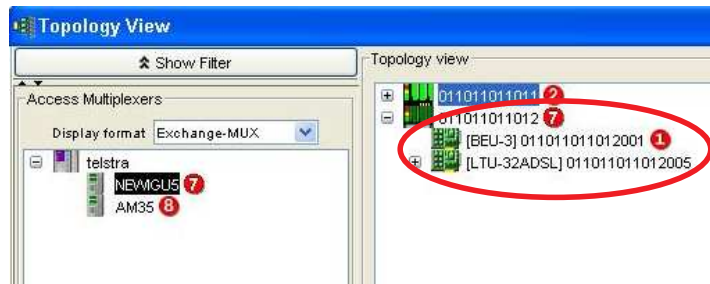
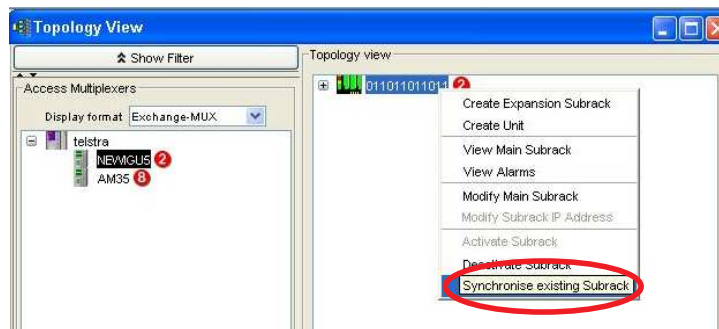
Proceed to login.

2. The BEU should be automatically discovered in Director-INMS. After successful discovery, the BEU Expansion subrack with all its elements will be seen in the network browser.



Discover BEU Expansion Subrack on Director-SMS Network Resources Client

1. Start up the Director-SMS client software on the Director Client PC:
Start->Programs->Director-SMS->Director-SMS Network Resources Client.
2. Login to the Director-SMS Network Resources Client
3. Click Views -> Topology View. Select the “Main Subrack”, which the BEU Expansion subrack has been added and right click to select “Synchronise Subrack”.



4. The newly added BEU Expansion subrack with all its elements will be seen in the Topology View.

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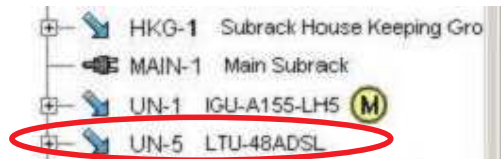
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Section 6

Adding/Removing cards in an AM31 Subrack and Adding an AM35 Expansion Unit to a AM35 Base Unit

ADDING A NEW ADSL LTU CARD TO AN AM31 SUBRACK

1. Insert new LTU-48ADSL or LTU-48ADSL-2 card into the AM31 subrack (for example into a previously empty slot 5). The card may take a couple of minutes to boot up.
2. The new ADSL card is now available to be used/configured.



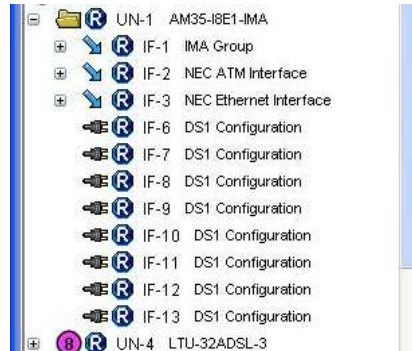
3. Activate a service via XDM on a port on the new ADSL card.
4. Connect a modem to the port of the new ADSL card. Verify that the modem syncs up with the card.
5. Run a speed check on the newly created service.

ADDING A NEW IMA LINK TO A WORKING SUB IMA GROUP

1. In the network browser, locate the IGU-8E1-IMA card on the AM31/AM35 Sub.

Underneath the card it will show the IMA Group titled IF-1.

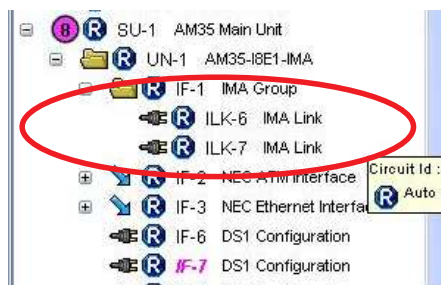
Underneath the IMA Group, will be 8 E1 links titled IF-6 (IMA link 1) to IF-13 (IMA Link 8).



2. Select the new IMA link to be added to the IMA Group and right-click to select “Add IMA link to group”.

The network browser will now show the IMA link in the IMA Group.

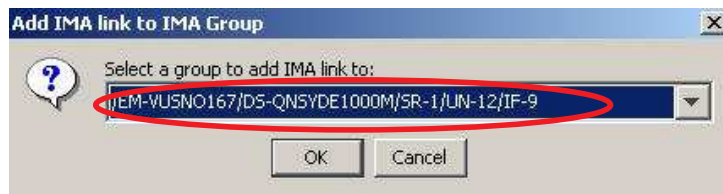
By default, IF-6 already added to the IMA Group 1.



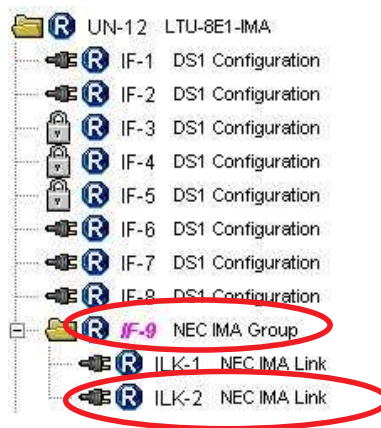
3. On the corresponding HUB LTU-8E1-IMA card, add the new IMA Link, by right-clicking on the interface (eg IF-2) and selecting the “Add IMA link to group option”.



4. Place the IMA link in an IMA Group. IF-9 corresponds to IMA Group 1. IF-11 corresponds to IMA Group 2 etc..



5. The new IMA link now appears under the appropriate IMA Group.



REPLACING AN IGU CARD IN AN AM31 SUBRACK

1. Disable “Automatic backup” on the IGU-8E1-IMA or IGU-A155-X card that is to be replaced.
2. Remove the IGU-8E1-IMA or IGU-A155-X card from the AM31 subrack.
3. The IGU in Director-INMS may appear offline while replacing the card.
4. Insert the new IGU-8E1-IMA or IGU-A155-X card into the AM31 subrack.
5. Connect a PC serial port to the new IGU-8E1-IMA or IGU-A155-X card and start a HyperTerminal session (See **Section 1 – Connecting to the Serial Port of an AM31/AM35** for more details on the serial connection).
6. Once connected press **Enter** to display the “**Password:**” prompt.
7. Enter a valid password. The factory default password is: **adsligu**
8. The following message will then appear:
Welcome to the NEC CuproPlus Integrated Gateway Unit
9. Type in all commands **except** the **ip** address command as in Section 1 – “Configuring the Network Settings of an IGU-8E1-IMA/IGU-A155-X (AM31/AM35) – Inband Management”
10. When the IGU-8E1-IMA or IGU-A155-X is back online in Director-INMS, right-click on the SR-1 corresponding to the replaced IGU-8E1-IMA or IGU-A155-X and select “Restore Network Element configuration to SR-1”.
11. The new IGU-8E1-IMA or IGU-A155-X should now have the same configuration as the replaced IGU-8E1-IMA or IGU-A155-X.
12. Enable “Automatic backup” on the IGU-8E1-IMA or IGU-A155-X replaced card.

CONNECTING AM35 EXPANSION TO AM35 BASE UNIT

1. If no AM35 Expansion Units are connected to the AM35 Base Unit then connect Expansion connector A at the AM35 Base to the Expansion connector at the AM35 Expansion Unit. If there is already a connection from the AM35 Base connector A, then use connector B to the AM35 Expansion Unit:
2. For a 4 port AM35 expansion unit to the Base unit, continue to use connectors C and then D.

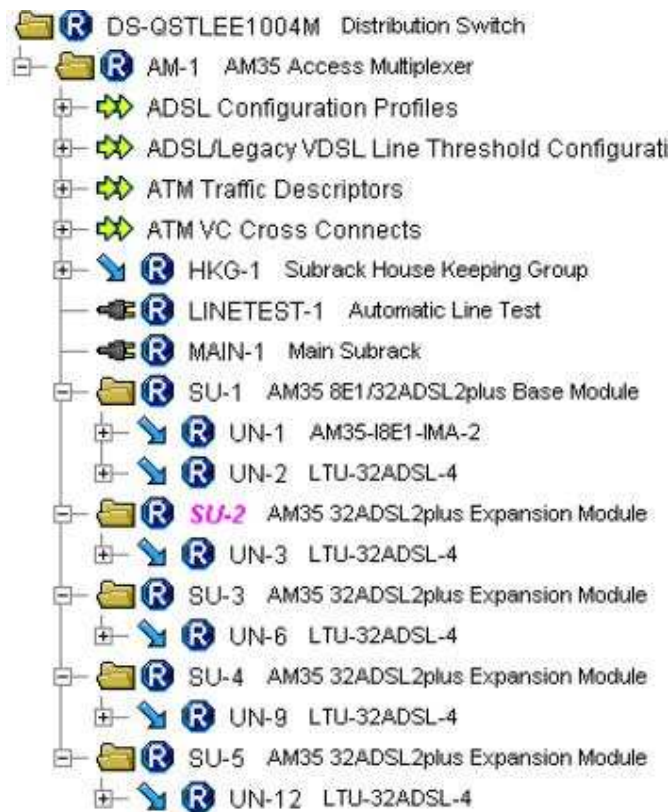
AM35 2 Port Base Unit



AM35 4 Port Base Unit



3. The Director-INMS software should learn that the new AM35 Expansion unit has been added.



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Section 7

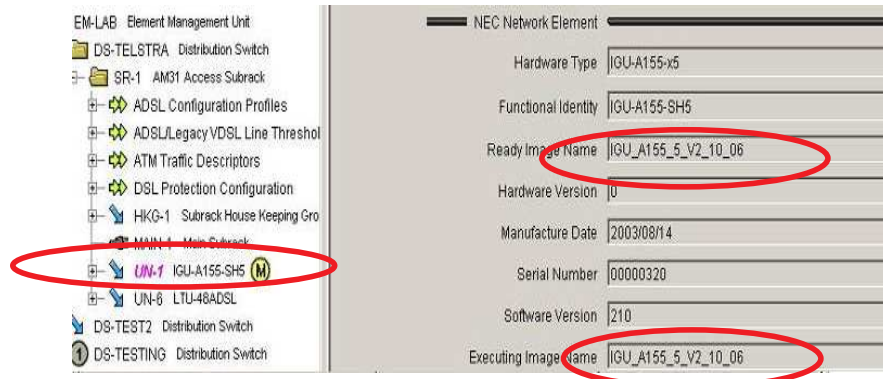
Software Download and NE Backup

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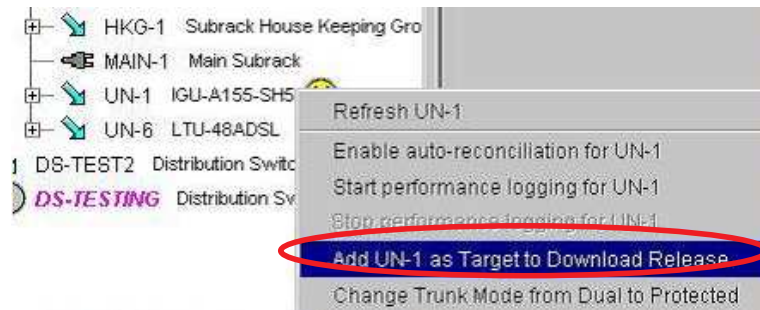
SOFTWARE DOWNLOAD

This section will run through the steps necessary to download software into the various cards in an AM31/AM35 system.

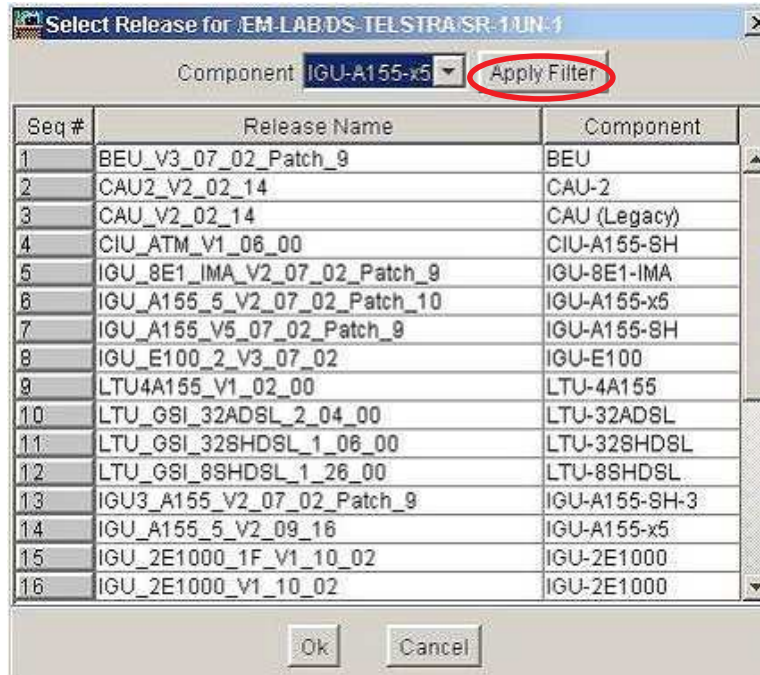
1. From the Director-INMS network browser, select the IGU-A155-SH5 to be upgraded. The Configuration tab on the right-hand side will show the current firmware version number:



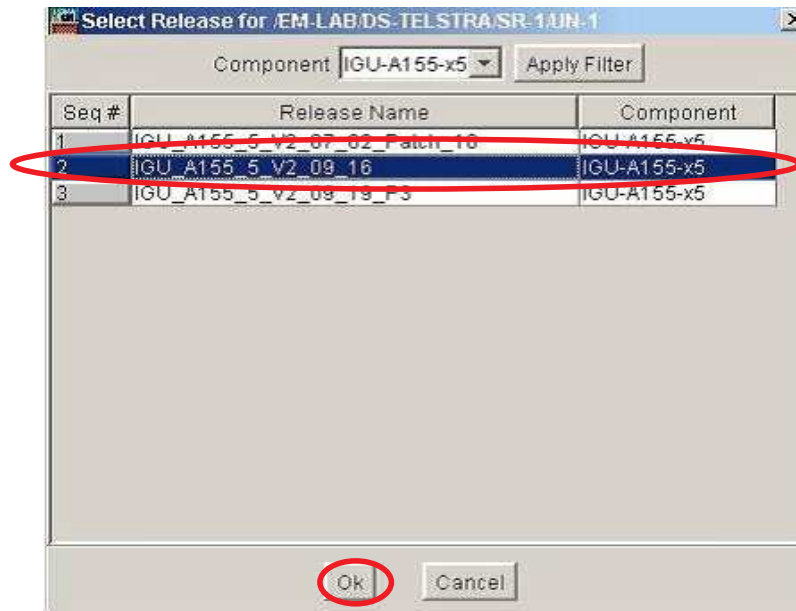
2. Right-click on the IGU-A155-SH5 and select the option “Add UN-1 as Target to Download Release”.



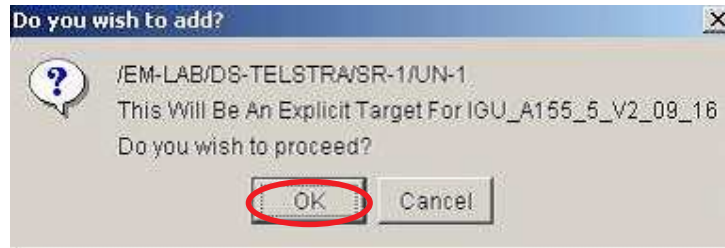
3. A “Select Release ...” window will appear showing all the available firmware versions for all the plug-in units. Click on the “Apply Filter” button to filter out the firmware versions for the IGU-A155-SH5.



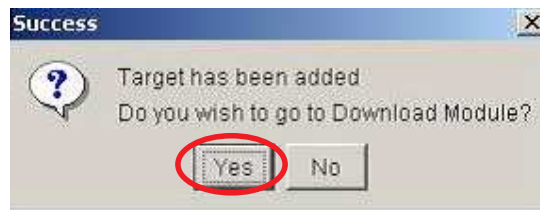
4. Select the firmware version that you want to upgrade to and click OK.



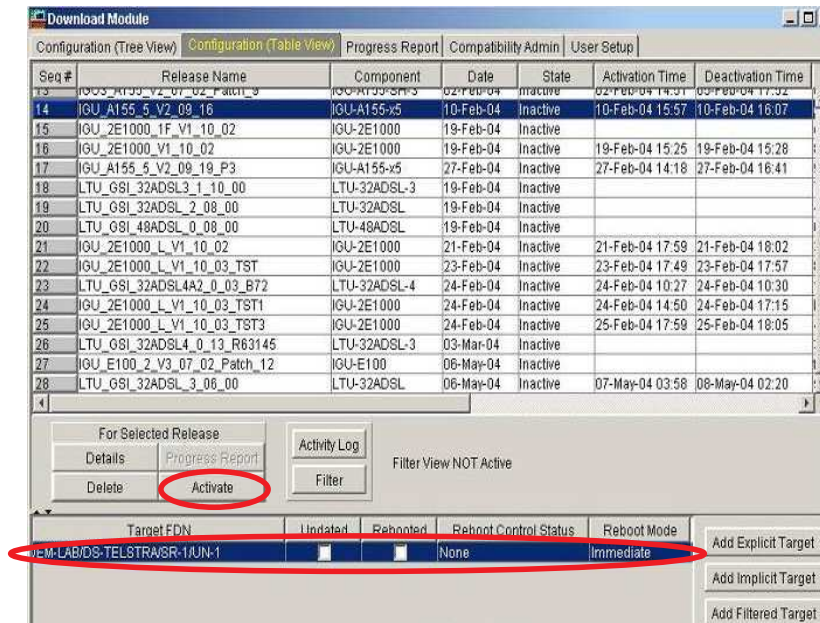
5. Click OK to proceed:



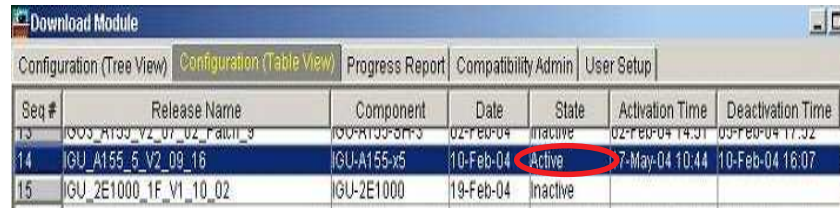
6. Click OK again to go to the Software Download window:



7. In the bottom half of the Software Download section, highlight all the IGU-A155-SH5 modules that you need to upgrade and then click on the Activate button.



8. The state of the firmware will change from **Inactive** to **Active**



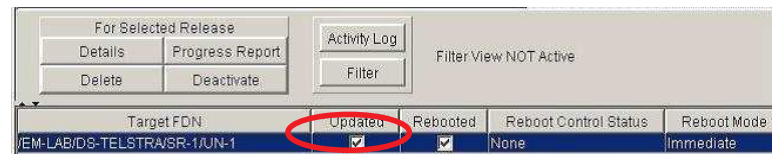
Seq #	Release Name	Component	Date	State	Activation Time	Deactivation Time
13	IGU_A135_V2_02_Fail01_9	IGU-A135-Fail01_9	02-Feb-04	Inactive	02-Feb-04 14:31	03-Feb-04 17:32
14	IGU_A155_5_V2_09_16	IGU-A155-x5	10-Feb-04	Active	7-May-04 10:44	10-Feb-04 16:07
15	IGU_2E1000_1F_V1_10_02	IGU-2E1000	19-Feb-04	Inactive		

9. Once the IGU-A155-SH5 card has been upgraded the **Updated** checkbox will be ticked.



Target FDN	Updated	Rebooted	Reboot Control Status	Reboot Mode
/EM-LAB/DS-TELSTRA/SR-1/JUN-1	☒	☐	Active	Immediate

10. After the upgrade, the card will reboot. After the card has rebooted, the **Rebooted** checkbox will be ticked.



Target FDN	Updated	Rebooted	Reboot Control Status	Reboot Mode
/EM-LAB/DS-TELSTRA/SR-1/JUN-1	☒	☒	None	Immediate

The IGU-A155-SH5 card is now upgraded.

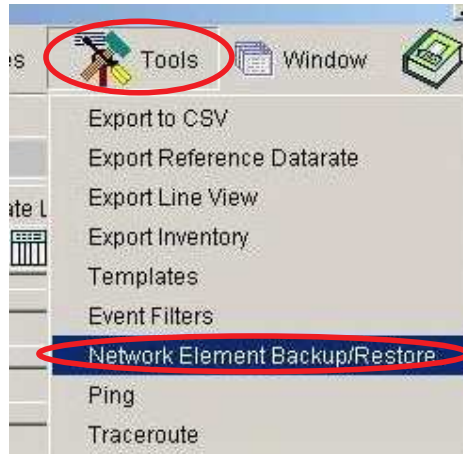
11. Repeat steps 1-10 for the BEU-3 card.

12. Repeat steps 1-10 for the LTU-48ADSL card.

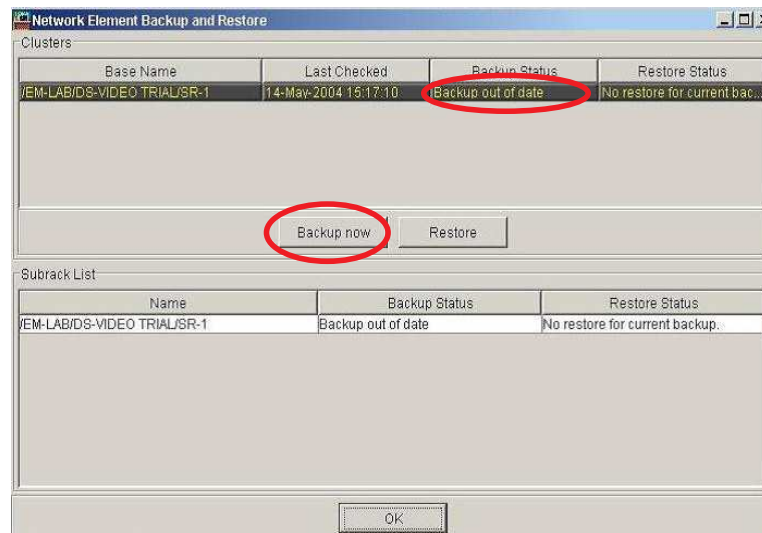
NE BACKUP

This section will run through the steps necessary to backup the NE.

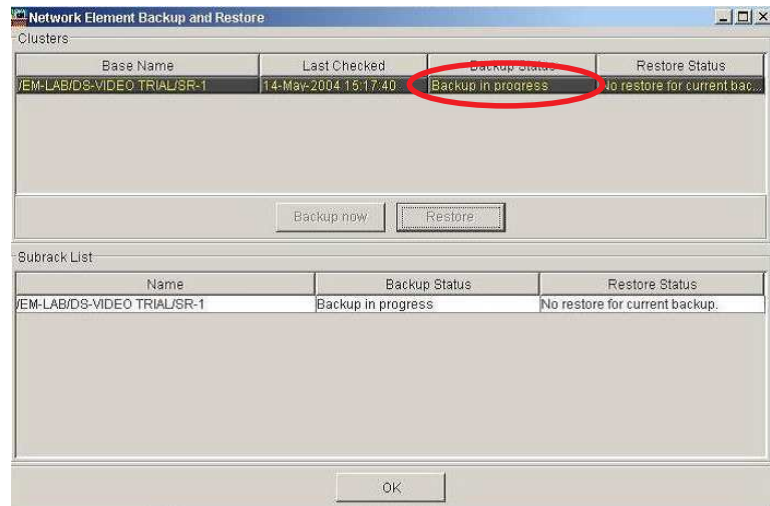
1. In the Director-INMS top menu, select Tools->Network Element Backup/Restore.



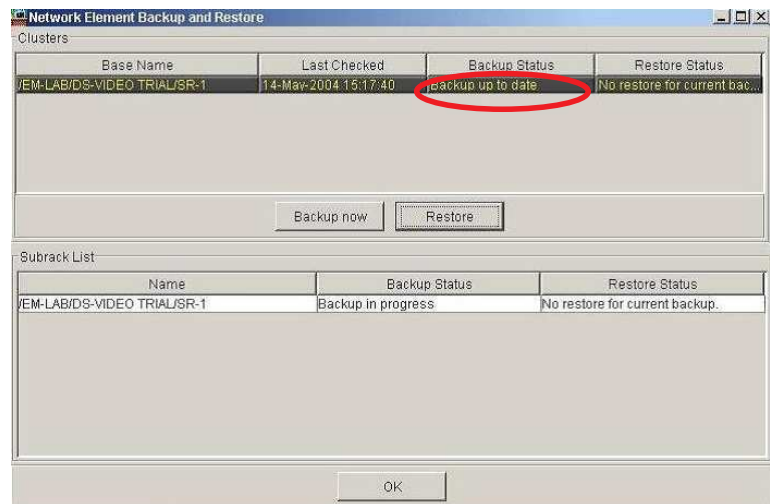
2. Select the NE to be backed up. The **Backup Status** may be **Backup out of date**. Click on the **Backup now** button.



3. During the Backup procedure the **Backup Status** will change to **Backup in progress**.



4. When the backup is complete the **Backup Status** will change to **Backup up to date**.



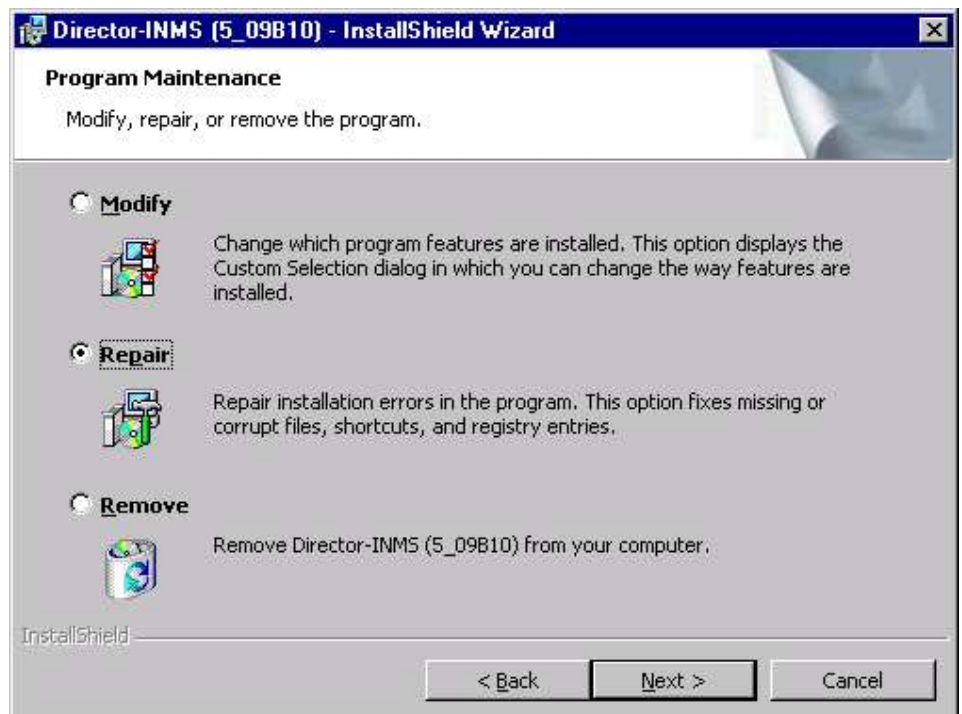
Section 8

Director Client Upgrade

DIRECTOR CLIENT UPGRADE

This section will run through the steps necessary to upgrade the Director Clients (INMS and SMS) onto a PC

1. The Director Servers must first be upgraded to the next version for both INMS and SMS.
2. Launch the Director-INMS client.
You will be asked whether you would like to upgrade the client to the server's release. Click the "Yes" button.
3. Follow, the prompts accordingly.
When the "Prompt Maintenance" window comes up, choose the "Repair" option:



4. After installation, launch Director-INMS again and verify that the new client can connect to the upgraded server.
5. Launch the Director-SMS client
You will be asked whether you would like to upgrade the client to the server's release. Click the "Yes" button.
6. Follow, the prompts accordingly.
When the "Prompt Maintenance" window comes up, choose the "Repair" option as shown in Step 3 above.
7. After installation, launch Director-SMS again and verify that the new client can connect to the upgraded server.

<Ripped by Subby>

<Ripped by Subby>

Section 9

Troubleshooting

IP PING

Ping function is available on IGU-A155-5/8E1-IMA to verify there is connectivity between the Director server and destination NE.

Local Craft Terminal (LCT)

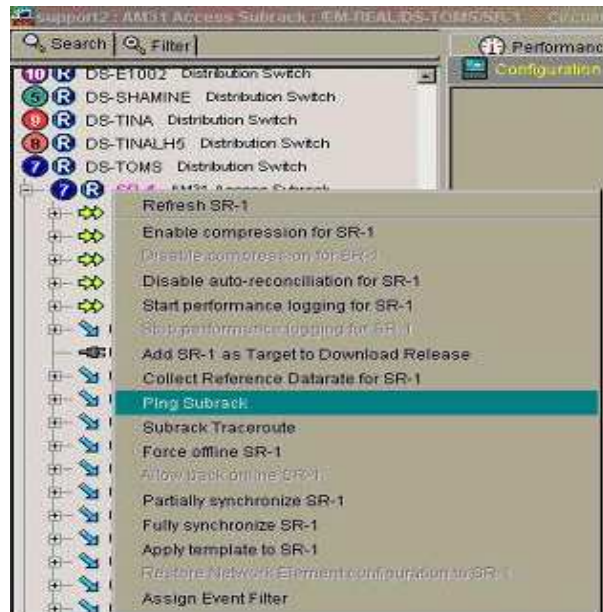
1. Connect local PC to the serial port of the IGU/BEU and start a HyperTerminal session.
2. Once connected press **Enter** to display the “**Password:**” prompt.
3. Enter a valid password. The factory default password is: **adsligu**
4. The following message will then appear:
Welcome to the NEC Integrated Gateway Unit
5. Type ping n.n.n.n (where n.n.n.n is the IP address of the Director server). The message “Response to PING n.n.n.n : OK” if the director server has been contacted.
6. If there is no response to your ping, check the following:
 - Ensure the physical link is active.
 - Check the configuration settings on IGU.
 - Check the configuration settings on the network.

```
test - HyperTerminal
File Edit View Call Transfer Help
MIB has been initia
LPM-9S000000000000CCF commS. 6.0dB
GS
LPM-BS000000000000D4ckLength(Int1):
rout
LPM-3S000000000000C6
LPM-4S000000000000C7
LPM-5S000000000000C8
LPM-6S000000000000C9
LPM-7S000000000000CA
LPM-8S000000000000CB
LPM-9S000000000000CC
LPM-AS000000000000CD
LPM-BS000000000000DE
LPM-CS000000000000DF
LPM-DS000000000000E0
LPM-ES000000000000E1
LPM-FS000000000000E2
ping 11.11.11.1
Response to PING 11.11.11.1 : OK
```

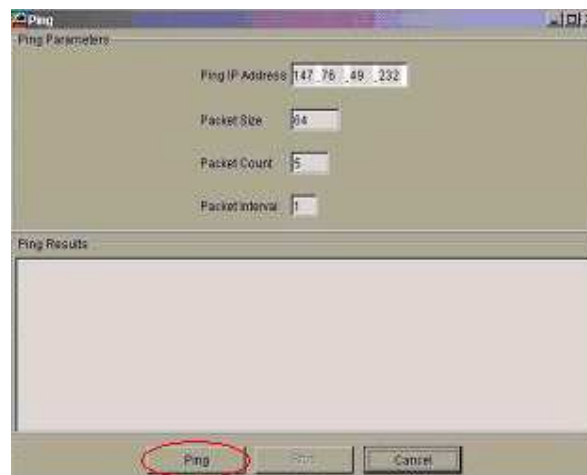
The screenshot shows a HyperTerminal window titled "test - HyperTerminal". The window displays the initialization sequence of the NEC Integrated Gateway Unit (IGU). It starts with "MIB has been initia", followed by "LPM-9S000000000000CCF commS. 6.0dB" and "GS". Then, it shows "LPM-BS000000000000D4ckLength(Int1):" and "rout". A list of LPM values follows: LPM-3S000000000000C6, LPM-4S000000000000C7, LPM-5S000000000000C8, LPM-6S000000000000C9, LPM-7S000000000000CA, LPM-8S000000000000CB, LPM-9S000000000000CC, LPM-AS000000000000CD, LPM-BS000000000000DE, LPM-CS000000000000DF, LPM-DS000000000000E0, LPM-ES000000000000E1, and LPM-FS000000000000E2. Finally, it shows a successful ping: "ping 11.11.11.1" and "Response to PING 11.11.11.1 : OK". The status bar at the bottom indicates "Connected 6:24:41", "VT100", "9600 B-W-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo". The taskbar shows the Windows XP interface with the start button and several open applications.

Director

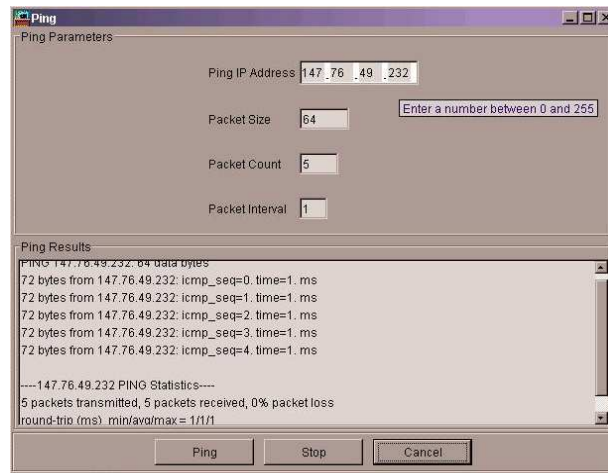
1. Start-up Director-INMS Client.
2. In the Network Browser, select the NE and right-click on the subrack eg SR-1, and select the “Ping Subrack” option.



3. Ping Window is displayed with IP address of the NE, default packet size, packet count and packet interval. Then, click “Ping”.



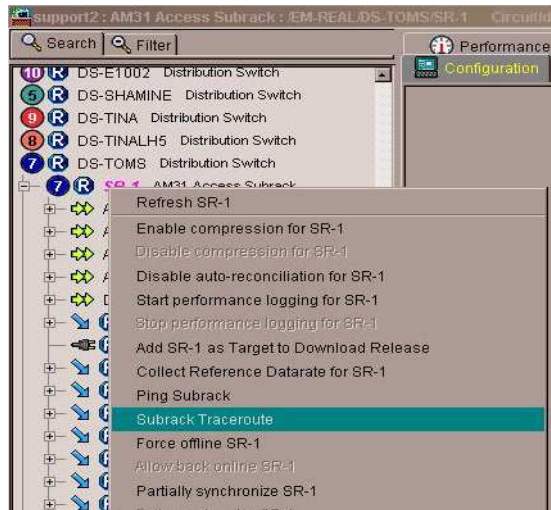
4. The result is then displayed.



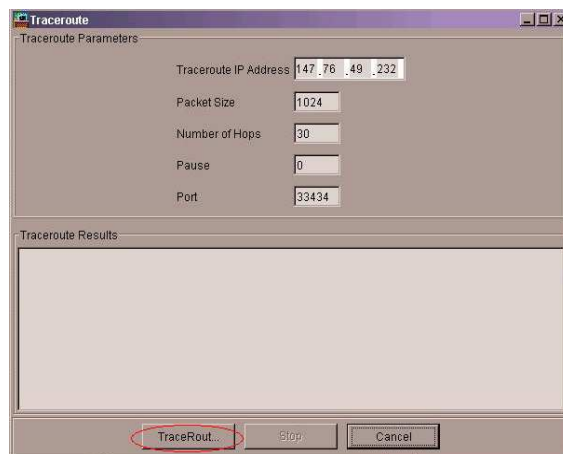
TRACE ROUTE USING DIRECTOR

Trace route function is available on Director-INMS to verify the hops from the Director client to the destination NE.

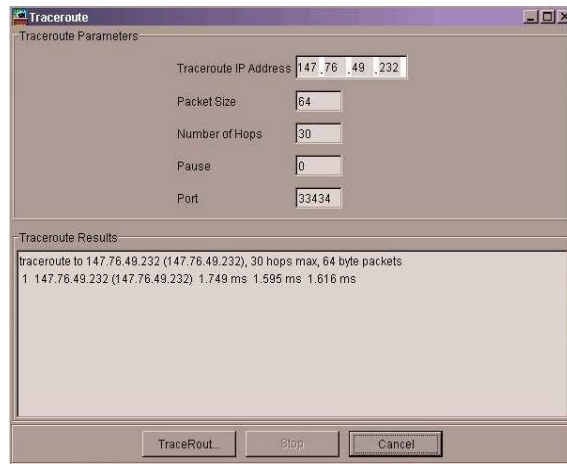
1. Start-up Director-INMS client.
2. In the Network Browser, select the NE and right-click on the subrack eg SR-1, and select the “Subrack Traceroute” option.



3. Trace route window is displayed. Then, click “Traceroute



4. The result is then displayed.



ATM OAM LOOPBACK

AM31 can generate and return OAM F4 and F5 loopback cells as per ITU-T I.610 into the network and towards the customer. This function is necessary to verify the layer 2 connectivity between IGU/BEU and the upper network.

Local Craft Terminal (LCT)

1. Connect local PC to the serial port of the IGU/BEU and start a HyperTerminal session.
2. Once connected press Enter to display the "Password:" prompt.
3. Enter a valid password. The factory default password is: adsligu
4. The following message will then appear:
Welcome to the NEC Integrated Gateway Unit
5. Turn on the ATM loopback function by setting the ATM loopback address of the IGU/BEU with the following command if NOT ALREADY done so in INMS under MAIN-1. If done in INMS, goto Step 7.

atmcc llid xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx, where xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx is 32 hex digits.

6. Once the function is enabled, the following message is displayed:
LLID xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx, enabled

7. Send an ATM segment loopback cell upstream on the inband management VCC:

atmcc lb 0 us seg

The following success message should appear:

LB 0 US SEG: OK, 10ms

8. Send an ATM end-to-end loopback cell upstream on the inband management VCC:

atmcc lb 0 us ete

The following success message should appear:

LB 0 US ETE: OK, 20ms

9. If the result of the ATM loopback cell is OK then the ATM VCC is configured correctly.

```
test - HyperTerminal
File Edit View Call Transfer Help
D [Icons]

atmcc llid 12345678 12345678 12345678 12345678
LLID 12345678 12345678 12345678 12345678, enabled

atmcc ccl 0
      |trunk-----| |customer-----|
index type  gr  vpi  vci  sub  slt  lin  lat  qos  dom  vpi  vci  pcr  cdvt  dubr
      0 VC  USIP  9   1   100      1  5  1  1  5  0  32  2600  7692
      1 VC  PP   1   1   300      1  5  1  1  5  0  3  2415100000  0
16364 VC  DSTP* 1   1   300      1  5  1  1  5  0  3  - - -
16365 VC  DSTP* 1   1   300      1  5  1  1  5  0  3  - - -
16366 VC  USIP* 9   1   3      1  5  1  1  0  0  4  - - -
16367 VC  USIP* 9   1   4      1  5  1  1  0  0  4  - - -

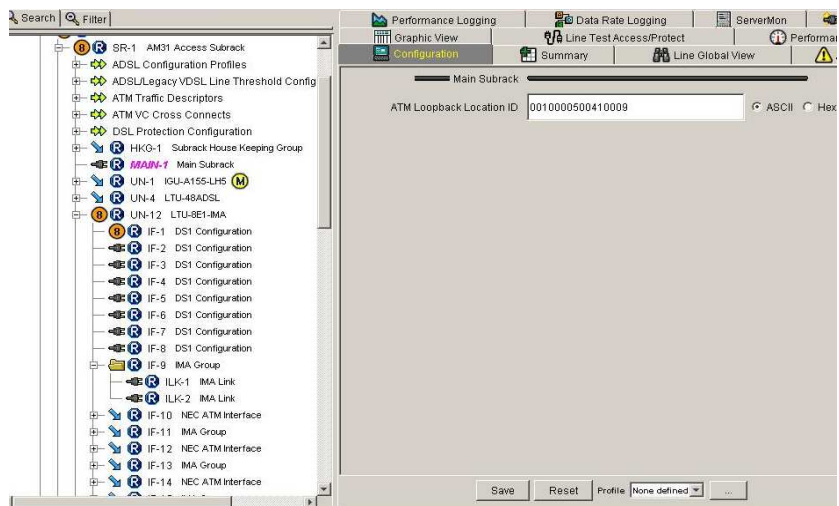
atmcc lb 0 us seg
*** LB 0 US SEG: OK, 0ms

atmcc lb 0 us ete
*** LB 0 US ETE: OK, 0ms

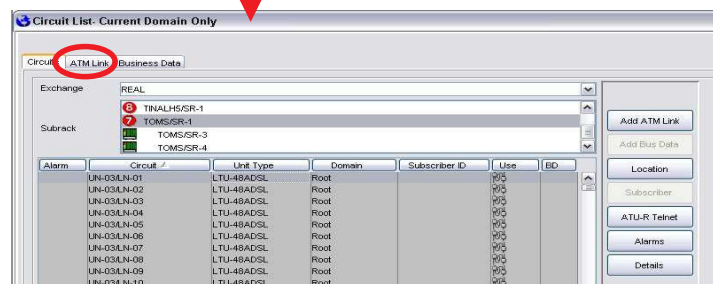
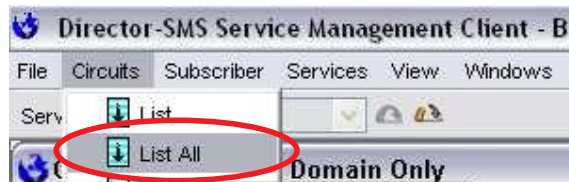
Connected 6-42:33 VT100 9600 B-N-1 SCROLL CAPS NUM Capture Print who
start test - HyperTerminal C:\WINDOWS\System32\cmd.exe Director INM5[emuaadn] Director-SMS Networ... Director-SMS Service ... 4:51 PM
```

Director

1. Start-up Director-INMS Client.
2. In the network browser, turn on the ATM loopback feature by filling in the Location Loopback ID (LLID) under SR-1 -> MAIN-1 Main Subrack and click "Save". Choose the "Hex" option. The ATM Loopback ID is derived from the IP Address of the Subrack with each byte of the IP Address padded to 4 digits.
Eg, IP Address 10.5.41.9
ATM Loopback ID = 0010 0005 0041 0009



3. Start-up Director-SMS Service Management Client.
4. Select Circuits -> List All to bring up the Circuit List.



5. Select the circuit/line, which ATM loopback test is to be performed and click "ATM Link" to bring up the cross-connect detail.

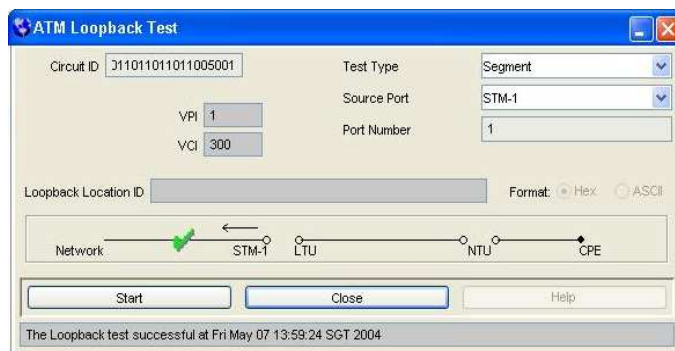


6. Select the cross-connect and click on “Test” to bring up “ATM Loopback Test” window.



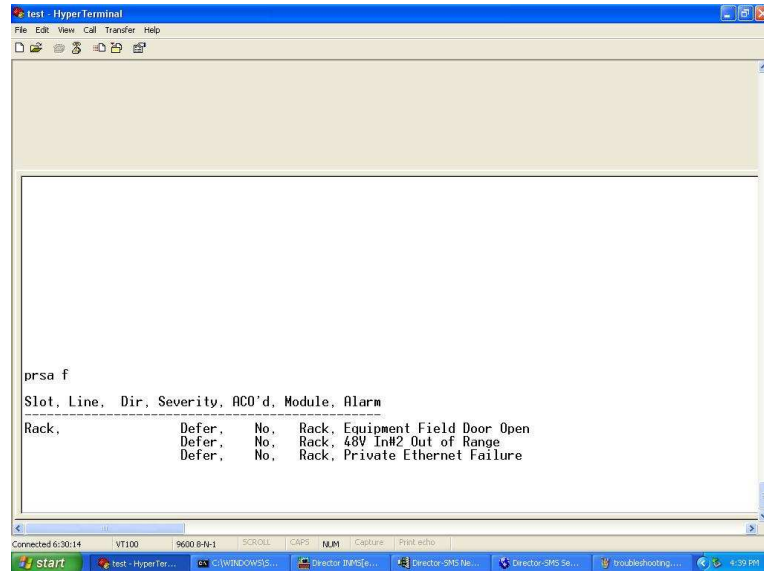
7. Select Test Type to be either “Network to end” or “Segment” and Source Port to be either “ STM-1” (sending upstream)or “LTU” (sending downstream). Then, click “Start”.

An example of successful ATM Loopback test is displayed below.



DISPLAY ACTIVE ALARMS USING LCT

1. Type “prsa f” to display all the active alarms on IGU.

**DISPLAY IMA LINK STATUS USING LCT**

1. From the IMA IGU LCT type “phy groupstat 1” to display the status of the IMA group and links.

```

phy groupstat 1

IMA group 1
  ne tx state OPERATIONAL, fe state OPERATIONAL, fe tx clock CTC,
  rx IMA ID 1, rx frame len 128, rx OAM label 3, tx timing ref link 1
IMA group 1, link 1
  ne tx state ACTIVE, ne rx state ACTIVE,
  fe tx state ACTIVE, fe rx state ACTIVE,
  ne rx fail state NO FAIL, fe rx fail state NO FAIL,
  tx LID 0, rx LID 0
IMA group 1, link 2
  ne tx state ACTIVE, ne rx state ACTIVE,
  fe tx state ACTIVE, fe rx state ACTIVE,
  ne rx fail state NO FAIL, fe rx fail state NO FAIL,
  tx LID 0, rx LID 1

```

2. From the IMA IGU LCT type “phy dslstat” to display the status of the physical layer for each IMA link.

```
phy dslstat  
  
DSL link 1  
  line status NO ALARM  
DSL link 2  
  line status NO ALARM  
DSL link 3  
  line status LOS  
DSL link 4  
  line status LOS  
DSL link 5  
  line status LOS  
DSL link 6  
  line status LOS  
DSL link 7  
  line status LOS  
DSL link 8  
  line status LOS
```

OPTICAL LASER ON

1. From the IGU-A155-X5 LCT, type “phy laser on”. This command turns the transmit laser on until a changed optical Rx state is discovered
2. To change the IGU-A155-X5 back to its original setting of automatic laser shutdown mode, type “phy laser auto”.
3. To view the current mode of the laser, type “phy laser”.

VIEW ADSL LINE SYNC-UP RATES

This section should only be used by installers to verify which lines have been synchronised up in an AM35 system. Please use these commands with caution. They are intended for diagnostic and debug purposes.

1. First enter the “p” command, which will print the slot and card occupancy.
2. Use this command to verify that the ADSL card/unit to be tested exists.

```
p
Slot   Card Type
1      AM35-I8E1-IMA - AM35 Subrack with 8 E1 IMA Interfaces [This Unit]
2      LTU-32ADSL3 - 32 Line Globespan ADSL Line Termination Unit, 3rd gen
3      LTU-32ADSL3 - 32 Line Globespan ADSL Line Termination Unit, 3rd gen
4      NO CARD
5      NO CARD
6      LTU-32ADSL4 - 32 Line Globespan ADSL Line Termination Unit, 4th gen
7      NO CARD
8      NO CARD
```

3. To view the Sync-Up rates for all lines on a particular ADSL card, type “unit_command <n> s* test 200” Where:
n = Slot number of ADSL card.

The example screen shot below shows the Sync-Up rates for all line on an AM35 Expansion unit in Slot 3. Note that line 10 is sync'd up using the Fast Channel.

```
unit_command 3 s* test 200

Ch1: DS 0 US 0 (Intl)
Ch1: DS 0 US 0 (Fast)
Ch2: DS 0 US 0 (Intl)
Ch2: DS 0 US 0 (Fast)
Ch3: DS 0 US 0 (Intl)
Ch3: DS 0 US 0 (Fast)
Ch4: DS 0 US 0 (Intl)
Ch4: DS 0 US 0 (Fast)
Ch5: DS 0 US 0 (Intl)
Ch5: DS 0 US 0 (Fast)
Ch6: DS 0 US 0 (Intl)
Ch6: DS 0 US 0 (Fast)
Ch7: DS 0 US 0 (Intl)
Ch7: DS 0 US 0 (Fast)
Ch8: DS 0 US 0 (Intl)
Ch8: DS 0 US 0 (Fast)
Ch9: DS 0 US 0 (Intl)
Ch9: DS 0 US 0 (Fast)
Ch10: DS 0 US 0 (Intl)
Ch10: DS 1536000 US 256000 (Fast)
Ch11: DS 0 US 0 (Intl)
Ch11: DS 0 US 0 (Fast)
```

4. To view the Sync-Up rates for only 1 particular line on an ADSL card, type “unit_command <n> s<x> test 200”. Where:
n = Slot number of ADSL card.
x = Line number on the ADSL card

The example screen shot below shows the Sync-Up rates for line 10 on an AM35 Expansion unit in Slot 3.

```
unit_command 3 s10 test 200
Ch10: D$ 0 US 0 (Int1)
Ch10: D$ 1536000 US 256000 (Fast)
```

5. To view more line status information on 1 particular line on an ADSL card, type “unit_command <n> s<x> config”. Where:
n = Slot number of ADSL card.
x = Line number on the ADSL card

The example screen shot below shows more line status information for line 10 on an AM35 Expansion unit in Slot 3.

```
unit_command 3 s10 config
ACTUAL TRANSCIEVER CONFIGURATION FOR LINE 10
=====
GSMIB_adslLineDMTTrellis:          GSMIB_trellisOn
GSMIB_adslLineType:                GSMIB_fastOrInterleaved
GSMIB_adslLineCoding:              GSMIB_dmt
GSMIB_adslLineTransAtucActual:      GSMIB_q9921PotsNonOverlapped
=====
GSMIB_adslAtucChanCurrTxRate(Fast): 1536000bps
GSMIB_adslAtucChanGsRsRedundancy(Fast): 0
GSMIB_adslAtucChanCrcBlockLength(Fast): 3264
=====
GSMIB_adslAturChanCurrTxRate(Fast): 256000bps
GSMIB_adslAturChanGsRsRedundancy(Fast): 0
GSMIB_adslAturChanCrcBlockLength(Fast): 544
=====
GSMIB_adslAtucChanCurrTxRate(Int1): 0bps
GSMIB_adslAtucChanInterleaveDelay: 0ms
GSMIB_adslAtucChanGsRsSymbols(Int1): 0
GSMIB_adslAtucChanGsRsDepth(Int1): 0
GSMIB_adslAtucChanGsRsRedundancy(Int1): 0
GSMIB_adslAtucChanCrcBlockLength(Int1): 0
=====
GSMIB_adslAturChanCurrTxRate(Int1): 0bps
GSMIB_adslAturChanInterleaveDelay: 0ms
GSMIB_adslAturChanGsRsSymbols(Int1): 0
GSMIB_adslAturChanGsRsDepth(Int1): 0
GSMIB_adslAturChanGsRsRedundancy(Int1): 0
GSMIB_adslAturChanCrcBlockLength(Int1): 0
=====
GSMIB_adslAtucCurrOutputPwr:        17.5dBm
GSMIB_adslAtucGsOverlapStatus:       GS_DMT_NON_OVERLAP
=====
GSMIB_adslAturCurrSnrMgn:            31.5dB
GSMIB_adslAturCurrAtn:               2.0dB
GSMIB_adslAturCurrOutputPwr:         11.6dBm
GSMIB_adslAtucCurrAttainableRate:    7336000bps
GSMIB_adslAturCurrAttainableRate:    989333bps
```

Section 10

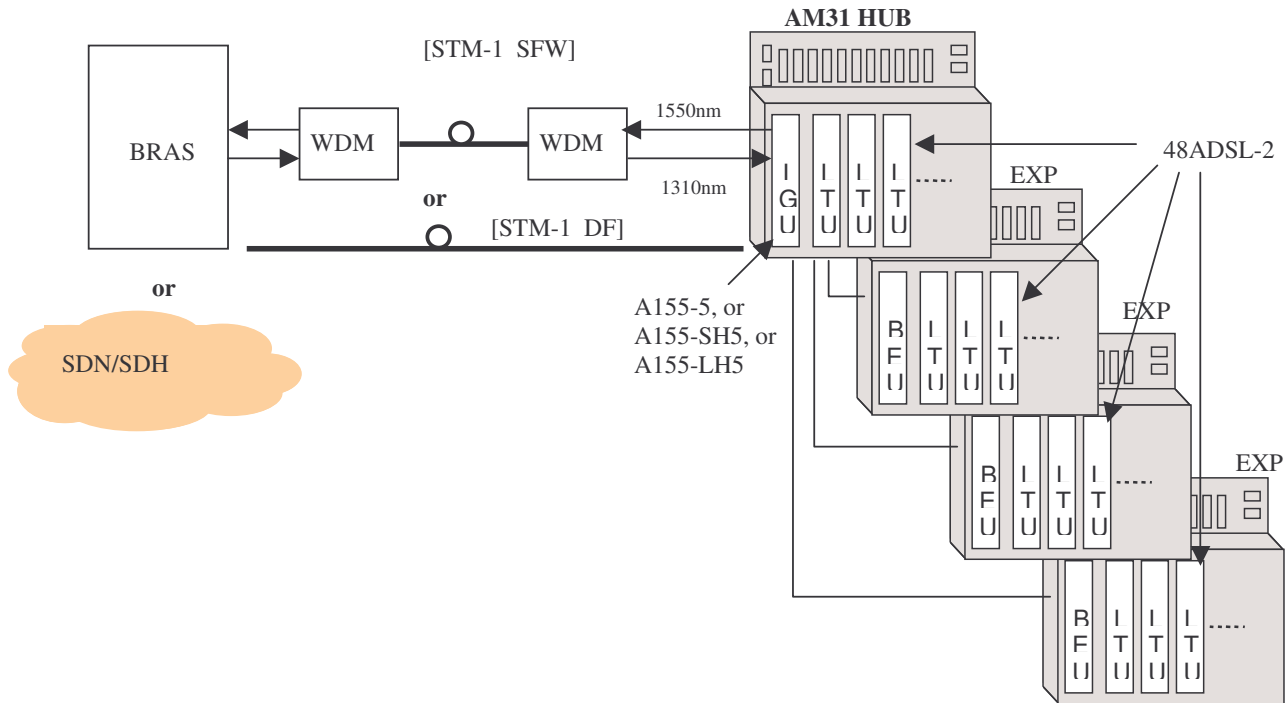
Network Clocking Configurations

This section contains drawings of the different configurations for connecting NEC's AM Series platform equipment into Telstra's network. Accompanying each drawing is a table of the recommended clocking configuration for each Unit installed. The setup reference column in the table provides references to the Director Configuration examples listed later in this section. The Director Configuration example referenced provides an example of the Director GUI to which the user needs to navigate to set the required clock setting.

Note: The factory default clock setting for the optical IGU units is dependent on the unit's hardware version. The hardware version can be identified from Director and is explained in subsection - Determining IGU-A155-X/AM35-I155 Hardware Versions on page 10-9.

NETWORK CLOCKING CONFIGURATION 1 – APPLICABLE FOR THE FOLLOWING FOUR OPTIC HUB NETWORK CONFIGURATIONS.

1. Single fibre working STM-1 connectivity from AM31 hub to BRAS.
2. Single fibre working STM-1 connectivity from AM31 to SDN/SDH network.
3. Dual fibre STM-1 connectivity from AM31 to BRAS.
4. Dual fibre STM-1 connectivity from AM1 to SDN/SDH network.

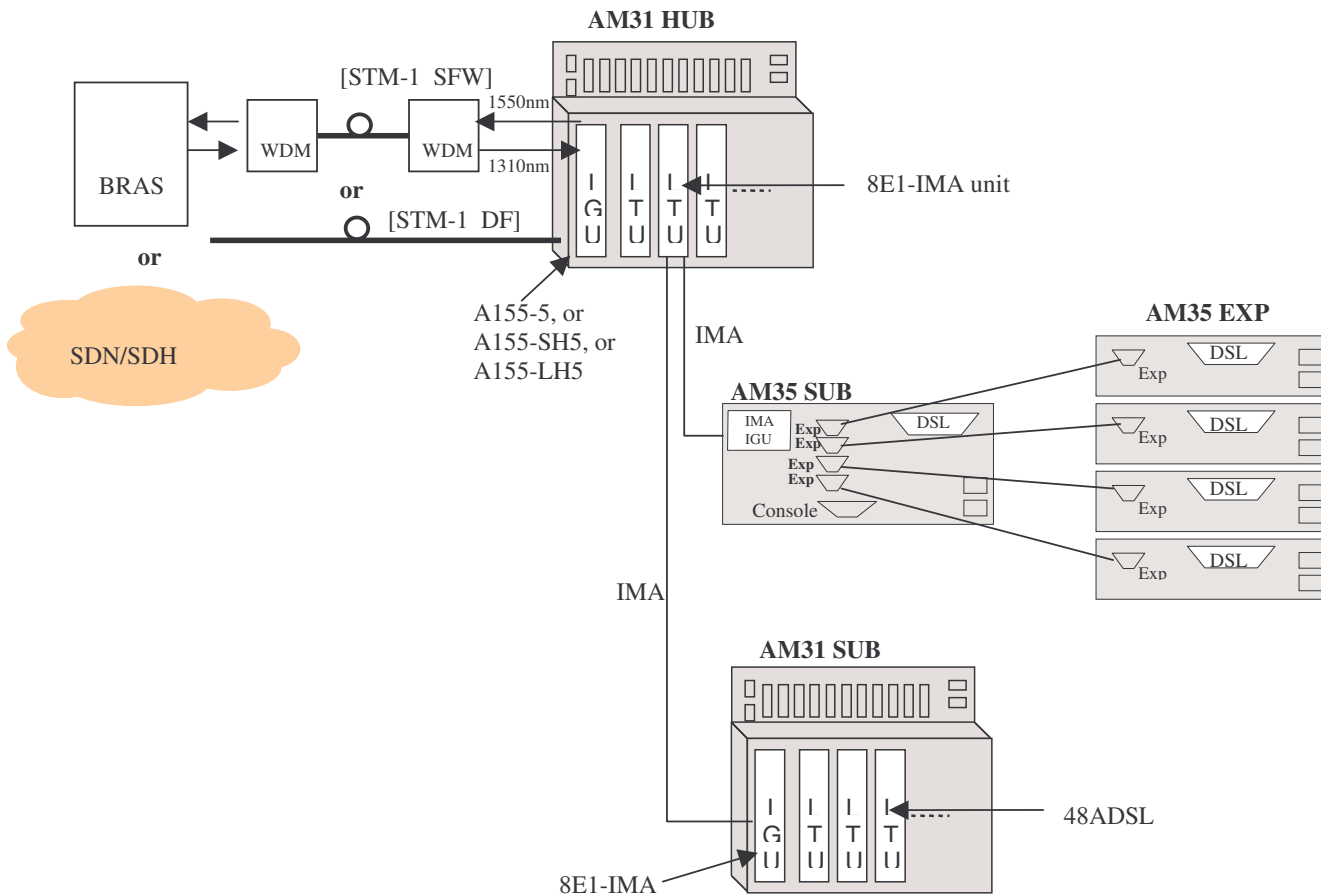


Unit Type	Clocking Configuration		Setup Reference
	Factory default setting	Required network setting	
AM31 Hub IGU-A155-5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-5 (Hardware Versions 1 & 2)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 1)	Local Always	Regenerate If Available	Director Config 6

Note: To check hardware version numbers see Subsection – Determining IGU-155-X/AM35-I155 Hardware Versions on page 10-9.

NETWORK CLOCKING CONFIGURATION 2 – APPLICABLE FOR THE FOLLOWING FOUR OPTIC HUB WITH DIRECT IMA SUBTEND NETWORK CONFIGURATIONS.

1. Single fibre working STM-1 AM31 Hub network connectivity to BRAS with direct IMA subtends to AM31 and AM35.
2. Single fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with direct IMA subtends to AM31 and AM35.
3. Dual fibre working STM-1 AM31 Hub network connectivity to BRAS with direct IMA subtends to AM31 and AM35.
4. Dual fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with IMA subtends to AM31 and AM35.

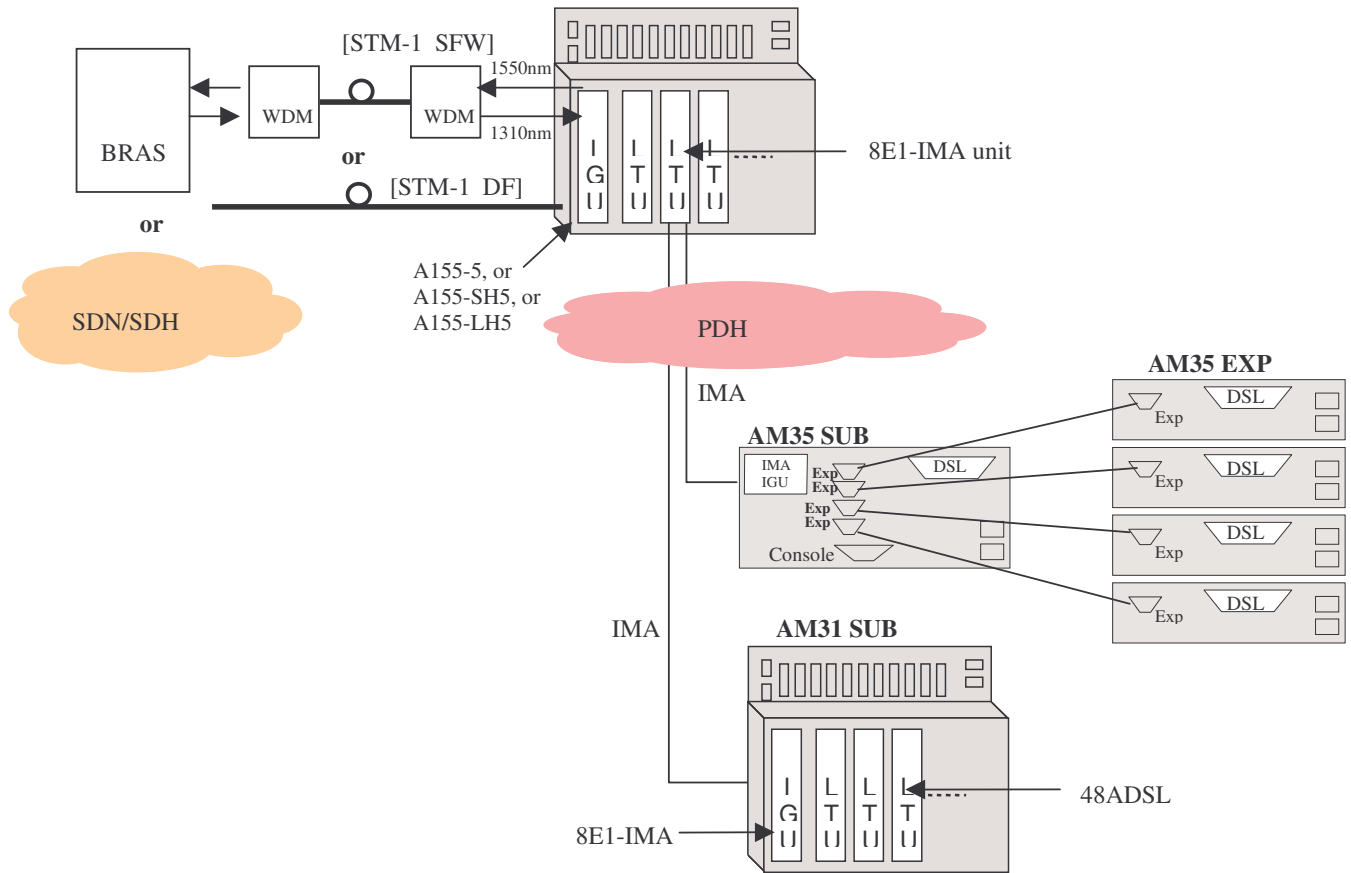


Unit Type	Clocking Configuration		Setup Reference
	Factory default setting	Required network setting	
AM31 Hub IGU-A155-5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-5 (Hardware Versions 1& 2)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 1)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub LTU-8E1-IMA	Local Timing	Local Timing	Director Config 11
AM35 Sub IGU-8E1-IMA (all Hardware Versions)	Loop Timing	Loop Timing	Director Config 2
AM31 Sub IGU-8E1-IMA (all Hardware Versions)	Loop Timing	Loop Timing	Director Config 8

Note: Check hardware version from subsection – Determining IGU-155-X/AM35-I155 Hardware Versions on page 10-9.

NETWORK CLOCKING CONFIGURATION 4 – APPLICABLE FOR THE FOLLOWING FOUR NETWORK HUB WITH SUBTEND CONFIGURATIONS.

- 1 Single fibre working STM-1 AM31 Hub network connectivity to BRAS with IMA subtends to AM31 and AM35 via PDH network.
- 2 Single fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with IMA subtends to AM31 and AM35 via PDH network.
- 3 Dual fibre working STM-1 AM31 Hub network connectivity to BRAS with IMA subtends to AM31 and AM35 via PDH network.
- 4 Dual fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with IMA subtends to AM31 and AM35 via PDH network.

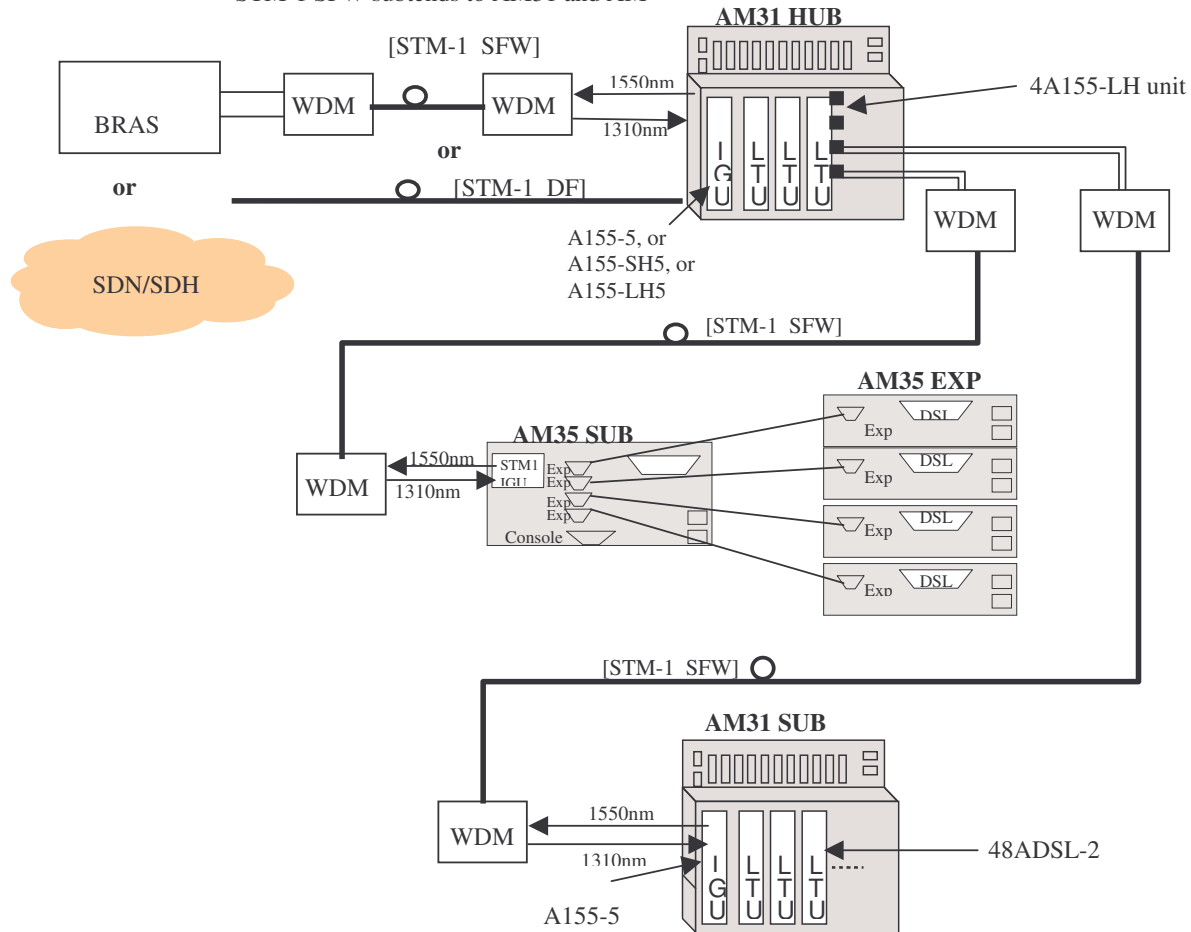


Unit Type	Clocking Configuration		Setup Reference
	Factory default setting	Required network setting	
AM31 Hub IGU-A155-5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-5 (Hardware Versions 1& 2)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 1)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub LTU-8E1-IMA	Local Timing	Local Timing	Director Config 11
AM35 Sub IGU-8E1-IMA (all Hardware Versions)	Loop Timing	Local Timing	Director Config 1
AM31 Sub IGU-8E1-IMA (all Hardware Versions)	Loop Timing	Local Timing	Director Config 7

Note: Check hardware version from subsection – Determining IGU-155-X/AM35-I155 Hardware Versions on page 10-9.

NETWORK CLOCKING CONFIGURATION 5 – APPLICABLE FOR THE FOLLOWING FOUR OPTIC HUB WITH DIRECT OPTIC SUBTEND NETWORK CONFIGURATIONS.

- 1 Single fibre working STM-1 AM31 Hub network connectivity to BRAS with direct STM-1 SFW subtends to AM31 and AM35.
- 2 Single fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with direct STM-1 SFW subtends to AM31 and AM35.
- 3 Dual fibre working STM-1 AM31 Hub network connectivity to BRAS with direct STM-1 SFW subtends to AM31 and AM35.
- 4 Dual fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with direct STM-1 SFW subtends to AM31 and AM

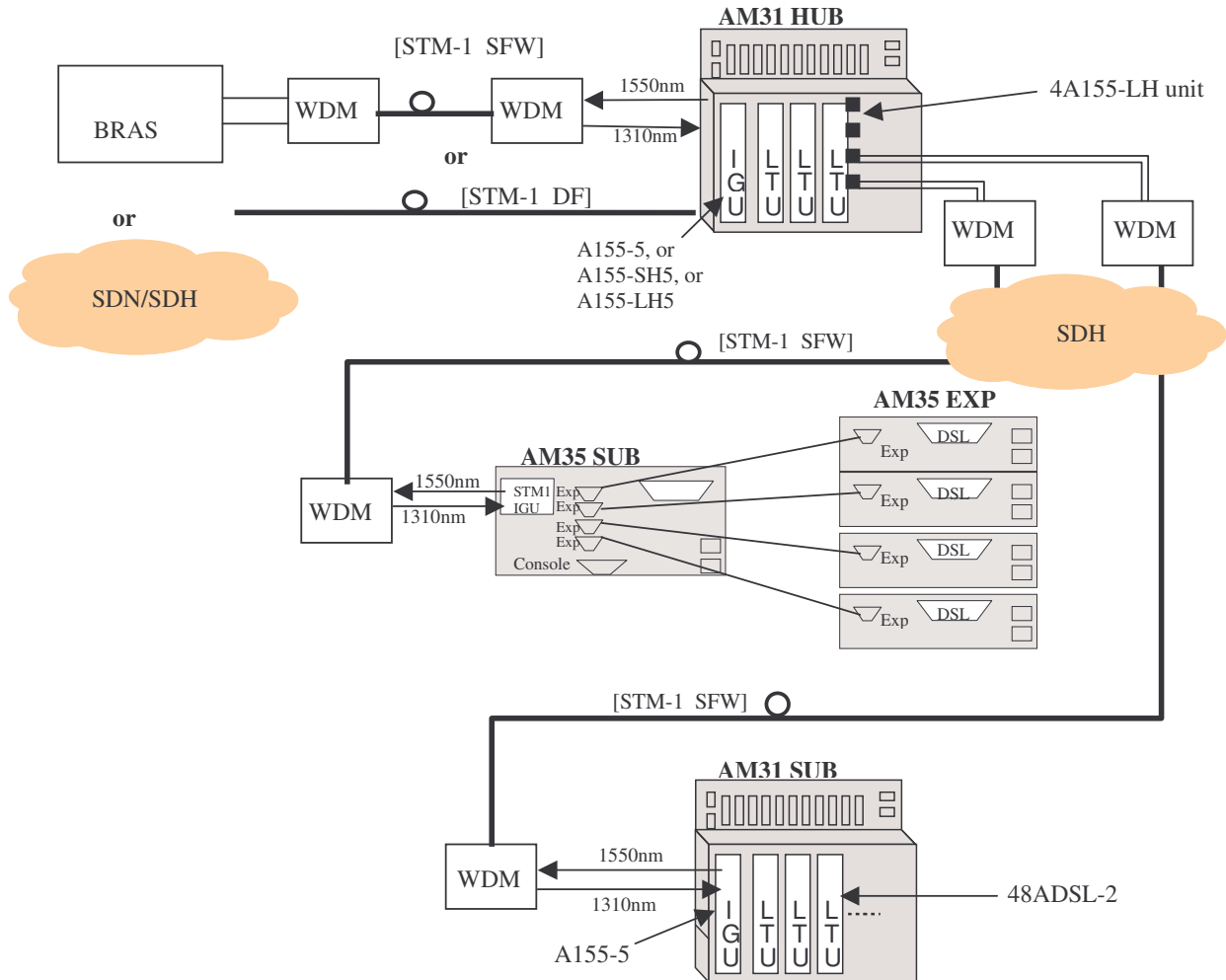


Unit Type	Clocking Configuration		Setup Reference
	Factory default setting	Required network setting	
AM31 Hub/Sub/AM35 Sub IGU-A155-5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub/Sub/AM35 Sub IGU-A155-5 (Hardware Versions 1 & 2)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 1)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub LTU-4A155	Local Always	Local Always	Director Config 9

Note: To check hardware version numbers see subsection 10 – Determining IGU-155-X/AM35-I155 Hardware Versions on page 10-9.

NETWORK CLOCKING CONFIGURATION 6 – APPLICABLE FOR THE FOLLOWING FOUR OPTIC HUB WITH OPTIC SUBTEND NETWORK CONFIGURATIONS.

- 1 Single fibre working STM-1 AM31 Hub network connectivity to BRAS with direct STM-1 SFW subtends to AM31 and AM35 via SDN/SDH network.
- 2 Single fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with direct STM-1 SFW subtends to AM31 and AM35 via SDN/SDH network.
- 3 Dual fibre working STM-1 AM31 Hub network connectivity to BRAS with direct STM-1 SFW subtends to AM31 and AM35 via SDN/SDH network.
- 4 Dual fibre working STM-1 AM31 Hub network connectivity to SDN/SDH network with direct STM-1 SFW subtends to AM31 and AM35 via SDN/SDH network.



Unit Type	Clocking Configuration		Setup Reference
	Factory default setting	Required network setting	
AM31 Hub/Sub/AM35 Sub IGU-A155-5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub/Sub/AM35 Sub IGU-A155-5 (Hardware Versions 1 & 2)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 0)	Regenerate If Available	Regenerate If Available	Director Config 6
AM31 Hub IGU-A155-SH5/LH5 (Hardware Version 1)	Local Always	Regenerate If Available	Director Config 6
AM31 Hub L TU-4A155	Local Always	Local Always	Director Config 9

Note: Check hardware version from subsection – Determining IGU-155-X/AM35-I155 Hardware Versions on page 10-9.

CLOCKING OPTIONS

Below is a reference table listing the available Clock Reference Source or Transmit Clock Source selections for each unit type, as provided in Director.

For Unit Type	Available Director Clock Reference Source and Transmit Clock Source selections
IGU-A155-SH5	Regenerate If Available
IGU-A155-LH5	External If Available
IGU-A155-5	Local Always
IGU-8E1-IMA	Loop Timing Local Timing
LTU-4A155	Local Always Regenerate If Available
LTU-8E1-IMA	Loop Timing Local Timing

From the network configuration drawings earlier in this section, a required Unit clock source setting can be identified. Setting the Unit clock source from Director is then done by navigating to the applicable Director Configuration GUI for the respective Unit. Twelve Director Configurations are shown below. From the Network Browser, navigate to and select the required Unit. Click on the Configuration tab and then scroll down the window pane to the Transmit Clock Source parameter (for IMA Units) or Clock Reference Source (for the Optic Units). Select the clock source parameter and then click the 'Apply to Selection' button. Repeat the process for other Units in the required network configuration.

DIRECTOR CONFIGURATIONS

Determining IGU-A155-X/AM35-I155 Hardware Versions

1. To find out the hardware version number of the IGU-A155-X card/AM35-I155 card, select “UN-1 IGU-A155-X” or “UN-1 AM35-I155” from the network browser and then click on the “Configuration” tab on the tight-hand side.
2. Check the “Hardware Version” field.
3. Below is a screen shot of the possible hardware versions

- a. IGU-A155-5: Hardware Version 0



- b. IGU-A155-5: Hardware Version 1



- c. IGU-A155-5: Hardware Version 2



- d. IGU-A155-SH5: Hardware Version 0



- e. IGU-A155-SH5: Hardware Version 1



- f. IGU-A155-LH5: Hardware Version 0



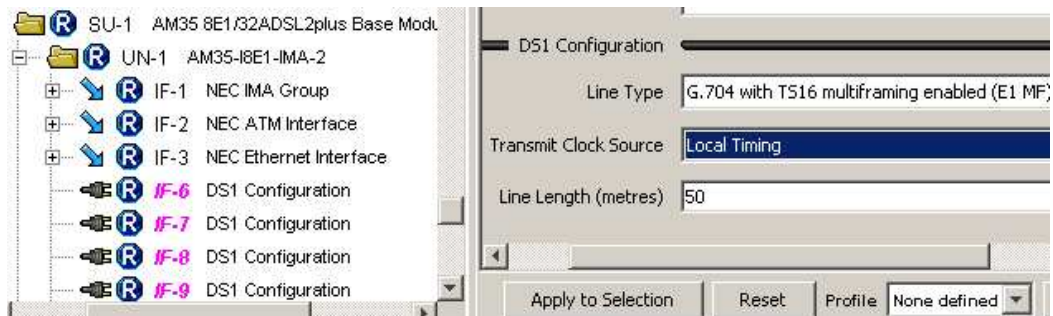
- g. IGU-A155-LH5: Hardware Version 1



- h. AM35-I155: Hardware Version 2

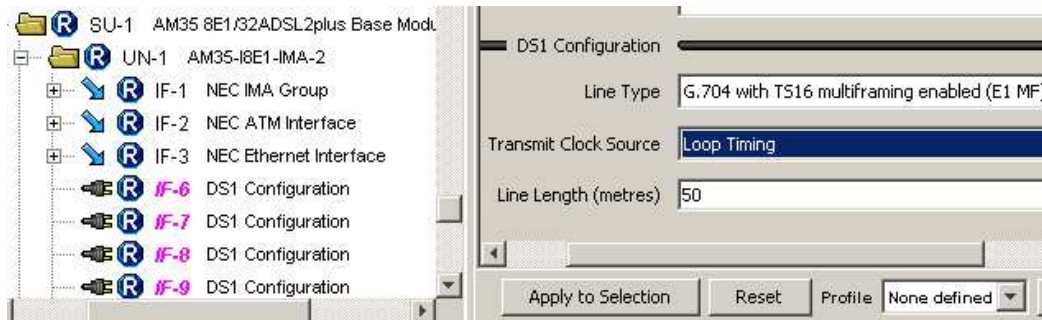


Director Configuration 1 – AM35 IMA Base Unit with Local Timing Clock



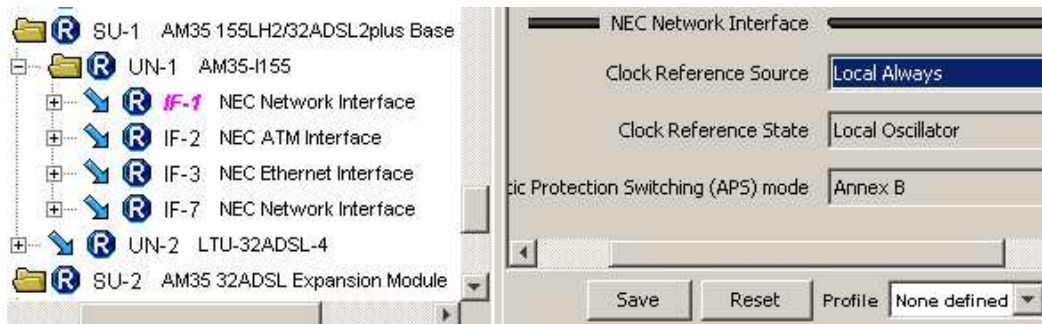
Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Local Timing”.

Director Configuration 2 – AM35 IMA Base Unit with Loop Timing Clock

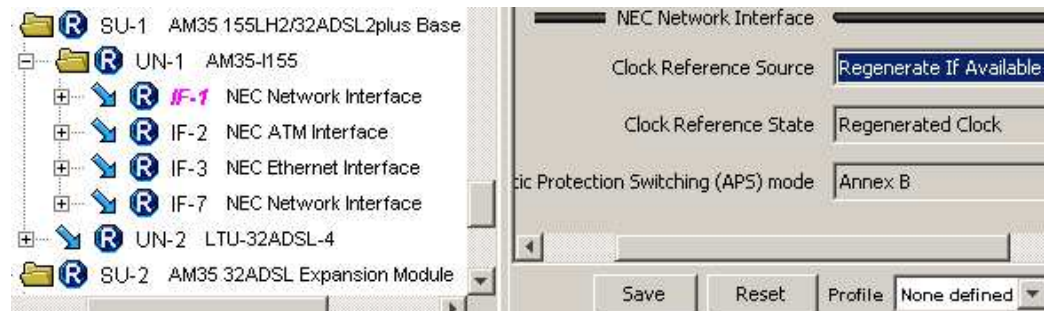


Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Loop Timing”.

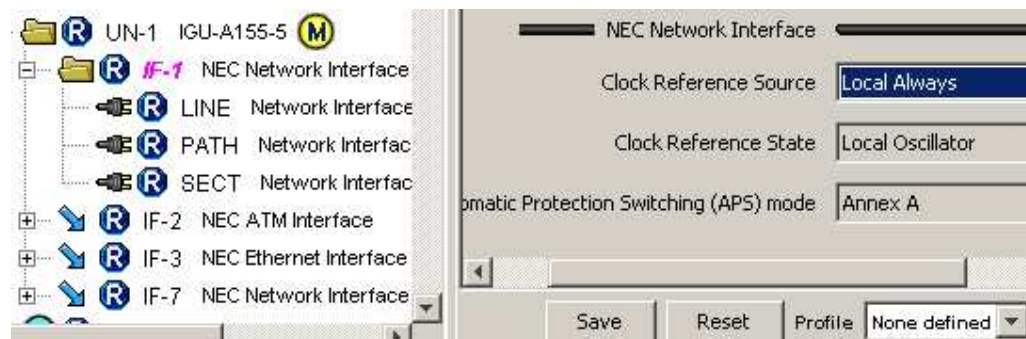
Director Configuration 3 – AM35 Optical Base Unit with Local Timing Clock



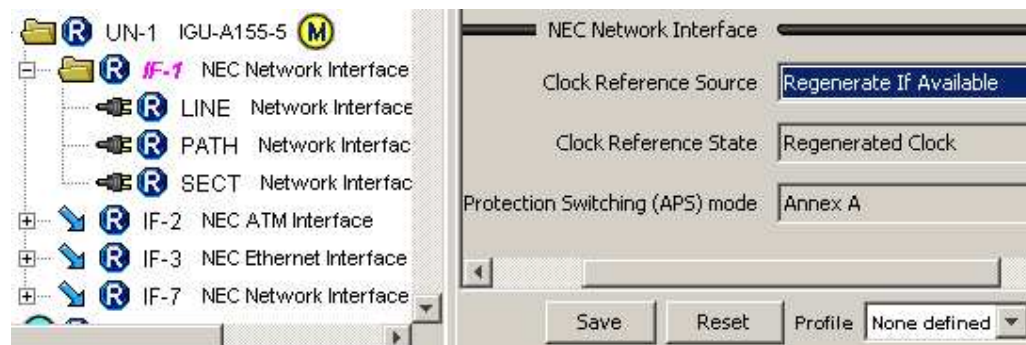
Director Configuration 4 – AM35 Optical Base Unit with Regenerate If Available Clock

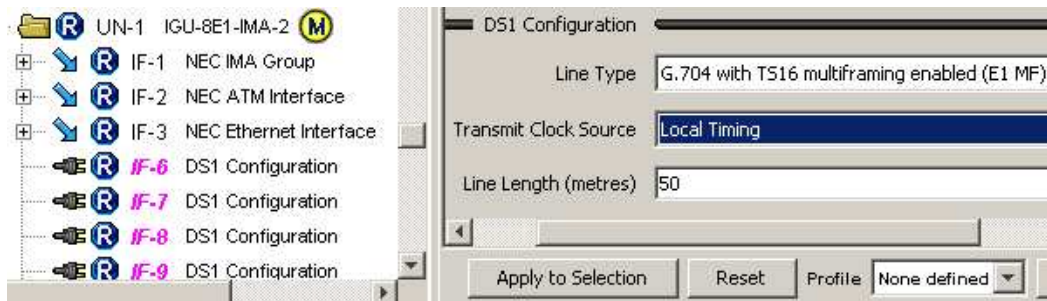


Director Configuration 5 – IGU-A155-X5 card with Local Timing Clock

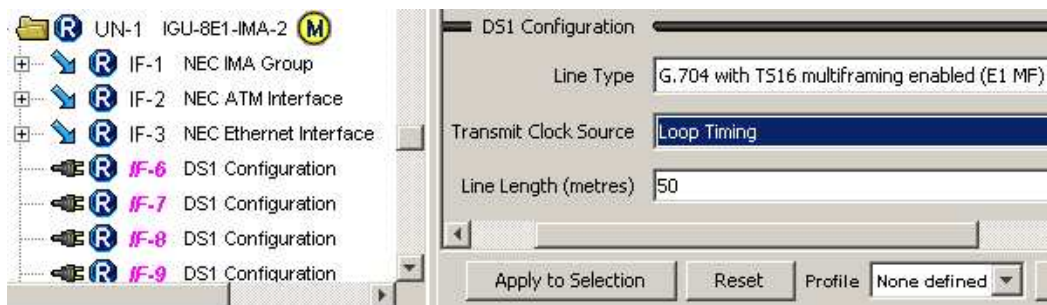


Director Configuration 6 – IGU-A155-X5 card with Regenerate If Available Clock

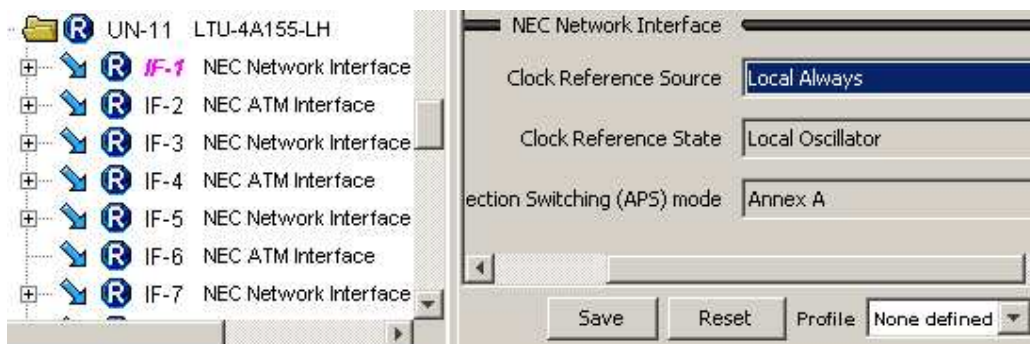


Director Configuration 7 – IGU-8E1-IMA2 card with Local Timing Clock

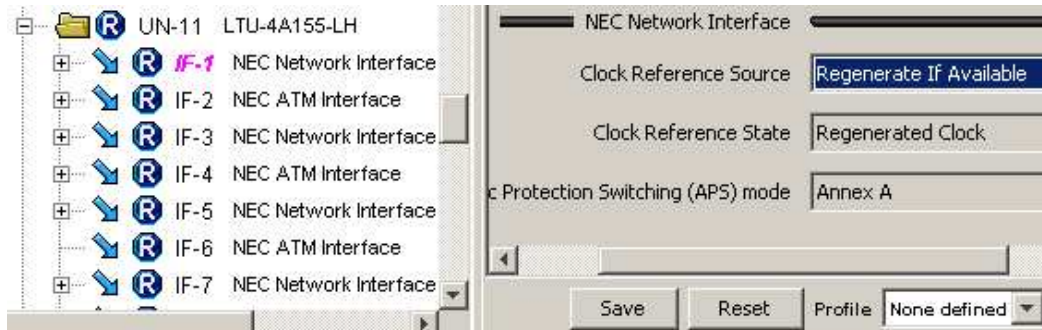
Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Local Timing”.

Director Configuration 8 – IGU-8E1-IMA2 card with Loop Timing Clock

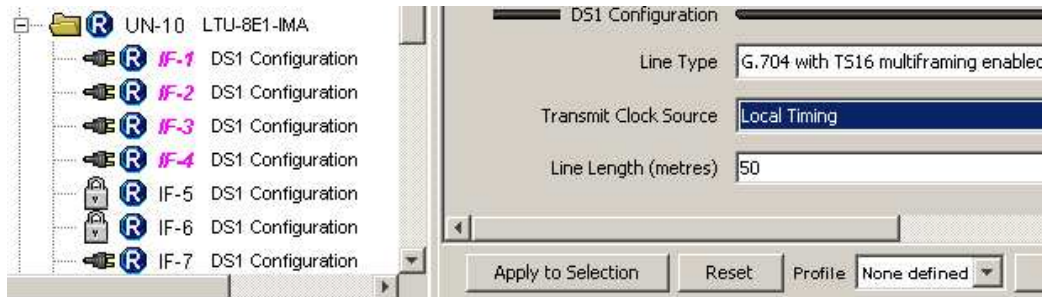
Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Loop Timing”.

Director Configuration 9 – LTU-4A155-LH card with Local Timing Clock

Director Configuration 10 – LTU-4A155-LH card with Regenerate If Available Clock

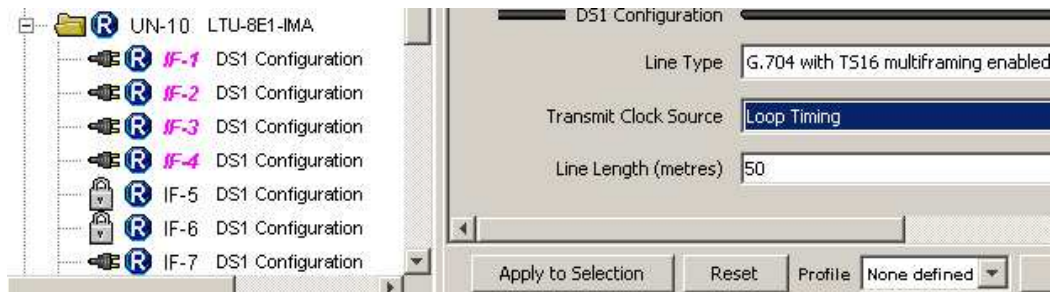


Director Configuration 11 – LTU-8E1-IMA card with Local Timing Clock



Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Local Timing”.

Director Configuration 12 – LTU-8E1-IMA card with Loop Timing Clock



Left click on the first IMA link in the group, Hold the SHIFT key down and then left click on the last IMA link in the group. All IMA links should be highlighted in pink. Then change the “Transmit Clock Source” to “Loop Timing”.

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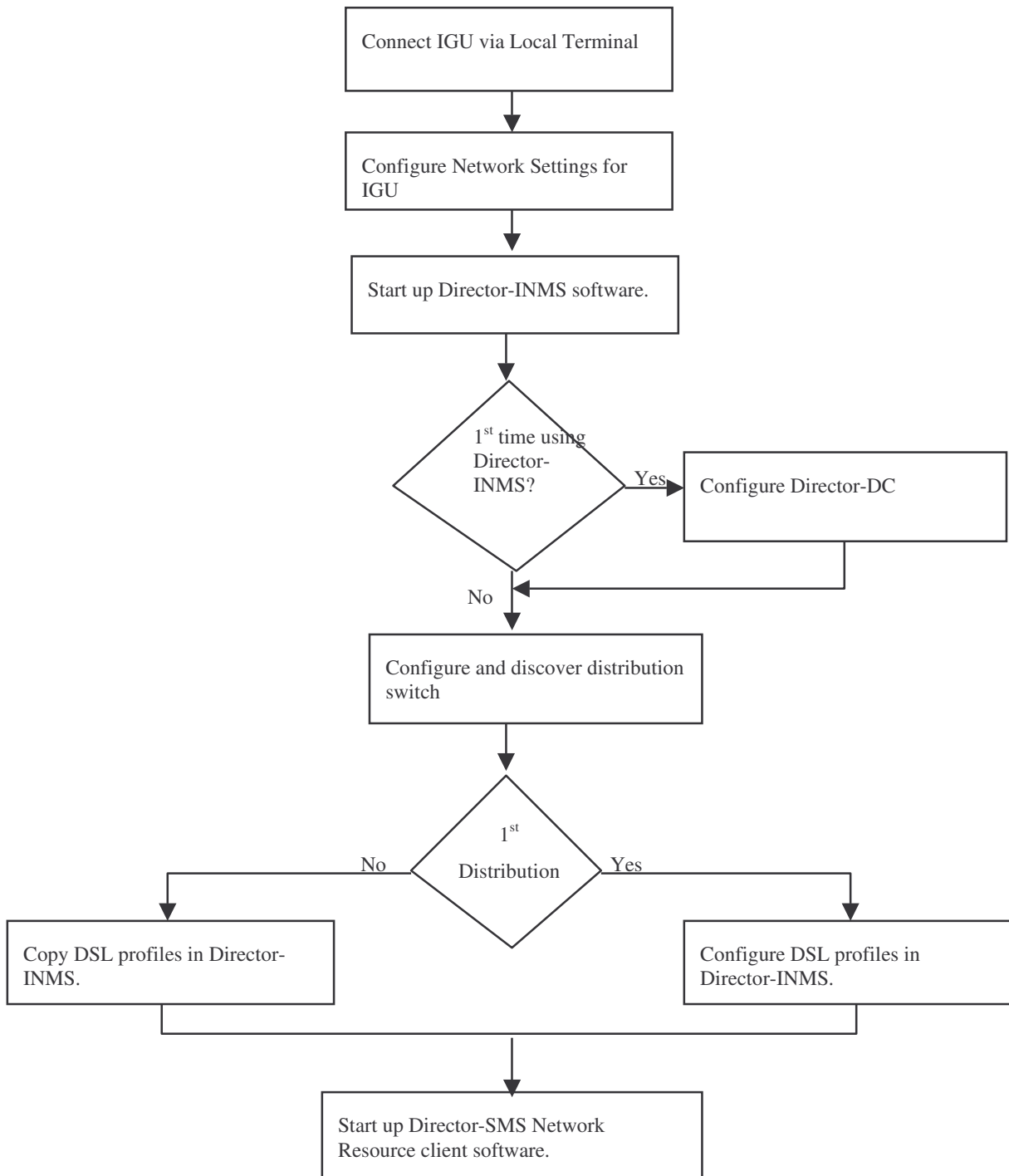
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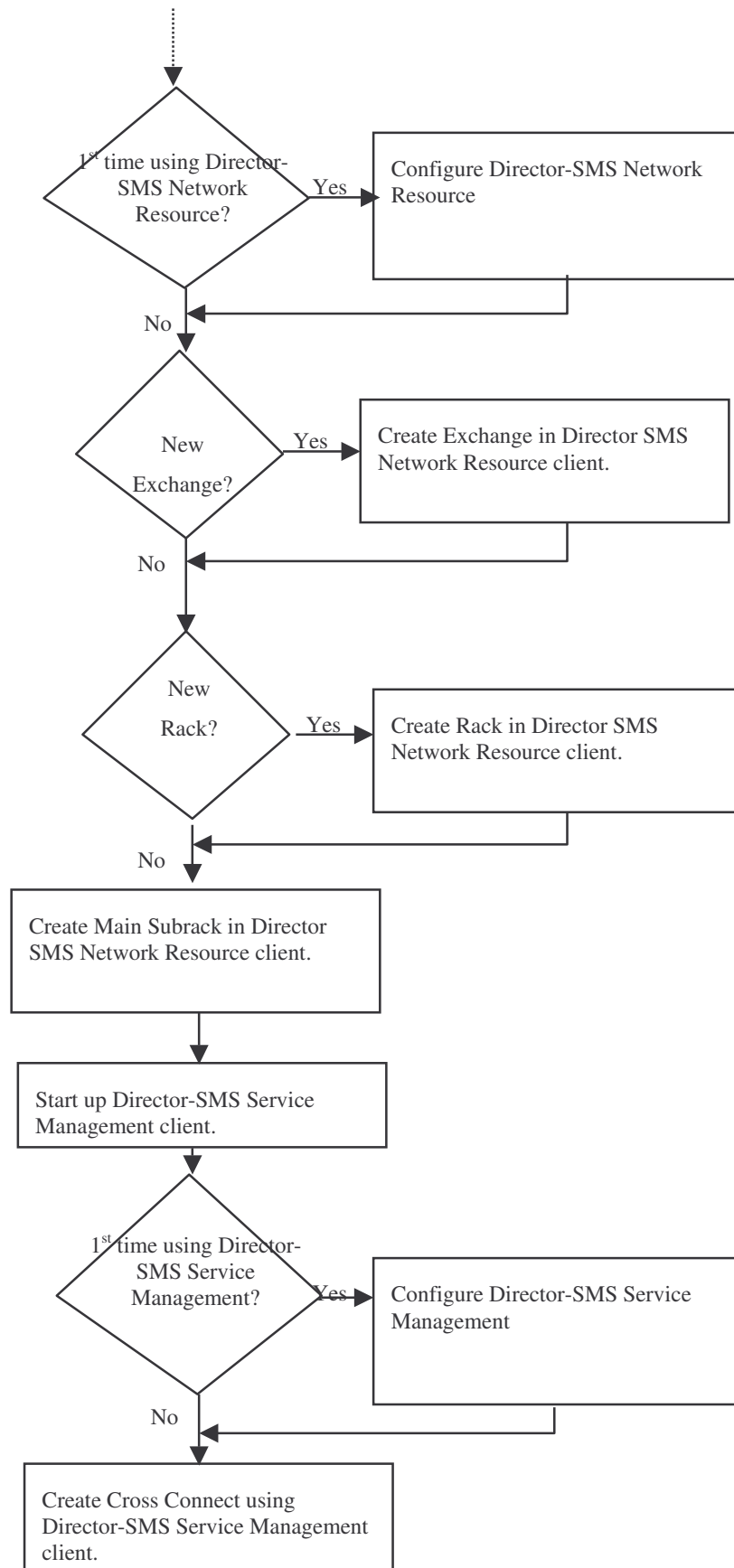
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Appendix A

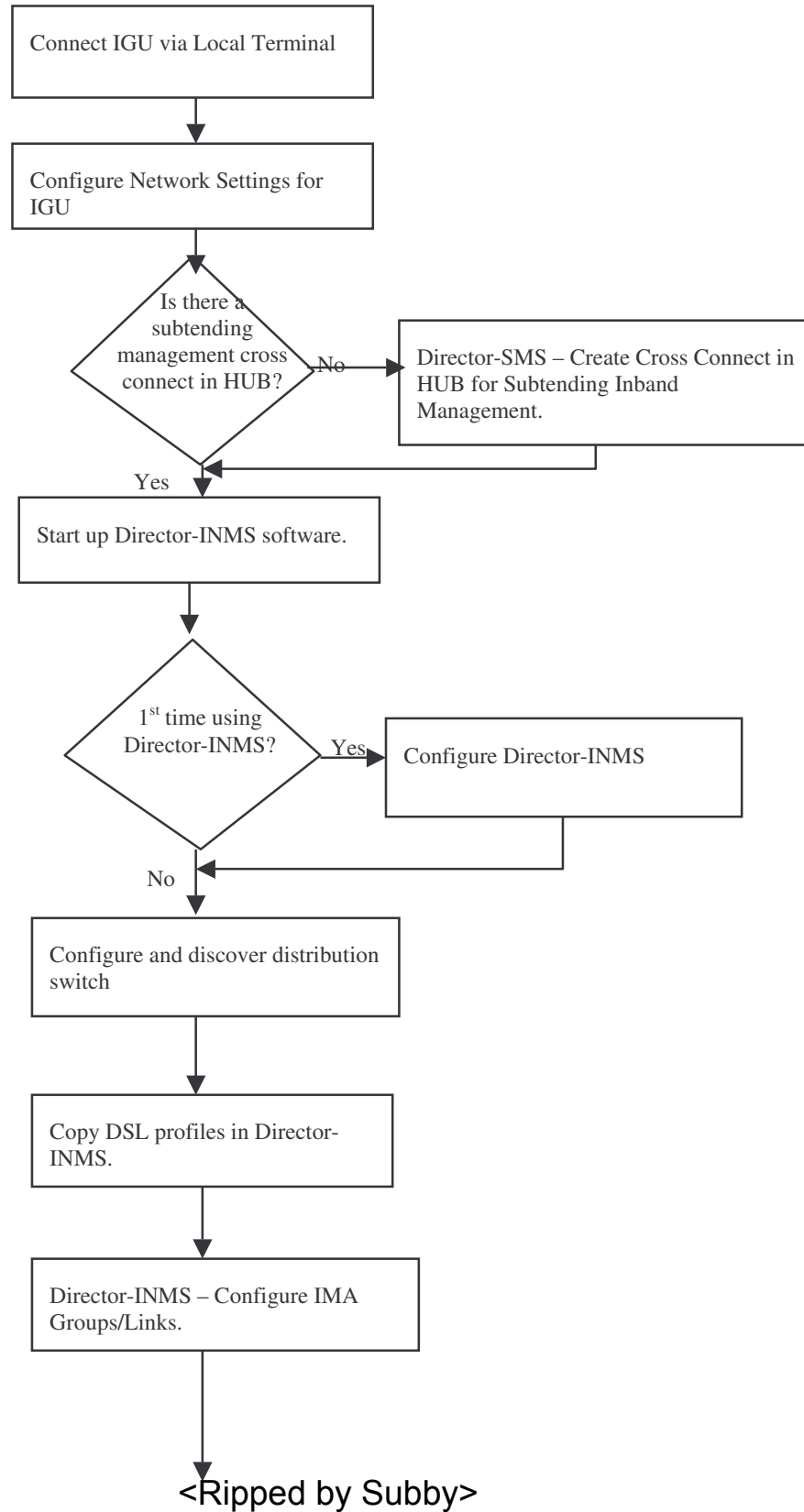
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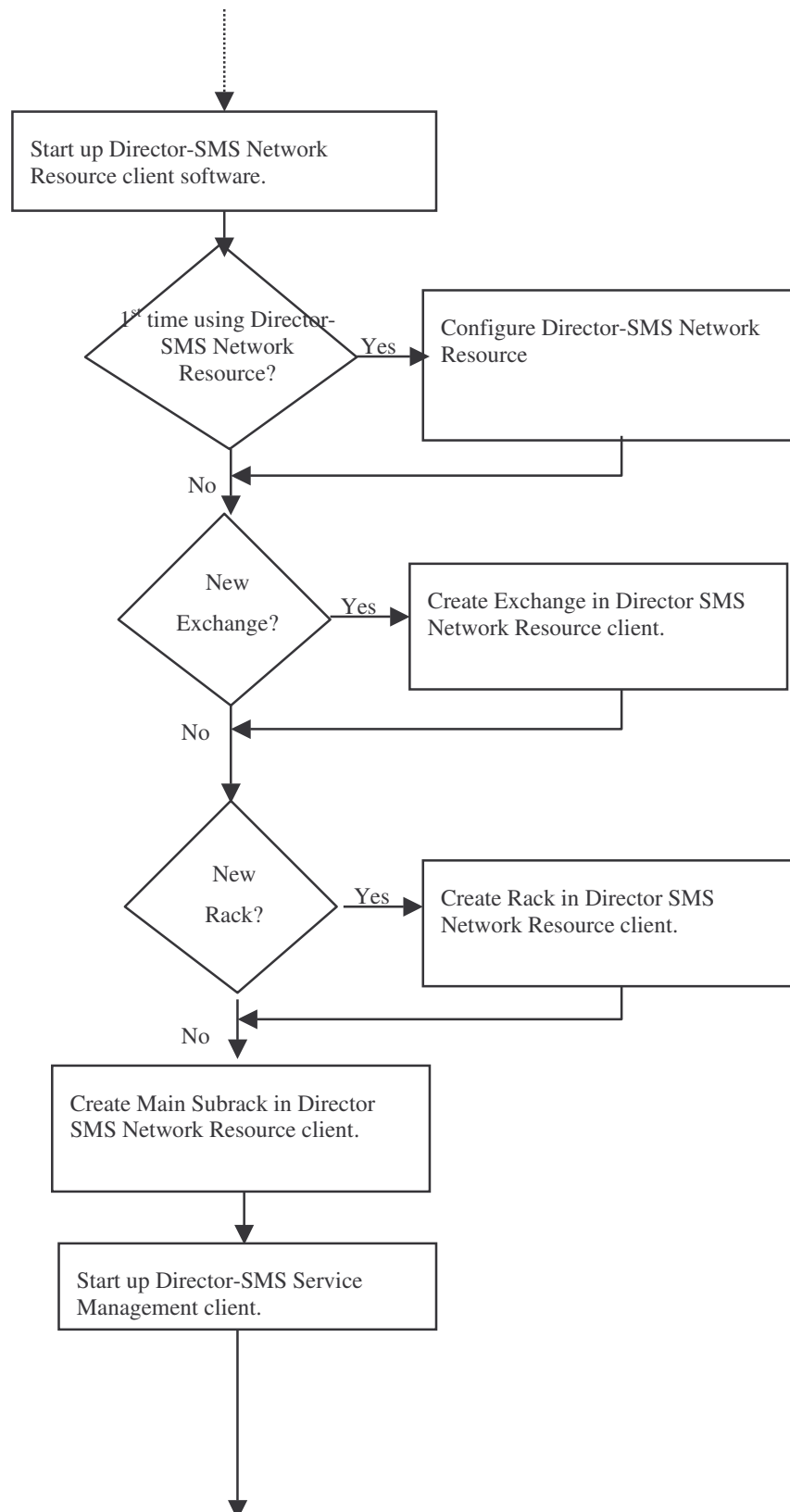
Flowchart for configuring AM31 HUB

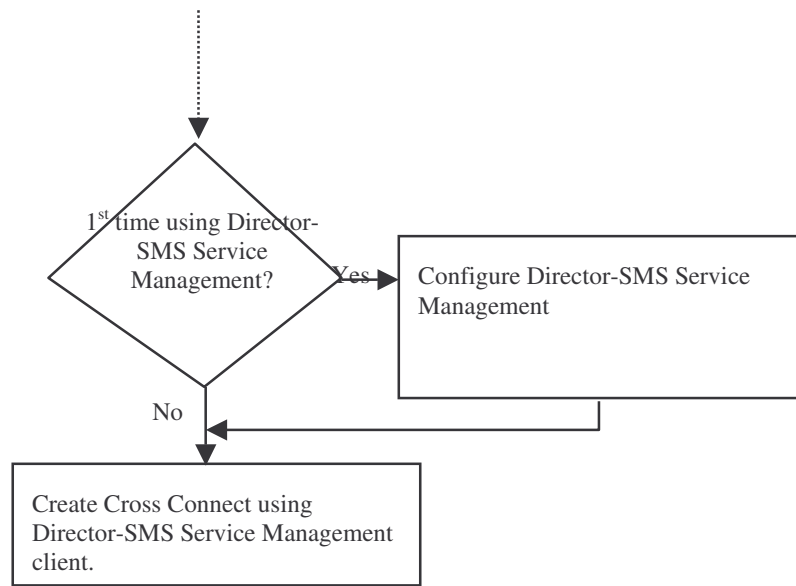




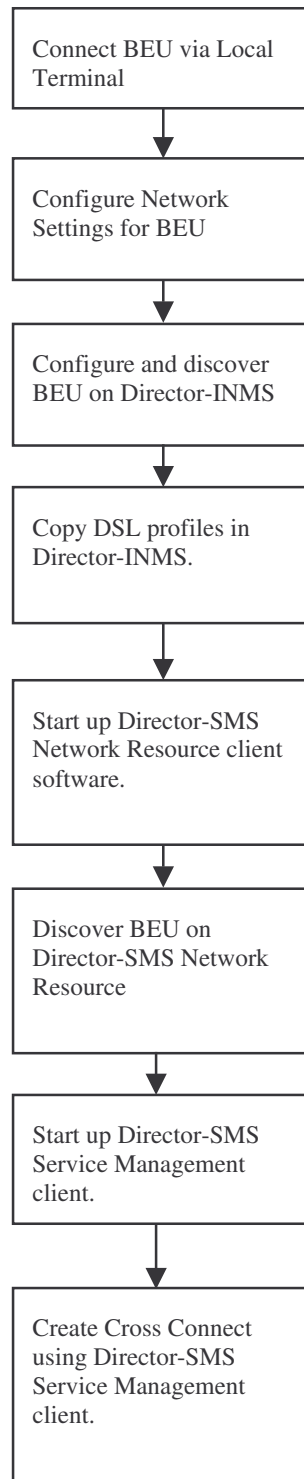
Flowchart for configuring Subtended AM31/AM35







Flowchart for configuring BEU



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