

LTE ENodeB

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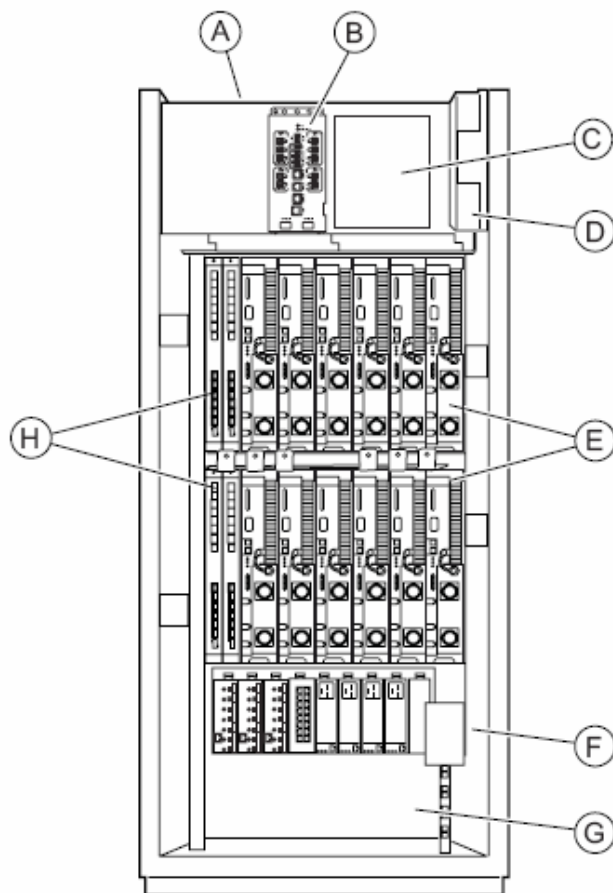
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1 HW

1.1 Cabinet view

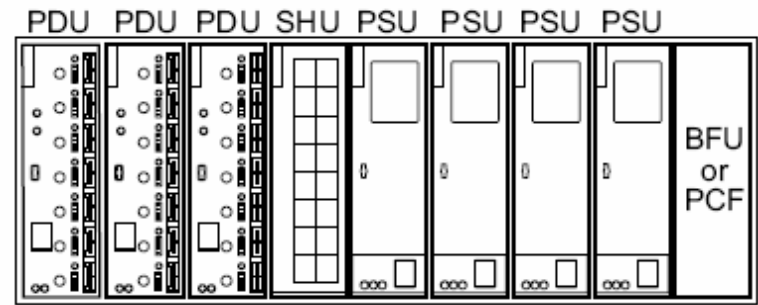
RBS 6201

- Top shelf: fan, heater and climate control (SCU)
- Middle two shelves: DU/RU
- Next shelf: Power Supply, power distribution, and Hub for the Control bus (SHU)
- Bottom shelf: transmission equipment

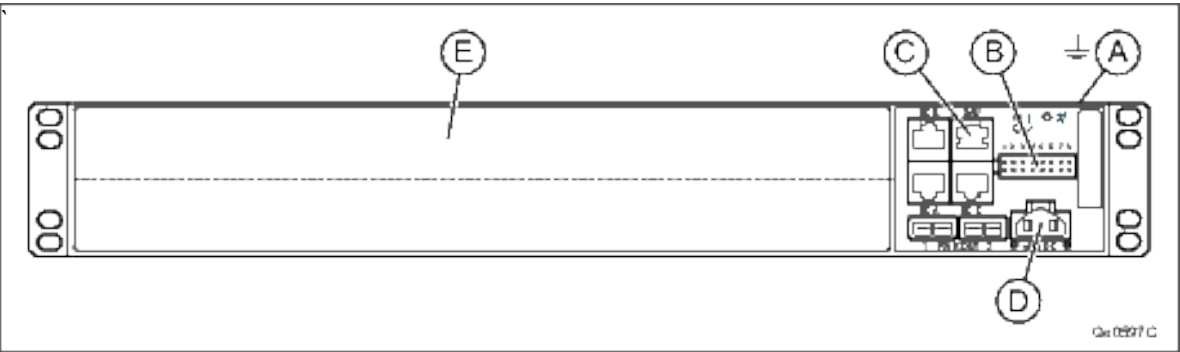


- Ⓐ Fans
- Ⓑ Support Control Unit (SCU)
- Ⓒ Power Connection Unit Alternating Current (PCU AC) or Power Connection Unit Direct Current (PCU DC)
- Ⓓ Power Connection Filter (PCF)
- Ⓔ Radio Units (RU) :
 - Modulation and demodulation of baseband signal
 - RF Power amplification and filtering
- Ⓕ Power subrack including:
 - Power Distribution Unit (PDU)
 - Support Hub Unit (SHU)
 - Power Supply Unit (PSU)
 - Power Filter Unit (PFU)
 - Power Connection Filter (PCF)
 - Battery Fuse Unit (BFU)
- Ⓖ Space for optional transmission equipment
- Ⓗ Digital Units (DU)
 - Control Processing
 - Baseband

Power Subrack



RBS 6601



Position Description

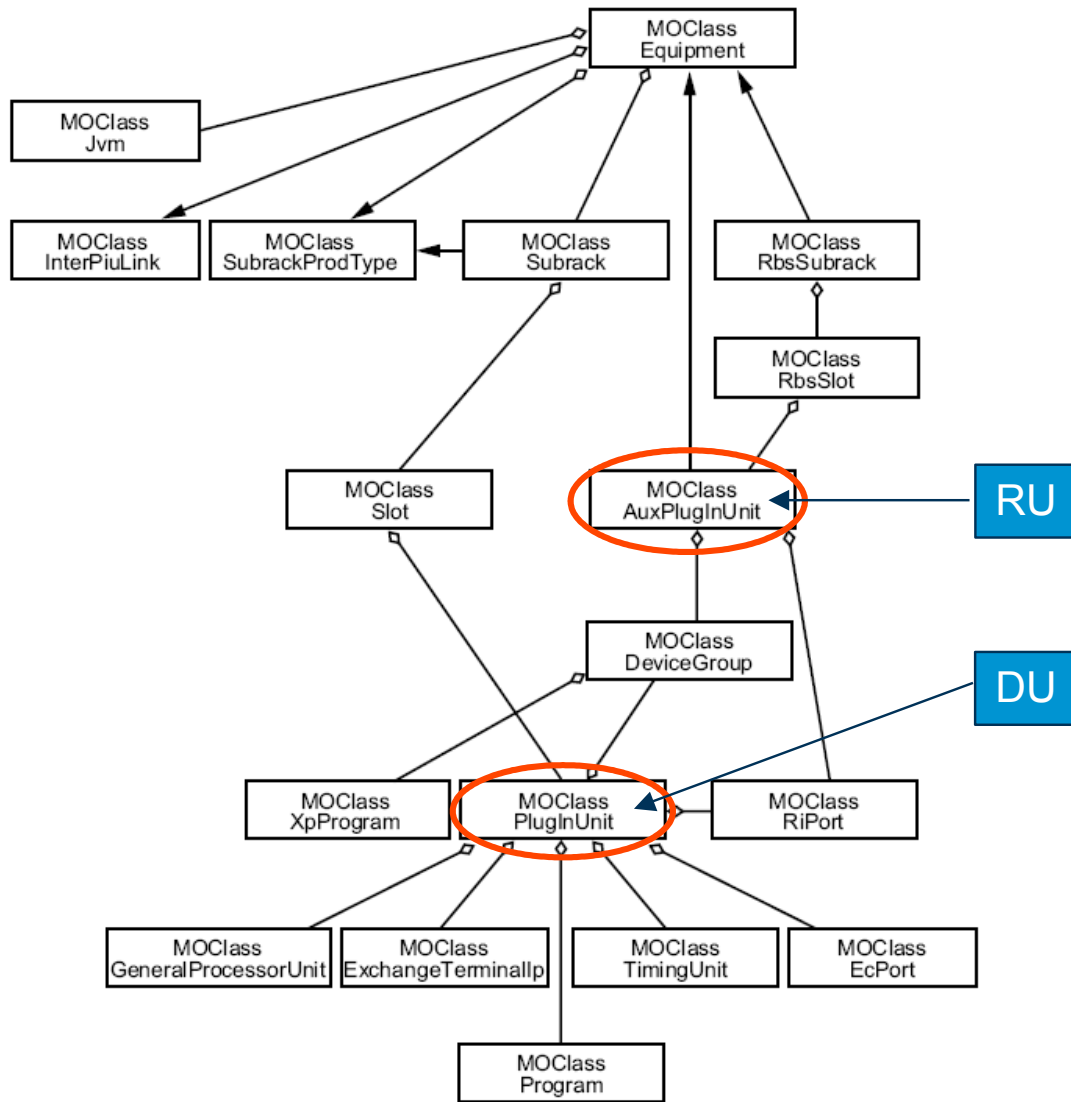
- A Earth grounding interface
(positioned at the back of the
main unit)
- B Built-in external alarm interface
- C SAU power interface
- D Power connection interface
- E 2 DUL (or 1 DUW or 2 DUG)

Board Descriptions

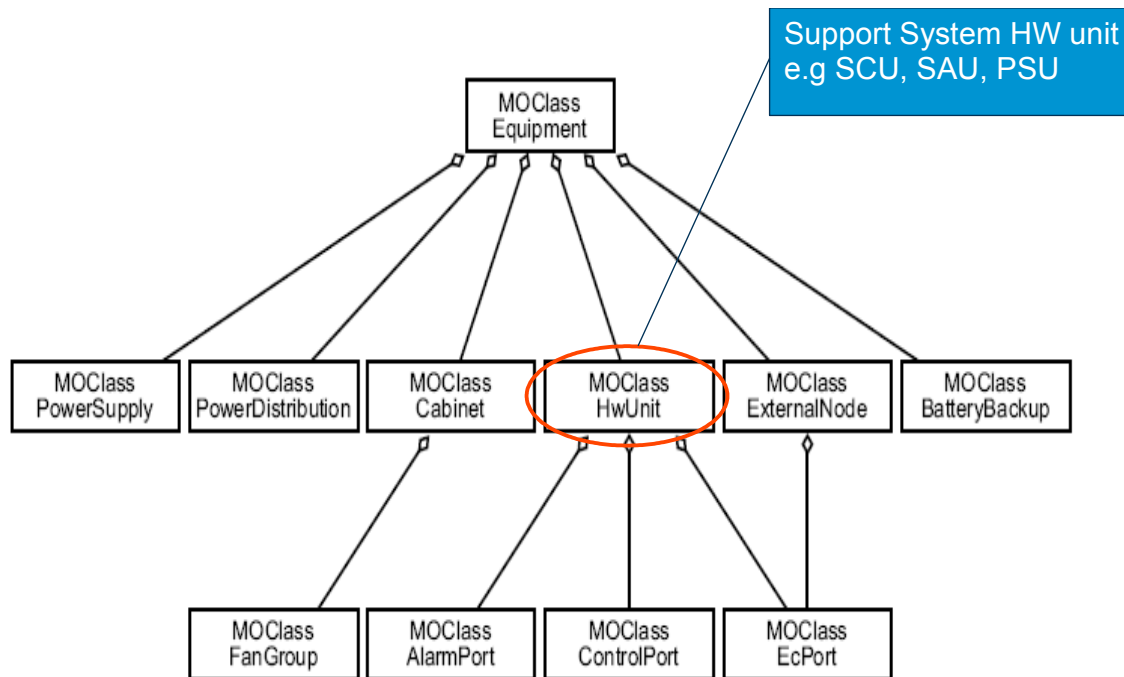
DU	(Digital Unit) Control, Timing, DL/UL baseband processing, IP Transmission handling, interface to RUs
RU	(Radio Unit) Transceiving Receiving Processing (TRP) Uplink and downlink filtering Power Amplifier (PA) functions Up to four carriers downlink and uplink with 2-RX diversity Supports the function Remote Electrical Tilt (RET) Support for external antenna equipment such as Antenna System Controller (ASC), Tower Mounted Amplifier (TMA), and RETU Interface Unit (RIU)
SCU	(System Control Unit) Control of fan speed and fan status

	Interface for smoke detector, external alarms, cabinet lamp, door-switch, temperature sensor, and heaters. RBS Cold start functionality Transient protected EC-bus ports for external connections
SHU	(Support Hub Unit) Extends the EC Hub in the Power Subrack Distributes signals for the Cold Start and Priority load functions RJ-45 connectors Cabling changes dependent on the use of internal/external BFU
SAU	(Support Alarm Unit) Up to 32 external alarms and four output control ports. Monitors and controls customer equipment. EC/Power connection to SCU is modular 10 pin Alarm connectors RJ-45
BFU	Battery and Fuse Unit
PDU	Power Distribution Unit

MOs for DU/RU



MOs for Common Support System



Example, RBS 6201

[~] moshell lienb0621/lienb0621_modump.zip

```

#####
#      Welcome to MoShell 8.0q      #
#      Finn Magnusson, Jan Pettersson      #
#      http://utran01.au.ao.ericsson.se/moshell      #
#      Contact: Finn.Magnusson@ericsson.com      #
#      David.Smith@ericsson.com      #
#####
  
```

unzip -ojq exercises/lte/lienb0621/lienb0621_modump.zip -d /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-105757_11340/modump

Found MO dump: /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-105757_11340/modump/lienb0621_dcg_k.log.gz

Found logfiles: exercises/lte/lienb0621/lienb0621_logfiles.zip

Found ropfiles: exercises/lte/lienb0621/lienb0621_ropfiles.zip

Found dcg CV: exercises/lte/lienb0621/lienb0621_DCG_20101205_055838_duringfault.zip

Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_6_COMPLETE.xml.cache.gzDone.

.Connected to OFFLINE_lienb0621_modump.zip (SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTELi,MeContext=lienb0621,ManagedElement=1)

Last MO: 660. Loaded 660 MOs. Total: 661 MOs.
Preparing offline MIB:
0% ~50% ~100%

HELP MENU : h
QUIT : q

For offline browsing of PM ropfiles, run "pmr/pmx".
For offline browsing of CPP logfiles, run "lg[options]".

ENB0621> invh

Node: RBS6201L CXP102051/10_R9AJ L11A.0.0.0 (EP26-2-CPP_8.0.0.3)

SMN	APN	BOARD	SWALLOCATION	S	OPER	MAINT	FAULT	c/p	d	CPU	PRODUCTNUMBER	REV SERIAL MO
0	1	DUL3	main	1	ON	OFF	OFF	27%	11%	3%	KDU137533/3	R2E C823580032 1,Slot=1

XPBOARD	ST	OPER	MAINT	FAULT	PRODUCTNUMBER	REV	SERIAL/NAME	MO				
FANGROUP		OFF			Cabinet=1,FanGroup=1							
FANGROUP		OFF			Cabinet=1,FanGroup=2							
FANGROUP		OFF			Cabinet=1,FanGroup=3							
PDU0201	1	ON	OFF	BMG980336/4	R2C/A	BJ31623595	HwUnit=PDU-1					
PSU	1	ON	OFF	BMR910427/1	R3G	BW92005780	HwUnit=PSU-1 (PSU DC)					
PSU	1	ON	OFF	BMR910427/1	R3G	BW92005702	HwUnit=PSU-2 (PSU DC)					
PSU	1	ON	OFF	BMR910427/1	R3G	BW92005097	HwUnit=PSU-3 (PSU DC)					
SCU0201	1	ON	OFF	BGM1361006/2	R2A	CD30471957	HwUnit=SCU					
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41465492	RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1				
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41441264	RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2				
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41433571	RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3				
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41441266	RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4				
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41441269	RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5				
RUL	1	ON	16HZ	OFF	KRC11856/1	R1D	CC41441271	RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6				

MO	SMN	PRODUCT	PRODUCTNUMBER	REV	SERIAL/NAME	DATE	transmissionType	maxPwr	fanConfiguration	position		

```
=====
=====
Subrack=1    0 Subrack  ROJ999999    *                ETHERNET_CABLE    NO_CPP_FAN
-----
```

```
=====
=====
MO          SMN PRODUCT  PRODUCTNUMBER  REV  SERIAL/NAME  DATE  activeSwitchPlane  switchState
=====
Subrack=1    0 Backplane
-----
```

```
ENB0621> s+

Sorting of MO list: activated.

ENB0621> lma equip equipment=1

Added 212 MOs to group: equip

ENB0621> mr equip program=

Removed 51 MOs from group: equip

ENB0621> mr equip port=|branch=

Removed 95 MOs from group: equip

ENB0621> lmr equip pluginunit=[^,]+,

Removed 24 MOs from group: equip

ENB0621> pr equip
```

```
=====
Proxy MO
=====
 57 Equipment=1
248 Equipment=1,AntennaUnitGroup=1
250 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1
251 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1
262 Equipment=1,AntennaUnitGroup=2
263 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1
264 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1
235 Equipment=1,AntennaUnitGroup=3
238 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1
239 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1
```

```

242 Equipment=1,Cabinet=1
245 Equipment=1,Cabinet=1,FanGroup=1
244 Equipment=1,Cabinet=1,FanGroup=2
243 Equipment=1,Cabinet=1,FanGroup=3
246 Equipment=1,HwUnit=BFU-1
147 Equipment=1,HwUnit=PDU-1
258 Equipment=1,HwUnit=PDU-2
77 Equipment=1,HwUnit=PSU-1
256 Equipment=1,HwUnit=PSU-2
260 Equipment=1,HwUnit=PSU-3
59 Equipment=1,HwUnit=SAU
149 Equipment=1,HwUnit=SCU
167 Equipment=1,RbsSubrack=1
190 Equipment=1,RbsSubrack=1,RbsSlot=1
191 Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1
202 Equipment=1,RbsSubrack=1,RbsSlot=2
203 Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2
179 Equipment=1,RbsSubrack=1,RbsSlot=3
180 Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3
224 Equipment=1,RbsSubrack=1,RbsSlot=4
225 Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4
168 Equipment=1,RbsSubrack=1,RbsSlot=5
169 Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5
213 Equipment=1,RbsSubrack=1,RbsSlot=6
214 Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6
201 Equipment=1,RbsSubrack=1,RbsSlot=7
79 Equipment=1,Subrack=1
81 Equipment=1,Subrack=1,Slot=1
82 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1
80 Equipment=1,Subrack=1,Slot=2
255 Equipment=1,SubrackProdType=ROJ999999_*

```

=====
Total: 42 MOs

Example, RBS 6601

ENB89 > invh

Node: RBS6601L CXP102051/12_R13V L11B (EP1-CPP_8.0.2)

=====
=====

SMN	APN	BOARD	SWALLOCATION	S	FAULT	OPER	MAINT	c/p	d	CPU	PRODUCTNUMBER	REV	SERIAL	DATE	MO
0	1	DUL3	main	1	OFF	ON	OFF	59%	26%	5%	KDU137533/3	R2E	C823517741	20100517	1,Slot=1

=====

```
=====
=====
XPBOARD  ST  FAULT OPER MAINT PRODUCTNUMBER  REV  SERIAL/NAME  DATE  MO
=====
=====
RRUS11B20 1 OFF ON OFF KRC11891/1 R1C/A C824030081 20101227 AuxPlugInUnit=RRU-1
RRUS11B20 1 OFF ON OFF KRC11891/1 R1C/A C824034458 20101228 AuxPlugInUnit=RRU-2
RRUS11B20 1 OFF ON OFF KRC11891/1 R1C/A C824034467 20101228 AuxPlugInUnit=RRU-3
FANGROUP  ?      ?      Cabinet=1,FanGroup=1
SAU      1 OFF ON      ZHY60117/1 R1D  C823356270 20100204 HwUnit=SAU
-----

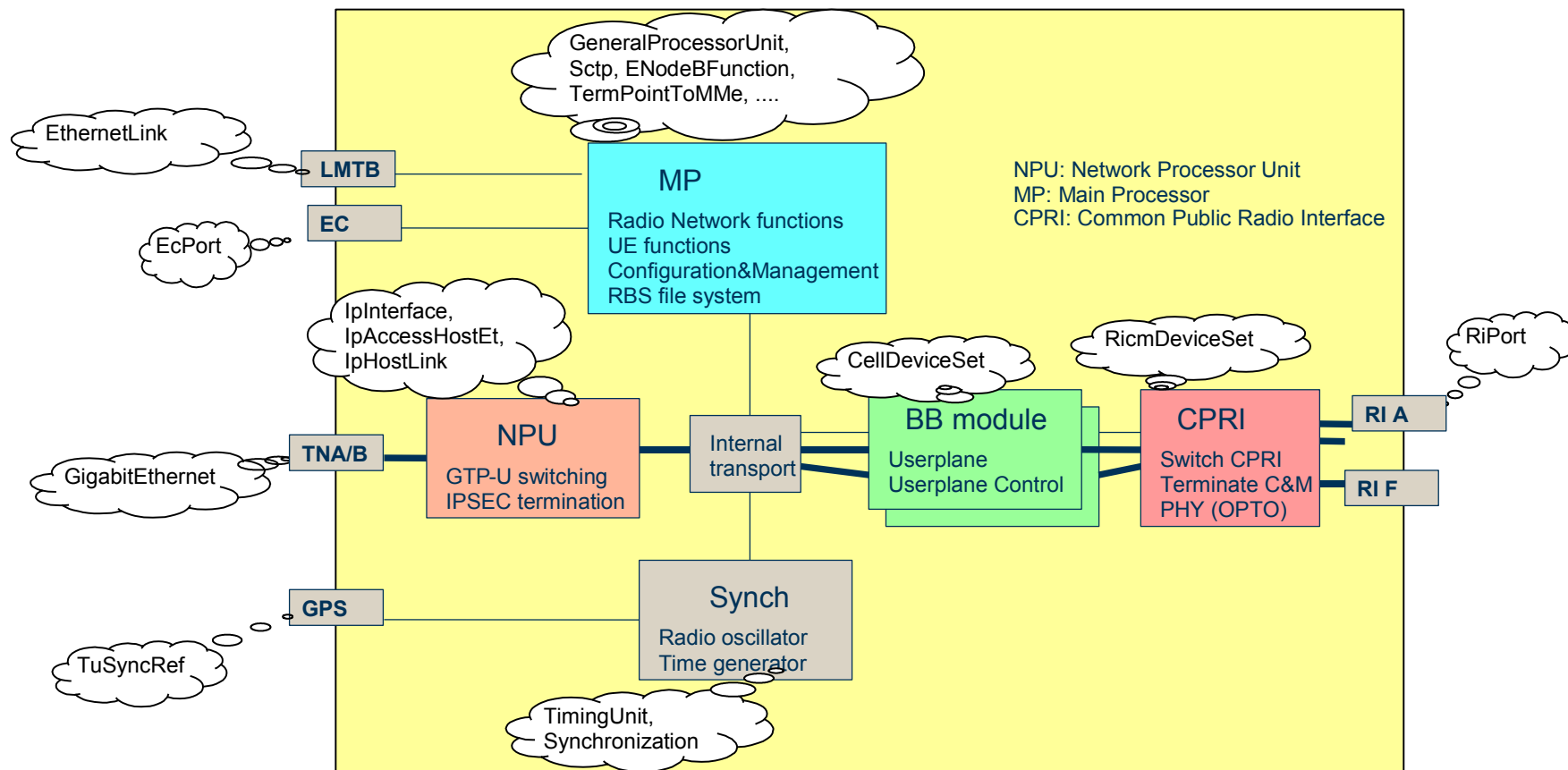
=====
=====
MO      SMN PRODUCT  PRODUCTNUMBER  REV  SERIAL/NAME  DATE  transmissionType maxPwr fanConfiguration position
=====
=====
Subrack=1    0 Subrack  ROJ999999      *      ETHERNET_CABLE      NO_CPP_FAN
-----

=====
=====
MO      SMN PRODUCT  PRODUCTNUMBER  REV  SERIAL/NAME  DATE  activeSwitchPlane switchState
=====
=====
Subrack=1    0 Backplane
-----
```

1.2 DU board



Port	Connector	Description
RI A-F	SFP	Interface DU-RU (electrical) or DU-RRU (optical)
TN A	RJ-45	Gigabit Ethernet (electrical)
TN B	SFP	Gigabit Ethernet (optical)
IDL	HSIO	Inter-DU link (DU to DU)
LMT A	RJ-45	Serial port for OSE shell over RS-232
LMT B	RJ-45	Fast Ethernet for O&M
AUX	RJ-45	Auxiliary (Common EC bus)
EC	RJ-45	EC bus (Dedicated EC bus)
GPS	RJ-45	Used when the network synchronization source is a GPS receiver



ENB0621> lma du ,plug

Added 65 MOs to group: du

ENB0621> mr du program

Removed 45 MOs from group: du

ENB0621> pr du

```
=====
Proxy MO
=====
```

```
82 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1
119 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,DeviceGroup=dul
140 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,EcPort=1
99 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1
100 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1
```

```
101 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=1
102 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2
93  Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1
94  Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1
98  Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=A
129 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=B
130 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=C
110 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=D
92  Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=E
128 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=F
113 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=bb-1
114 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=bb-1,CellDeviceSet=1
131 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=du-1
132 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=du-1,RicmDeviceSet=1
115 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,TimingUnit=1
=====
Total: 20 MOs
```

ENB0621> st du

```
=====
Proxy  Adm State   Op. State   MO
=====
82 1 (UNLOCKED) 1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1
119      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,DeviceGroup=du1
99      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1
100 1 (UNLOCKED) 1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1
101      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=1
102      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2
93      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1
94      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1
98      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=A
129      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=B
130      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=C
110      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=D
92      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=E
128      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=F
113      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=bb-1
114      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=bb-1,CellDeviceSet=1
131      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=du-1
132      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,SubDeviceGroup=du-1,RicmDeviceSet=1
115      1 (ENABLED) Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,TimingUnit=1
=====
Total: 19 MOs
```

ENB4016> moma device

#####

MO Class Attributes/Actions

#####

CellDeviceSet CellDeviceSetId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the grand-parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

The attributes of this MO class may only be changed by Ericsson personnel.

DeviceGroup DeviceGroupId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

This MO must at manual configuration be created in the same transaction as its parent MO (PlugInUnit or AuxPlugInUnit) and its children MOs. If not done accordingly then a restart of the system is required to facilitate proper function.

Generic device group for device boards and auxiliary units . Depending on type of device board/auxiliary unit it may contain different kind of device sets and number of devices in the sets. The device group type is given by the MO ID, i.e. the value of the DeviceGroupId attribute.

RcmDeviceSet RcmDeviceSetId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the grand-parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

This MO models a Radio Interface Connection device set.

The attributes of this MO class may only be changed by Ericsson personnel.

SchDevice SchDeviceId,availabilityStatus,operationalState,reservedBy,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the grand-parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

The attributes of this MO class may only be changed by Ericsson personnel.

SchDeviceSet SchDeviceSetId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the grand-parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

The attributes of this MO class may only be changed by Ericsson personnel.

SubDeviceGroup SubDeviceGroupId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the parent PlugInUnit is created. For the MO to be correctly configured the PlugInUnit must refer to a proper PiuType.

This MO must at manual configuration be created in the same transaction as its parent MO (PlugInUnit) and its children MOs. If not done accordingly then a restart of the system is required to facilitate proper function.

Generic device group for logical boards. Depending on type of device board it may contain different kind of device sets and number of devices in the sets. The device group type is given by the MO ID, i.e. the value of the SubDeviceGroupId attribute.

The attributes of this MO class may only be changed by Ericsson personnel.

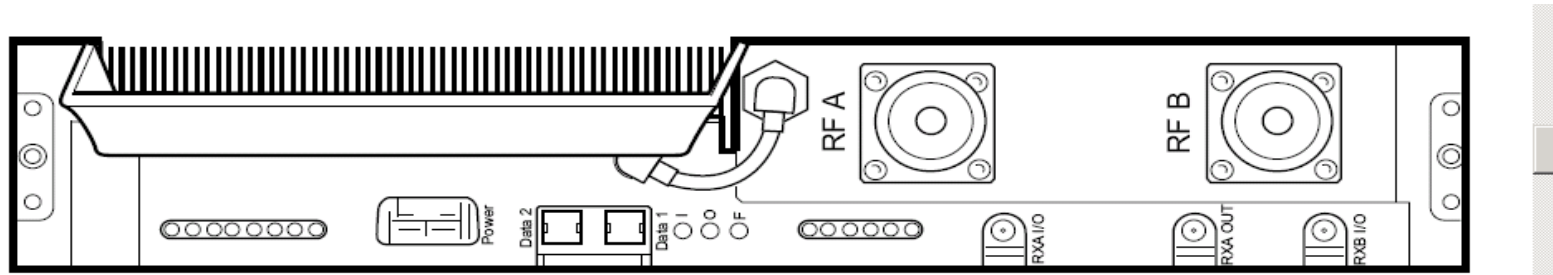
TrDeviceSet TrDeviceSetId,availabilityStatus,operationalState,usageState

This MO is created by the auto-configuration function (attribute autoConfigurationAllowed must be set to TRUE in MO ManagedElementDatafunction) when the grand-parent AuxPlugInUnit or PlugInUnit is created. For the MO to be correctly configured the AuxPlugInUnit or PlugInUnit must refer to a proper PiuType.

This MO models a Transmit/Receive device set.

1.3 RU board

Found in RBS 610x and 620x



ENB0621> lma ru ,aux

Added 60 MOs to group: ru

ENB0621> st ru

```
=====
Proxy  Adm State   Op. State   MO
=====
191 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1
193      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru
195 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
199 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=B
197 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXA_IO
194 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXB_IO
198      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,TrDeviceSet=tr
192      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1
200      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_2
203 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2
205      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru
207 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=A
210 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=B
208 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=RXA_IO
211 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=RXB_IO
206      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,TrDeviceSet=tr
212      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,RiPort=DATA_1
204      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,RiPort=DATA_2
180 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3
183      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru
189 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=A
186 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=B
185 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=RXA_IO
188 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=RXB_IO
187      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,TrDeviceSet=tr
181      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,RiPort=DATA_1
182      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,RiPort=DATA_2
225 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4
227      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru
232 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=A
233 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=B
229 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=RXA_IO
228 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=RXB_IO
231      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,TrDeviceSet=tr
226      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,RiPort=DATA_1
234      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,RiPort=DATA_2
169 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5
172      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru
176 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=A
174 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=B
=====
```

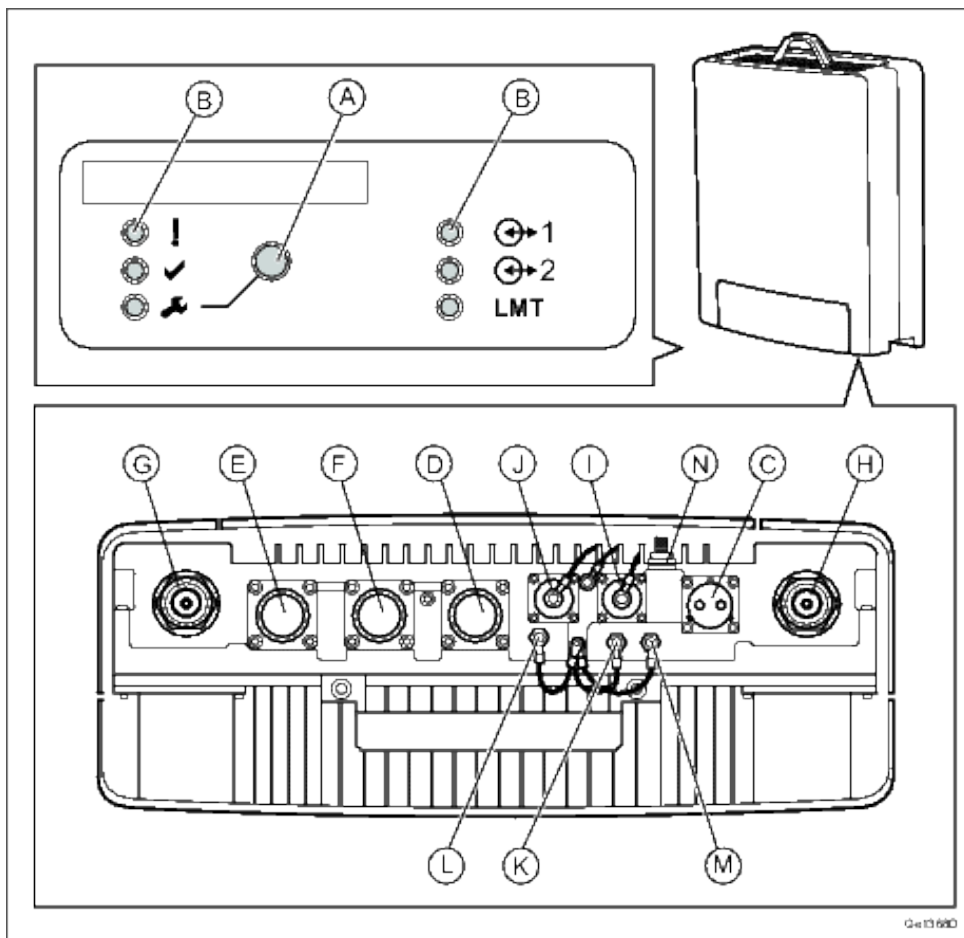
```

177 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=RXA_IO
173 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=RXB_IO
175      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,TrDeviceSet=tr
170      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,RiPort=DATA_1
171      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,RiPort=DATA_2
214 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6
215      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru
220 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=A
216 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=B
217 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=RXA_IO
219 1 (UNLOCKED) 1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=RXB_IO
218      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,TrDeviceSet=tr
223      1 (ENABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,RiPort=DATA_1
222      0 (DISABLED) Equipment=1,RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,RiPort=DATA_2
=====
Total: 54 MOs

```

1.4 Remote RU

Found in RBS 660x



Position	Description	Marking
A	Maintenance button	
B	Optical indicators	 ⊕1, ⊕2 LMT (RRUS 11 only)
C	-48 V DC power supply	
D	Local Maintenance Terminal	LMT
E	Optical cable 1	⊕1
F	Optical cable 2	⊕2
G	Antenna 1	
H	Antenna 2	RRUS 01: RRUS 11:
I	ALD (RET)	RRUS 01: ALD Ctrl RRUS 11: ALD
J	External alarm	RRUS 01: EXT Alarm RRUS 11:
K	Cross connect RXA	RXA I/O
L	RXA co-site	RXA Out
M	Cross connect RXB	RXB I/O
N	Earth grounding	

ENB54> Ist auxpluginunit=rru-1

```
=====
Proxy  Adm State  Op. State  MO
=====
202 1 (UNLOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1
204      1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru
207 0 (LOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=1
210 0 (LOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=2
213 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=3
217 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=4
208 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=5
211 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=6
215 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=7
205 0 (LOCKED) 0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,AlarmPort=8
```

```

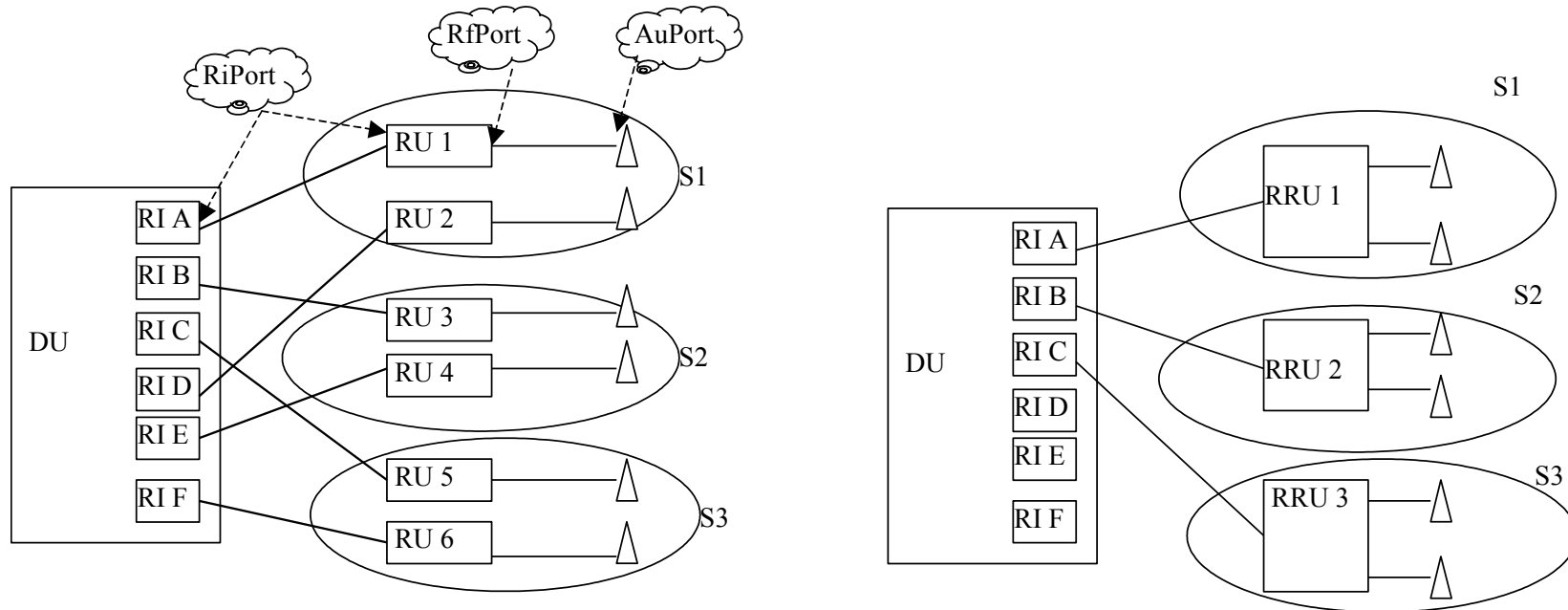
212 1 (UNLOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,RfPort=A
216 1 (UNLOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,RfPort=B
206 1 (UNLOCKED) 1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,DeviceGroup=ru,RfPort=R
203      1 (ENABLED) Equipment=1,AuxPlugInUnit=RRU-1,RiPort=DATA_1
218      0 (DISABLED) Equipment=1,AuxPlugInUnit=RRU-1,RiPort=DATA_2
=====

```

Total: 15 MOs

1.5 DU-RU connections

In L11A, only star topology is supported. More CPRI topologies will be supported later, eg: ring, cascade.



Example Three sector site with RUs:

ENB0621> hget riport remote

```

=====
=====
MO                                remoteRiPortRef
=====
=====
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=A
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_2

```

```
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=D
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,RiPort=DATA_2
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=B
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,RiPort=DATA_2
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=E
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,RiPort=DATA_2
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=C
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,RiPort=DATA_2
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=F
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,RiPort=DATA_2
Subrack=1,Slot=1,PlugInUnit=1,RiPort=A          RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=B          RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=C          RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=D          RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=E          RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=F          RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,RiPort=DATA_1
=====
=====
Total: 18 MOs
```

LIENB0621 > hget rfport=[ab] reservedby

```
=====
=====
MO                               reservedBy
=====
=====
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=1,RfBranch=1
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=B [0] =
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=1,RfBranch=2
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=B [0] =
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=2,RfBranch=1
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=B [0] =
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=2,RfBranch=2
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=B [0] =
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=3,RfBranch=1
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=B [0] =
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=3,RfBranch=2
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=B [0] =
=====
=====
Total: 12 MOs
```

LIENB0621 > hget rfbranch= auport

```
=====
=====
MO                               auPortRef
```

```

=====
=====
AntennaUnitGroup=1,RfBranch=1 [1] = AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=1,RfBranch=2 [1] = AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=2
AntennaUnitGroup=2,RfBranch=1 [1] = AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=2,RfBranch=2 [1] = AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=2
AntennaUnitGroup=3,RfBranch=1 [1] = AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=3,RfBranch=2 [1] = AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=2
=====
=====
Total: 6 MOs

```

Example Three sector site with RRUs:

ENB54> hget riport ref

```

=====
=====
MO                               remoteRiPortRef
=====
=====
AuxPlugInUnit=RRU-1,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=A
AuxPlugInUnit=RRU-1,RiPort=DATA_2
AuxPlugInUnit=RRU-2,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=B
AuxPlugInUnit=RRU-2,RiPort=DATA_2
AuxPlugInUnit=RRU-3,RiPort=DATA_1 Subrack=1,Slot=1,PlugInUnit=1,RiPort=C
AuxPlugInUnit=RRU-3,RiPort=DATA_2
Subrack=1,Slot=1,PlugInUnit=1,RiPort=A AuxPlugInUnit=RRU-1,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=B AuxPlugInUnit=RRU-2,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=C AuxPlugInUnit=RRU-3,RiPort=DATA_1
Subrack=1,Slot=1,PlugInUnit=1,RiPort=D
Subrack=1,Slot=1,PlugInUnit=1,RiPort=E
Subrack=1,Slot=1,PlugInUnit=1,RiPort=F
=====
=====
Total: 12 MOs

```

ENB54> hget rfport=[ab] reservedby

```

=====
=====
MO                               reservedBy
=====
=====
AuxPlugInUnit=RRU-1,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=1,RfBranch=1
AuxPlugInUnit=RRU-1,DeviceGroup=ru,RfPort=B [1] = AntennaUnitGroup=1,RfBranch=2
AuxPlugInUnit=RRU-2,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=2,RfBranch=1
AuxPlugInUnit=RRU-2,DeviceGroup=ru,RfPort=B [1] = AntennaUnitGroup=2,RfBranch=2

```

AuxPlugInUnit=RRU-3,DeviceGroup=ru,RfPort=A [1] = AntennaUnitGroup=3,RfBranch=1
AuxPlugInUnit=RRU-3,DeviceGroup=ru,RfPort=B [1] = AntennaUnitGroup=3,RfBranch=2

=====

=====

Total: 6 MOs

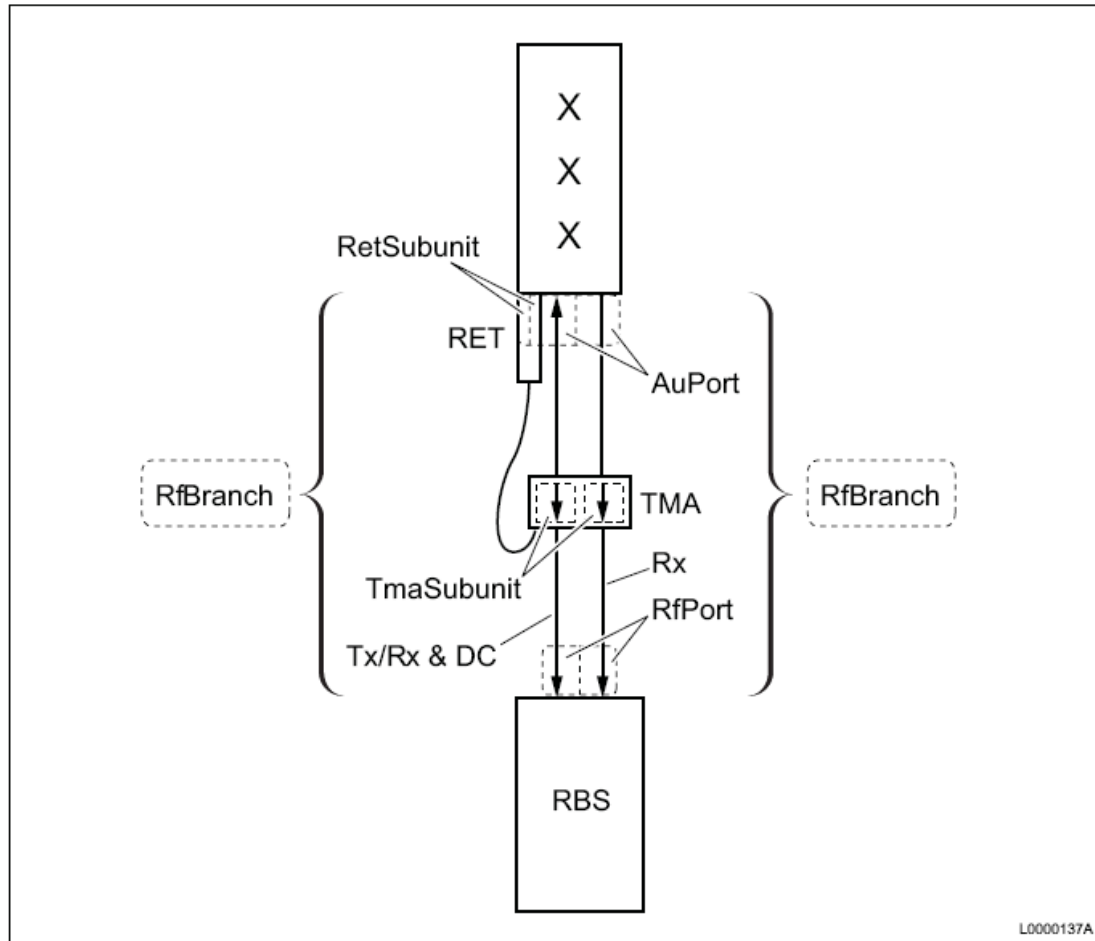
ENB54> hget rfbranch= auport

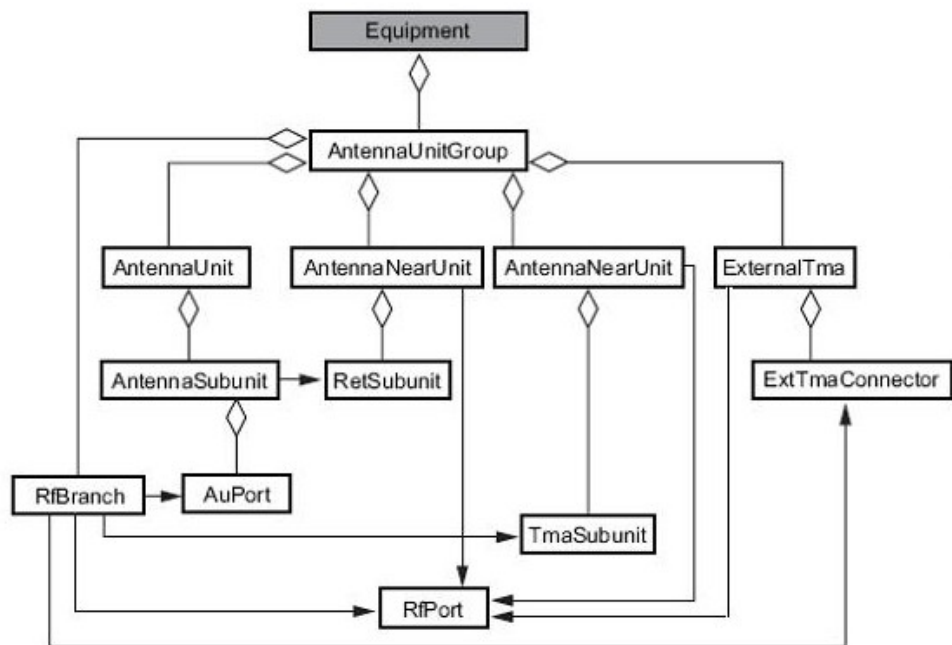
=====

=====

MO	auPortRef
=====	
=====	
AntennaUnitGroup=1,RfBranch=1 [1]	= AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=1,RfBranch=2 [1]	= AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=2
AntennaUnitGroup=2,RfBranch=1 [1]	= AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=2,RfBranch=2 [1]	= AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=2
AntennaUnitGroup=3,RfBranch=1 [1]	= AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=1
AntennaUnitGroup=3,RfBranch=2 [1]	= AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=2
=====	
=====	
Total: 6 MOs	

1.6 Antenna System MOs





ENB0621> momt antennaunitgroup

```

AntennaUnitGroup[0-24]
  AntennaNearUnit[0-48]
    RetSubUnit[0-4]
    TmaSubUnit[0-4]
  AntennaUnit[0-8]
    AntennaSubunit[0-3]
      AuPort[0-2]
  ExternalTMA[0-24]
    ExtTmaConnector[0-2]
  RfBranch[0-24]
  
```

Example Three Sector site with 6 RUs, no TMA/RET

ENB0621> lpr antenna

=====

```
Proxy MO
=====
124 Equipment=1,AntennaUnitGroup=1
127 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1
128 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1
130 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=1
129 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=2
126 Equipment=1,AntennaUnitGroup=1,RfBranch=1
125 Equipment=1,AntennaUnitGroup=1,RfBranch=2
233 Equipment=1,AntennaUnitGroup=2
234 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1
235 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1
236 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=1
237 Equipment=1,AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=2
239 Equipment=1,AntennaUnitGroup=2,RfBranch=1
238 Equipment=1,AntennaUnitGroup=2,RfBranch=2
219 Equipment=1,AntennaUnitGroup=3
222 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1
223 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1
225 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=1
224 Equipment=1,AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=2
221 Equipment=1,AntennaUnitGroup=3,RfBranch=1
220 Equipment=1,AntennaUnitGroup=3,RfBranch=2
=====
Total: 36 MOs

ENB0621> hget ant reservedby|ref

=====
=====
MO reservedBy
=====
=====
AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = AntennaUnitGroup=1,RfBranch=1
AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = AntennaUnitGroup=1,RfBranch=2
AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = AntennaUnitGroup=2,RfBranch=1
AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = AntennaUnitGroup=2,RfBranch=2
AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = AntennaUnitGroup=3,RfBranch=1
AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = AntennaUnitGroup=3,RfBranch=2
=====
=====
Total: 6 MOs

Added 6 MOs to group: hget_group

=====
=====
MO auPortRef reservedBy rfPortRef tmaRef
```

```

=====
=====
AntennaUnitGroup=1,RfBranch=1 [1] = AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = SectorEquipmentFunction=S1
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=1,RfBranch=2 [1] = AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = SectorEquipmentFunction=S1
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=2,RfBranch=1 [1] = AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = SectorEquipmentFunction=S2
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=2,RfBranch=2 [1] = AntennaUnitGroup=2,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = SectorEquipmentFunction=S2
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=3,RfBranch=1 [1] = AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=1 [1] = SectorEquipmentFunction=S3
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=3,RfBranch=2 [1] = AntennaUnitGroup=3,AntennaUnit=1,AntennaSubunit=1,AuPort=2 [1] = SectorEquipmentFunction=S3
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=A
=====
=====
Total: 6 MOs

```

Added 6 MOs to group: hget_group

```

=====
=====
MO                                reservedBy
=====
=====
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=1,RfBranch=1
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXB_IO [0] =
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=1,RfBranch=2
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=RXB_IO [0] =
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=2,RfBranch=1
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=3,AuxPlugInUnit=RU-1-3,DeviceGroup=ru,RfPort=RXB_IO [0] =
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=2,RfBranch=2
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=4,AuxPlugInUnit=RU-1-4,DeviceGroup=ru,RfPort=RXB_IO [0] =
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=3,RfBranch=1
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=5,AuxPlugInUnit=RU-1-5,DeviceGroup=ru,RfPort=RXB_IO [0] =
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=A    [1] = AntennaUnitGroup=3,RfBranch=2
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=B    [0] =
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=RXA_IO [0] =
RbsSubrack=1,RbsSlot=6,AuxPlugInUnit=RU-1-6,DeviceGroup=ru,RfPort=RXB_IO [0] =

```

=====

=====

Total: 24 MOs

Added 24 MOs to group: hget_group

Example RBS with one sector TMA+RET

ENB32> lpr antenna

=====

Proxy MO

=====

121 Equipment=1,AntennaUnitGroup=1

124 Equipment=1,AntennaUnitGroup=1,AntennaNearUnit=1

125 Equipment=1,AntennaUnitGroup=1,AntennaNearUnit=1,TmaSubUnit=1

126 Equipment=1,AntennaUnitGroup=1,AntennaNearUnit=1,TmaSubUnit=2

131 Equipment=1,AntennaUnitGroup=1,AntennaNearUnit=2

132 Equipment=1,AntennaUnitGroup=1,AntennaNearUnit=2,RetSubUnit=1

127 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1

128 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1

129 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=A

130 Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=B

122 Equipment=1,AntennaUnitGroup=1,RfBranch=A

123 Equipment=1,AntennaUnitGroup=1,RfBranch=B

=====

Total: 12 MOs

ENB32> get rfbranch=a ref|reservedby

=====

=====

MO	Attribute	Value
AntennaUnitGroup=1,RfBranch=A	auPortRef	[1] =
>>> auPortRef =	Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=A	
AntennaUnitGroup=1,RfBranch=A	reservedBy	[1] =
>>> reservedBy =	SectorEquipmentFunction=S1	
AntennaUnitGroup=1,RfBranch=A	rfPortRef	RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=1,RfBranch=A	tmaRef	AntennaUnitGroup=1,AntennaNearUnit=1,TmaSubUnit=1

=====

=====

Total: 1 MOs

ENB32> get rfbranch=b ref|reservedby

```

=====
=====
MO                               Attribute      Value
=====
=====
AntennaUnitGroup=1,RfBranch=B      auPortRef      [1] =
>>> auPortRef = Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=B
AntennaUnitGroup=1,RfBranch=B      reservedBy      [1] =
>>> reservedBy = SectorEquipmentFunction=S1
AntennaUnitGroup=1,RfBranch=B      rfPortRef      RbsSubrack=1,RbsSlot=2,AuxPlugInUnit=RU-1-2,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=1,RfBranch=B      tmaRef         AntennaUnitGroup=1,AntennaNearUnit=1,TmaSubUnit=2
=====
=====

```

Total: 1 MOs

ENB32> get antennasu ref

```

=====
=====
MO                               Attribute      Value
=====
=====
AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1      retSubunitRef      AntennaUnitGroup=1,AntennaNearUnit=2,RetSubUnit=1
=====
=====

```

Total: 1 MOs

ENB32> hget nearun type|ref

```

=====
=====
MO                               anuType      iuantDeviceType rfPortRef
=====
=====
AntennaUnitGroup=1,AntennaNearUnit=1 0 (IUANT) 2      RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=1,AntennaNearUnit=2 0 (IUANT) 1      RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
=====
=====

```

Total: 2 MOs

ENB32> mom ant type

```

#####
#####
MO Class      Attribute      Type      Flags
#####
#####
AntennaNearUnit      anuType      enumRef:AntNearUnit      restricted,mandatory

```

Defines if the Antenna Near Unit is an Iuant or an Ericsson proprietary antenna unit.
Dependencies: If IUANT is set then the attribute iuantDeviceType needs to be set to a value specified in section 4.7 in 3GPP 25.462 as well.

AntennaNearUnit iuantDeviceType long

Type of iuant-compliant antenna line device.
Takes its value from the specification on section 4.7 from 3GPP 25.462 (after conversion from hex to decimal):

- **1 (indicates single-antenna RET Device)**
- **2 (indicates TMA, Tower Mounted Amplifier)**
- 17 (indicates multi-antenna RET Device)

Note! 3GPP 25.462 defines device type providing an hexadecimal code. This HEX-code must be converted to decimal in order to be used in the system without misunderstandings. (i.e. Even if "multi-Antenna RET Device" is indicated with 0x11HEX in 3GPP 25.462, 17 (the decimal equivalent for 0x11hex) must instead be used here)
Take effect: At restart of the Antenna Near Unit.
Range: 1, 2, 17, Default=1

ENB4016> moma port\$|branch

#####

MO Class Attributes/Actions

#####

AlarmPort

AlarmPortId,activeExternalAlarm,administrativeState,alarmSlogan,availabilityStatus,normallyOpen,operationalState,perceivedSeverity,probableCause,userLabel
This MO models an Alarm Port. It is used to detect a fault indication from external equipment and report it as external alarm to the Network Management System.
Dependencies: Can only exist in the node when the attribute supportSystemControl on MO EquipmentSupportFunction is set to true.

AuPort AuPortId,reservedBy,userLabel

This MO represents an antenna feeder port on the Antenna Unit where the antenna branch is connected.

ControlPort ControlPortId,administrativeState,availabilityStatus,equipmentName,normallyOpen,operationalState,portStatus,userLabel

This MO models a Control Port. It is used to switch on/off external equipment.
Dependencies: Can only exist in the node when the attribute supportSystemControl on MO EquipmentSupportFunction is set to true.

EcPort EcPortId,hubPosition

This MO represents one port in a HwUnit MO or ExternalNode MO where the Enclosure Control Bus (ECB) is connected.

InternalEthernetPort InternalEthernetPortId,dscpPbitMap,ethernetSwitchRef,frameFormat,macAddress,userLabel
 setDscpPbit

Internal Ethernet Port
This MO configures the internal ethernet port on the board.

RetSupport RetSupportId,featureStateRetSupport,keyIdRetSupport,licenseStateRetSupport,serviceStateRetSupport
Contains the licensing parameters for the optional feature Support for Remote Electrical Tilt of AISGv2/3GPP Iuant compliant antennas.
Note: Instances of this MO class are SystemCreated.

RfBranch RfBranchId,auPortRef,dIAttenuation,dITrafficDelay,reservedBy,rfPortRef,tmaRef,uIAttenuation,uITrafficDelay,userLabel

This MO represents the connection from an antenna feeder port on the RU to one antenna feeder connector on one or several antenna units. The MO represents all equipment between the radio and the antenna which isn't modelled by any other MO. That includes feeder, filters and non-supervised, non-controlled TMA

RfPort

RfPortId,administrativeState,availabilityStatus,maxCurrent,minCurrent,nodeUniqueRfPortId,operationalState,reservedBy,userLabel,vswrSupervisionActive,vswrSupervisionSensitivity

This MO represents port on the RU/RRU of various type depending on MOid.

It represents an antenna feeder port on the RU/RRU when it has the MOid; A, B C, etc...

It represents a cross connection port on the RU/RRU when it has the MOid; RXA_IO or RXB_IO.

It represents a RET-port on the RRU if it has the MOid; R.

RiPort

RiPortId,availabilityStatus,operationalState,remoteRiPortRef,reservedBy

This MO represents a port on the DU or the Radio where the Radio Interface (CPRI) cable is connected. It is used to connect a Radio to a DU or to another Radio.

When the RiPort is a child of PlugInUnit (i.e. the DU), the valid values are A, B, C, D, E and F. When it is a child of AuxPlugInUnit (i.e a radio), the valid values are Data1 and Data2.

The RiPort on each unit must refer to each other to make the configuration of the radio interface connection complete.

SharedNetworkSupport

SharedNetworkSupportId,featureStateSharedNetworkSupport,keyIdSharedNetworkSupport,licenseStateSharedNetworkSupport,serviceStateSharedNetworkSupport

Contains the licensing parameters for the licensed feature LTE Shared Network Support (NETSH).

Note: Instances of this MO class are SystemCreated.

SrioTestPort

SrioTestPortId,operationalState,portNr

This MO presents a sRIO test port on DU. It is used to connect to the UE simulator UcTool.

The attributes of this MO class may only be changed by Ericsson personnel.

TmaSupport

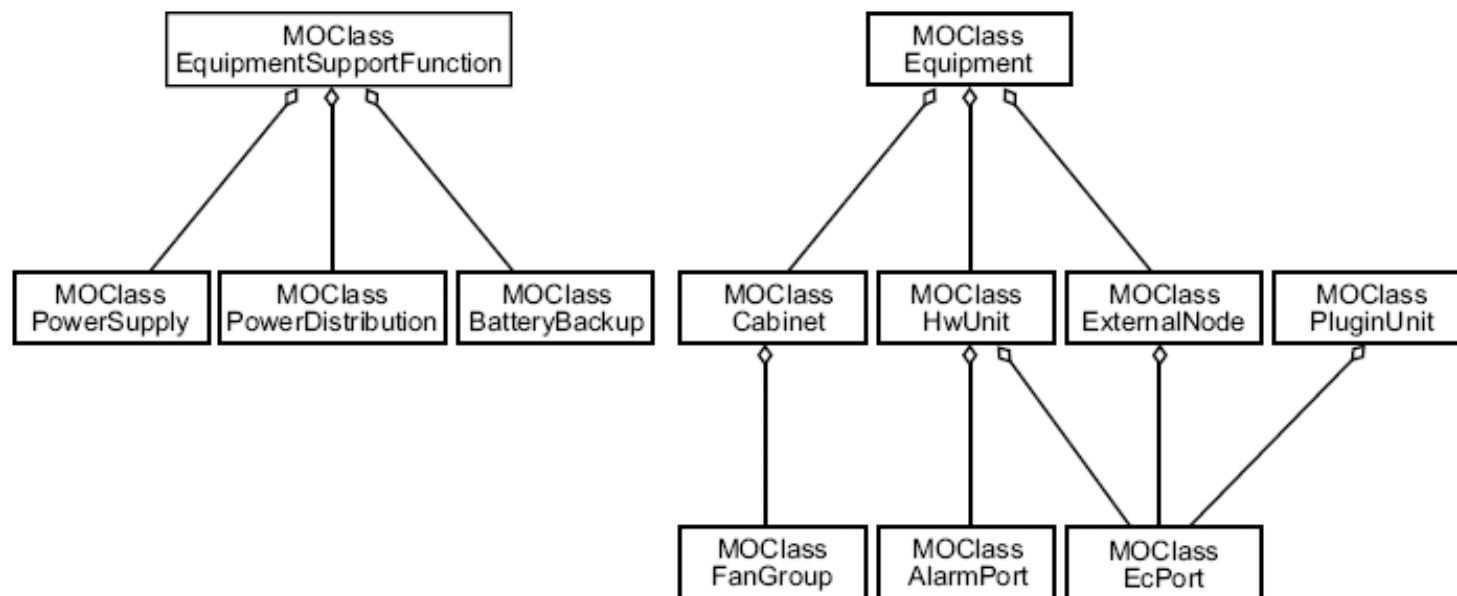
TmaSupportId,featureStateTmaSupport,keyIdTmaSupport,licenseStateTmaSupport,serviceStateTmaSupport

Contains the licensing parameters for the optional feature TMA Support.

Note: Instances of this MO class are SystemCreated.

1.7 Support System

MO Structure



ENB0621> momt

```

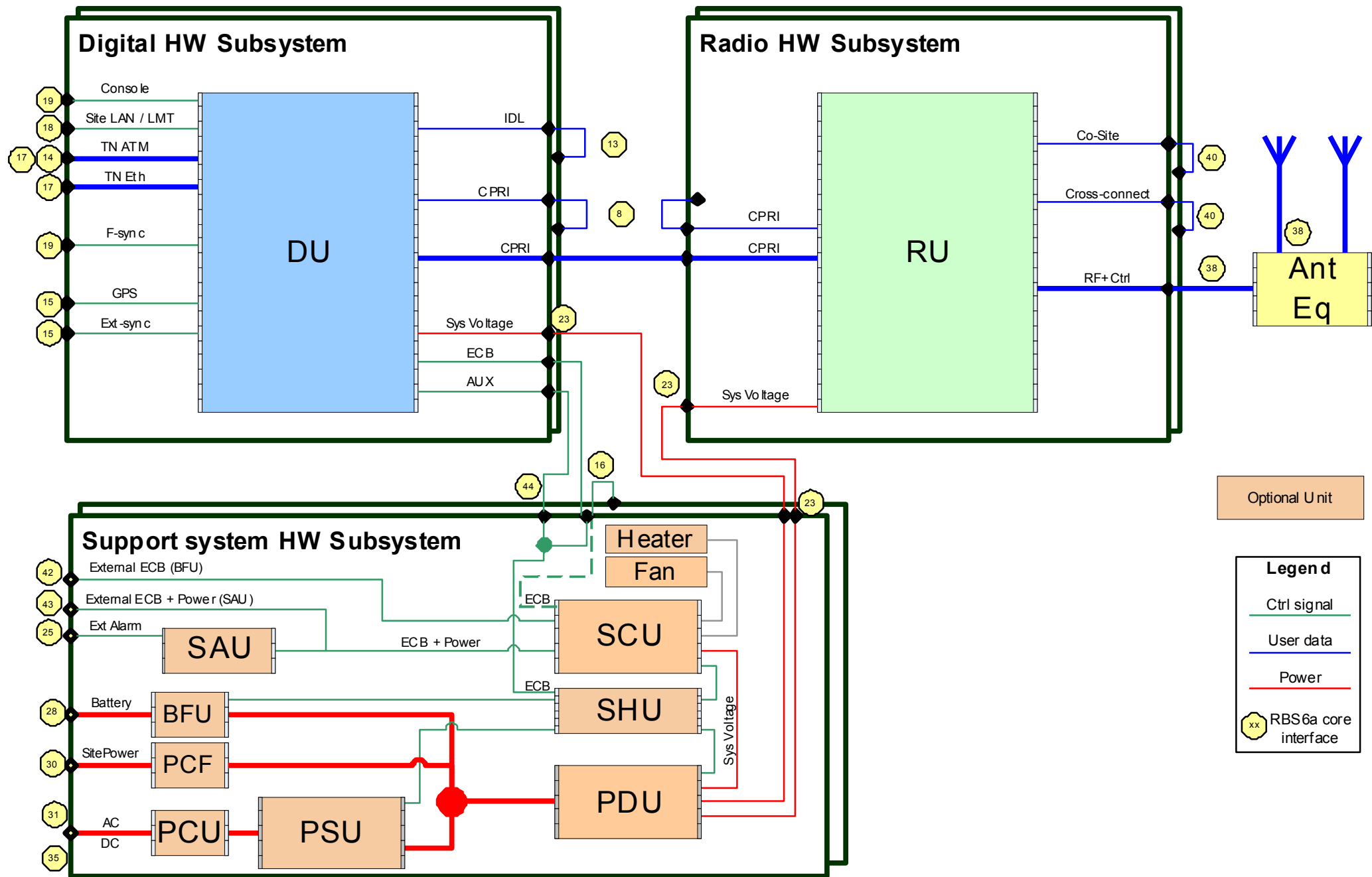
Cabinet[0-1]
  FanGroup[0-4]
ExternalNode[0-7]
  EcPort[0-2]
HwUnit[0-]
  AlarmPort[0-32]
  ControlPort[0-8]
  EFuse[0-16]
  EcPort[0-1]
  UnitHandling[0-1]
  
```

```

EquipmentSupportFunction[0-1] (systemCreated)
  BatteryBackup[0-1]
  PowerDistribution[0-1]
  
```

PowerSupply[0-1]

Connections



The SAU, Heater, Fan connect to the SCU
The DU, SCU,PSU,PDU, BFU connect to the SHU

ENB3012> hget ecport hub

=====	
=====	
MO	hubPosition
=====	
=====	
Subrack=1,Slot=1,PlugInUnit=1,EcPort=1 B1	
HwUnit=SAU,EcPort=1	
HwUnit=BFU,EcPort=1	B5
HwUnit=SCU,EcPort=1	A1
HwUnit=PSU1,EcPort=1	A3
HwUnit=PSU2,EcPort=1	B3
HwUnit=PSU3,EcPort=1	A4
HwUnit=PDU1,EcPort=1	A2
HwUnit=PDU2,EcPort=1	B2
=====	
=====	
Total: 9 MOs	

ENB0621> lst hwunit

=====			
Proxy	Adm State	Op. State	MO
=====			
246	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=BFU-1
147	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=PDU-1
258	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=PDU-2
77	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=PSU-1
256	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=PSU-2
260	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=PSU-3
59	1 (UNLOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU
64	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=1
67	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=10
74	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=11
61	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=12
70	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=13
60	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=14
62	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=15
72	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=16
71	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=2
66	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=3
73	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=4
65	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=5
63	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=6
75	0 (LOCKED)	1 (ENABLED)	Equipment=1,HwUnit=SAU,AlarmPort=7

```

68 0 (LOCKED) 1 (ENABLED) Equipment=1,HwUnit=SAU,AlarmPort=8
76 0 (LOCKED) 1 (ENABLED) Equipment=1,HwUnit=SAU,AlarmPort=9
149 1 (UNLOCKED) 1 (ENABLED) Equipment=1,HwUnit=SCU
158 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=1
156 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=10
166 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=11
157 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=12
153 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=13
163 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=14
150 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=15
159 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=16
151 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=2
161 0 (LOCKED) 1 (ENABLED) Equipment=1,HwUnit=SCU,AlarmPort=3
155 0 (LOCKED) 1 (ENABLED) Equipment=1,HwUnit=SCU,AlarmPort=4
164 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=5
152 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=6
165 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=7
154 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=8
162 0 (LOCKED) 0 (DISABLED) Equipment=1,HwUnit=SCU,AlarmPort=9

```

=====
Total: 40 MOs

ENB0621> hget alarmport !userlabel|alarmportid|state

=====
=====

MO	activeExternalAlarm	alarmSlogan	availabilityStatus	normallyOpen	perceivedSeverity	probableCause
=====						
=====						
HwUnit=SAU,AlarmPort=1 false		Test Slogan 0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=10 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=11 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=12 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=13 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=14 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=15 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=16 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=2 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=3 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=4 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=5 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=6 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=7 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=8 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SAU,AlarmPort=9 false		0 (NO_STATUS)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SCU,AlarmPort=1 false		128 (NOT_INSTALLED)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SCU,AlarmPort=10 false		128 (NOT_INSTALLED)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	
HwUnit=SCU,AlarmPort=11 false		128 (NOT_INSTALLED)	true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)	

HwUnit=SCU,AlarmPort=12 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=13 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=14 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=15 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=16 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=2 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=3 false	0 (NO_STATUS) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=4 false	0 (NO_STATUS) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=5 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=6 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=7 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=8 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)
HwUnit=SCU,AlarmPort=9 false	128 (NOT_INSTALLED) true	4 (MINOR)	550 (EXTERNAL_EQUIPMENT_FAILURE)

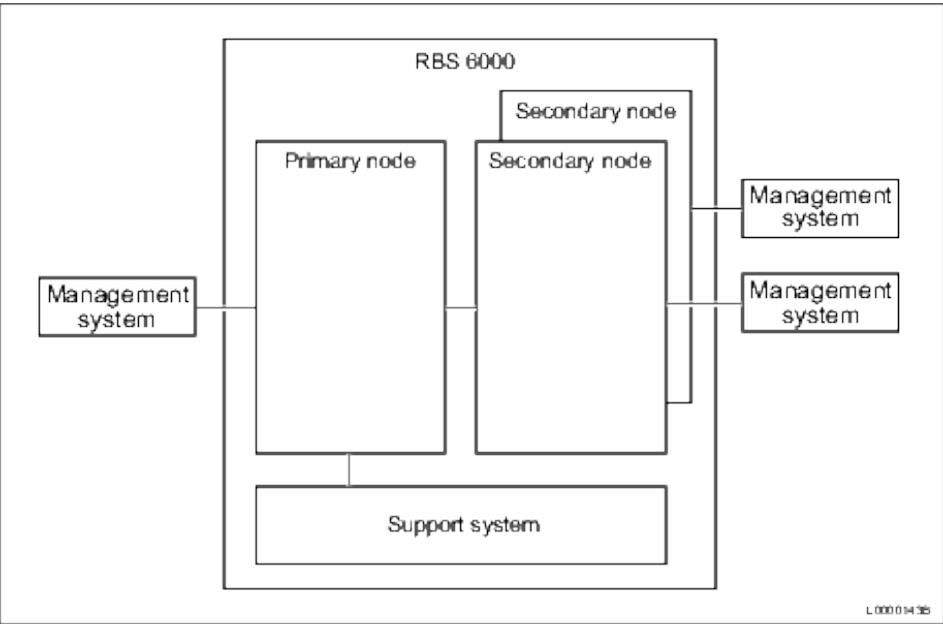
=====

=====

Total: 32 MOs

Added 32 MOs to group: hget_group

Shared Support System



PRIMARY> hget supportfunction|externalnode !id\$|full

=====

=====

```
MO          logicalName      radioAccessTechnology supportSystemControl
=====
=====
EquipmentSupportFunction=1 VIC_RBS54_Box_Hill_539914 3 (LTE)      true
=====
=====
Total: 1 MOs
```

```
=====
=====
MO          informationOnly logicalName      radioAccessTechnology supportSystemControl
=====
=====
ExternalNode=RBS55 false      VIC_RBS55_Box_Hill_539915 3 (LTE)      0 (FALSE)
=====
=====
```

SECONDARY> hget supportfunction|externalnode !id\$

```
=====
=====
MO          logicalName      radioAccessTechnology supportSystemControl
=====
=====
EquipmentSupportFunction=1 VIC_RBS55_Box_Hill_539915 3 (LTE)      false
=====
=====
Total: 1 MOs
```

```
=====
=====
MO          informationOnly logicalName      radioAccessTechnology supportSystemControl
=====
=====
ExternalNode=RBS54 true      VIC_RBS54_Box_Hill_539914 3 (LTE)      1 (TRUE)
=====
=====
Total: 1 MOs
```

PRIMARY> st hwunit

```
=====
Proxy  Adm State   Op. State   MO
=====
  65  1 (UNLOCKED)  1 (ENABLED)  Equipment=1,HwUnit=PDU-1
  85  1 (UNLOCKED)  1 (ENABLED)  Equipment=1,HwUnit=PDU-2
 176  1 (UNLOCKED)  1 (ENABLED)  Equipment=1,HwUnit=SCU-1
=====
Total: 3 MOs
```

PRIMARY> get ecport pos

```
=====
=====
MO                               Attribute    Value
=====
=====
HwUnit=PDU-1,EcPort=1           hubPosition  A2
HwUnit=PDU-2,EcPort=1           hubPosition  B2
HwUnit=SCU-1,EcPort=1           hubPosition  A1
ExternalNode=RBS55,EcPort=A6    hubPosition  A6
=====
=====
Total: 4 MOs
```

SECONDARY> hget ecport pos

```
=====
=====
MO                               hubPosition
=====
=====
Subrack=1,Slot=1,PlugInUnit=1,EcPort=A6 A6
=====
=====
Total: 1 MOs
```

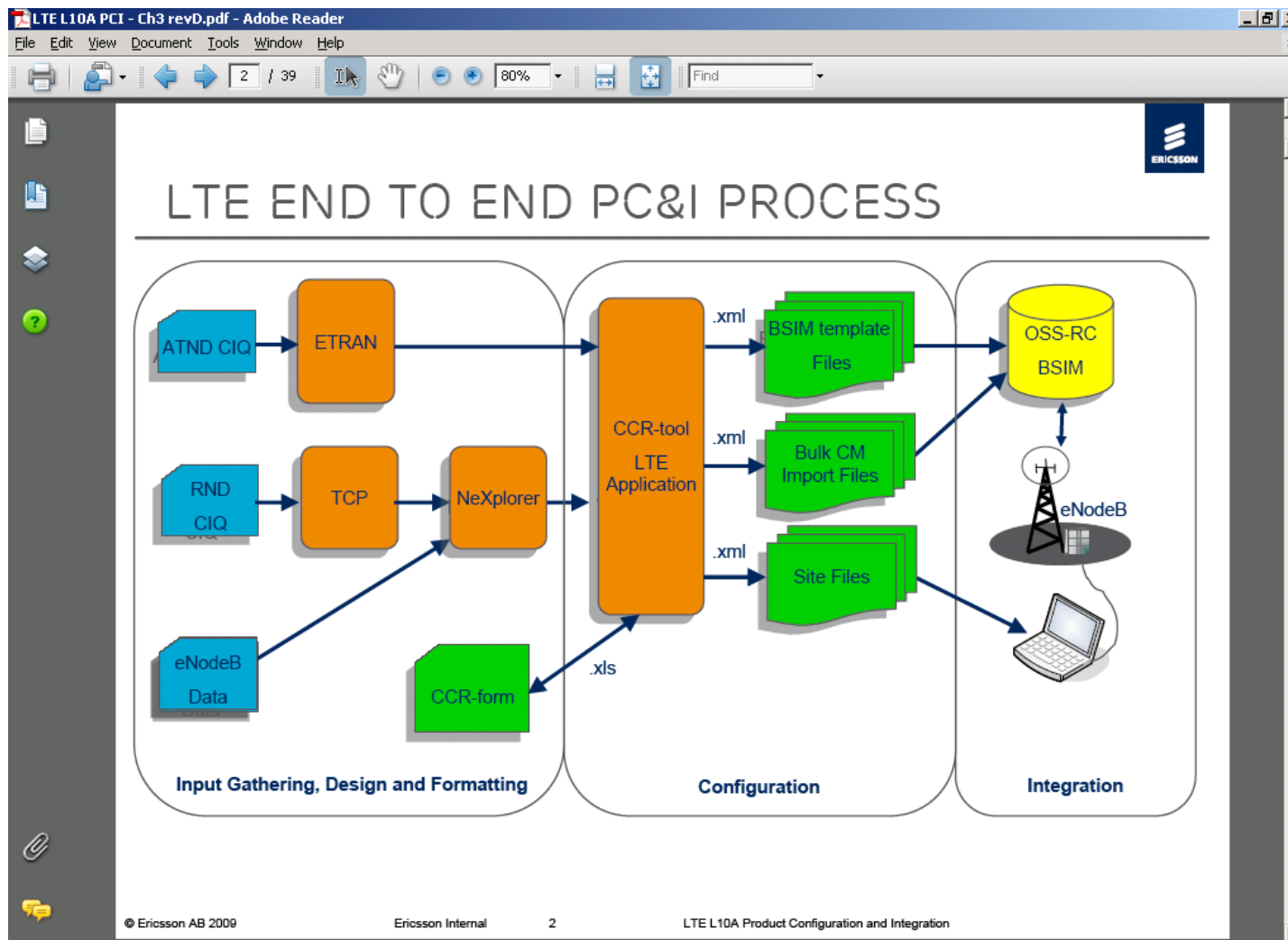
1.8 Configuration and Integration

LTE Product Configuration and Integration course:

- <http://utran01.epa.ericsson.se/utranwiki/LtePciCourse>
- http://utran01.epa.ericsson.se/~epathj/PC&I_Centra/
- <http://utran01.epa.ericsson.se/~epathj/EVO/Configuration/>

Also:

- http://utran01.epa.ericsson.se/utranwiki/BETE_LTE_Lab
- [Knowledge Objects - LTE Alternate Integration Quick Guide](#)



Moshell printouts:

ENB4016> momd rbsconfiguration

....

```

#####
#####
MO Class      Action      ReturnType  Parameters
#####
#####
  
```

RbsConfiguration	cancelRbsIntegration	void	0
RbsConfiguration	changelpForOamSetting	void	4:smrsUserId:smrsPassword:summaryFilePath:summaryFileHash
RbsConfiguration	modifyConfiguration	void	1:parametersXml:string
RbsConfiguration	setUniqueLogicalName	void	1:uniqueLogicalName:string
RbsConfiguration	startProductionTestConfiguration	void	4:siteBasicFilePath:rbsEquipmentFilePath:productionTestConfFilePath:logicalName
RbsConfiguration	startRbsIntegration	void	1:parametersXml:string
RbsConfiguration	storeConfigurationReport	void	4:smrsUserId:smrsPassword:smrsAddress:configReportFilePath
RbsConfiguration	updateRbsIntegrationParameters	void	1:updatedParametersXml:string

Enum Values

RbsConfigLevel 0:UNDEFINED, 1:BASIC_CV, 3:SITE_BASIC, 4:SITE_EQUIPMENT, 5:SITE_CONFIG_COMPLETE, 6:OSS_ACTIVATING_CONFIGURATION, 7:OSS_CONFIGURATION_SUCCESSFUL, 8:OSS_CONFIGURATION_FAILED, 9:S1_COMPLETE, 10:INTEGRATION_COMPLETE, 11:NPC_CONFIGURATION, 12:NPC_COMPLETE, 13:CERTIFICATE_ENROLLMENT_COMPLETE, 14:SECURITY_LEVEL_3_ACTIVE, 15:GIGABIT_LINK_DETECTED, 16:SECURITY_PREPARATION_COMPLETE, 17:SECURITY_ACTIVE, 18:INITIAL_IPSEC_FOR_OAM_ACTIVE, 19:FEATURES_ACTIVATED, 20:ACTIVATING_FEATURES, 21:ACTIVATING_FEATURES_FAILED, 22:CELLS_UNLOCKED, 23:UNLOCKING_CELLS, 24:UNLOCKING_CELLS_FAILED, 25:READY_FOR_SERVICE

Print the MO commands executed by the Autointegration:

ENB4016> lgq | grep -i rbsconfiguration

2011-04-08 05:58:09 **ACTION** (actionName **startRbsIntegration** mo "ManagedElement=1,ENodeBFunction=1,RbsConfiguration=1" exception none nrOfParameters 1 String "<StartAutoIntegration> <VlanId value='1029'/> <SmrsUserId value='IraNaif'/> <SmrsPassword value='[HIDDEN]'/> <SmrsAddress value='10.75.24.25'/> <SmrsSummaryFilePath value='/Itesmrs2s/AIF/kienb4019/AutoIntegrationRbsSummaryFile.xml'/> <DnsServerAddress value='10.62.101.135'/> <DefDomainName value='enodeb.example.com'/> <OamHostIpAddress value='10.62.10.29'/> <OamSubnetmask value='255.255.255.0'/> <DefaultRouter0 value='10.62.10.1'/> <RbsIntegrationCode value='[HIDDEN]'/> <ActivateSecurity value='false'/> <ActivateIpSecurity value='false'/> <LogicalName value='kienb4019'/> <Cabinet productionDate='20100414' productName='RBS6102AC' productNumber='BYB40505/08' productRevision='R2A' serialNumber='X231376423'/> <ClientUtcTime value='1302242280697'/> </StartAutoIntegration>" returnValue none)

2011-04-08 05:59:20 **SET** (mo "ManagedElement=1,ENodeBFunction=1,RbsConfiguration=1" exception none **rbsConfigLevel** Integer 6)

2011-04-08 05:59:26 **SET** (mo "ManagedElement=1,ENodeBFunction=1,RbsConfiguration=1" exception none **rbsConfigLevel** Integer 7)

2011-04-08 05:59:38 **SET** (mo "ManagedElement=1,ENodeBFunction=1,RbsConfiguration=1" exception none **rbsConfigLevel** Integer 10)

2011-04-08 06:02:04 **SET** (mo "ManagedElement=1,ENodeBFunction=1,RbsConfiguration=1" exception none **ossCorbaNameServiceAddress** String "10.62.101.7")

Then the S1 is set-up

2011-04-08 05:59:23 CREATE (parent "ManagedElement=1,IpSystem=1" identity "1" moType IpAccessSctp exception none nrOfAttributes 2 ipAccessHostEtRef1 Reference "ManagedElement=1,IpSystem=1,IpAccessHostEt=1" userLabel String "ip_sctp")

2011-04-08 05:59:23 CREATE (parent "ManagedElement=1,TransportNetwork=1" identity "1" moType Sctp exception none nrOfAttributes 30 maxInitialRtrAtt Integer 10 maximumRto Integer 40 bundlingActivated Integer 1 rpuld Reference "ManagedElement=1,SwManagement=1,ReliableProgramUnit=sctp_host" bundlingTimer Integer 100 maxOutgoingStream Integer 100 associationMaxRtx Integer 10 nPercentage Integer 50 initialAdRecWin Integer 16384 heartbeatInterval Integer 1 mBuffer Integer 16 maxUserDataSize Integer 556 nThreshold Integer 12 keyChangePeriod Integer 30 minimumRto Integer 10 pathMaxRtx Integer 6 maxShutDownRtrAtt Integer 10 rtoAlphaIndex Integer 4 numberOfAssociations Integer 48 initialRto Integer 20 heartbeatStatus Boolean true heartbeatPathProbingInterval Integer 40 maxIncomingStream

Integer 100 allowedIncrementCookieLife Integer 30 rtoBetaIndex Integer 4 ipAccessSctpRef Reference "ManagedElement=1,IpSystem=1,IpAccessSctp=1" validCookieLife Integer 20 intervalOobPkts Integer 1000 tSack Integer 10 maxBurst Integer 1000)
2011-04-08 05:59:23 SET (mo "ManagedElement=1,ENodeBFunction=1" exception none eNBId Integer 104019 sctpRef Reference "ManagedElement=1,TransportNetwork=1,Sctp=1" eNodeBPlmnId Struct nrOfElements 3 mcc Integer 262 mnc Integer 80 mncLength Integer 2)
2011-04-08 05:59:24 CREATE (parent "ManagedElement=1,ENodeBFunction=1" identity "EUTranCellFDD_1" moType EUTranCellFDD exception none nrOfAttributes 14 frameStartOffset Struct nrOfElements 3 symbolOffset Integer 0 timeOffset Integer 0 subFrameOffset Integer 0 qRxLevMinOffset Integer 1000 cellId Integer 9 administrativeState Integer 0 noOfPucchSrUsers Integer 160 tac Integer 2304 noOfPucchCqiUsers Integer 160 earfcnul Integer 21150 physicalLayerCellIdGroup Integer 3 userLabel String "1_EUTranCellFDD" earfcndI Integer 3150 sectorFunctionRef Reference "ManagedElement=1,SectorEquipmentFunction=S1" physicalLayerSubCellId Integer 0 prsPeriod Integer 3)
2011-04-08 05:59:28 SET (mo "ManagedElement=1,ENodeBFunction=1,EUTranCellFDD=EUTranCellFDD_1" exception none administrativeState Integer 1)

ENB4016> ftree /c/logfiles/autointegration

```

      /c/logfiles/autointegration/
-rw-rw-rw- 15906   21 Jun 2010 13:09:32 /c/logfiles/autointegration/configurationReport.log.restore_2010-06-21_143456
-rw-rw-rw- 0      3 Jun 2010 06:38:32 /c/logfiles/autointegration/reportFile_2010-06-03_063832.backup
-rw-rw-rw- 15906   19 Aug 2010 21:21:54 /c/logfiles/autointegration/configurationReport.log.restore_2010-08-19_213409
-rw-rw-rw- 10570   21 Jun 2010 14:34:57 /c/logfiles/autointegration/reportFile_2010-06-21_143457.backup
-rw-rw-rw- 9239    19 Aug 2010 21:34:10 /c/logfiles/autointegration/reportFile_2010-08-19_213410.backup
-rw-rw-rw- 15906   18 Oct 2010 12:55:01 /c/logfiles/autointegration/configurationReport.log
```

ENB4016> get rbsconfi !report

```

=====
=====
MO              Attribute      Value
=====
=====
RbsConfiguration=1      RbsConfigurationId 1
RbsConfiguration=1      configFaultReason Struct{2}
>>> 1.faultReason = 10 (UNDEFINED)
>>> 2.faultInformation =
RbsConfiguration=1      dhcpClientIdentifier
RbsConfiguration=1      ossCorbaNameServiceAddress 10.62.101.7
RbsConfiguration=1      progressInformation 19 (AUTO_INTEGRATION_COMPL)
RbsConfiguration=1      progressLevel 100
RbsConfiguration=1      rbsConfigLevel 10 (INTEGRATION_COMPLETE)
RbsConfiguration=1      supportedConfigFileRevisions
File name      Product number      Revisions
NPC.dtd        CXC 172 9124/1      C
SiteBasic.dtd  CXC 172 9121/1      E
SiteEquipment.dtd  CXC 172 9123/1      F
NPC.xsd        CXC 172 9124/1      D
SiteBasic.xsd  CXC 172 9121/1      T
SiteEquipment.xsd  CXC 172 9123/1      M
=====
=====
Total: 1 MOs
```

The configuration report shows where the MO configuration scripts are stored , both server location and on node (usually /d/ftp)

ENB4016> get rbsconfi report

```
=====
=====
MO                               Attribute      Value
=====
=====
RbsConfiguration=1              configurationReport 2010-04-13 08:22:36.784 RbsConfiguration::rbsConfigLevel      BASIC_CV
2010-06-02 12:24:09.044 RbsConfiguration:actionStartRbsAutoIntegration <- Attribute = Value ->
                                vlanId = 1029
                                logicalName = kienb4016
                                smrsUserId = lraiaif
                                smrsPassword = ***
                                smrsAddress = 10.62.101.235
                                smrsSummaryFilePath = /tesmrs3s/AIF/kienb4016/AutoIntegrationRbsSummaryFile.xml
                                dnsServerAddress = 10.64.208.236
                                defDomainName =
                                oamHostIpAddress = 10.62.10.26
                                oamSubnetmask = 255.255.255.0
                                defaultGateway = 10.62.10.1
                                siteBasicFilePath =
                                siteEquipmentFilePath =
                                licensingKeyFilePath =
                                localUPFilePath =
2010-06-02 12:24:09.152 RbsConfiguration::progressInformation      Activating basic IP configuration
2010-06-02 12:24:09.709 RbsConfiguration::progressInformation      Detecting gigabit link
2010-06-02 12:24:09.946 GigaBitEthernet=1::administrativeState      UNLOCKED
2010-06-02 12:24:15.282 GigaBitEthernet=1::administrativeState      UNLOCKED
2010-06-02 12:24:20.419 GigaBitEthernet:create                                <- Attribute = Value ->
                                linkType = 0
                                portNo = 2
                                protectiveMode = false
2010-06-02 12:24:20.753 IpInterface:create                                <- Attribute = Value ->
                                defaultRouter0 = 10.62.10.1
                                networkPrefixLength = 24
                                rps = false
2010-06-02 12:24:21.239 IpInterface:set                                <- Attribute = Value ->
                                vid = 1029
                                VLan = true
2010-06-02 12:24:21.507 IpRoutingTable:actionAddStaticRoute            <- Attribute = Value ->
                                ipAddress = 0.0.0.0
                                networkMask = 0.0.0.0
                                nextHopIpAddr = 10.62.10.1
                                routeMetric = 16
                                redistribute = false
```

```

2010-06-02 12:24:21.603 IpHostLink:create          <- Attribute = Value ->
                                     ipInterfaceMoRef = IpInterface=1
                                     ipAddress = 10.62.10.26
2010-06-02 12:24:21.679 Ip::dnsServer             10.64.208.236
2010-06-02 12:24:21.738 Ip::workingMode           0
2010-06-02 12:24:21.809 Ip=1::nodeInterfaceName      lh0
2010-06-02 12:24:58.815 RbsConfiguration::progressInformation  Fetching summary file
2010-06-02 12:24:58.878 Downloading File:          <- Attribute = Value ->
                                     Local path = /d/ftp/SummaryFile.xml
                                     Remote path = /ltesmrs3s/AIF/kienb4016/AutoIntegrationRbsSummaryFile.xml
                                     Host = 10.62.101.235
2010-06-02 12:25:00.250 Configuration files        Fetching site basic file from SMRS.
2010-06-02 12:25:00.308 RbsConfiguration::progressInformation  Fetching site basic file
2010-06-02 12:25:00.385 Downloading File:          <- Attribute = Value ->
                                     Local path = /d/ftp/SiteBasic.xml
                                     Remote path = /ltesmrs3s/AIF/kienb4016/SiteBasic.xml
                                     Host = 10.62.101.235
2010-06-02 12:25:01.348 Configuration files        Fetching site equipment file from SMRS.
2010-06-02 12:25:01.419 RbsConfiguration::progressInformation  Fetching site equipment file
2010-06-02 12:25:01.487 Downloading File:          <- Attribute = Value ->
                                     Local path = /d/ftp/SiteEquipment.xml
                                     Remote path = /ltesmrs3s/AIF/kienb4016/RbsEquipment.xml
                                     Host = 10.62.101.235
2010-06-02 12:25:02.293 Upgrade                  No upgrade performed since no upgrade package was specified.
2010-06-02 12:25:02.541 Certificate Enrollment      No certificate enrollment performed since no input was specified
2010-06-02 12:25:02.622 RbsConfiguration::progressInformation  Activating site basic data
2010-06-02 12:25:02.732 RbsConfiguration::ossCorbaNameServiceAddress  10.62.101.7
2010-06-02 12:25:02.784 ManagedElementData::documentServerAddress  http://intra.example.com/alex2
2010-06-02 12:25:03.092 ManagedElementData:          <- Attribute = Value ->
                                     ntpServerAddressPrimary = 10.62.1.10
                                     ntpServiceActivePrimary = true
2010-06-02 12:25:03.152 ManagedElementData:          <- Attribute = Value ->
                                     ntpServerAddressSecondary = 0.0.0.0
                                     ntpServiceActiveSecondary = false
2010-06-02 12:25:03.374 ManagedElementData::swServerUriList  ftp://intra.example.com/sw/property.file
2010-06-02 12:25:03.513 ManagedElementData::logonServerAddress  SLS11
2010-06-02 12:25:03.565 ManagedElementData::daylightSavingTime  false
2010-06-02 12:25:03.634 ManagedElementData::nodeLocalTimeZone  ECT
2010-06-02 12:25:03.699 ManagedElementData::docLibUserDefined  EN/LZN7450009R2A
2010-06-02 12:25:04.156 IpInterface:create          <- Attribute = Value ->
                                     networkPrefixLength = 24
                                     defaultRouter0 = 10.62.11.1
                                     rps = false
                                     vid = 1030
                                     vLan = true
2010-06-02 12:25:04.246 IpAccessHostEt:create      <- Attribute = Value ->
                                     ipAddress = 10.62.11.26
                                     ipInterfaceMoRef =
ManagedElement=1,Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2

```

```

2010-06-02 12:25:04.298 IpAccessHostEt=1::administrativeState UNLOCKED
2010-06-02 12:25:04.383 IpSyncRef:create <- Attribute = Value ->
                        ntpServerIpAddress = 10.62.1.10
2010-06-02 12:25:04.444 IpSyncRef=1::administrativeState UNLOCKED
2010-06-02 12:25:05.147 Synchronization:addSyncRefResource <- Attribute = Value ->
                        LDN = ManagedElement=1,IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
                        Priority = 5
2010-06-02 12:25:05.311 RbsConfiguration::rbsConfigLevel SITE_BASIC
2010-06-02 12:25:05.414 RbsConfiguration::progressInformation Notifying OSS
2010-06-02 12:25:06.101 RbsConfiguration::progressInformation Activating site equipment data
2010-06-02 12:25:06.302 SwAllocation=RBS_RU:create Attributes: role
                        Values: RBS_RU
2010-06-02 12:25:06.393 SwAllocation:Add repertoire <- Attribute = Value ->
                        SwAllocation = ManagedElement=1,SwManagement=1,SwAllocation=RBS_RU
                        PiuType = ManagedElement=1,SwManagement=1,PiuType=INITIALRBSRU_*
                        Repertoire = ManagedElement=1,SwManagement=1,Repertoire=RBS_RU
2010-06-02 12:25:06.464 OSS:Inform OSS <- Attribute = Value ->
                        IPAddress = 10.62.10.26
                        nameServerAddress:port = 10.62.101.7:50073
                        nodeDiscoveryService = com/ericsson/nms/umts/ranos/WmaNodeDiscoveryUnsecure
2010-06-02 12:25:06.731 RbsSubrack=1:create Attributes: subrackPosition
                        Values:
2010-06-02 12:25:06.984 AuxPlugInUnit:create <- Attribute = Value ->
                        LDN = ManagedElement=1,Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1
                        piuType = PiuType=INITIALRBSRU_*
2010-06-02 12:25:07.170 Cabinet:create <- Attribute = Value ->
                        climateSystem = 0
2010-06-02 12:25:07.243 ManagedElement Adding Radio Access Technology information to product name.
2010-06-02 12:25:07.303 ManagedElement: <- Attribute = Value ->
                        Site = kienb4016
2010-06-02 12:25:07.458 AntennaUnitGroup:create
2010-06-02 12:25:07.556 AntennaUnit:create <- Attribute = Value ->
                        mechanicalAntennaTilt = -10
2010-06-02 12:25:07.647 AntennaSubunit:create <- Attribute = Value ->
                        minTotalTilt = -100
                        maxTotalTilt = 100
2010-06-02 12:25:07.736 AuPort:create
2010-06-02 12:25:07.815 AuPort:create
2010-06-02 12:25:07.937 RfBranch:create <- Attribute = Value ->
                        dlAttenuation = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        ulAttenuation = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        dlTrafficDelay = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        ulTrafficDelay = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
2010-06-02 12:25:08.026 RfBranch:create <- Attribute = Value ->
                        dlAttenuation = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        ulAttenuation = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        dlTrafficDelay = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
                        ulTrafficDelay = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
2010-06-02 12:25:08.330 RiPort:set remoteRiPortRef <- Attribute = Value ->

```

```

                from = ManagedElement=1,Equipment=1,RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1
                to  = ManagedElement=1,Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,RiPort=A
2010-06-02 12:25:08.807 SectorEquipmentFunction:create      <- Attribute = Value ->
                        LDN = ManagedElement=1,SectorEquipmentFunction=S1
2010-06-02 12:25:08.868 AuxPlugInUnit=RU-1-1::administrativeState  UNLOCKED
2010-06-02 12:25:08.936 SectorEquipmentFunction=S1::administrativeStateUNLOCKED
2010-06-02 12:25:09.026 RfPort=A::administrativeState      UNLOCKED
2010-06-02 12:25:09.101 RfPort=B::administrativeState      UNLOCKED
2010-06-02 12:25:10.639 RbsConfiguration::rbsConfigLevel      SITE_EQUIPMENT
2010-06-02 12:25:10.738 Licensing                      No License Key File specified.
2010-06-02 12:25:10.870 ConfigurationVersion:Creating CV      Attributes: name
                        Values:  RbsConfiguration_SiteEquipmentComplete
2010-06-02 12:25:31.675 RbsConfiguration::rbsConfigLevel      SITE_CONFIG_COMPLETE
2010-06-02 12:25:31.724 RbsConfiguration::progressInformation  Waiting for OSS configuration
2010-06-02 12:25:40.364 RbsConfiguration::rbsConfigLevel      OSS_ACTIVATING_CONFIGURATION
2010-06-02 12:25:40.412 RbsConfiguration::progressInformation  Waiting for MIB synchronization to complete
2010-06-02 12:25:44.682 RbsConfiguration::rbsConfigLevel      OSS_CONFIGURATION_SUCCESSFUL
2010-06-02 12:25:44.733 RbsConfiguration::progressInformation  Activating configuration
2010-06-02 12:25:44.891 RbsConfiguration::rbsConfigLevel      S1_COMPLETE
2010-06-02 12:25:44.940 RbsConfiguration::progressInformation  Waiting for establishment of S1 connection to MME
2010-06-02 12:25:57.223 RbsConfiguration::rbsConfigLevel      INTEGRATION_COMPLETE
2010-06-02 12:25:57.271 RbsConfiguration::progressInformation  Unlocking cells
RbsConfiguration=1      progressReport  <?xml version="1.0" encoding="ISO-8859-1"?>
<IntegrationProcess revision="R1A">
  <IntegrationGroup name="Initial creation of Configuration Version (CV)" group="50" message="Handles initial creation of Configuration Version (CV)">
    <IntegrationStep name="Creating initial Configuration Version (CV)" step="50" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
  </IntegrationGroup>
  <IntegrationGroup name="Initial IP Connectivity" group="100" message="Handles basic IP configuration">
    <IntegrationStep name="Fetching of IP Configuration via DHCP" step="100" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
    <IntegrationStep name="Activation of IP Connectivity" step="200" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
  </IntegrationGroup>
  <IntegrationGroup name="Summary File" group="200" message="Handles the Summary file">
    <IntegrationStep name="Fetching of Summary file" step="300" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
    <IntegrationStep name="Reading of Summary file" step="400" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
  </IntegrationGroup>
  <IntegrationGroup name="Upgrade" group="300" message="Handles upgrade of the RBS">
    <IntegrationStep name="Fetching of upgrade package" step="500" status="Not started" timeStamp="Not started">
      <DetailedInformation>Not specified yet.</DetailedInformation>
    </IntegrationStep>
  </IntegrationGroup>

```

```

<IntegrationStep name="Installation of upgrade package" step="600" status="Not started" timeStamp="Not started">
  <DetailedInformation>Not specified yet.</DetailedInformation>
</IntegrationStep>
<IntegrationStep name="Upgrade of installed upgrade package" step="700" status="Not started" timeStamp="Not started">
  <DetailedInformation>Not specified yet.</DetailedInformation>
</IntegrationStep>
</IntegrationGroup>
<IntegrationGroup name="Licensing" group="400" message="Handles licensing in the RBS">
  <IntegrationStep name="Installation of license key file" step="800" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
</IntegrationGroup>
<IntegrationGroup name="Site Basic Configuration" group="500" message="Handles Site Basic configuration">
  <IntegrationStep name="Fetching of Site Basic file" step="900" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Reading of Site Basic file" step="1000" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Activation of Site Basic configuration" step="1100" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Configuration of IPSec" step="1200" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
</IntegrationGroup>
<IntegrationGroup name="Site Equipment Configuration" group="600" message="Handles Site Equipment configuration">
  <IntegrationStep name="Fetching of Site Equipment file" step="1300" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Reading of Site Equipment file" step="1400" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Configuration of radio equipment" step="1500" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Configuration of support system" step="1600" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Configuration of antenna systems" step="1700" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
</IntegrationGroup>
<IntegrationGroup name="Security Configuration" group="700" message="Handles Security configuration">
  <IntegrationStep name="Fetching of Initial Security Containment File (ISCF)" step="1900" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Installation of node security" step="2000" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>

```

```

</IntegrationStep>
<IntegrationStep name="Installation of IPSec certificates" step="2100" status="Not started" timeStamp="Not started">
  <DetailedInformation>Not specified yet.</DetailedInformation>
</IntegrationStep>
<IntegrationStep name="Activation of node security" step="2200" status="Not started" timeStamp="Not started">
  <DetailedInformation>Not specified yet.</DetailedInformation>
</IntegrationStep>
</IntegrationGroup>
<IntegrationGroup name="OSS Configuration" group="800" message="Handles OSS configuration">
  <IntegrationStep name="Notification of OSS" step="2300" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Creating Configuration Version (CV)" step="2350" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Activation of planned configuration - RN and TN" step="2400" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Establishment of S1 connection" step="2500" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
  <IntegrationStep name="Configuration finalization" step="2600" status="Not started" timeStamp="Not started">
    <DetailedInformation>Not specified yet.</DetailedInformation>
  </IntegrationStep>
</IntegrationGroup>
<RbsIntegrationCanBeStarted value="false"/>
<RbsIntegrationStarted value="false"/>
<RbsIntegrationFinished value="false"/>
<RbsIntegrationCancelled value="false"/>
<ConfigurationVersionBeingCreated value="false"/>
</IntegrationProcess>

```

```

=====
=====
Total: 1 MOs

```

1.9 Processor addressing and COLI interface

Finding all processors available via COLI and their link handler address:

- 000100 : the MP processor in DU
- gcpu00256 : Uplink processing
- gcpu00512 : Uplink processing
- gcpu00768 : Downlink processing
- gcpu01024 : Control, scheduling

- **BXP_x_y** : the XP processor in RU

ENB0621> bp all

```
=====
Board BoardType      SwAllocation      BoardGroups
=====
000100 DUL3          main              all allp coremp et etip mp ommp sctmp tu
gcpu00256          **              all gcpu gcpu1
gcpu00512          **              all gcpu gcpu2
gcpu00768          **              all gcpu gcpu3
gcpu01024          **              all gcpu gcpu4
BXP_0_1            **              all ru ru1 xp
BXP_1_1            **              all ru ru2 xp
BXP_2_1            **              all ru ru3 xp
BXP_3_1            **              all ru ru4 xp
BXP_4_1            **              all ru ru5 xp
BXP_5_1            **              all ru ru6 xp
=====
```

Total: 11 boards

ENB0621> cabx

```
=====
=====
SMN APN BOARD  FAULT OPER  MAINT  PRODUCTNUMBER REV  SERIAL  DATE  TEMP COREMGR
=====
=====
0 1 DUL      OFF  ON    OFF   KDU137533/3  R2B  C823230364 20091203
=====
```

```
=====
SMN ProductNr  Rev  Name    Date    SerialNr
=====
0 ROJ 999 999  *    BACKPLANE
=====
```

```
=====
=====
SMN APN PORT    BOARD    FAULT OPER  MAINT  PRODUCT NR  REV  SERIAL  DATE  TEMP
=====
=====
0 1 BXP_0_1  RUS      off  steady off  KRC11859/1  R2A  C823348076 20100128 39.0
0 1 BXP_1_1  RUS      off  steady off  KRC11859/1  R2A  C823343994 20100126 35.0
0 1 BXP_2_1  RUS      off  steady off  KRC11859/1  R2B  C823488430 20100426 33.0
0 1 BXP_3_1  RUS      off  steady off  KRC11859/1  R2A  C823283500 20100105 36.0
0 1 BXP_4_1  RUS      off  steady off  KRC11859/1  R2A  C823323949 20100120 33.5
0 1 BXP_5_1  RUS      off  steady off  KRC11859/1  R1B  C822542992 20090610 31.5
```

Printing list of COLI commands available on each processor:

ENB0621> ?

\$?

Command	Description
	default shell command
.	execute commands from file
?	print description of commands
EtHostDump	List internal data for the Et Host SWB
EtHostMo_getPmCounters	Get PM counters for a specified host
...	
who	list who is logged on
wrfpga	Writes to a register in the FPGA.
zzosvarp	Show the address of the OSE kernel data handle.
\$	

ENB0621> lhsh 000100 ?

\$ lhsh 000100 ?

Command	Description
	default shell command
.	execute commands from file
?	print description of commands
EtHostDump	List internal data for the Et Host SWB
EtHostMo_getPmCounters	Get PM counters for a specified host
....	
wrfpga	Writes to a register in the FPGA.
zzosvarp	Show the address of the OSE kernel data handle.
\$	

ENB0621> lhsh gcpu00256 ?

\$ lhsh gcpu00256 ?

Command	Description
	default shell command
.	execute commands from file
?	print description of commands
aom	Active Obervability Manager
biosls	List installed bios modules
bl	list processes
....	
upe	Add UPP External commands (unsupported)
upi	Add UPP Internal commands (unsupported)
uptime	display system uptime
who	list who is logged on

\$

ENB0621> lhsh BXP_0_1 ?

\$ lhsh BXP_0_1 ?

Command	Description
.	default shell command
.	execute commands from file
?	print description of commands
ai	Access to the AI Interface
antp	Send ANTP signals
atf	Execute ATF command
...	
warpB	Warp driver test interface
who	list who is logged on
xpp	XPP test interface

\$

Showing all board groups and their contents:

ENB0621> bp

Board-Group	Nr of Boards
all	11
allp	1
coremp	1
et	1
etip	1
gcpu	4
gcpu1	1
gcpu2	1
gcpu3	1
gcpu4	1
mp	1
ommp	1
ru	6
ru1	1
ru2	1
ru3	1
ru4	1
ru5	1
ru6	1
sctmp	1
tu	1
xp	6

Total: 23 groups

ENB0621> bp all

Board	BoardType	SwAllocation	BoardGroups
000100	DUL3	main	all allp coremp et etip mp ommp sctmp tu
BXP_0_1		**	all ru ru1 xp
BXP_1_1		**	all ru ru2 xp
BXP_2_1		**	all ru ru3 xp
BXP_3_1		**	all ru ru4 xp
BXP_4_1		**	all ru ru5 xp
BXP_5_1		**	all ru ru6 xp
gcpu00256		**	all gcpu gcpu1
gcpu00512		**	all gcpu gcpu2
gcpu00768		**	all gcpu gcpu3
gcpu01024		**	all gcpu gcpu4
Total: 11 boards			

ENB0621> bp ru

Board	BoardType	SwAllocation	BoardGroups
BXP_0_1		**	all ru ru1 xp
BXP_1_1		**	all ru ru2 xp
BXP_2_1		**	all ru ru3 xp
BXP_3_1		**	all ru ru4 xp
BXP_4_1		**	all ru ru5 xp
BXP_5_1		**	all ru ru6 xp
Total: 6 boards			

ENB0621> bp gcpu

Board	BoardType	SwAllocation	BoardGroups
gcpu00256		**	all gcpu gcpu1
gcpu00512		**	all gcpu gcpu2
gcpu00768		**	all gcpu gcpu3
gcpu01024		**	all gcpu gcpu4
Total: 4 boards			

Running COLI commands against a board group:

ENB0621> lh gcpu lmlist

```

=====
$ lhsh gcpu00256 lmclist
gcpu00256: LMfile[ 0]: info = CXC1724302/1_R12E01
gcpu00256: LMfile[ 1]: info = CXC1725372%1R1A01
gcpu00256: LMfile[ 2]: info = 001 068 080 076
=====
$ lhsh gcpu00512 lmclist
gcpu00512: LMfile[ 0]: info = CXC1724302/1_R12E01
gcpu00512: LMfile[ 1]: info = CXC1725372%1R1A01
gcpu00512: LMfile[ 2]: info = 001 068 080 076
=====
$ lhsh gcpu00768 lmclist
gcpu00768: LMfile[ 0]: info = CXC1724302/1_R12E01
gcpu00768: LMfile[ 1]: info = CXC1725372%1R1A01
gcpu00768: LMfile[ 2]: info = 001 068 080 076
=====
$ lhsh gcpu01024 lmclist
gcpu01024: LMfile[ 0]: info = CXC1724302/1_R12E01
gcpu01024: LMfile[ 1]: info = CXC1725372%1R1A01
gcpu01024: LMfile[ 2]: info = 001 068 080 076
$

```

ENB0621> lh all te log read | grep ERROR

```

BXP_0_1: [2010-12-03 20:34:05.024] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_1_1: [2010-12-03 20:34:05.148] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_2_1: [2010-12-03 20:34:05.212] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_3_1: [2010-12-02 15:26:43.428] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_3_1: [2010-12-03 00:08:00.956] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_3_1: [2010-12-03 20:34:05.432] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_4_1: [2010-12-02 15:26:43.228] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_4_1: [2010-12-03 00:08:00.292] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_4_1: [2010-12-03 20:34:05.120] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_4_1: [2010-12-03 20:34:05.128] timeOutSrv warpHalf.cc:2730 ERROR:Missing carrierId
BXP_4_1: [2010-12-03 20:34:05.128] timeOutSrv HAL_Interface.cc:1495 ERROR:Missing carrierId
BXP_5_1: [2010-12-02 15:26:43.872] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_5_1: [2010-12-03 00:08:00.432] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device
BXP_5_1: [2010-12-03 20:34:06.832] antpServerProc_ ruAntp.cc:1145 ERROR:Problem when stoping vswr meas: Not allowed, does not support VSWR on this device

```

ENB0621> lh ru lmclist ; fui get temp ; fui get vswr

```

=====
$ lhsh BXP_0_1 lmclist
BXP_0_1: SlotProt State  Size  Curr ProdDate      Seq Type  LMs SwPid
BXP_0_1: 0 Unlocked Working 15728640No 2009-10-13 15:00 0 Boot 5 CXP901096%12_R4C01
BXP_0_1: 1 Unlocked Working 16908288Yes 2010-08-06 13:00 0 Applic 10 CXP9013268%6_R19SU
BXP_0_1: 2 Unlocked Working 16908288No 2010-10-14 11:00 1 Applic 11 CXP9013268%6_R25NH
BXP_0_1: 3 Unlocked Erased

```

```
=====
$ lhsh BXP_0_1 fui get temp
BXP_0_1: temp: 43.0[C]
=====
```

```
$ lhsh BXP_0_1 fui get vswr
BXP_0_1: vswr: 21.0[dB]
=====
```

```
$ lhsh BXP_1_1 lmclist
BXP_1_1: SlotProt State Size Curr ProdDate Seq Type LMs SwPid
BXP_1_1: 0 Unlocked Working 15728640No 2009-10-13 15:00 0 Boot 5 CXP901096%12_R4C01
BXP_1_1: 1 Unlocked Working 16908288No 2010-05-05 00:00 0 Applic 8 CXP9013268%6_R17ZA01
BXP_1_1: 2 Unlocked Working 16908288Yes 2010-08-06 13:00 1 Applic 10 CXP9013268%6_R19SU
BXP_1_1: 3 Unlocked Working 16908288No 2010-10-14 11:00 2 Applic 11 CXP9013268%6_R25NH
=====
```

```
$ lhsh BXP_1_1 fui get temp
BXP_1_1: temp: 53.5[C]
=====
```

```
$ lhsh BXP_1_1 fui get vswr
BXP_1_1: vswr: 20.6[dB]
=====
```

```
$ lhsh BXP_2_1 lmclist
BXP_2_1: SlotProt State Size Curr ProdDate Seq Type LMs SwPid
BXP_2_1: 0 Unlocked Working 15728640No 2010-02-11 10:00 0 Boot 5 CXP901096%12_R4D03
BXP_2_1: 1 Unlocked Working 16908288Yes 2010-08-06 13:00 0 Applic 10 CXP9013268%6_R19SU
BXP_2_1: 2 Unlocked Working 16908288No 2010-10-14 11:00 1 Applic 11 CXP9013268%6_R25NH
BXP_2_1: 3 Unlocked Erased
=====
```

```
$ lhsh BXP_2_1 fui get temp
BXP_2_1: temp: 54.0[C]
=====
```

```
$ lhsh BXP_2_1 fui get vswr
BXP_2_1: vswr: 24.1[dB]
=====
```

```
$ lhsh BXP_3_1 lmclist
BXP_3_1: SlotProt State Size Curr ProdDate Seq Type LMs SwPid
BXP_3_1: 0 Unlocked Working 15728640No 2009-10-13 15:00 0 Boot 5 CXP901096%12_R4C01
BXP_3_1: 1 Unlocked Working 16908288Yes 2010-08-06 13:00 6 Applic 10 CXP9013268%6_R19SU
BXP_3_1: 2 Unlocked Working 16908288No 2010-10-14 11:00 7 Applic 11 CXP9013268%6_R25NH
BXP_3_1: 3 Unlocked Working 16908288No 2010-07-05 18:00 5 Applic 10 CXP9013268%6_R19SM
=====
```

```
$ lhsh BXP_3_1 fui get temp
BXP_3_1: temp: 47.0[C]
=====
```

```
$ lhsh BXP_3_1 fui get vswr
BXP_3_1: error. Type 'te log read' for more info
BXP_3_1: No TX-carrier configured - unable to measure VSWR.
=====
```

```
$ lhsh BXP_4_1 lmclist
BXP_4_1: SlotProt State Size Curr ProdDate Seq Type LMs SwPid
```

```

BXP_4_1: 0 Unlocked Working 15728640No 2009-10-13 15:00 0 Boot 5 CXP901096%12_R4C01
BXP_4_1: 1 Unlocked Working 16908288No 2010-05-05 00:00 0 Applic 8 CXP9013268%6_R17ZA01
BXP_4_1: 2 Unlocked Working 16908288No 2010-10-14 11:00 2 Applic 11 CXP9013268%6_R25NH
BXP_4_1: 3 Unlocked Working 16908288Yes 2010-08-06 13:00 1 Applic 10 CXP9013268%6_R19SU
=====

```

```

$ lhsh BXP_4_1 fui get temp
BXP_4_1: temp: 47.5[C]
=====

```

```

$ lhsh BXP_4_1 fui get vswr
BXP_4_1: error. Type 'te log read' for more info
BXP_4_1: No TX-carrier configured - unable to measure VSWR.
=====

```

```

$ lhsh BXP_5_1 lmclst
BXP_5_1: SlotProt State Size Curr ProdDate Seq Type LMs SwPid
BXP_5_1: 0 Unlocked Working 15728640No 2009-06-05 12:00 0 Boot 5 CXP901096%12_R2C02
BXP_5_1: 1 Unlocked Working 16908288No 2010-01-25 11:00 7 Applic 7 CXP9013268%6_R12NC01
BXP_5_1: 2 Unlocked Working 16908288No 2010-10-14 11:00 9 Applic 11 CXP9013268%6_R25NH
BXP_5_1: 3 Unlocked Working 16908288Yes 2010-08-06 13:00 8 Applic 10 CXP9013268%6_R19SU
=====

```

```

$ lhsh BXP_5_1 fui get temp
BXP_5_1: temp: 43.0[C]
=====

```

```

$ lhsh BXP_5_1 fui get vswr
BXP_5_1: error. Type 'te log read' for more info
BXP_5_1: No TX-carrier configured - unable to measure VSWR.
$

```

Selecting protocol for COLI and file transfer

secure_shell : 0=telnet, 1=ssh

secure_ftp : 0=ftp, 1=sftp

```
ENB21> uv secure_
```

```

secure_ftp      = 0
secure_shell    = 0

```

File handling commands

Refer to MoshellBasic chapter 8.5

2 SW

2.1 SW Management

Refer to chapter 9 in Moshell Basic

2.2 System Upgrade

Refer to chapter 12 in Moshell Basic

2.3 SW Releases

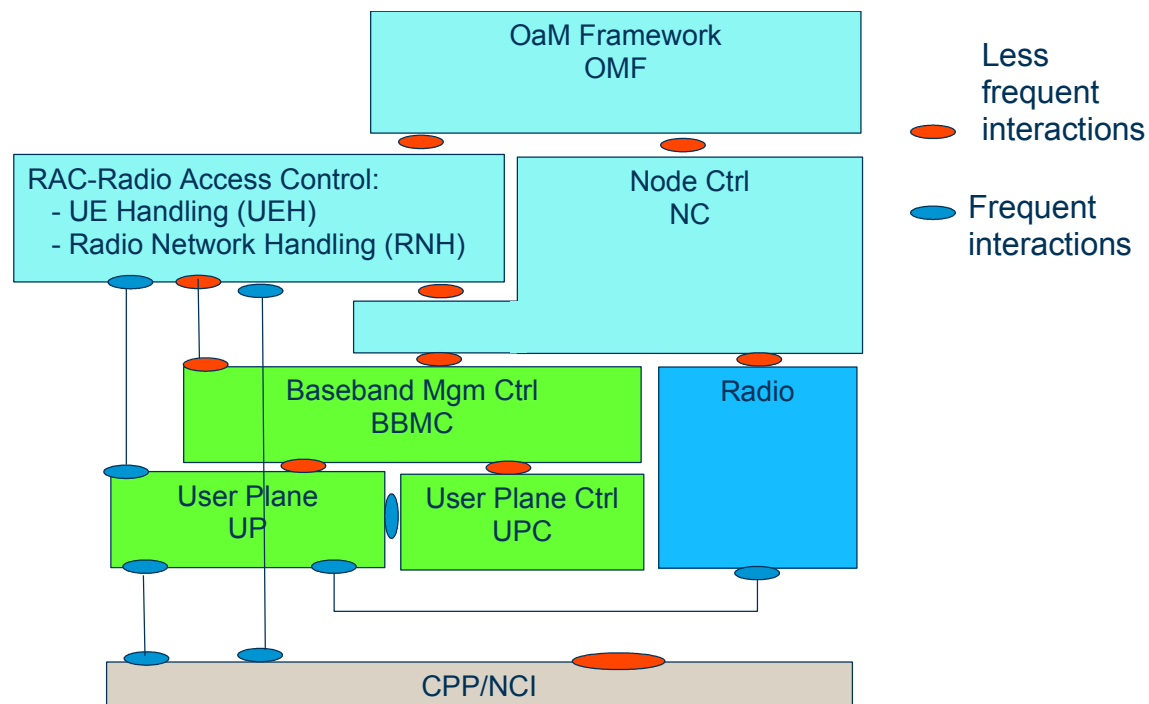
ENB4016> upido erbs

Node	UpgradePackage	Release/MOM
ERBS	CXP102051/1	L10B (A) // Iteration 7
ERBS	CXP102051/10	L11A (A) // Iteration 10
ERBS	CXP102051/11	L11B (B) // Iteration 11
ERBS	CXP102051/12	L11B (B) // Iteration 12
ERBS	CXP102051/13	L12A (B) // Iteration 13
ERBS	CXP102051/14	L12A (C) // Iteration 14
ERBS	CXP102051/15	L12B (C) // Iteration 15
ERBS	CXP102051/16	L12B (C) // Iteration 16

...

2.4 Application subsystems

More info: http://newtran01.au.ao.ericsson.se/moshell/training/references/lte/LteSWA_PA4.ppt

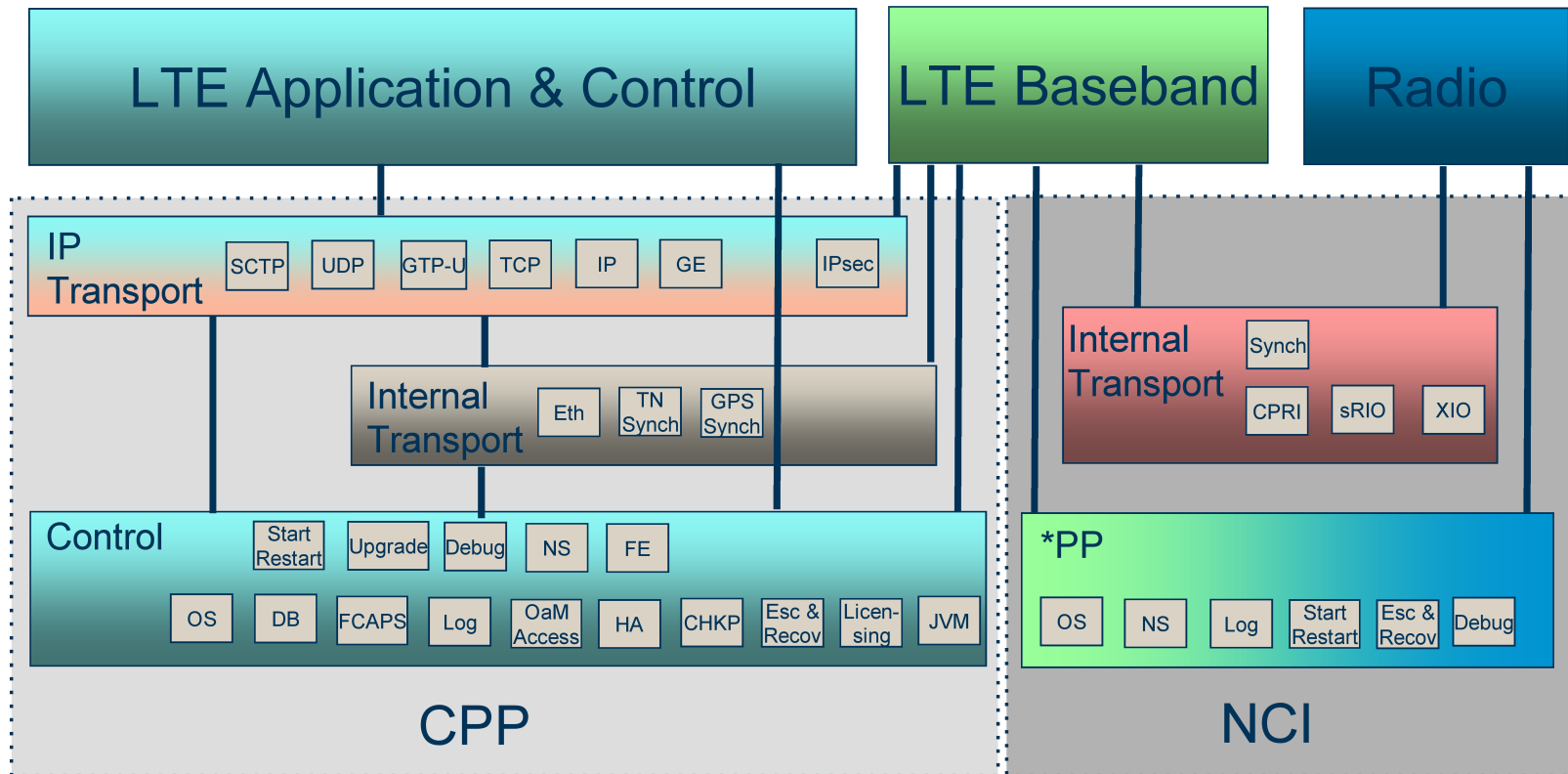


- **OaM Framework (OMF)**
In comparison to other subsystems OMF provides less actual code but provides more of framework and pattern alignment rules. The actual OaM functionality is mostly provided by the platform. Beyond the platform functions OMF introduces generic interfaces between MAO and fRO layers. In addition a rule set for PM producers as well as for observability events are governed by OMF. The actual implementation of the rules are part of other subsystems.
- **Node Control (NC):**
This subsystems provides the RBS with functionality to bring up the node to a ready state. NC mainly starts, configures and supervises HW units. In that capacity NC mainly acts at the RBS bring-up and remains fairly static afterwards. One of the important aspects of the role of NC is to provide the lion share of RERC, the resource abstraction layer in the logical model. NC acts as a mediator between users (the LTE RNC application) and resource suppliers such as baseband. The entire point being to isolate application from HW deployment knowledge. The support system functionality is allocated to this subsystem.
- **Radio Network Handling RNH**
The primary objective for RNH is to establish the radio network, maintaining S1/X2 control plane topology. RNH is also responsible for bringing up the cells in the node.
- **User Equipment Handling (UEH)**
UEH deals with the mobility management of UE's. As long as a UE is present in any cell, UEH is responsible for maintaining state information about the UE and act on state transitions.

- Baseband Module Control (BBMC)
BBMC acts as the mediator between the control plane (RNH, UEH and NC) and the baseband. BBMC is also part of the RERC layer hiding implementation details from the layers above. BBMC is also responsible for configuring the baseband as well as handling resource allocation in baseband. Furthermore BBMC also acts as the equipment handler for baseband including observability aspects.
- User Plane Control (UPC)
UPC provides the user plane with control functionality such as scheduling.
- User Plane (UP)
User plane contains the functionality corresponding to L1/L2 protocol processing in baseband.
- Radio
The radio subsystem contains the functionality related to the radio. The radio is controlled from a configuration perspective (OaM) by NC, whereas UP is providing and retrieving IQ samples.

2.5 Platforms

Platform services

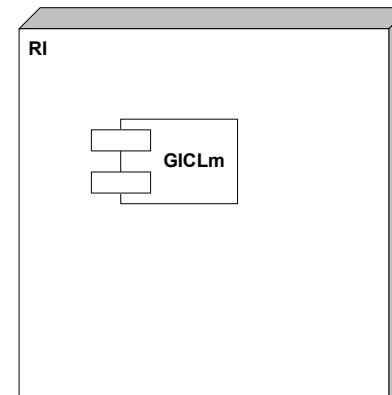
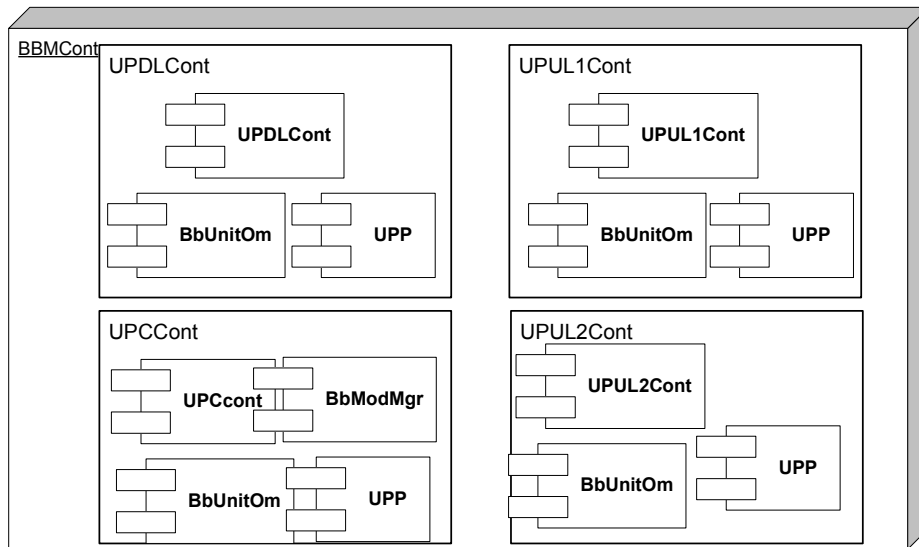
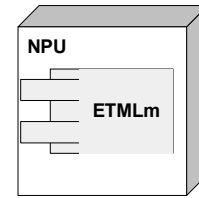
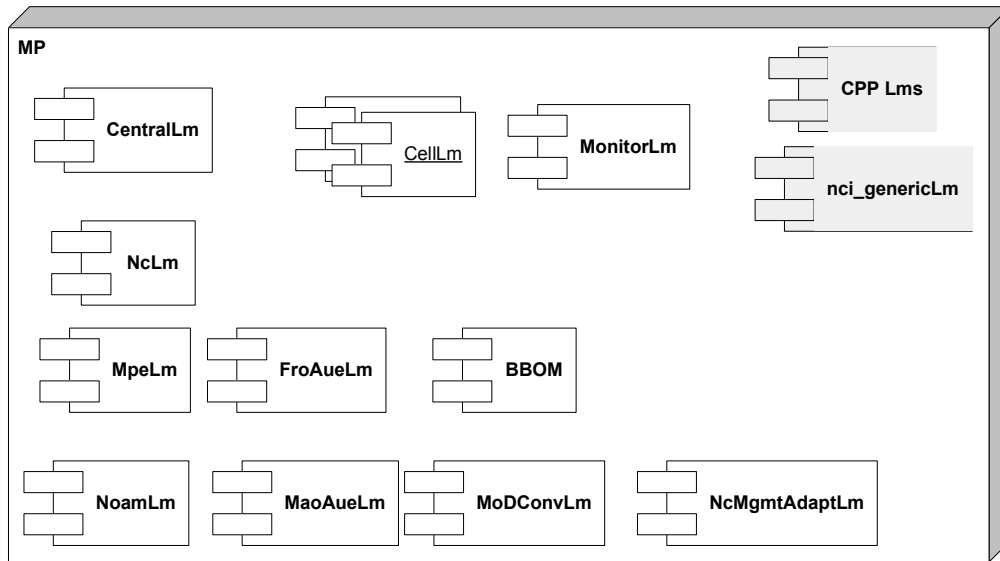


An important part of the implementation of the RBS consists of two platforms, Connectivity Processing Platform (CPP) and Node Common Infrastructure (NCI). CPP only provides platform functions on the main processor where the control plane is executing. NCI provides less functionality but caters for HW not handled by CPP, e.g. load of baseband and execution platform for the radio. Both platforms incorporate OSE as operating system. The following picture gives an overview of the functionality provided and used by LTE RBS:

As can be seen in the picture NCI provides a limited variant of CPP used on HW not designed by CPP.

2.6 Load Modules

The LTE RBS source code is compiled into a number of load modules that are executed in the RBS.



Dig HW only

The primary load modules executing on the digital part are:

Java

- noam
This load module is a java jar file that contains the OaM interface for the nc, cell and central load modules. This load module executes on the main processor.
- soam
This is another java jar file that contains the OaM interface for the supSysC load module, i.e. configuration and status reporting of e.g. battery levels. This load module executes on the main processor.

MP

- nc
This load module contains the functionality provided by the NC subsystem, i.e. start and control of HW units related to the user plane flow e.g. radio. In addition the load module contains code for HW independence. This load module executes on the main processor.
- supSysC
This load module contains the remaining parts of the nc subsystem. i.e. start and control of support systems devices such as power and climate control. This load module executes on the main processor.
- central
This load module contains centralized parts of RNH and UEH subsystems. Primary functions are MME handling and termination of S1/X2 control plane protocols. This load module executes on the main processor.
- cell
The cell load module contains functions primarily for UE handling and functions specific to a cell. The content originates from RNH and UEH subsystems. This load module executes on the main processor.
- monitor
The monitor load module contains functionality OMF subsystem related to observability, e.g. collection of performance data. This load module executes on the main processor.
- bbom
This load module belongs to the subsystem bbmc, however it also provides functions for up and upc. The primary purpose is to hide baseband internal partitioning and also serve as the entry point for configuration of baseband. This load module executes on the main processor.

GCPU

- bbmCont
This load module is a container of all code used in the baseband processing. This code executes in the baseband module.

In addition to these load modules there are a handful of load modules related to support functionality such as upgrade. The platforms also deliver load modules also executing on the digital part.

Furthermore there are load modules for auxiliary units such as the radio and also load modules intended for operations

In INV printout, the application programs are at the bottom

ENB4016> inv

```
=====
=====
SMN APN BOARDTYPE ST PRODUCTNUMBER_REV NAME MO
=====
=====
0 1 DUL3 1 CXC1729957_B151044 bos_gpm3 1,Slot=1,PlugInUnit=1,Program=CXC1729957_B151044
0 1 DUL3 1 CXC1728594_R73D24 cbf2_v2_fpga 1,Slot=1,PlugInUnit=1,Program=CXC1728594_R73D24
0 1 DUL3 1 CXC1727010_R73D27 iell_basic_b 1,Slot=1,PlugInUnit=1,Program=CXC1727010_R73D27
0 1 DUL3 1 CXC1320785_R73D25 loaderserver 1,Slot=1,PlugInUnit=1,Program=CXC1320785_R73D25
0 1 DUL3 1 CXC1320781_R73D27 database 1,Slot=1,PlugInUnit=1,Program=CXC1320781_R73D27
0 1 DUL3 1 CXC1320782_R73D50 equipment_re 1,Slot=1,PlugInUnit=1,Program=CXC1320782_R73D50
0 1 DUL3 1 CXC1320787_R73D29 SystemManage 1,Slot=1,PlugInUnit=1,Program=CXC1320787_R73D29
0 1 DUL3 1 CXC1321314_R73D25 sock 1,Slot=1,PlugInUnit=1,Program=CXC1321314_R73D25
0 1 DUL3 1 CXC1321315_R73D32 inet 1,Slot=1,PlugInUnit=1,Program=CXC1321315_R73D32
0 1 DUL3 1 CXC1321316_R73D25 ethernet 1,Slot=1,PlugInUnit=1,Program=CXC1321316_R73D25
0 1 DUL3 1 CXC1321341_R73D28 sw_installat 1,Slot=1,PlugInUnit=1,Program=CXC1321341_R73D28
0 1 DUL3 1 CXC1322506_R73D25 iputil 1,Slot=1,PlugInUnit=1,Program=CXC1322506_R73D25
0 1 DUL3 1 CXC1323464_R73D28 objectsuppor 1,Slot=1,PlugInUnit=1,Program=CXC1323464_R73D28
0 1 DUL3 1 CXC1325792_R73D33 licensemanag 1,Slot=1,PlugInUnit=1,Program=CXC1325792_R73D33
0 1 DUL3 1 CXC1327705_R73D18 dbagent 1,Slot=1,PlugInUnit=1,Program=CXC1327705_R73D18
0 1 DUL3 1 CXC1320783_R73D24 http_server 1,Slot=1,PlugInUnit=1,Program=CXC1320783_R73D24
0 1 DUL3 1 CXC1320784_R73D37 jvm 1,Slot=1,PlugInUnit=1,Program=CXC1320784_R73D37
0 1 DUL3 1 CXC1323911_R73D38 ssh 1,Slot=1,PlugInUnit=1,Program=CXC1323911_R73D38
0 1 DUL3 1 CXC1326054_R73D27 target_monit 1,Slot=1,PlugInUnit=1,Program=CXC1326054_R73D27
0 1 DUL3 1 CXC1721176_R73D26 pm_agent 1,Slot=1,PlugInUnit=1,Program=CXC1721176_R73D26
0 1 DUL3 1 CXC1727282_R73D20 iell_resourc 1,Slot=1,PlugInUnit=1,Program=CXC1727282_R73D20
0 1 DUL3 1 CXC1321344_R73D18 pms 1,Slot=1,PlugInUnit=1,Program=CXC1321344_R73D18
0 1 DUL3 1 CXC1325240/1_R73D24 sctp_adm 1,Slot=1,PlugInUnit=1,Program=CXC1325240/1_R73D24
0 1 DUL3 1 CXC1325241/1_R73D35 sctp_host 1,Slot=1,PlugInUnit=1,Program=CXC1325241/1_R73D35
0 1 DUL3 1 CXC1327846_R73D36 ipcp_adm_lm 1,Slot=1,PlugInUnit=1,Program=CXC1327846_R73D36
0 1 DUL3 1 CXC1327943_R73D32 ipadm_lm 1,Slot=1,PlugInUnit=1,Program=CXC1327943_R73D32
0 1 DUL3 1 CXC1727219_R73D29 nsscbm 1,Slot=1,PlugInUnit=1,Program=CXC1727219_R73D29
0 1 DUL3 1 CXC1727220_R73D31 nsstum2 1,Slot=1,PlugInUnit=1,Program=CXC1727220_R73D31
0 1 DUL3 1 CXC1727238_R73D23 iphost_cbm_l 1,Slot=1,PlugInUnit=1,Program=CXC1727238_R73D23
0 1 DUL3 1 CXC1728281_R73D25 ipsec_adm_mp 1,Slot=1,PlugInUnit=1,Program=CXC1728281_R73D25
0 1 DUL3 1 CXC1323891/2_R31F01 lmbpp 1,Slot=1,PlugInUnit=1,Program=CXC1323891/2_R31F01
0 1 DUL3 1 CXC1329000/3_R5C/2 lmatf_3 1,Slot=1,PlugInUnit=1,Program=CXC1329000/3_R5C/2
0 1 DUL3 1 CXC1720483_R73D23 ncli 1,Slot=1,PlugInUnit=1,Program=CXC1720483_R73D23
0 1 DUL3 1 CXC1725190/10_R7J centralLm 1,Slot=1,PlugInUnit=1,Program=CXC1725190/10_R7J
0 1 DUL3 1 CXC1725191/10_R7J cellLm 1,Slot=1,PlugInUnit=1,Program=CXC1725191/10_R7J
0 1 DUL3 1 CXC1725192/10_R7K nclm 1,Slot=1,PlugInUnit=1,Program=CXC1725192/10_R7K
0 1 DUL3 1 CXC1725398/10_R7J bbom 1,Slot=1,PlugInUnit=1,Program=CXC1725398/10_R7J
0 1 DUL3 1 CXC1725422/1_R10K01 ricm 1,Slot=1,PlugInUnit=1,Program=CXC1725422/1_R10K01
0 1 DUL3 1 CXC1726088/10_R7J monitorLm 1,Slot=1,PlugInUnit=1,Program=CXC1726088/10_R7J
0 1 DUL3 1 CXC1728262_R73D46 ip_lte_cbm_l 1,Slot=1,PlugInUnit=1,Program=CXC1728262_R73D46
0 1 DUL3 1 CXC1729152/3_R4AA duICtrl 1,Slot=1,PlugInUnit=1,Program=CXC1729152/3_R4AA
```

```

0 1 DUL3      1 CXP102066/3_R3D01  gic      1,Slot=1,PlugInUnit=1,Program=CXP102066/3_R3D01
0 1 DUL3      1 CXP9020294/10_R7T  bbm_cont 1,Slot=1,PlugInUnit=1,Program=CXP9020294/10_R7T
0 1 EtIp=1    1 CXC1726213_R73D05  app3342_lm 1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,Program=CXC1726213_R73D05
0 1 EtIp=1    1 CXC1729756_R73D02  bif_basic 1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,Program=CXC1729756_R73D02
-----

```

```

=====
JVM  PRODUCTNUMBER_REV  NAME      MO
=====
jvm=1 CXC1723378_R74E01  rfa       LoadModule=CXC1723378_R74E01
jvm=1 CXC1725791_R74E01  jvm_supp_lm LoadModule=CXC1725791_R74E01
jvm=1 CXC1726723_R74D01  jdbc_jvm_lm LoadModule=CXC1726723_R74D01
jvm=1 CXC1320960_R74G02  oms       LoadModule=CXC1320960_R74G02
jvm=1 CXC1328917_R74E01  vls       LoadModule=CXC1328917_R74E01
jvm=1 CXC1720482_R74G02  ncliserver LoadModule=CXC1720482_R74G02
jvm=1 CXC1721553_R74G01  csus      LoadModule=CXC1721553_R74G01
jvm=1 CXC1721555_R74D01  prngcApi  LoadModule=CXC1721555_R74D01
jvm=1 CXC1721558_R74D01  jacorb    LoadModule=CXC1721558_R74D01
jvm=1 CXC1729858_R74G02  esa       LoadModule=CXC1729858_R74G02
jvm=1 CXC1721192_R74G02  atm       LoadModule=CXC1721192_R74G02
jvm=1 CXC1721196_P0A03  iptransport LoadModule=CXC1721196_P0A03
jvm=1 CXC1721201_R74G02  internaltran LoadModule=CXC1721201_R74G02
jvm=1 CXC1721203_R74G02  ipoam     LoadModule=CXC1721203_R74G02
jvm=1 CXC1721206_R74G02  equipment LoadModule=CXC1721206_R74G02
jvm=1 CXC1721208_R74G03  licensing LoadModule=CXC1721208_R74G03
jvm=1 CXC1721210_R74G02  managedeleme LoadModule=CXC1721210_R74G02
jvm=1 CXC1721212_R74G02  security  LoadModule=CXC1721212_R74G02
jvm=1 CXC1721216_R74G02  swmanagement LoadModule=CXC1721216_R74G02
jvm=1 CXC1721218_R74G02  synchronizat LoadModule=CXC1721218_R74G02
jvm=1 CXC1721282_R74G02  sctp      LoadModule=CXC1721282_R74G02
jvm=1 CXC1721371_R74G03  cma_bootstra LoadModule=CXC1721371_R74G03
jvm=1 CXC1723048_R74G02  log       LoadModule=CXC1723048_R74G02
jvm=1 CXC1724100_R74G02  maofroi   LoadModule=CXC1724100_R74G02
jvm=1 CXC1728445_R74G03  ipsec     LoadModule=CXC1728445_R74G03
jvm=1 CXC1726067_R74G02  viewfilecrea LoadModule=CXC1726067_R74G02
jvm=1 CXC1720327_R74G02  ma_services LoadModule=CXC1720327_R74G02
jvm=1 CXC1730437_R74E01  nia       LoadModule=CXC1730437_R74E01
jvm=1 CXC1730438_R74F01  seclev    LoadModule=CXC1730438_R74F01
jvm=1 CXC1725193/11_R6AD  noam      LoadModule=CXC1725193/11_R6AD
jvm=1 CXC1730620/5_R2A    soam      LoadModule=CXC1730620/5_R2A
jvm=1 CXC1730135/5_R2A    crbsGoamLm LoadModule=CXC1730135/5_R2A
-----

```

In proglis printout, the application programs are at the top

kienb4016> proglis -e class

Handle	State	Lmid	Name	Heap	Pool
0x000302a5	started	CXC1720483_R73D23	NcliShell	200000	300000 CELLO_LOAD_CLASS=500
0x00030289	started	CXC1728262_R73D43	ip_lte_cbm_l	6000000	3000000 CELLO_LOAD_CLASS=500
0x00040279	started	CXC1729152%3_R4L	duCtrl	2500000	1000000 CELLO_LOAD_CLASS=500
0x00030267	started	CXC1726088%10_R5AZ	monitorLm	19968960	1000000 CELLO_LOAD_CLASS=500
0x00040256	started	CXC1725191%10_R5BH	cellLm	106959632	2000000 CELLO_LOAD_CLASS=500
0x00040245	started	CXC1725190%10_R5BD	centralLm	10284580	1000000 CELLO_LOAD_CLASS=500
0x00020235	started	CXC1725192%10_R5BC	ncLm	UNDEF	2000000 CELLO_LOAD_CLASS=500
0x00030209	started	CXC1323891%2_R31D01	lmbpp	UNDEF	4000000 CELLO_LOAD_CLASS=500
0x000201fa	started	CXC1329000%3_R5C%1	lmatf_3	UNDEF	153600 CELLO_LOAD_CLASS=500
0x000501db	started	CXC1725398%10_R5AY	bbom	UNDEF	1200000 CELLO_LOAD_CLASS=500
0x000301d6	started	CXC1725422%1_R10G01	ricm	UNDEF	140000 CELLO_LOAD_CLASS=500
0x000201cd	started	CXC1727219_R73D27	nsscblm	741400	200000 CELLO_LOAD_CLASS=400
0x000301b7	started	CXC1321344_R73D18	Pms	25552	100000 CELLO_LOAD_CLASS=400
0x000301ab	started	CXC1728281_R73D22	ipsec_adm_mp	1000000	1000000 CELLO_LOAD_CLASS=400
0x000301a0	started	CXC1325240%1_R73D24	SctpAdm	1000000	500000 CELLO_LOAD_CLASS=400
0x00030185	started	CXC1327846_R73D31	lpcplpAdm	500000	500000 CELLO_LOAD_CLASS=400
0x0003016c	started	CXC1327943_R73D30	lpacplAdm	447000	500000 CELLO_LOAD_CLASS=400
0x00030167	started	CXC1727238_R73D23	iphost_cbm_l	100000	1090000 CELLO_LOAD_CLASS=400
0x0002015e	started	CXC1325241%1_R73D34	SctpHost	28685574	4084928 CELLO_LOAD_CLASS=400
0x00030156	started	CXC1727220_R73D29	tu_cbm_lm	741400	200000 CELLO_LOAD_CLASS=400
0x0003014f	started	CXC1727282_R73D20	iell_resourc	1000000	1000000 CELLO_LOAD_CLASS=300
0x00030145	started	CXC1320784_R73D37	Jvm	20000000	4100000 CELLO_LOAD_CLASS=300
0x0003013e	started	CXC1320783_R73D24	Http	741888	459000 CELLO_LOAD_CLASS=300
0x00020133	started	CXC1323911_R73D37	ssh	3142688	3000000 CELLO_LOAD_CLASS=300
0x0003012c	started	CXC1326054_R73D26	target_monit	UNDEF	500000 CELLO_LOAD_CLASS=300
0x00030125	started	CXC1721176_R73D26	PmAgent	3728	32000 CELLO_LOAD_CLASS=300
0x0003011e	started	CXC1325792_R73D31	licensemanag	20000	100000 CELLO_LOAD_CLASS=200
0x00030117	started	CXC1321341_R73D27	SwInst	108240	300000 CELLO_LOAD_CLASS=200
0x0003010e	started	CXC1327705_R73D18	dbagent	10000	100000 CELLO_LOAD_CLASS=200
0x00030101	started	CXC1320782_R73D49	EqmRes	1269600	1016388 CELLO_LOAD_CLASS=200
0x000200f8	started	CXC1320781_R73D27	Database	20000000	3000000 CELLO_LOAD_CLASS=200
0x000300ec	started	CXC1323464_R73D27	ObjectSupport	108240	200000 CELLO_LOAD_CLASS=200
0x000300e2	started	CXC1322506_R73D25	lpUtil	459000	225000 CELLO_LOAD_CLASS=200
0x000300da	started	CXC1321315_R73D31	inet	741888	1100000 CELLO_LOAD_CLASS=200
0x000300d3	started	CXC1321316_R73D25	ethernet	9760	600000 CELLO_LOAD_CLASS=200
0x000300c5	started	CXC1321314_R73D25	sock	66896	1000000 CELLO_LOAD_CLASS=200
0x000700bd	started	CXC1320787_R73D29	SysMan	741888	1200000 CELLO_LOAD_CLASS=200
0x000300b1	started	CXC1320785_R73D25	LoaderServer	25552	300000 CELLO_LOAD_CLASS=100
0x0003009a	started	CXC1727010_R73D27	iell_basic_b	UNDEF	SHARED CELLO_LOAD_CLASS=68
0x0001000f	started	CXC1729957_R73D85	core_module	UNDEF	SHARED

>>> Total: 1 processors, 40 programs

List of program settings which can be viewed with option -e <string> :

BCS_APPL_HEAP_CONFIG,BCS_APPL_POOL_CONFIG,BCS_PGM_RESTARTED,CELLO_BOARD_RESTART_ON_ERROR,CELLO_LOAD_CLASS,CELLO_TEMI_NO_EQ_RESOURCES,CLS_TE MI_NO_EQ_RESOURCES,CMD_PREFIX,CMD_STACK,CS_CONFDIR,CS_GLOBAL_CONFDIR,CS_LMDIR,CWD,EFS_DEFAULT_STDIO,EFS_FRAGSIZE_MAX,EFS_SHMEM,FAST_PREFIX,HEA

P_LARGE_BUF_THRESHOLD,HEAP_MALLOC_ERROR_ON_NULL,HEAP_MAX_SIZE,HEAP_SMALL_BUF_EXT_SIZE,HEAP_SMALL_BUF_INIT_SIZE,HUNT_TIMEOUT,LM_CMINFO,LM_PATH,LM_VERS,MALLOC_RETURN_ONLY_ON_SUCCESS,MANPATH,MAX_IF,MAX_MONITOR_SIZE,MAX_SOCKETS,MAX_SOCKET_PCB,MAX_TRACE_SIZE,OSA_SSHD_IDLE_TIMEOUT,OSE_I
NET,OSE_LM_BSS_INIT,OSE_LM_DATA_INIT,OSE_LM_EXEC_MODEL,OSE_LM_HEAP_SIZE,OSE_LM_IDENTITY,OSE_LM_MAIN_NAME,OSE_LM_MAIN_PRIORITY,OSE_LM_MAIN_STACK
SIZE,OSE_LM_POOL_SIZE,OSE_LM_PROGRAM_TYPE,OSE_LM_SIGNAL_SIZES,OSE_LM_STACK_SIZES,OSE_LM_SUPERVISOR_MODE,OS_MODE,PS_COLUMN_WIDTH,RTL_PHYS_MEM
_TEXT,SOCKET_SERVER,STACK_SIZE,SystemName,appl_hook_env,efs_flib_vars,heap_ref,ose_rtl_elf_chunk_size

2.7 Licensing

Printing the features status and capacity limits

ENB4016> inv

...

Feature	keyId	licenseState	featureState	serviceState	description	
Anr=1	CXC4010620	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	Automated Neighbour Relations	
Cdma2000SessionContinuity=1	CXC4010614	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	CDMA2000 Session continuity, coverage triggered	
CsfbForLimitedDualRadioUE=1	CXC4010949	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
DL64Qam=1	CXC4010610	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	64-QAM DL	
Drx=1	CXC4010912	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
DualAntDlPerfPkg=1	CXC4010609	1 (ENABLED)	1 (ACTIVATED)	1 (OPERABLE)	Dual Antenna DL Performance Package	
GsmSessionContinuity=1	CXC4010618	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	GERAN Session continuity, coverage triggered	
InterFrequencySessionContinuity=1	CXC4010770	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
IntraLTEHODataFwd=1	CXC4010613	1 (ENABLED)	1 (ACTIVATED)	1 (OPERABLE)	Data forwarding at Intra LTE handover	
IntraLTEHandover=1	CXC4010612	1 (ENABLED)	1 (ACTIVATED)	1 (OPERABLE)	Intra LTE handover	
Irc=1	CXC4010319	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
MultiErabsPerUser=1	CXC4010723	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	Multiple Radio Bearer per user	
PmInitiatedUeMeasurements=1	CXC4010717	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	PM Initiated UE Measurements	
RbsEventStreamer=1	CXC4010856	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
RetCascading=1	CXC4010798	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	Support for Cascading of 3GPP Compatible RET Antennas	
RetConfigurationMgt=1	CXC4010830	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	Configuration management of 3GPP luan and AISGv2.0 compatible ALDs	
RetSupport=1	CXC4010622	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	RET Support	
TimeAndPhaseSynchWithGPS=1	CXC4010917	0 (DISABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
TmaSupport=1	CXC4010621	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	TMA Support	
UePosCellId=1	CXC4010841	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)		
UL16Qam=1	CXC4010611	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	16-QAM UL	
VswrSupervision=1	CXC4010799	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	VSWR	
WcdmaSessionContinuity=1	CXC4010616	1 (ENABLED)	0 (DEACTIVATED)	0 (INOPERABLE)	WCDMA Session continuity, coverage triggered	
Capacity	keyId	licenseState	licenseCapacity	capacityUnit	hardLimit	percentileConf

ChannelBandwidth=10MHz	CXC4010718	1 (ENABLED)	12	Nr of 10000kHz licenses		
ChannelBandwidth=15MHz	CXC4010719	1 (ENABLED)	12	Nr of 15000kHz licenses		
ChannelBandwidth=1p4Mhz	CXC4010721	0 (DISABLED)	0	Nr of 1400kHz licenses		
ChannelBandwidth=20MHz	CXC4010720	1 (ENABLED)	12	Nr of 20000kHz licenses		
ChannelBandwidth=3MHz	CXC4010722	0 (DISABLED)	0	Nr of 3000kHz licenses		
ChannelBandwidth=5MHz	CXC4010627	1 (ENABLED)	12	Nr of 5000kHz licenses		
ConnectedUsers=1	CXC4010608	1 (ENABLED)	500	Nr of Connected Users	50	90
DIBasebandCapacity=1	CXC4010623	1 (ENABLED)	400	Mbit/s	0	90
OutputPower=40Watt	CXC4010625	1 (ENABLED)	12	Nr of 40 Watt Licenses		
OutputPower=60Watt	CXC4010626	1 (ENABLED)	12	Nr of 60 Watt Licenses		
UIBasebandCapacity=1	CXC4010624	1 (ENABLED)	200	Mbit/s	0	90
=====						
=====						

....

Printing license related counters

ENB4016> pmomc licensing

#####	
MO Class	Pm Counters
#####	
CapacityConnectedUsers	5
	pmLicConnectedUsersActual
	pmLicConnectedUsersDistr [24]
	pmLicConnectedUsersHardLimit
	pmLicConnectedUsersLicense
	pmLicConnectedUsersTimeCong

DIBasebandCapacity	4
	pmLicDICapActual
	pmLicDICapDistr [20]
	pmLicDICapLicense
	pmLicDICapMax

UIBasebandCapacity	4
	pmLicUICapActual
	pmLicUICapDistr [20]
	pmLicUICapLicense
	pmLicUICapMax

Enter a second argument in the pmom command for description of a counter (or type "h pmom" for help).

Total: 13 counters (74 including PDF)

Activating all features

Example: activating all features on the ENB is much quicker with eset as each attribute has a different name but matches the string “featurestate”. With regular “set” command we would have to run a separate command for each attribute.

ENB32> lget optional featurestate

```
=====
=====
MO                               Attribute      Value
=====
=====
Licensing=1,OptionalFeatures=1,DI64Qam=1      featureStateDI64Qam 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,IntraLTEHandover=1 featureStateIntraLTEHandover 1 (ACTIVATED)
Licensing=1,OptionalFeatures=1,CsfbForLimitedDualRadioUE=1 featureStateCsfbForLimitedDualRadioUE 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,RetSupport=1     featureStateRetSupport 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,Anr=1           featureStateAnr 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,Irc=1           featureStateIrc 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,MultiErabsPerUser=1 featureStateMultiErabsPerUser 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,WcdmaSessionContinuity=1 featureStateWcdmaSessionContinuity 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,RbsEventStreamer=1 featureStateEventStreaming 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,PmInitiatedUeMeasurements=1 featureStatePmInitiatedUeMeasurements 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,TimeAndPhaseSynchWithGPS=1 featureStateTimeAndPhaseSynchWithGPS 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,InterFrequencySessionContinuity=1 featureStateInterFrequencySessionContinuity 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,UePosCellId=1    featureStateCellId 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,RetCascading=1    featureStateRetCascading 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,VswrSupervision=1 featureStateVswrSupervision 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,DualAntDIPerfPkg=1 featureStateDualAntDIPerfPkg 1 (ACTIVATED)
Licensing=1,OptionalFeatures=1,IntraLTEHODDataFwd=1 featureStateIntraLTEHODDataFwd 1 (ACTIVATED)
Licensing=1,OptionalFeatures=1,GsmSessionContinuity=1 featureStateGsmSessionContinuity 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,TmaSupport=1     featureStateTmaSupport 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,Cdma2000SessionContinuity=1 featureStateCdma2000SessionContinuity 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,RetConfigurationMgt=1 featureStateRetConfigurationMgt 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,Drx=1           featureStateDrx 0 (DEACTIVATED)
Licensing=1,OptionalFeatures=1,UI16Qam=1       featureStateUI16Qam 0 (DEACTIVATED)
=====
=====
Total: 23 MOs
```

ENB32> leset optional featurestate 1

Set following 23 attributes?

```
=====
=====
20 Licensing=1,OptionalFeatures=1,DI64Qam=1      featureStateDI64Qam
21 Licensing=1,OptionalFeatures=1,IntraLTEHandover=1 featureStateIntraLTEHandover
22 Licensing=1,OptionalFeatures=1,CsfbForLimitedDualRadioUE=1 featureStateCsfbForLimitedDualRadioUE
23 Licensing=1,OptionalFeatures=1,RetSupport=1     featureStateRetSupport
24 Licensing=1,OptionalFeatures=1,Anr=1           featureStateAnr
25 Licensing=1,OptionalFeatures=1,Irc=1           featureStateIrc
```

```

26 Licensing=1,OptionalFeatures=1,MultiErabsPerUser=1      featureStateMultiErabsPerUser
27 Licensing=1,OptionalFeatures=1,WcdmaSessionContinuity=1  featureStateWcdmaSessionContinuity
28 Licensing=1,OptionalFeatures=1,RbsEventStreamer=1       featureStateEventStreaming
29 Licensing=1,OptionalFeatures=1,PmInitiatedUeMeasurements=1 featureStatePmInitiatedUeMeasurements
30 Licensing=1,OptionalFeatures=1,TimeAndPhaseSynchWithGPS=1 featureStateTimeAndPhaseSynchWithGPS
31 Licensing=1,OptionalFeatures=1,InterFrequencySessionContinuity=1 featureStateInterFrequencySessionContinuity
32 Licensing=1,OptionalFeatures=1,UePosCellId=1            featureStateCellId
33 Licensing=1,OptionalFeatures=1,RetCascading=1           featureStateRetCascading
34 Licensing=1,OptionalFeatures=1,VswrSupervision=1        featureStateVswrSupervision
35 Licensing=1,OptionalFeatures=1,DualAntDIPerfPkg=1       featureStateDualAntDIPerfPkg
36 Licensing=1,OptionalFeatures=1,IntraLTEHODDataFwd=1     featureStateIntraLTEHODDataFwd
37 Licensing=1,OptionalFeatures=1,GsmSessionContinuity=1   featureStateGsmSessionContinuity
38 Licensing=1,OptionalFeatures=1,TmaSupport=1             featureStateTmaSupport
39 Licensing=1,OptionalFeatures=1,Cdma2000SessionContinuity=1 featureStateCdma2000SessionContinuity
40 Licensing=1,OptionalFeatures=1,RetConfigurationMgt=1     featureStateRetConfigurationMgt
41 Licensing=1,OptionalFeatures=1,Drx=1                   featureStateDrx
42 Licensing=1,OptionalFeatures=1,Ul16Qam=1               featureStateUl16Qam
=====

```

=====
Set 23 attributes. Are you Sure [y/n] ? y

```

=====
=====
Id MO                Attribute      Value      Result
=====
=====
20 Licensing=1,OptionalFeatures=1,DI64Qam=1      featureStateDI64Qam 1      >>> Set.
21 Licensing=1,OptionalFeatures=1,IntraLTEHandover=1 featureStateIntraLTEHandover 1      >>> Set.
22 Licensing=1,OptionalFeatures=1,CsfbForLimitedDualRadioUE=1 featureStateCsfbForLimitedDualRadioUE 1 >>> Set.
23 Licensing=1,OptionalFeatures=1,RetSupport=1    featureStateRetSupport 1      >>> Set.
24 Licensing=1,OptionalFeatures=1,Anr=1           featureStateAnr 1      >>> Set.
25 Licensing=1,OptionalFeatures=1,Irc=1           featureStateIrc 1      >>> Set.
26 Licensing=1,OptionalFeatures=1,MultiErabsPerUser=1 featureStateMultiErabsPerUser 1      >>> Set.
27 Licensing=1,OptionalFeatures=1,WcdmaSessionContinuity=1 featureStateWcdmaSessionContinuity 1 >>> Set.
28 Licensing=1,OptionalFeatures=1,RbsEventStreamer=1 featureStateEventStreaming 1      >>> Set.
29 Licensing=1,OptionalFeatures=1,PmInitiatedUeMeasurements=1 featureStatePmInitiatedUeMeasurements 1 >>> Set.
30 Licensing=1,OptionalFeatures=1,TimeAndPhaseSynchWithGPS=1 featureStateTimeAndPhaseSynchWithGPS 1 >>> Set.
31 Licensing=1,OptionalFeatures=1,InterFrequencySessionContinuity=1 featureStateInterFrequencySessionContinuity 1 >>> Set.
32 Licensing=1,OptionalFeatures=1,UePosCellId=1    featureStateCellId 1      >>> Set.
33 Licensing=1,OptionalFeatures=1,RetCascading=1   featureStateRetCascading 1      >>> Set.
34 Licensing=1,OptionalFeatures=1,VswrSupervision=1 featureStateVswrSupervision 1      >>> Set.
35 Licensing=1,OptionalFeatures=1,DualAntDIPerfPkg=1 featureStateDualAntDIPerfPkg 1      >>> Set.
36 Licensing=1,OptionalFeatures=1,IntraLTEHODDataFwd=1 featureStateIntraLTEHODDataFwd 1      >>> Set.
37 Licensing=1,OptionalFeatures=1,GsmSessionContinuity=1 featureStateGsmSessionContinuity 1      >>> Set.
38 Licensing=1,OptionalFeatures=1,TmaSupport=1     featureStateTmaSupport 1      >>> Set.
39 Licensing=1,OptionalFeatures=1,Cdma2000SessionContinuity=1 featureStateCdma2000SessionContinuity 1 >>> Set.
40 Licensing=1,OptionalFeatures=1,RetConfigurationMgt=1 featureStateRetConfigurationMgt 1      >>> Set.
41 Licensing=1,OptionalFeatures=1,Drx=1           featureStateDrx 1      >>> Set.
42 Licensing=1,OptionalFeatures=1,Ul16Qam=1       featureStateUl16Qam 1      >>> Set.

```

```
=====
====
Total: 23 attributes attempted, 23 attributes set
```

Installing a new license key file

ENB11> acc licensing=1 updatelicensekeyfile

```
=====
=====
Proxy MO                               Action          Nr of Params
=====
=====
  1  Licensing=1                       updateLicenseKeyFile      4
```

Parameter 1 of 4, userId (string): ftp

Parameter 2 of 4, password (string):

Parameter 3 of 4, ipAddress (string): 137.58.214.3

Parameter 4 of 4, sFile (string): /export/home/ftp/wanessa_B/licensing/X911040657_100224_112337.xml

>>> Return value = null

```
=====
=====
Total: 1 MOs attempted, 1 MOs actioned
```

2.8 System Constants

ENB4016 > get constant

```
=====
=====
940                               ENodeBFunction=1, SystemConstants=1
=====
=====
SystemConstantsId                1
systConstants                    125:3,213:200,204:100,193:0
=====
=====
Total: 1 MOs
```

Convert the string:

- online at <http://utran01.epa.ericsson.se/ltetoolkit/#/webtools/scripts/convertsysconst>
- or offline with the script convert_sysconst.pl <http://utran01.epa.ericsson.se/utranwiki/LtePlmMelbourne/LteToolsRepo>

Example: translating the string 125:3,213:200,204:100,193:0 for increment 10 gives:

SysConstNr	ParameterName	CurrVal	Default	Min	Max	Mapping	TakesEffect	Description
125	initialTransmissionMode	3	2	1	7	Enum transmissionMod	Cell Setup	Initial state for the Transmission Mode Control
213	maxNrOfAdmittedUesPerBbm	200	200	0	220	N/A	Immediately	To be provided later, if needed.
204	ulMaxNrOfPrbsPerBb	100	48	0	300	prb	Immediately	The parameter will limit the number of PRBs used in UL.
193	enableS1AndCellDependency	0	TRUE	0	1	False = 0, True = 1	Immediately	Normally a cell requires an S1 connection to be enabled. Setting this parameter to false will allow the cell to become enabled without any S1 connection (to be used for testing only!)

Recommended system constant values:

- L11A : 19706-CXP102051_10-*
- L11B : 19706-CXP102051_11-*
- etc...

Changing a system constant --> cannot set the attribute (readOnly), must use MO action

ENB4016> mom systemconst .

```
#####
#####
MO Class      Attribute      Type      Flags
#####
#####
SystemConstants  SystemConstantsId      string      restricted,noNotification,mandatory
```

The value component of the RDN.

```
*****
SystemConstants      systConstants      string      readOnly,noNotification,EricssonOnly
```

A string that holds system constants (name and value). A system constant pair consists of a name and a value. The name and value is separated by ':' while system constant pairs are separated by ','. If a system constant is not included in the attribute, then the default value of system constant is used. The default value is hard-coded by the owner of system constant.

This attribute may only be changed by Ericsson personnel.

Range: 0 to 512

```
*****
```

MO Class	Action	ReturnType	Parameters
SystemConstants	resetSystConst	void	1:name:string

This action deletes a constant pair (name and value) from systConstants string. When a system constant is deleted from the string then the default value of the system constant is used.

Parameters

Name: name

Range: 1-31

Description: The name of the system constant

Transaction required: Yes

This action may only be invoked by Ericsson personnel.

ReturnType: void

Parameter 1: name (string).

SystemConstants	writeSystConst	void	2:name:value:string:string
-----------------	----------------	------	----------------------------

This action adds a new constant pair (name and value) to systConstants string or modifies an existing constant pair in the systConstants string. The possible system constants to add are specified in system contstant excel file. The name and value are not allowed to include the characters ‘,’ or ‘:’ .

Parameters

Name: name

Range: 1-31

Description: The name of the system constant

Dependency: The total number of characters allowed for name and value together may not exceed 31

Name: value

Range: 1-31

Description: The value of the system constant

Dependency: The total number of characters allowed for name and value together may not exceed 31

Transaction required: Yes

Persistent: Yes

This action may only be invoked by Ericsson personnel.

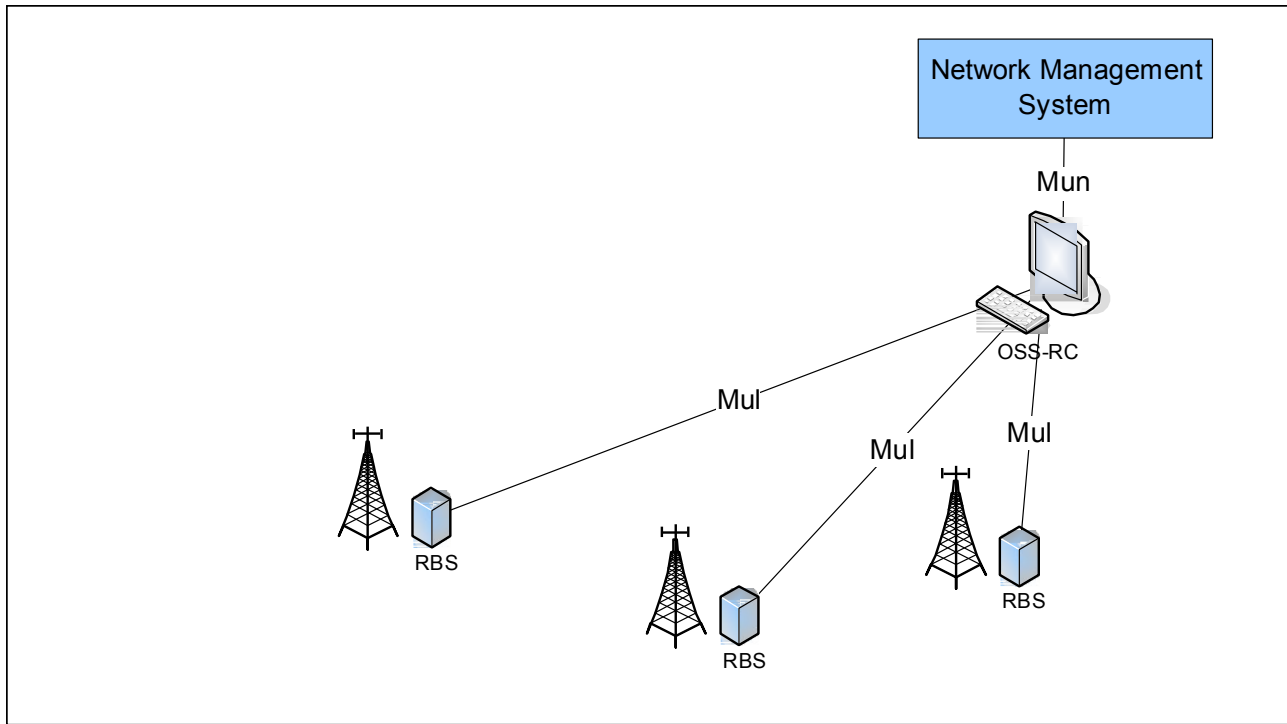
ReturnType: void

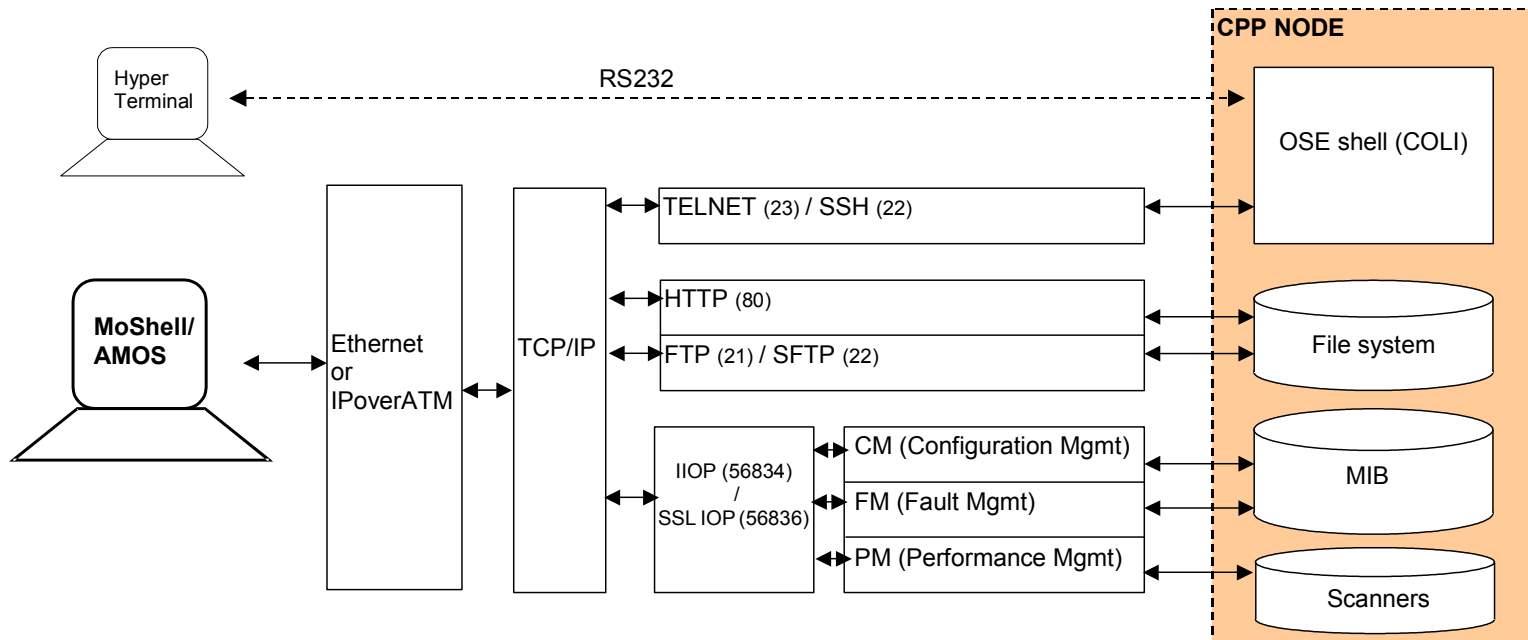
Parameter 1: name (string).

Parameter 2: value (string).

3 Interfaces

3.1 O&M interface





ENB0621> lpr ipoam

=====
Proxy MO
=====

```
588 IpOam=1
589 IpOam=1,Ip=1
590 IpOam=1,Ip=1,EthernetLink=1
591 IpOam=1,Ip=1,IpHostLink=1
592 IpOam=1,Ip=1,IpRoutingTable=1
593 IpOam=1,Dhcp=1
```

=====
Total: 6 MOs

ENB0621> lacl ipoam

=====
Proxy MO
=====

	Action	Nr of Params
588 IpOam=1	ping	1
588 IpOam=1	traceRoute	1
589 Ip=1	disableLink	1
589 Ip=1	enableLink	1

```

590 Ip=1,EthernetLink=1          assignAllIpAddresses      3
591 Ip=1,IpHostLink=1           assignIpAddress           6
591 Ip=1,IpHostLink=1           assignIpAddress2          2
592 Ip=1,IpRoutingTable=1       addStaticRoute            5
592 Ip=1,IpRoutingTable=1       deleteStaticRoute         1
592 Ip=1,IpRoutingTable=1       getRoutingTableEntry      1
592 Ip=1,IpRoutingTable=1       listRoutes                0
592 Ip=1,IpRoutingTable=1       modifyStaticRoute         2
592 Ip=1,IpRoutingTable=1       numberOfRoutes            0
593 Dhcp=1                      addDhcpServerAddress      1
593 Dhcp=1                      getDhcpData               4
593 Dhcp=1                      removeDhcpServerAddress   1

```

```

=====
=====

```

There are two O&M interfaces:

- **le0 = fast Ethernet , used for on-site connection. Usually assigned the ip address 169.254.1.10. When using this connection, the default Gateway in the PC must be set to 169.254.1.10**
- **lh0 = gigabit Ethernet**

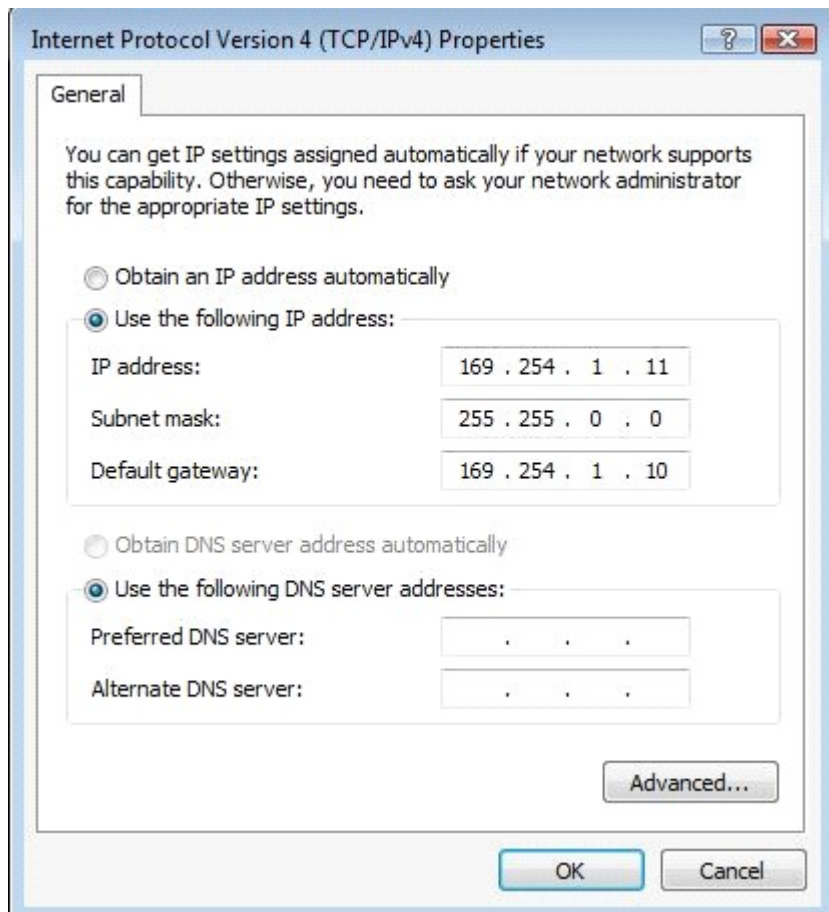
ENB36> lget ,ip= interfacename|ipadd

```

=====
=====
MO      Attribute      Value
=====
=====
Ip=1      nodeInterfaceName lh0
Ip=1      nodeIpAddress 10.56.4.23
Ip=1,EthernetLink=1      interfaceName le0
Ip=1,EthernetLink=1      ipAddress 169.254.1.10
Ip=1,IpHostLink=1      interfaceName lh0
Ip=1,IpHostLink=1      ipAddress 10.56.4.23
=====
=====
Total: 3 MOs

```

Example, PC configuration when connecting to le0 (sitelan):



```
route add 0.0.0.0 mask 0.0.0.0 169.254.1.10
```

```
$ route print
```

```
=====
Interface List
16 ...00 ff 00 67 31 88 ..... Juniper Network Connect Virtual Adapter
11 ...00 1f 3b cd a6 35 ..... Intel(R) Wireless WiFi Link 4965AGN
10 ...00 1e 68 44 09 1c ..... Intel(R) 82566MM Gigabit Network Connection
1 ..... Software Loopback Interface 1
26 ...00 00 00 00 00 00 00 e0 isatap.{DBBC7E9B-5B58-40BE-A9F0-31F700E9AA8E}
14 ...00 00 00 00 00 00 00 e0 6TO4 Adapter
27 ...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #2
17 ...00 00 00 00 00 00 00 e0 6TO4 Adapter
36 ...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #4
=====
```

```
IPv4 Route Table
=====
Active Routes:
Network Destination    Netmask          Gateway          Interface Metric
    0.0.0.0           0.0.0.0 169.254.1.10 169.254.1.11 276
    127.0.0.0       255.0.0.0      On-link       127.0.0.1    306
    127.0.0.1 255.255.255.255      On-link       127.0.0.1    306
  127.255.255.255 255.255.255.255      On-link       127.0.0.1    306
    169.254.0.0     255.255.0.0      On-link    169.254.1.11 276
    169.254.1.11 255.255.255.255      On-link    169.254.1.11 276
  169.254.255.255 255.255.255.255      On-link    169.254.1.11 276
    224.0.0.0       240.0.0.0      On-link       127.0.0.1    306
    224.0.0.0       240.0.0.0      On-link    169.254.1.11 276
  255.255.255.255 255.255.255.255      On-link       127.0.0.1    306
  255.255.255.255 255.255.255.255      On-link    169.254.1.11 276
=====
Persistent Routes:
    Network Address      Netmask  Gateway Address  Metric
    0.0.0.0      0.0.0.0 169.254.1.10 Default
=====
```

```
IPv6 Route Table
=====
Active Routes:
If Metric Network Destination    Gateway
    1 306 ::1/128      On-link
   10 276 fe80::/64      On-link
   10 276 fe80::c408:a43:d919:b6d6/128
                        On-link
    1 306 ff00::/8      On-link
   10 276 ff00::/8      On-link
=====
Persistent Routes:
    None
```

Note: In the example below, the le0 interface has got a regular address in order to reach it remotely, because it is a lab node.

```
ENB0621> lget ,ip= interfacename|ipadd

=====
MO              Attribute      Value
=====
ip=1            nodeInterfaceName lh0
ip=1            nodeIpAddress 10.75.0.121
ip=1,EthernetLink=1      interfaceName le0
ip=1,EthernetLink=1      ipAddress 10.75.1.121
```

```
Ip=1,IpHostLink=1                interfaceName  lh0
Ip=1,IpHostLink=1                ipAddress      10.75.0.121
=====
=====
Total: 3 MOs

ENB0621> acc ipr listroutes

=====
=====
Proxy MO                          Action          Nr of Params
=====
=====
592 Ip=1,IpRoutingTable=1        listRoutes          0
>>> Return value = 5
destinationIpAddr destinationNetMask nextHopIpAddr routeMetric routeType interface redistribute active
0.0.0.0      0.0.0.0      10.75.0.1  16      2:LOCAL  lh0  FALSE  active
0.0.0.0      0.0.0.0      10.75.1.1  64      2:LOCAL  le0  FALSE  active
10.75.0.0    255.255.255.0  0.0.0.3   1      2:LOCAL  lh0  FALSE  active
10.75.1.0    255.255.255.0  0.0.0.2   1      2:LOCAL  le0  FALSE  active
127.0.0.1    255.255.255.255 127.0.0.1  0      2:LOCAL  lo0  FALSE  active

=====
=====
Total: 1 MOs attempted, 1 MOs actioned

ENB0621> lget ipoam=

=====
=====
588                                IpOam=1
=====
=====
IpOamId                            1
userLabel
=====
=====
589                                IpOam=1,Ip=1
=====
=====
IpId                                1
availabilityStatus                  0 (NO_STATUS)
connectionAttemptTimer              75
defDomainName
dnsServerAddresses                  s[1] = 10.75.24.12
dscp                                0
icmpRedirect                        true
ipAccessHostEtRef
ipFrold                             1
```

```

isDefDomainName      false
isRecursiveSearch    true
isSubDomainName      true
maxRetransmissionAttempts 12
noOfRetrans          5
nodeInterfaceName    lh0
nodeIpAddress        10.75.0.121
numberOfLinks        2
operationalState     1 (ENABLED)
reservedBy
retransInterval      4
udpChecksumState     1
useHostFile          true
userLabel
workingMode          0 (HOST_MODE)

```

```

=====
=====

```

```

590                  IpOam=1,Ip=1,EthernetLink=1

```

```

=====
=====

```

```

EthernetLinkId      1
activeMau            Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1
availabilityStatus   0 (NO_STATUS)
availableMaus        [1] =
>>> availableMaus = Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1
broadcastAddress     10.75.1.255
ethernetFrold        0
interfaceName        le0
ipAddress            10.75.1.121
macAddress           00:1e:df:c8:15:e2
metric              1
mtuSize             1500
operationalState     1 (ENABLED)
reservedBy           [0] =
subnetMask           255.255.255.0
userLabel

```

```

=====
=====

```

```

591                  IpOam=1,Ip=1,IpHostLink=1

```

```

=====
=====

```

```

IpHostLinkId        1
availabilityStatus   0 (NO_STATUS)
interfaceName        lh0
ipAddress            10.75.0.121
ipInterfaceMoRef     Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=1
operationalState     1 (ENABLED)
userLabel

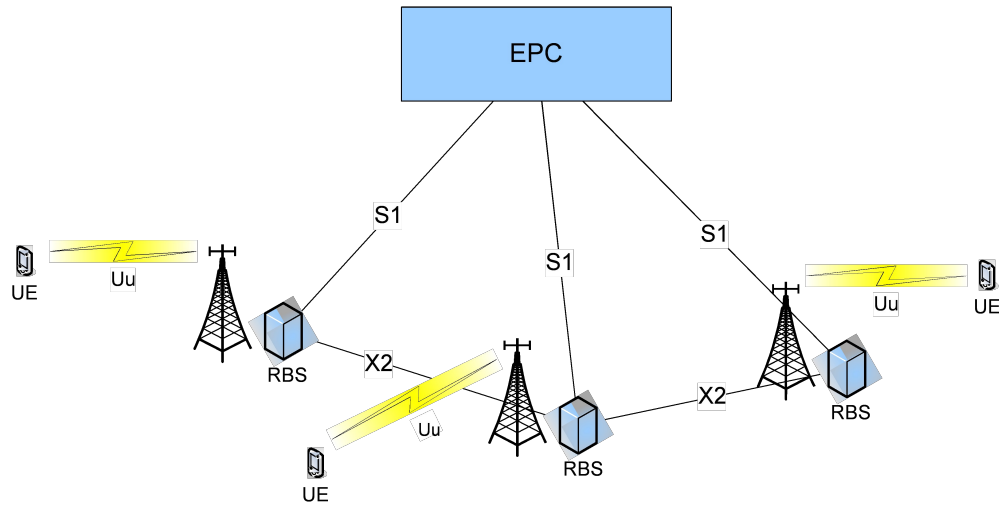
```

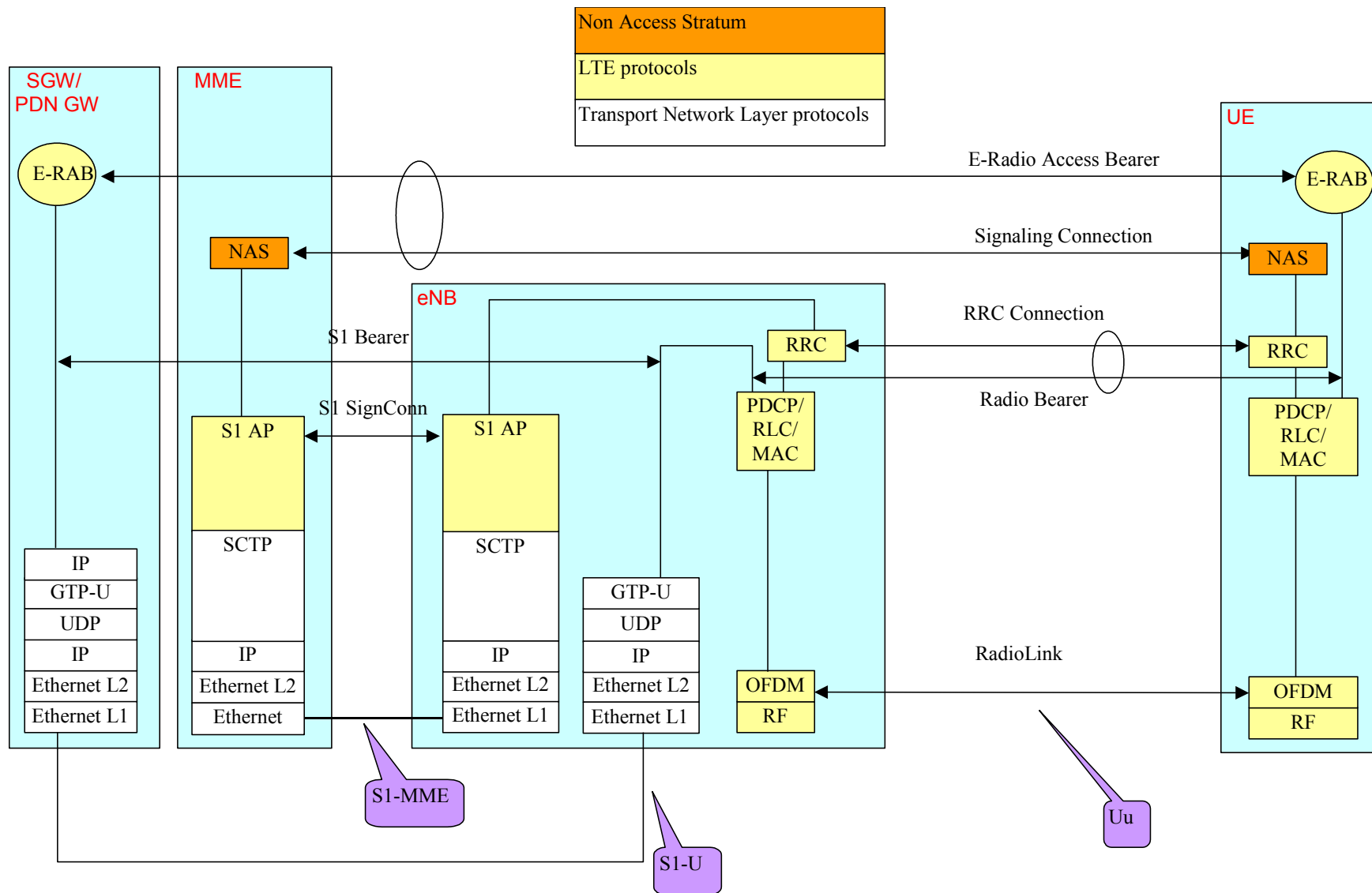
```

=====
=====
592                IpOam=1,Ip=1,IpRoutingTable=1
=====
=====
IpRoutingTableId      1
indexOfDeletableStaticRoutes  i[3] = 0 1 4
staticRoutes          t[2] =
>>> Struct[0] has 6 members:
>>> 1.indexOfStaticRoute = 2
>>> 2.ipAddress = 0.0.0.0
>>> 3.networkMask = 0.0.0.0
>>> 4.nextHopIpAddr = 10.75.0.1
>>> 5.redistribute = false
>>> 6.routeMetric = 16
>>> Struct[1] has 6 members:
>>> 1.indexOfStaticRoute = 1
>>> 2.ipAddress = 0.0.0.0
>>> 3.networkMask = 0.0.0.0
>>> 4.nextHopIpAddr = 10.75.1.1
>>> 5.redistribute = false
>>> 6.routeMetric = 64
userLabel
=====
=====
593                IpOam=1,Dhcp=1
=====
=====
DhcpId                1
dhcpServerAddresses    s[0] =
userLabel
=====
=====
Total: 6 MOs

```

3.2 Traffic Protocols





[~]\$ moshell modumps/KIENB3012_modump.zip

ENB3012> s+

Sorting of MO list: activated.

ENB3012> lpr enodebf

```

=====
Proxy MO
=====
980 ENodeBFunction=1
1028 ENodeBFunction=1,AnrFunction=1
999 ENodeBFunction=1,EUtraNetwork=1
1000 ENodeBFunction=1,EUtraNetwork=1,EUtranFrequency=1
1007 ENodeBFunction=1,EUtraNetwork=1,EUtranFrequency=_3150
1004 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016
1005 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179
1006 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016
1001 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017
1002 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165
1003 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017
1018 ENodeBFunction=1,EUtranCellFDD=kienb3012_1
1021 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=1
1022 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=1,EUtranCellRelation=4016_179
1019 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=_3150
1020 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=_3150,EUtranCellRelation=_26280104017165
1023 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,UeMeasControl=1
1026 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEUtraBadCovPrim=1
1024 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEUtraBadCovSec=1
1025 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEUtraBestCell=1
1012 ENodeBFunction=1,Paging=1
1031 ENodeBFunction=1,PmEventService=1
985 ENodeBFunction=1,QciTable=default
991 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=1
993 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=2
997 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=3
995 ENodeBFunction=1,QciTable=default,QciProfilePredefined=default
986 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci1
990 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci2
994 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci3
998 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci4
988 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci5
989 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci6
992 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci7
996 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci8
987 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci9
981 ENodeBFunction=1,RadioBearerTable=default
983 ENodeBFunction=1,RadioBearerTable=default,DataRadioBearer=1
984 ENodeBFunction=1,RadioBearerTable=default,MACConfiguration=1
982 ENodeBFunction=1,RadioBearerTable=default,SignalingRadioBearer=1
1027 ENodeBFunction=1,RbsConfiguration=1
1029 ENodeBFunction=1,Rcs=1
1013 ENodeBFunction=1,Rrc=1
1010 ENodeBFunction=1,SecurityHandling=1
1014 ENodeBFunction=1,SrbTable=default
1017 ENodeBFunction=1,SrbTable=default,Srb1Profile=1

```

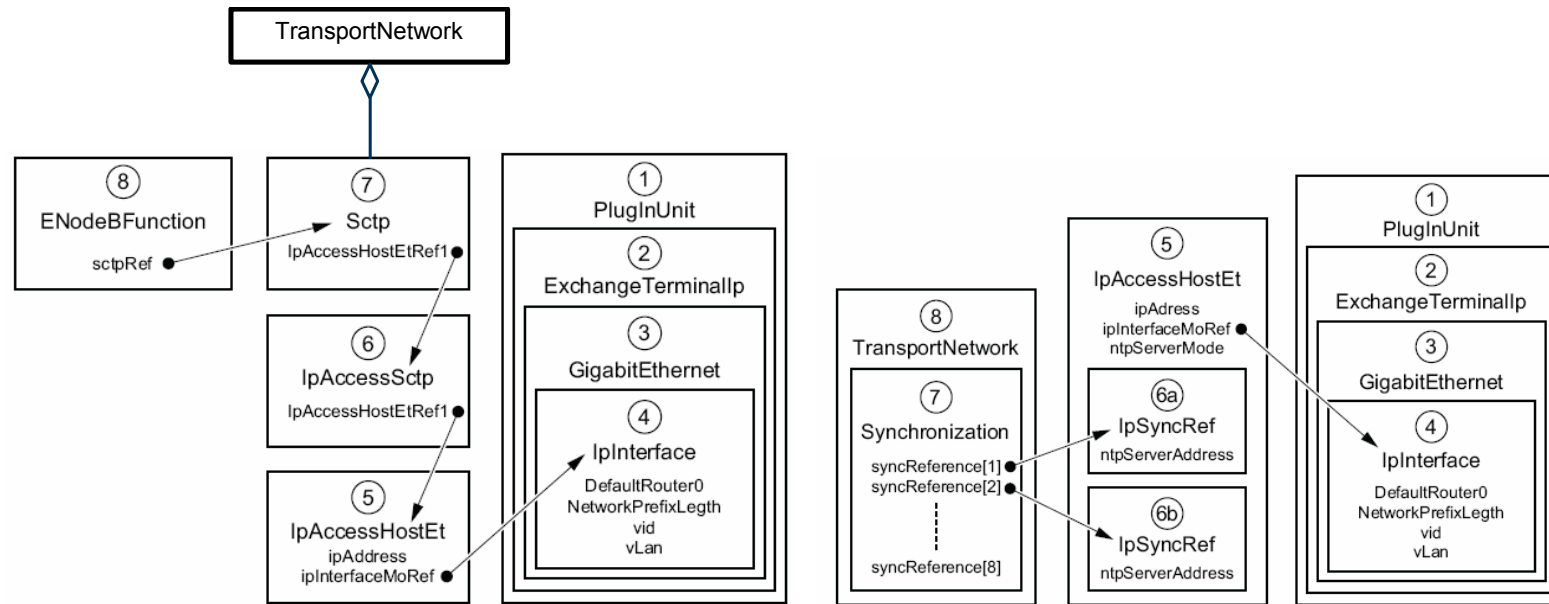
```

1015 ENodeBFunction=1,SrbTable=default,Srb2Profile=1
1016 ENodeBFunction=1,SrbTable=default,SrbLogicalChannelGroup=1
1011 ENodeBFunction=1,SystemConstants=1
1008 ENodeBFunction=1,TermPointToMme=MME010064193091
1030 ENodeBFunction=1,TermPointToMme=MME010064193101
1009 ENodeBFunction=1,UcToolFunction=1

```

=====
Total: 52 MOs

3.3 Transport network



Overview of S1/X2 interfaces:

kienb4005> stip

```

=====
=====
Locallp:Port      Remotelp:Port      StandbyRemotelp  TSHP  Assoc  TermPoint
=====
10.62.11.15:36422 10.62.11.16:36422      1111    5  ENB=4006
10.62.11.15:36422 10.62.8.14:36422       1111   10  ENB=kienb3004
10.62.11.15:36422 10.64.193.81:36412     10.64.193.82  1111    1  Mme=MME010064193081
10.62.11.15:36422 10.64.193.91:36412     10.64.193.92  1111    4  Mme=MME010064193091

```

=====

kienb4005> h sti

....
Printout format, S1/X2 interfaces in ERBS:

The TermPoints "ENB" refer to X2 interfaces, "Mme" refer to S1 interfaces. In the status column T=TermPoint, S=Sctp, H=IpAccessHostEt, P=ping
....

Detailed MO view

ENB3012> lma transport transportnetwork|exchangeterminalip|ipsystem

Added 14 MOs to group: transport

ENB3012> pr transport

=====

Proxy	MO
93	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1
95	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1
96	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=1
97	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2
94	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,Program=CXC1726213_R73D05
98	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,Program=CXC1729756_R73D02
974	IpSystem=1
976	IpSystem=1,IpAccessHostEt=1
977	IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
975	IpSystem=1,IpAccessSctp=1
44	TransportNetwork=1
46	TransportNetwork=1,Sctp=1
45	TransportNetwork=1,Synchronization=1

=====

Total: 14 MOs

Two physical ports, one optical (link1, TN-B) and one electrical (link2, TN-A)

ENB3012> hget gigabiteth state\$

=====

MO	administrativeState	link1State	link2State	operationalState
----	---------------------	------------	------------	------------------

=====

Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1 1 (UNLOCKED) 1 (ENABLED) 0 (DISABLED) 1 (ENABLED)
=====

MO Class	Attribute	Type	Flags
GigaBitEthernet	link1State	enumRef:OperState	readOnly,nonPersistent,noNotification

Operational state of the link 1 (lower).

GigaBitEthernet	link2State	enumRef:OperState	readOnly,nonPersistent,noNotification
-----------------	------------	-------------------	---------------------------------------

Operational state of the link 2 (upper).

Two Ip interfaces, one for traffic (used by IpAccessHostEt), one for O&M (used by IpHostLink)

ENB3012> hget ipinterf reserv|vid

MO	reservedBy	vid
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=1 [1] = Ip=1,IpHostLink=1 221		
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2 [1] = IpAccessHostEt=1 220		

Total: 2 MOs

ENB3012> mr transport atm|program

Removed 3 MOs from group: transport

ENB3012> get transport

93	Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1
----	--

ExchangeTerminalIpId 1

```

availabilityStatus      0 (NO_STATUS)
frolid                  1
operationalState        1 (ENABLED)
userLabel
=====
95                      Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalp=1,GigaBitEthernet=1
=====
GigaBitEthernetId       1
activeLink               0 (PRIMARY_ACTIVE)
actualSpeedDuplex        6 (ETH_1000_MB_FULL)
administrativeState      1 (UNLOCKED)
autoNegotiation          true
availabilityStatus       0 (NO_STATUS)
dscpPbitMap              t[64] =
>>> Struct[0] has 2 members:
>>> 1.dscp = 0
>>> 2.pbit = 0
>>> Struct[1] has 2 members:
>>> 1.dscp = 1
>>> 2.pbit = 0
....
frameFormat             0 (ETHERNET_2_DIX)
link1State               1 (ENABLED)
link2State               0 (DISABLED)
linkType                 0 (FRONT_PORTS)
macAddressLink1          00:1E:DF:C8:2E:2B
macAddressLink2
operationalState         1 (ENABLED)
portNo                   2
primaryLink               0 (LINK_ONE_PRIMARY_LINK_TWO_SECONDARY)
protectiveMode            false
sfpInformation            Struct{3}
>>> 1.sfpProductNumber = ELECTRICAL_GE
>>> 2.sfpState = 3 (NOT_APPLICABLE)
>>> 3.sfpType = NOT_DEFINED
sfpPort                  false
shutDownTimeout          1800
statePropagationDelay     25
switchBackTimer          30
userLabel
=====
96                      Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalp=1,GigaBitEthernet=1,IplInterface=1
=====
IplInterfaceId          1
accessControlListRef

```

availabilityStatus	0 (NO_STATUS)
defaultRouter0	10.62.7.1
defaultRouter0State	1 (ENABLED)
defaultRouter1	0.0.0.0
defaultRouter1State	0 (DISABLED)
defaultRouter2	0.0.0.0
defaultRouter2State	0 (DISABLED)
defaultRouterPingInterval	4
defaultRouterTraffic	0 (TRAFFIC_DEF_ROUTER_0)
froid	1
logging	1 (ENABLED)
maxNoOfFailedPings	2
maxWaitForPingReply	3
mtu	1500
networkPrefixLength	24
noOfPingsBeforeOk	2
operationalState	1 (ENABLED)
ownIpAddressActive	0.0.0.0
ownIpAddressPassive	0.0.0.0
reservedBy	[1] =
>>> reservedBy = IpOam=1,Ip=1,IpHostLink=1	
rps	false
subnet	10.62.7.0
switchBackTimer	180
trafficType	0 (NOT_USED)
userLabel	
vLan	true
vid	1026
vlanRef	

=====

=====

97 Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2

=====

=====

IpInterfaceId	2
accessControlListRef	
availabilityStatus	0 (NO_STATUS)
defaultRouter0	10.62.8.1
defaultRouter0State	1 (ENABLED)
defaultRouter1	0.0.0.0
defaultRouter1State	0 (DISABLED)
defaultRouter2	0.0.0.0
defaultRouter2State	0 (DISABLED)
defaultRouterPingInterval	4
defaultRouterTraffic	0 (TRAFFIC_DEF_ROUTER_0)
froid	2
logging	1 (ENABLED)
maxNoOfFailedPings	2
maxWaitForPingReply	3

```

mtu 1500
networkPrefixLength 24
noOfPingsBeforeOk 2
operationalState 1 (ENABLED)
ownIpAddressActive 0.0.0.0
ownIpAddressPassive 0.0.0.0
reservedBy [1] =
>>> reservedBy = IpSystem=1,IpAccessHostEt=1
rps false
subnet 10.62.8.0
switchBackTimer 180
trafficType 0 (NOT_USED)
userLabel
vLan true
vid 1027
vlanRef

```

```

=====
974 IpSystem=1
=====

```

```

=====
IpSystemId 1
userLabel
=====

```

```

976 IpSystem=1,IpAccessHostEt=1
=====

```

```

=====
IpAccessHostEtId 1
administrativeState 1 (UNLOCKED)
availabilityStatus 0 (NO_STATUS)
ipAddress 10.62.8.22
ipDefaultTtl 64
ipInterfaceMoRef Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2
ntpDscp 46
ntpServerMode 0 (DISABLED)
operationalState 1 (ENABLED)
reservedBy [2] =
>>> reservedBy = IpSystem=1,IpAccessSctp=1
>>> reservedBy = ENodeBFunction=1
userLabel
=====

```

```

977 IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
=====

```

```

=====
IpSyncRefId 1
administrativeState 1 (UNLOCKED)
availabilityStatus 0 (NO_STATUS)

```

```

cachedIpAddress
ntpServerIpAddress      10.62.1.10
operationalState        1 (ENABLED)
reservedBy               [1] =
>>> reservedBy = TransportNetwork=1,Synchronization=1
syncStatus               2 (OK)
userLabel
=====
=====

```

```

975                      IpSystem=1,IpAccessSctp=1
=====
=====

```

```

IpAccessSctpId           1
availabilityStatus        0 (NO_STATUS)
froid                    2
ipAccessHostEtRef1       IpAccessHostEt=1
ipAccessHostEtRef2
operationalState         1 (ENABLED)
reservedBy               [1] =
>>> reservedBy = TransportNetwork=1,Sctp=1
userLabel                ip_sctp
=====
=====

```

```

44                      TransportNetwork=1
=====
=====

```

```

TransportNetworkId       1
userLabel
=====
=====

```

```

46                      TransportNetwork=1,Sctp=1
=====
=====

```

```

SctpId                   1
allowedIncrementCookieLife 30
associationMaxRtx         8
availabilityStatus        0 (NO_STATUS)
bundlingActivated         1 (ENABLED)
bundlingTimer             10
heartbeatInterval         30
heartbeatMaxBurst         0
heartbeatPathProbingInterval 500
heartbeatStatus           true
initialAdRecWin           32768
initialRto                20
intervalLostUser          0
intervalOobPkts           3600
ipAccessHostGpbld
ipAccessSctpRef           IpAccessSctp=1

```

```

keyChangePeriod      4
mBuffer              256
maxBurst             4
maxDataSizeIp        1500
maxIncomingStream     17
maxInitialRtrAtt      8
maxOutgoingStream     17
maxShutDownRtrAtt     5
maxUserDataSize      1480
maximumRto           40
minimumRto           10
nPercentage           85
nThreshold            192
numberOfAssociations  10
operationalState      1 (ENABLED)
pathMaxRtx            4
pathSelection         0 (SCTP_PATHS)
reservedBy            [1] =
>>> reservedBy = ENodeBFunction=1
rpuld                 ReliableProgramUnit=sctp_host
rtoAlphaIndex         3
rtoBetaIndex          2
tSack                 4
userLabel             NBap
validCookieLife       60

```

```

=====
45                      TransportNetwork=1,Synchronization=1
=====

```

```

SynchronizationId    1
degradationIsFault    0 (DEGR_NOT_FAULT)
nodeSystemClock       2 (LOCKED_MODE)
syncRefActivity        i[8] = 2 1 1 1 1 1 1 1
syncRefPriority        i[8] = 5 0 0 0 0 0 0 0
syncRefStatus         i[8] = 3 0 0 0 0 0 0 0
syncReference         [8] =
>>> syncReference = IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
userLabel

```

```

=====
Total: 11 MOs

```

Checking all SCTP associations

OTENDB5055> ? sctp*

\$? sctp*

Command	Description
---------	-------------

sctp_config	prints some SCTP-ROF configuration data
-------------	---

sctpadm_config	cmd sctpadm_config lists some configuration data in SCTP ADM.
----------------	---

sctpadm_info	cmd sctpadm_info lists all process info in SCTP ADM
--------------	---

sctpadmrofcmd	cmd sctpadmrofcmd send trace settings to user plane.
---------------	--

sctphost	prints some SCTP-ROF configuration data, statistical information and lists association or endpoint info in SCTP HOST
----------	--

sctphost_info	cmd sctphost_info lists association or endpoint info in SCTP HOST
---------------	---

sctphost_stat	cmd sctphost_stat prints some statistical information
---------------	---

sctphosttrace	Configure log filtering.
---------------	--------------------------

\$

kienb4017> sctphost_info -assoc -all

\$ sctphost_info -assoc -all

sctphost_info - START.

```
|-----|
|----- SCTP HOST -----|
|Rpuld:      17
|SctpInstId:  0
|Base State:  BASE_RUN
|Host State:  A|C|R|X|IA
|Ext. client: CONNECTED
|Alarm Timer: NOT RUNNING
|----- SCTP ASSOCIATION 3 -----|
|-----|
|-----Statistic (assoc level)-----|
| localPort:      36422
| remotePort:     36412
| dscp:           6
| ulpKey:         0x00000002
| numOfLocalIp:   1
| localIpAddress 1: * 10.62.11.27
| numOfRemotelp:  2
| remotelpAddress 1: * 10.64.193.101
| remotelpAddress 2: 10.64.193.102
|
|----- SCTP ASSOCIATION 5 -----|
|-----|
|-----Statistic (assoc level)-----|
| localPort:      36422
| remotePort:     36422
| dscp:           6
```

```
| ulpKey:          0x00000042
| numOfLocalIp:    1
| localIpAddress 1: * 10.62.11.27
| numOfRemoteIp:   1
| remoteIpAddress 1: * 10.62.8.22
```

\$

Printing SCTP messages

ENB3010> sctphost_stat -comm

\$ sctphost_stat -comm

sctphost_stat - START.

```
|-----|
|----- SCTP HOST -----|
|Rpuld:      17
|SctpInstId:  0
|Base State:  BASE_RUN
|Host State:  A|C|R|X|IA
|Ext. client: CONNECTED
|Alarm Timer: NOT RUNNING
```

SCTP events:

```
Wed Jun  1 09:16:17 2011 CommUpInd      epId[0x00000001] asId[6] ulpKey[0x00000000] orig[1] rPort[36422]
                        ip1[IPv4 10.62.11.26]
                        ip2[None None]

Wed Jun  1 09:16:17 2011 SetUlpKeyReq    assocId[6] ulpKey[0x00000042]

Wed Jun  1 09:16:18 2011 CommLostInd     assocId[6] ulpKey[0x00000042]
                        origin[1] event[10]

Wed Jun  1 09:16:32 2011 CommUpInd      epId[0x00000001] asId[7] ulpKey[0x00000000] orig[1] rPort[36422]
                        ip1[IPv4 10.62.11.26]
                        ip2[None None]

Wed Jun  1 09:16:32 2011 SetUlpKeyReq    assocId[7] ulpKey[0x00000041]

Wed Jun  1 09:16:32 2011 CommLostInd     assocId[7] ulpKey[0x00000041]
                        origin[1] event[10]

Wed Jun  1 09:16:52 2011 CommUpInd      epId[0x00000001] asId[8] ulpKey[0x00000000] orig[1] rPort[36422]
                        ip1[IPv4 10.62.11.26]
                        ip2[None None]

Wed Jun  1 09:16:52 2011 SetUlpKeyReq    assocId[8] ulpKey[0x00000042]
```

Wed Jun 1 09:16:52 2011 CommLostInd assocId[8] ulpKey[0x00000042]
origin[1] event[10]

Wed Jun 1 09:16:58 2011 CommUpInd epId[0x00000001] asId[10] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Wed Jun 1 09:16:58 2011 SetUlpKeyReq assocId[10] ulpKey[0x00000041]

Wed Jun 1 09:16:58 2011 CommLostInd assocId[10] ulpKey[0x00000041]
origin[1] event[10]

Wed Jun 1 09:17:04 2011 CommUpInd epId[0x00000001] asId[2] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Wed Jun 1 09:17:04 2011 SetUlpKeyReq assocId[2] ulpKey[0x00000042]

Wed Jun 1 09:17:04 2011 CommLostInd assocId[2] ulpKey[0x00000042]
origin[1] event[10]

Wed Jun 1 09:17:23 2011 CommUpInd epId[0x00000001] asId[3] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Wed Jun 1 09:17:23 2011 SetUlpKeyReq assocId[3] ulpKey[0x00000041]

Wed Jun 1 09:17:23 2011 CommLostInd assocId[3] ulpKey[0x00000041]
origin[1] event[10]

Wed Jun 1 09:17:25 2011 CommUpInd epId[0x00000001] asId[4] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Wed Jun 1 09:17:25 2011 SetUlpKeyReq assocId[4] ulpKey[0x00000042]

Wed Jun 1 09:17:25 2011 CommLostInd assocId[4] ulpKey[0x00000042]
origin[1] event[10]

Wed Jun 1 09:17:34 2011 CommUpInd epId[0x00000001] asId[5] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Wed Jun 1 09:17:34 2011 SetUlpKeyReq assocId[5] ulpKey[0x00000041]

Wed Jun 1 09:17:35 2011 CommLostInd assocId[5] ulpKey[0x00000041]
origin[1] event[10]

Wed Jun 1 09:17:43 2011 CommUpInd epId[0x00000001] asId[6] ulpKey[0x00000000] orig[1] rPort[36422]

ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 09:17:43 2011 SetUlpKeyReq assocId[6] ulpKey[0x00000042]

Wed Jun 1 09:17:43 2011 CommLostInd assocId[6] ulpKey[0x00000042]
 origin[1] event[10]

Wed Jun 1 09:17:55 2011 CommUpInd epId[0x00000001] asId[7] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 09:17:55 2011 SetUlpKeyReq assocId[7] ulpKey[0x00000041]

Wed Jun 1 09:17:55 2011 CommLostInd assocId[7] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 09:18:08 2011 CommUpInd epId[0x00000001] asId[8] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 09:18:08 2011 SetUlpKeyReq assocId[8] ulpKey[0x00000042]

Wed Jun 1 09:18:08 2011 CommLostInd assocId[8] ulpKey[0x00000042]
 origin[1] event[10]

Wed Jun 1 09:18:22 2011 CommUpInd epId[0x00000001] asId[10] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 09:18:22 2011 SetUlpKeyReq assocId[10] ulpKey[0x00000041]

Wed Jun 1 09:18:22 2011 CommLostInd assocId[10] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 09:18:27 2011 CommUpInd epId[0x00000001] asId[2] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 09:18:27 2011 SetUlpKeyReq assocId[2] ulpKey[0x00000042]

Wed Jun 1 11:51:58 2011 AssocRestartInd assocId[2] ulpKey[0x00000042]
 ip1[IPv4 10.62.11.26]
 ip2[None]

Wed Jun 1 11:51:58 2011 CommLostInd assocId[2] ulpKey[0x00000042]
 origin[1] event[10]

Wed Jun 1 11:52:12 2011 CommUpInd epId[0x00000001] asId[3] ulpKey[0x00000000] orig[1] rPort[36422]

ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 11:52:12 2011 SetUlpKeyReq assocId[3] ulpKey[0x00000041]

Wed Jun 1 11:52:13 2011 CommLostInd assocId[3] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 11:52:23 2011 CommUpInd epId[0x00000001] asId[4] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 11:52:23 2011 SetUlpKeyReq assocId[4] ulpKey[0x00000042]

Wed Jun 1 12:48:27 2011 AssocRestartInd assocId[4] ulpKey[0x00000042]
 ip1[IPv4 10.62.11.26]
 ip2[None]

Wed Jun 1 12:48:27 2011 CommLostInd assocId[4] ulpKey[0x00000042]
 origin[1] event[10]

Wed Jun 1 12:48:32 2011 CommUpInd epId[0x00000001] asId[5] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 12:48:32 2011 SetUlpKeyReq assocId[5] ulpKey[0x00000041]

Wed Jun 1 12:48:32 2011 CommLostInd assocId[5] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 12:48:55 2011 CommUpInd epId[0x00000001] asId[6] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.26]
 ip2[None None]

Wed Jun 1 12:48:55 2011 SetUlpKeyReq assocId[6] ulpKey[0x00000042]

Wed Jun 1 13:07:52 2011 CommLostInd assocId[9] ulpKey[0x00000043]
 origin[1] event[3]

Wed Jun 1 13:08:02 2011 CommUpInd epId[0x00000001] asId[7] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 13:08:02 2011 SetUlpKeyReq assocId[7] ulpKey[0x00000041]

Wed Jun 1 13:08:02 2011 CommLostInd assocId[7] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 13:08:15 2011 CommUpInd epId[0x00000001] asId[8] ulpKey[0x00000000] orig[1] rPort[36422]

ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 13:08:15 2011 SetUlpKeyReq assocId[8] ulpKey[0x00000043]

Wed Jun 1 13:44:49 2011 CommLostInd assocId[8] ulpKey[0x00000043]
 origin[1] event[3]

Wed Jun 1 13:44:51 2011 CommUpInd epId[0x00000001] asId[9] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 13:44:51 2011 SetUlpKeyReq assocId[9] ulpKey[0x00000041]

Wed Jun 1 13:44:51 2011 CommLostInd assocId[9] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 13:45:09 2011 CommUpInd epId[0x00000001] asId[10] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 13:45:09 2011 SetUlpKeyReq assocId[10] ulpKey[0x00000043]

Wed Jun 1 14:10:28 2011 AssocRestartInd assocId[10] ulpKey[0x00000043]
 ip1[IPv4 10.62.11.27]
 ip2[None]

Wed Jun 1 14:10:28 2011 CommLostInd assocId[10] ulpKey[0x00000043]
 origin[1] event[10]

Wed Jun 1 14:10:34 2011 CommUpInd epId[0x00000001] asId[2] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 14:10:34 2011 SetUlpKeyReq assocId[2] ulpKey[0x00000041]

Wed Jun 1 14:10:34 2011 CommLostInd assocId[2] ulpKey[0x00000041]
 origin[1] event[10]

Wed Jun 1 14:10:40 2011 CommUpInd epId[0x00000001] asId[3] ulpKey[0x00000000] orig[1] rPort[36422]
 ip1[IPv4 10.62.11.27]
 ip2[None None]

Wed Jun 1 14:10:40 2011 SetUlpKeyReq assocId[3] ulpKey[0x00000043]

Thu Jun 2 09:32:33 2011 CommLostInd assocId[6] ulpKey[0x00000042]
 origin[1] event[10]

Thu Jun 2 09:32:33 2011 CommLostInd assocId[3] ulpKey[0x00000043]

origin[1] event[10]

Thu Jun 2 09:32:44 2011 NetStatusChangeInd assocId[1] ulpKey[0x00000001] status[0]

Thu Jun 2 09:32:44 2011 NetStatusChangeInd assocId[1] ulpKey[0x00000001] status[0]

Thu Jun 2 09:32:44 2011 CommLostInd assocId[1] ulpKey[0x00000001]
origin[0] event[5]

Thu Jun 2 09:33:10 2011 AssociateReq epId[0x00000001] ulpKey[0x00000001] rPort[36412]
ip1[IPv4 10.64.193.81]

Thu Jun 2 09:33:10 2011 AssociateCfm assocId[4] ulpKey[0x00000001]

Thu Jun 2 09:33:13 2011 CommLostInd assocId[4] ulpKey[0x00000001]
origin[0] event[0]

Thu Jun 2 09:33:43 2011 AssociateReq epId[0x00000001] ulpKey[0x00000001] rPort[36412]
ip1[IPv4 10.64.193.81]

Thu Jun 2 09:33:43 2011 AssociateCfm assocId[5] ulpKey[0x00000001]

Thu Jun 2 09:33:46 2011 CommLostInd assocId[5] ulpKey[0x00000001]
origin[0] event[0]

Thu Jun 2 09:33:46 2011 AssociateReq epId[0x00000001] ulpKey[0x00000001] rPort[36412]
ip1[IPv4 10.64.193.82]

Thu Jun 2 09:33:46 2011 AssociateCfm assocId[6] ulpKey[0x00000001]

Thu Jun 2 09:33:46 2011 CommLostInd assocId[6] ulpKey[0x00000001]
origin[0] event[0]

Thu Jun 2 09:34:16 2011 AssociateReq epId[0x00000001] ulpKey[0x00000001] rPort[36412]
ip1[IPv4 10.64.193.81]

Thu Jun 2 09:34:16 2011 AssociateCfm assocId[7] ulpKey[0x00000001]

Thu Jun 2 09:34:17 2011 CommLostInd assocId[7] ulpKey[0x00000001]
origin[0] event[0]

Thu Jun 2 09:34:38 2011 CommUpInd epId[0x00000001] asId[8] ulpKey[0x00000000] orig[1] rPort[36422]
ip1[IPv4 10.62.11.26]
ip2[None None]

Thu Jun 2 09:34:38 2011 ShutdownCfm assocId[8] ulpKey[0x00000000]

Thu Jun 2 09:34:38 2011 ShutdownReq assocId[8]

```

Thu Jun  2 09:34:38 2011 CommLostInd      assocId[8] ulpKey[0x00000000]
                        origin[0] event[2]

Thu Jun  2 09:34:47 2011 AssociateReq      epId[0x00000001] ulpKey[0x00000001] rPort[36412]
                        ip1[IPv4 10.64.193.81]

Thu Jun  2 09:34:47 2011 AssociateCfm      assocId[9] ulpKey[0x00000001]

Thu Jun  2 09:34:47 2011 CommUpInd          epId[0x00000001] asId[9] ulpKey[0x00000001] orig[0] rPort[36412]
                        ip1[IPv4 10.64.193.81]
                        ip2[IPv4 10.64.193.82]

Thu Jun  2 09:34:50 2011 CommUpInd          epId[0x00000001] asId[10] ulpKey[0x00000000] orig[1] rPort[36422]
                        ip1[IPv4 10.62.11.27]
                        ip2[None None]

Thu Jun  2 09:34:50 2011 SetUlpKeyReq      assocId[10] ulpKey[0x00000041]

Thu Jun  2 09:35:00 2011 CommUpInd          epId[0x00000001] asId[1] ulpKey[0x00000000] orig[1] rPort[36422]
                        ip1[IPv4 10.62.11.26]
                        ip2[None None]

Thu Jun  2 09:35:00 2011 SetUlpKeyReq      assocId[1] ulpKey[0x00000043]

```

Checking all unreachable SCTP associations

```
$ sctphost_info -assoc -unreach
```

```
sctphost - START.
```

```

|-----|
|----- SCTP HOST -----|
Rpuld:      18
SctpInstId:  0
Base State:  BASE_RUN
Host State:  A|C|R|X|IA
Ext. client: CONNECTED
Alarm Timer: NOT RUNNING
$

```

Checking IP configuration

```
kienb4017> lget termpoint|host ipaddress
```

```

=====
=====
MO                               Attribute      Value
=====
=====

```

```
Ip=1,IpHostLink=1                               ipAddress      10.62.10.27
IpAccessHostEt=1                               ipAddress      10.62.11.27
IpAccessHostEt=1,IpSyncRef=1                   cachedIpAddress
IpAccessHostEt=1,IpSyncRef=1                   ntpServerIpAddress 10.62.1.10
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 ipAddress      10.62.11.26
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 usedIpAddress  0.0.0.0
EUtraNetwork=1,ExternalENodeBFunction=3012,TermPointToENB=3012 ipAddress      10.62.8.22
EUtraNetwork=1,ExternalENodeBFunction=3012,TermPointToENB=3012 usedIpAddress  10.62.8.22
TermPointToMme=MME010064193091                ipAddress1     10.64.193.91
TermPointToMme=MME010064193091                ipAddress2     0.0.0.0
TermPointToMme=MME010064193091                usedIpAddress  0.0.0.0
TermPointToMme=MME010064193101                ipAddress1     10.64.193.101
TermPointToMme=MME010064193101                ipAddress2     0.0.0.0
TermPointToMme=MME010064193101                usedIpAddress  10.64.193.101
```

=====
Total: 7 MOs

IP connectivity tests, ping, traceroute

```
kienb4017> acl . ping
```

=====

Proxy	MO	Action	Nr of Params
763	IpOam=1	ping	1
771	IpAccessHostEt=1	ping	1

=====

```
kienb4017> acl . traceroute
```

=====

Proxy	MO	Action	Nr of Params
763	IpOam=1	traceRoute	1

=====

```
kienb4017> ? | egrep -i 'ping|traceroute'
```

EtHostMo_startPing Start a ping session
EtHostMo_startTraceRoute Start a trace route session
ethtraceroute Determine the IP network route to a specified destination

ipac_ping Send echo request from IPAC host.
ipac_traceroute Send traceroute request from IPAC host.
ping The command verifies the IP connectivity to a host.
traceroute The command finds the routing path to a certain host.

please note that the time display in the output is based on router configuration

Ping/traceroute from O&M interface:

kienb4017> acc 763 ping

```
=====
=====
Proxy MO                               Action          Nr of Params
=====
=====
763 IpOam=1                            ping            1
```

Parameter 1 of 1, host (string): 10.62.8.22
>>> Return value = * / 10.62.8.22 is alive

```
=====
=====
Total: 1 MOs attempted, 1 MOs actioned
```

kienb4017> acc 763 traceroute

```
=====
=====
Proxy MO                               Action          Nr of Params
=====
=====
763 IpOam=1                            traceRoute      1
```

Parameter 1 of 1, host (string): 10.62.8.22
>>> Return value = IP address path to 10.62.8.22 is: / 10.62.10.1 / 10.62.8.22 /

```
=====
=====
Total: 1 MOs attempted, 1 MOs actioned
```

kienb4017> ethtraceroute -d 10.62.8.22 -h 1 -w 1

\$ ethtraceroute -d 10.62.8.22 -h 1 -w 1
Wrong syntax of IP address 1, should be 4 octets separated by 3 dots '.', in total 7-15 characters.

Command syntax:

ethtraceroute -d <destIpAddr> -h <hostIpAddr> -q <nQueries> -s <pktSize> -f <firstHop> -m <maxHop> -w <waitTime>

..where..

ethtraceroute is mandatory and name of the COLI command

- d <destIpAddr> is mandatory (dotted decimal notation)
- h <hostIpAddr> is mandatory (dotted decimal notation)
- q <nQueries> is optional (default value 4)
- s <pktSize> is optional (default value 56 byte ICMP payload)
- f <firstHop> is optional (default value 1)
- m <maxHop> is optional (default value 40)
- w <waitTime> is optional (default value 5)

Example:

```
ethtracroute -d 192.168.3.25 -h 192.168.1.1 -q 5 -s 18 -f 3 -m 15 -w 3
$
```

```
kienb4017> ethtracroute -d 10.62.8.22 -h 10.62.11.27 -w 1
```

```
$ ethtracroute -d 10.62.8.22 -h 10.62.11.27 -w 1
$      (3)      (3)      (3)      (3): 10.62.11.1
      (2)      (2)      (2)      (2): 10.62.8.22
$
```

Ping/traceroute from traffic interface:

```
kienb4017> EtHostMo_startPing
```

```
$ EtHostMo_startPing
```

Wrong number of arguments, expected 5, 7 or 9 arguments, but received 1 argument(s)

Command syntax:

```
EtHostMo_startPing -d <destIpAddr> -h <hostFrold> -c <noPings> -s <pktSize>
```

..where..

EtHostMo_startPing is mandatory and name of the COLI command

-d <destIpAddr> is mandatory (dotted decimal notation)

-h <hostFrold> is mandatory (integer > 0)

-c <noPings> is optional (default value 4)

-s <pktSize> is optional (default value 56 byte ICMP payload)

Example:

```
EtHostMo_startPing -d 192.168.1.2 -h 1 -c 25 -s 18
```

```
$
```

```
kienb4017> fro ipaccessshostet
```

```
=====
=====
MO                               Attribute      Value
=====
=====
IpAccessHostEt=1                ipacHostEtFrold  1
=====
=====
Total: 1 MOs
```

```
kienb4017> EtHostMo_startPing -d 10.62.8.22 -h 1
```

```
$ EtHostMo_startPing -d 10.62.8.22 -h 1
$ (10.62.11.27) received echo reply from (10.62.8.22). icmpSeq=0 time=3 ms
(10.62.11.27) received echo reply from (10.62.8.22). icmpSeq=1 time=2 ms
(10.62.11.27) received echo reply from (10.62.8.22). icmpSeq=2 time=2 ms
(10.62.11.27) received echo reply from (10.62.8.22). icmpSeq=3 time=2 ms
----- 10.62.11.27 PING statistics -----
4 packets transmitted from (10.62.11.27) to (10.62.8.22).
Packets received/timed-out: 4/0 (Packet loss 0%)
round-trip (ms) min/avg/max: 2/2/3
$
```

```
kienb4017> EtHostMo_startTraceRoute -d 10.62.8.22
```

```
$ EtHostMo_startTraceRoute -d 10.62.8.22
Wrong number of arguments, expected 5, 7, 9, 11, 13, or 15 arguments, but received 3 argument(s)
Command syntax:
EtHostMo_startTraceRoute -d <destIpAddr> -h <hostFrold> -q <nQueries> -s <pktSize> -f <firstHop> -m <maxHop> -w <waitTime>
..where..
EtHostMo_startTraceRoute is mandatory and name of the COLI command
-d <destIpAddr> is mandatory (dotted decimal notation)
-h <hostFrold> is mandatory (integer > 0)
-q <nQueries> is optional (default value 4)
-s <pktSize> is optional (default value 56 byte ICMP payload)
-f <firstHop> is optional (default value 1)
-m <maxHop> is optional (default value 40)
-w <waitTime> is optional (default value 5)
Example:
EtHostMo_startTraceRoute -d 192.168.1.2 -h 1 -q 5 -s 18 -f 3 -m 60 -w 3
$
```

```
kienb4017> EtHostMo_startTraceRoute -d 10.62.8.22 -h 1 -w 1
```

```
$ EtHostMo_startTraceRoute -d 10.62.8.22 -h 1 -w 1
$      (3)      (3)      (3)      (3): 10.62.11.1
      (2)      (2)      (2)      (2): 10.62.8.22
$
```

Note: in later LTE SW, the command EtHostMo_startTraceRoute is replaced with “traceroute” and “traceroute6”

```
ENB32> traceroute 10.64.193.73
```

[illegible]

```
kienb4017> ? | grep ipac
```

```
ipac_blockHostRegi Command for blocking of IPHOSTREGI
ipac_blockSyncRegi Command for blocking of IPSYNCREGI
ipac_ipadm      Status info for the IPAC IP Adm administrator program
ipac_ipsyncref  Status info for the IPAC IP Sync Ref administrator program
ipac_ping       Send echo request from IPAC host.
ipac_traceroute Send traceroute request from IPAC host.
```

3.4 Network Synchronization

Network synchronization using NTP

no additional HW needed but sensitive to disturbances in IP network

```
kienb4017> get synchroniz
```

```
=====
=====
46                      TransportNetwork=1,Synchronization=1
=====
=====
SynchronizationId      1
degradationIsFault     0 (DEGR_NOT_FAULT)
nodeSystemClock        2 (LOCKED_MODE)
syncRefActivity        i[8] = 2 1 1 1 1 1 1 1
syncRefPriority         i[8] = 5 0 0 0 0 0 0 0
syncRefStatus          i[8] = 3 0 0 0 0 0 0 0
syncReference          [8] =
>>> syncReference = IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
userLabel
=====
=====
Total: 1 MOs
```

```
kienb4017> get ipsyncref
```

```

=====
=====
898                IpSystem=1,IpAccessHostEt=1,IpSyncRef=1
=====
=====
IpSyncRefId        1
administrativeState 1 (UNLOCKED)
availabilityStatus  0 (NO_STATUS)
cachedIpAddress
ntpServerIpAddress 10.62.1.10
operationalState    1 (ENABLED)
reservedBy          [1] =
>>> reservedBy = TransportNetwork=1,Synchronization=1
syncStatus          2 (OK)
userLabel
=====
=====
Total: 1 MOs

```

Network synchronization using GPS

additional HW is needed but not sensitive to disturbances in IP network

ENB75> get synchroniz

```

=====
=====
46                TransportNetwork=1,Synchronization=1
=====
=====
SynchronizationId   1
degradationIsFault  0 (DEGR_NOT_FAULT)
nodeSystemClock     2 (LOCKED_MODE)
syncRefActivity      i[8] = 2 1 1 1 1 1 1 1
syncRefPriority      i[8] = 1 0 0 0 0 0 0 0
syncRefStatus        i[8] = 3 0 0 0 0 0 0 0
syncReference        [8] =
>>> syncReference = Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,TimingUnit=1,TuSyncRef=1
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
>>> syncReference =
userLabel
=====
=====
Total: 1 MOs

```

ENB75> get tusyncref

```
=====
=====
106                      Equipment=1,Subrack=1,Slot=1,PlugInUnit=1,TimingUnit=1,TuSyncRef=1
=====
=====
TuSyncRefId              1
administrativeState      1 (UNLOCKED)
availabilityStatus       0 (NO_STATUS)
operationalState         1 (ENABLED)
reservedBy               [1] =
>>> reservedBy = TransportNetwork=1,Synchronization=1
userLabel
=====
=====
Total: 1 MOs
```

Network synchronization COLI printouts

ENB0621> nssinfo all;nssmpinfo all;nsstableinfo

\$ nssinfo all

***** NSS TUM2 TU_IIF related data *****

```
nsPid      : 0x100a6
procTuiifMpPid : 0x101f1
tuiifStartState : TUIIF_START_RESTART_READY (2)
firstPriCall : True (1)
ownPiuInstanceld : 1
ownPiuHwAddr_r.smn : 0
ownPiuHwAddr_r.apn : 1
selectedRef : NTP_REF (3)
prevSelectedRef : NO_REF (1)
lastRegulatorState : NSS_TUIIF_FREQUENCY_LOCKED (3)
ltrStatus : False (0)
savedCbmStatusData.
```

....

```
par_pmHDVB1Pct : 0
par_pmHDVB10Pct : 0
par_pmHDVB50Pct : 0
```

***** NSS TUM2 tumgr_proc related data *****

```
hwdiagReturnCode : NO_ERROR (0)
temiRestartType : COLD (2)
```

***** NSS TUM2 tuhwif related data *****

fpgaRev : 50343232
isRev3 : Not P3
A1ref : 4e5
writeMultNo : 1

***** NSS TUM2 tumgr_hwdiag related data *****

***** END *****

\$ nssmpinfo all

***** Reference Information *****

+ IP REF in position: SMN= 0, APN= 1
- frolid= 1
- instance= CBMA_IP_REF
- priority= 5
- synch state= OK
- LOSS OF TRACKING= NO
- reference path state= REF PATH UNKNOWN
- reference degradation state= REF QUALITY UNKNOWN
- ref ADM state= ADM UNLOCKED
- ref OPER state= OPER ENABLED
- ref AVAIL state= NO STATUS
- Packet rate= 1
- ref path configured= True
- ref is active= True
- board present= True
- available for selection= True

* Total: 1 (1 available)

.....

* Quality reset timer started: NO
* Reference path reset timer started: NO

* LTR recovery timer started: NO

* PM counters subscribed: NO
* Slave alarm timer started: NO

* Unlockable timer started: NO

* Reset unlockable timer started: NO

* Pending reference selection: NO

* Pending master/slave switch: NO

\$ nsstableinfo

***** Table Information *****

Various parameters

* CBM_A = 1
* CBM_B = 2
* ET_REF = 0
* CBM_REF = 1
* IP_REF = 2

....

Object: index (0 -> 1)

index:	0	1
type:	CBM_A_DED	CBM_B_DED

activeTxId:	-	-
unCommitted.frold:	-	-
unCommitted.adminState:	-	-
unCommitted.tuFrold:	-	-
latestCommitted.frold:	-	-
latestCommitted.adminState:	-	-
latestCommitted.tuFrold:	-	-

\$

3.5 IpSec

See description in CPI: http://cpistore.internal.ericsson.com/alexserv?!D=4564&DB=29043-7840900_R9Alzn784090011r9a.alx&FN=50_1553-HSC10550_1Uen.PB4.html

Without IPSEC

LIENB0621 > hget ipaccesshostet reservedby|ipadd|ipinter

```
=====
=====
MO      ipAddress  ipInterfaceMoRef      reservedBy
=====
=====
IpAccessHostEt=1 10.75.16.228 Subrack=1,Slot=1,PlugInUnit=1,*,IpInterface=2 [2] = ENodeBFunction=1 IpAccessSctp=1
=====
=====
Total: 1 MOs
```

With IPSEC

ENB54> hget ipaccesshostet reservedby|ipadd|ipint

=====			
MO	ipAddress	ipInterfaceMoRef	reservedBy
=====			
=====			
IpAccessHostEt=1 172.26.136.60 VpnInterface=1		[2] = IpAccessSctp=1 ENodeBFunction=1	
IpAccessHostEt=2 192.169.0.2 Subrack=1,Slot=1,PlugInUnit=1,*,IpInterface=2		[1] = VpnInterface=1	
=====			
=====			
Total: 2 MOs			

IPsec Log

ENB32> lgz

Get /c/logfiles/iptran/097903_520453_CELLO_IPTRAN_LOG_20110429T090138.push /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20110511-044645_20987/iptranLog21029.xml.tmp ... OK

Get /c/logfiles/iptran/CELL0_IPTRAN_LOG.xml /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20110511-044645_20987/iptranLog21029.xml.tmp ... OK

=====		
Timestamp (UTC)	MO-reference	Event
=====		
=====		
2011-04-12 11:53:38	IPTR IpSec=1,IpSecTunnel=1, InDiscNoSa, SPI - 0x1319bdc7, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=12502, RemotePort=2048	
2011-04-12 11:54:13	IPTR IpSec=1,IpSecTunnel=1, OutDiscNoSa, LocalIP=10.75.10.233, RemoteIP=10.64.193.79, Proto - 132, LocalPort=36422, RemotePort=36412	
2011-04-12 11:54:18	IPTR IpSec=1,IpSecTunnel=2, InDiscNoSa, SPI - 0x5d1206eb, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, Proto - 1, LocalPort=8202, RemotePort=2048	
2011-04-12 12:30:56	IPTR IpSec=1,IpSecTunnel=1, InDiscNoSa, SPI - 0x766af45f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=28345, RemotePort=2048	
2011-04-12 12:30:57	IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500	
2011-04-12 12:30:58	IPTR IpSec=1,IkePeer=1, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500	
2011-04-12 12:30:58	IPTR IpSec=1,IpSecTunnel=1, InDiscNoSa, SPI - 0x766af45f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=28045, RemotePort=2048	
2011-04-12 12:31:05	IPTR IpSec=1,IpSecTunnel=2, InDiscNoSa, SPI - 0x5ed97775, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, Proto - 1, LocalPort=27045, RemotePort=2048	
2011-04-13 13:17:37	IPTR IpSec=1,IpSecTunnel=1, InDiscNoSa, SPI - 0x0451f001, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=38845, RemotePort=2048	
2011-04-26 06:40:47	IPTR IpSec=1,IkePeer=1, AuthFail, authentication failed, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500	
2011-04-26 06:40:50	IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500	
2011-04-26 06:40:52	IPTR IpSec=1,IkePeer=1, AuthFail, authentication failed on peers side, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500	

2011-04-26 06:40:57 IPTR IpSec=1,IkePeer=1, AuthFail, authentication failed, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:02 IPTR IpSec=1,IkePeer=2, AuthFail, authentication failed on peers side, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:17 IPTR IpSec=1,IkePeer=1, AuthFail, authentication failed, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:23 IPTR IpSec=1,IkePeer=2, AuthFail, authentication failed on peers side, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:37 IPTR IpSec=1,IkePeer=1, AuthFail, authentication failed, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:44 IPTR IpSec=1,IkePeer=2, AuthFail, authentication failed on peers side, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:45 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x7162d75f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=1650, RemotePort=2048
 2011-04-26 06:41:47 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x7162d75f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=1450, RemotePort=2048
 2011-04-26 06:41:55 IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:41:57 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x7162d75f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=350, RemotePort=2048
 2011-04-26 06:41:57 IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:42:05 IPTR IpSec=1,IkePeer=2, AuthFail, authentication failed on peers side, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:42:07 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x7162d75f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=64785, RemotePort=2048
 2011-04-26 06:42:17 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x7162d75f, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=63685, RemotePort=2048
 2011-04-26 06:42:17 IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:42:21 IPTR IpSec=1,IkePeer=2, AuthFail, received ID_R (type IDT_IPADDR [(unknown format)]) does not match my id, LocalIP=10.75.0.143, RemoteIP=10.75.0.254, LocalPort=500, RemotePort=500
 2011-04-26 06:55:07 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x0d3742e3, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=44021, RemotePort=2048
 2011-04-26 06:55:16 IPTR IpSec=1,IpSecTunnel=643_OAM, InDiscAReFail, SPI - 0x57691399, LocalIP=10.75.0.143, RemoteIP=10.75.0.254
 2011-04-26 06:55:17 IPTR IpSec=1,IpSecTunnel=643_CP, InDiscNoSa, SPI - 0x0d3742e3, LocalIP=10.75.16.233, RemoteIP=10.75.16.254, Proto - 1, LocalPort=42921, RemotePort=2048
 2011-04-26 06:55:18 IPTR IpSec=1,IpSecTunnel=643_OAM, InDiscAReFail, SPI - 0x57691399, LocalIP=10.75.0.143, RemoteIP=10.75.0.254
 2011-04-26 06:55:19 IPTR IpSec=1,IpSecTunnel=643_OAM, InDiscAReFail, SPI - 0x57691399, LocalIP=10.75.0.143, RemoteIP=10.75.0.254

IPSEC MOS

MO tree

ENB54> momt ipsystem

 MO classes under IpSystem (systemCreated)

 AccessControlList[0-]
 IpAccessAutoConfig[0-32]
 IpAccessHostEt[0-64]
 IpSyncRef[0-8]
 IpAccessHostGpb[0-64]
 IpAccessHostSpb[0-64]
 IpAccessSctp[0-33]

```
IpMux[0-64]
IpSec[0-1]
    IkePeer[0-]
    IpSecTunnel[0-]
VpnInterface[0-]
```

MO Actions

```
ENB54> momdc ipsystem
```

...

#####			
#####			
MO Class	Action	ReturnType	Parameters
#####			
#####			
AccessControlList	addEntry	void	2:entry:index
AccessControlList	removeEntry	void	1:index:long
IkePeer	installPreSharedKey	void	1:preSharedKey
...			
IpSec	cancelCertEnrollment	void	0
IpSec	cancelInstallTrustedCertificates	void	0
IpSec	initCertEnrollment	void	1:enrollmentData
IpSec	installTrustedCertificates	void	2:certSpecList:accountInfoList
IpSec	removeTrustedCert	void	2:serialNumber:issuer

MO attributes

```
ENB54> lpr ipsystem
```

```
=====
Proxy MO
=====
1137 IpSystem=1
1138 IpSystem=1,IpAccessSctp=1
1139 IpSystem=1,IpAccessHostEt=2
1140 IpSystem=1,IpAccessHostEt=1
1141 IpSystem=1,VpnInterface=1
1142 IpSystem=1,IpSec=1
1143 IpSystem=1,IpSec=1,IpSecTunnel=1
1144 IpSystem=1,IpSec=1,IkePeer=1
=====
Total: 8 MOs
```

```
ENB54> lget ipsystem=
```

```

=====
=====
868                IpSystem=1
=====
=====
IpSystemId          1
userLabel
=====
=====
871                IpSystem=1,IpAccessHostEt=1
=====
=====
IpAccessHostEtId    1
administrativeState  1 (UNLOCKED)
availabilityStatus   0 (NO_STATUS)
ipAddress            172.26.136.60
ipDefaultTtl         64
ipInterfaceMoRef     VpnInterface=1
networkPrefixLength  0
ntpDscp              56
ntpServerMode        0 (DISABLED)
operationalState     1 (ENABLED)
reservedBy           [2] =
>>> reservedBy = IpSystem=1,IpAccessSctp=1
>>> reservedBy = ENodeBFunction=1
userLabel            IpAccessHostEt-1-Inner
=====
=====
870                IpSystem=1,IpAccessHostEt=2
=====
=====
IpAccessHostEtId    2
administrativeState  1 (UNLOCKED)
availabilityStatus   0 (NO_STATUS)
ipAddress            192.169.0.2
ipDefaultTtl         64
ipInterfaceMoRef     Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2
networkPrefixLength  0
ntpDscp              56
ntpServerMode        0 (DISABLED)
operationalState     1 (ENABLED)
reservedBy           [1] =
>>> reservedBy = IpSystem=1,VpnInterface=1
userLabel            IpAccessHostEt-2-Outer
=====
=====
869                IpSystem=1,IpAccessSctp=1
=====
=====

```

```

IpAccessSctpId          1
availabilityStatus      0 (NO_STATUS)
froid                  3
ipAccessHostEtRef1      IpAccessHostEt=1
ipAccessHostEtRef2
operationalState        1 (ENABLED)
reservedBy              [1] =
>>> reservedBy = TransportNetwork=1,Sctp=1
userLabel               ip_sctp
=====
=====
873                     IpSystem=1,IpSec=1
=====
=====
IpSecId                 1
certEnrollErrorMsg
certEnrollState         0 (IDLE)
certExpirWarnTime       90
certificate              Struct{6}
>>> 1.issuer = CN=LTEIPSecNEcusRootCA, O=Ericsson
>>> 2.notValidAfter = 201030102618Z
>>> 3.notValidBefore = 110421133509Z
>>> 4.serialNumber = 41289482
>>> 5.subject = CN=DXLB54, O=Ericsson
>>> 6.fingerprint = SHA1 Fingerprint=86:5b:e6:b4:ec:1a:ee:0d:d1:84:57:6c:d8:dc:08:f7:a5:7a:b4:12
featureState            1 (ACTIVATED)
installedTrustedCertificates t[2] =
>>> Struct[0] has 6 members:
>>> 1.issuer = CN=LTEIPSecNEcusRootCA, O=Ericsson
>>> 2.notValidAfter = 201030102618Z
>>> 3.notValidBefore = 101102102618Z
>>> 4.serialNumber = 977182355
>>> 5.subject = CN=LTEIPSecNEcusRootCA, O=Ericsson
>>> 6.fingerprint = SHA1 Fingerprint=80:02:0b:19:ab:03:d6:3f:c6:51:4e:2e:6a:48:db:f6:bd:82:2e:2c
>>> Struct[1] has 6 members:
>>> 1.issuer = CN=LTEIPSecSEGRootCA, O=Ericsson
>>> 2.notValidAfter = 201030102637Z
>>> 3.notValidBefore = 101102102637Z
>>> 4.serialNumber = 139723544
>>> 5.subject = CN=LTEIPSecSEGRootCA, O=Ericsson
>>> 6.fingerprint = SHA1 Fingerprint=1c:8c:97:a8:8d:98:c8:e0:3d:7c:fc:a5:0d:05:3c:ed:83:e8:09:e0
licenseState            1 (ENABLED)
operationalState        1 (ENABLED)
trustedCertInstallErrorMsg
trustedCertInstallState 0 (IDLE)
userLabel
=====
=====
875                     IpSystem=1,IpSec=1,IkePeer=1

```

```

=====
=====
IkePeerId          1
allowedTransforms   t[1] =
>>> Struct[0] has 4 members:
>>> 1.diffieHellmanGroup = 1 (GROUP_14)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.pseudoRandomFunction = 1 (HMAC_SHA1)
authenticationMethod 1 (CERTIFICATE)
availabilityStatus    0 (NO_STATUS)
childSaLifeTime       Struct{2}
>>> 1.dataLimit = 50000
>>> 2.time = 1440
deadPeerDetectionInterval 60
ikeSaLifeTime          1440
logging                1 (ENABLED)
operationalState       1 (ENABLED)
ownIdentity            Struct{3}
>>> 1.idFqdn =
>>> 2.ownIdType = 0 (AUTOMATIC)
>>> 3.ipv4Address =
peerCertificate        Struct{5}
>>> 1.issuer = /CN=LTEIPSecSEGRootCA/O=Ericsson
>>> 2.notValidAfter = 201030102637Z
>>> 3.notValidBefore = 110315140359Z
>>> 4.serialNumber = 471319439
>>> 5.subject = /CN=Moenchengladbach
peerIdentity          Struct{3}
>>> 1.idFqdn = cisco.com
>>> 2.idType = 1 (IP_V4_ADDRESS)
>>> 3.ipv4Address = 10.69.226.254
peerIpAddress         10.69.226.254
reservedBy            [1] =
>>> reservedBy = IpSystem=1,IpSec=1,IpSecTunnel=1
securityAssociations   t[1] =
>>> Struct[0] has 6 members:
>>> 1.diffieHellmanGroup = 1 (GROUP_14)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.pseudoRandomFunction = 1 (HMAC_SHA1)
>>> 5.localSpiValue = 0x6752202B50149115
>>> 6.remoteSpiValue = 0x37840FB6241FBEE4
userLabel
=====
=====
874                  IpSystem=1,IpSec=1,IpSecTunnel=1
=====
=====

```

```

IpSecTunnelId          1
allowedTransforms      t[1] =
>>> Struct[0] has 2 members:
>>> 1.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 2.integrityAlgorithm = 2 (HMAC_SHA_1_96)
antiReplayProtection   true
ikePeerRef             IpSec=1,IkePeer=1
priority               1
securityAssociations   t[4] =
>>> Struct[0] has 6 members:
>>> 1.direction = 1 (EGRESS)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.localTrafficSelectors = Ip Address Range = 172.26.136.60 - 172.26.136.60, Protocol = 0, Port Range = 0 - 0
>>> 5.remoteTrafficSelectors = Ip Address Range = 172.0.0.0 - 172.255.255.25, Protocol = 0, Port Range = 0 - 0
>>> 6.spiValue = 0xAD123338
>>> Struct[1] has 6 members:
>>> 1.direction = 0 (INGRESS)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.localTrafficSelectors = Ip Address Range = 172.26.136.60 - 172.26.136.60, Protocol = 0, Port Range = 0 - 0
>>> 5.remoteTrafficSelectors = Ip Address Range = 172.0.0.0 - 172.255.255.25, Protocol = 0, Port Range = 0 - 0
>>> 6.spiValue = 0x4AB63D77
>>> Struct[2] has 6 members:
>>> 1.direction = 1 (EGRESS)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.localTrafficSelectors = Ip Address Range = 172.26.136.60 - 172.26.136.60, Protocol = 0, Port Range = 0 - 0
>>> 5.remoteTrafficSelectors = Ip Address Range = 172.0.0.0 - 172.255.255.25, Protocol = 0, Port Range = 0 - 0
>>> 6.spiValue = 0x216D38A5
>>> Struct[3] has 6 members:
>>> 1.direction = 0 (INGRESS)
>>> 2.encryptionAlgorithm = 2 (AES_CBC_256)
>>> 3.integrityAlgorithm = 2 (HMAC_SHA_1_96)
>>> 4.localTrafficSelectors = Ip Address Range = 172.26.136.60 - 172.26.136.60, Protocol = 0, Port Range = 0 - 0
>>> 5.remoteTrafficSelectors = Ip Address Range = 172.0.0.0 - 172.255.255.25, Protocol = 0, Port Range = 0 - 0
>>> 6.spiValue = 0x175C9DE4
tsLocalIpRanges        t[1] =
>>> Struct[0] has 2 members:
>>> 1.ipAddress = 172.26.136.60
>>> 2.mask = 32
tsProtocols             i[1] = 0
tsRemoteIpRanges       t[1] =
>>> Struct[0] has 2 members:
>>> 1.ipAddress = 172.0.0.0
>>> 2.mask = 8
userLabel
vpnInterfaceRef         VpnInterface=1

```

```

=====
=====
872                IpSystem=1,VpnInterface=1
=====
=====
VpnInterfaceId      1
availabilityStatus   0 (NO_STATUS)
ipAccessHostEtRef    IpAccessHostEt=2
networkPrefixLength  31
operationalState     1 (ENABLED)
reservedBy           [2] =
>>> reservedBy = IpSystem=1,IpAccessHostEt=1
>>> reservedBy = IpSystem=1,IpSec=1,IpSecTunnel=1
subnet              172.26.136.60
userLabel            VpnInterface-Inner
=====
=====
Total: 8 MOs

```

MO command log

ENB89> lgq | grep -i ike

```

cat /net/rncweb/export/share4/RNC/LOG_SERVER/rnciov/PV/eanzmagn/logs_moshell/tempfiles/20110511-
165720_11597/cpplogs/logfiles/audit_trail/CORBA_AUDITTRAIL_LOG.xml /net/rncweb/export/share4/RNC/LOG_SERVER/rnciov/PV/eanzmagn/logs_moshell/tempfiles/20110511-
165720_11597/cpplogs/logfiles/audit_trail/562954_727602_CORBA_AUDITTRAIL_LOG_20110401T135021.push >
/net/rncweb/export/share4/RNC/LOG_SERVER/rnciov/PV/eanzmagn/logs_moshell/tempfiles/20110511-165720_11597/audit_trailLog11693.xml
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 1 )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 0 )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 1 )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 0 )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )

```

```

ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 1 )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 0 )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName manualRestart mo "ManagedElement=1" exception none nrOfParameters 3 Integer 2 Integer 0 String "ike dis" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
CREATE ( parent "ManagedElement=1,IpSystem=1,IpSec=1" identity "1" moType IpSecTunnel exception none nrOfAttributes 7 tsLocalIpAddressRanges Array Struct 1
nrOfElements 2 ipAddress String "172.31.221.11" mask Integer 32 tsProtocols Array Integer 1 0 tsRemotelpAddressRanges Array Struct 1 nrOfElements 2 ipAddress String
"172.31.0.0" mask Integer 16 priority Integer 1 allowedTransforms Array Struct 1 nrOfElements 2 encryptionAlgorithm Integer 2 integrityAlgorithm Integer 2 ikePeerRef
Reference "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" vpnInterfaceRef Reference "ManagedElement=1,IpSystem=1,VpnInterface=1" )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 1 )
SET ( mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none authenticationMethod Integer 0 )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )
ACTION ( actionName installPreSharedKey mo "ManagedElement=1,IpSystem=1,IpSec=1,IkePeer=1" exception none nrOfParameters 1 Struct nrOfElements 2 encoding
Integer 1 preSharedKey String "*****" returnValue none )

```

Finn Magnusson 2011-06-02 rev PA20 119/219)

ENB0621> momt mme

MO classes over TermPointToMme

```
ENodeBFunction[1].TermPointToMme[0-64]
```

ENB0621> mom mme

#####

MO Class	Attributes/Actions
----------	--------------------

#####

TermPointToMme

TermPointToMmeId,administrativeState,availabilityStatus,domainName,gUMMEIList,ipAddress1,ipAddress2,logicalName,mmeName,operationalState,relativeMmeCapacity,serverPlmnIdList,usedIpAddress

Models the MME termination point of an S1 link between the RBS and the MME node.

ENB0621> momda ...!deprecated (\x020)mme|s1

#####

#####

MO Class	Attribute	Type	Flags
----------	-----------	------	-------

#####

#####

ENodeBFunction dnsLookupOnTai enumRef:DnsLookup

ENodeBFunction	dnsLookupTimer	long
----------------	----------------	------

ENodeBFunction	eNBId	long
----------------	-------	------

ENodeBFunction	eNodeBPlmnId	structRef:PlmnIdentity
----------------	--------------	------------------------

ENodeBFunction nnsfMode enumRef:NnsfModeVals

```
ENodeBFunction      sctpRef      moRef:Sctp
```

ENodeBFunction	tHODataFwdReordering	long
----------------	----------------------	------

ENodeBFunction	upIpAccessHostRef	moRef:IpAccessHostEt
----------------	-------------------	----------------------

ENodeBFunction	x2IpAddrViaS1Active	boolean
----------------	---------------------	---------

EuTranCellFDD	activePlmnList	sequence:structRef-PlmnIdentity	readOnly,nonPersistent
---------------	----------------	---------------------------------	------------------------

EUTRANCellTDD	activePlmnList	sequence:structRef-PlmnIdentity	readOnly,nonPersistent
---------------	----------------	---------------------------------	------------------------

Paging	defaultPagingCycle	long
--------	--------------------	------

Paging	pagingDiscardTimer	long
--------	--------------------	------

TermPointToMme	domainName	string
----------------	------------	--------

TermPointToMme	ipAddress1	string
----------------	------------	--------

TermPointToMme	ipAddress2	string
----------------	------------	--------

TermPointToMme	ipv6Address1	string
----------------	--------------	--------

TermPointToMme	ipv6Address2	string
----------------	--------------	--------

TermPointToMme	mmeName	string	readOnly,nonPersistent
----------------	---------	--------	------------------------

TermPointToMme	relativeMmeCapacity	long	readOnly,nonPersistent
----------------	---------------------	------	------------------------

TermPointToMme	servedPlmnListLteRelated	sequence:structRef-PlmnIdentity	readOnly,nonPersistent
----------------	--------------------------	---------------------------------	------------------------

ENB0621> get . dnslookup

=====		
MO	Attribute	Value
=====		
=====		
ENodeBFunction=1	dnsLookupOnTai	1 (ON)
ENodeBFunction=1	dnsLookupTimer	0
=====		
=====		
Total: 1 MOs		

ENB0621> mom . dnslookup

#####			
#####			
MO Class	Attribute	Type	Flags
#####			
#####			
ENodeBFunction	dnsLookupOnTai	enumRef:DnsLookup	

Controls whether TAI shall be used to get IP addresses to MME nodes from DNS.
If ON, the RBS will use TAI to automatically fetch all MMEs IP addresses from the DNS when dnsLookupOnTai is switched on or at RBS start/restart. The MME IP address list is refreshed periodically and MME connections released and setup according to the new list. The MME IP address list can also be refreshed on trigger from OSS.
Takes effect: Immediately.
Default=ON

ENodeBFunction	dnsLookupTimer	long
----------------	----------------	------

Defines the frequency to perform DNS Lookup to get possible new IP addresses for MME nodes. The DNS lookup is performed for TAI domain name. If value is set to zero, then no periodic DNS Lookup will be done.
Unit: 1 Hour.
Resolution: 1
Takes effect: Immediately.
Range: 0 to 1000, Default=0

ENB0621> pr mme

=====	
Proxy MO	
=====	
1007	ENodeBFunction=1,TermPointToMme=MME010064193091
1029	ENodeBFunction=1,TermPointToMme=MME010064193101
=====	

Total: 2 MOs

ENB0621> get mme !list

=====

MO	Attribute	Value
=====		
TermPointToMme=MME010064193091	TermPointToMmeId	MME010064193091
TermPointToMme=MME010064193091	administrativeState	1 (UNLOCKED)
TermPointToMme=MME010064193091	availabilityStatus	0 (NO_STATUS)
TermPointToMme=MME010064193091	domainName	
TermPointToMme=MME010064193091	ipAddress1	10.64.193.91
TermPointToMme=MME010064193091	ipAddress2	0.0.0.0
TermPointToMme=MME010064193091	logicalName	kienb3012
TermPointToMme=MME010064193091	mmeName	
TermPointToMme=MME010064193091	operationalState	0 (DISABLED)
TermPointToMme=MME010064193091	relativeMmeCapacity	0
TermPointToMme=MME010064193091	usedIpAddress	0.0.0.0
TermPointToMme=MME010064193101	TermPointToMmeId	MME010064193101
TermPointToMme=MME010064193101	administrativeState	1 (UNLOCKED)
TermPointToMme=MME010064193101	availabilityStatus	0 (NO_STATUS)
TermPointToMme=MME010064193101	domainName	
TermPointToMme=MME010064193101	ipAddress1	10.64.193.101
TermPointToMme=MME010064193101	ipAddress2	0.0.0.0
TermPointToMme=MME010064193101	logicalName	kienb3012
TermPointToMme=MME010064193101	mmeName	youlab-mme20
TermPointToMme=MME010064193101	operationalState	1 (ENABLED)
TermPointToMme=MME010064193101	relativeMmeCapacity	128
TermPointToMme=MME010064193101	usedIpAddress	10.64.193.101

=====

Total: 2 MOs

ENB0621> hget mme list

=====

MO	gUMMEIList	servedPlmnIdList	mcc	mmeCode	mmeGI	mnc	mncLength
=====							
TermPointToMme=MME010064193091	t[6]	=	t[6]	=			
TermPointToMme=MME010064193091	t[0]		t[0]		0	0	0
TermPointToMme=MME010064193091	t[1]		t[1]		0	0	0
TermPointToMme=MME010064193091	t[2]		t[2]		0	0	0
TermPointToMme=MME010064193091	t[3]		t[3]		0	0	0
TermPointToMme=MME010064193091	t[4]		t[4]		0	0	0

```

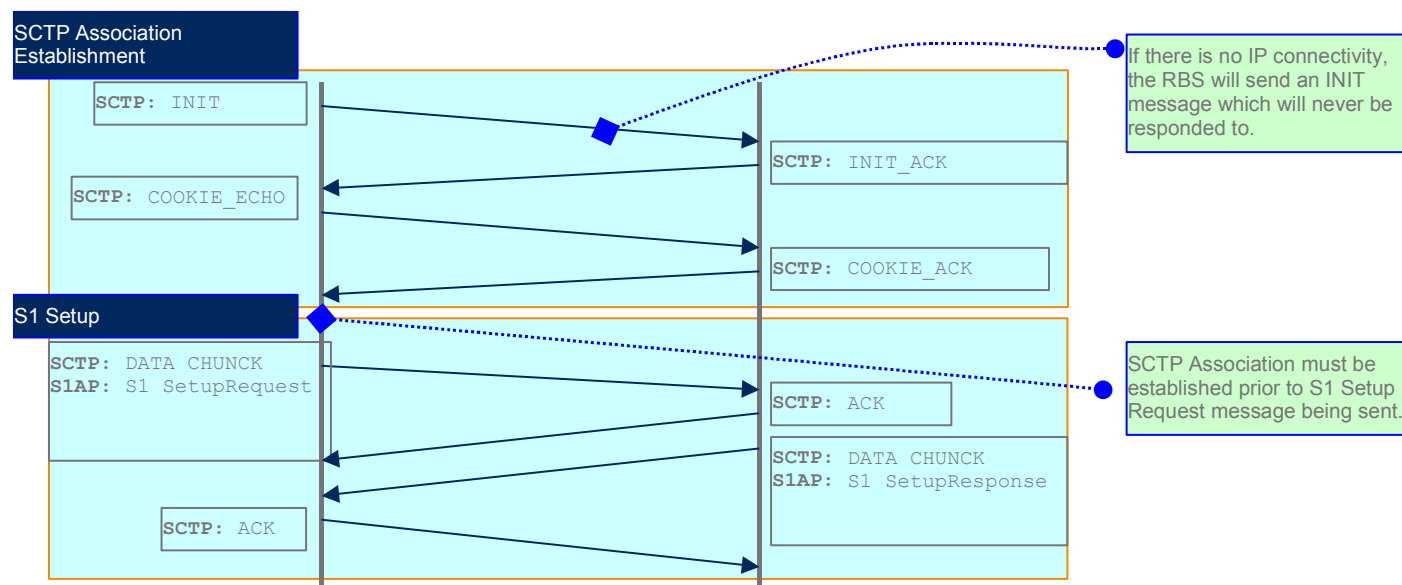
TermPointToMme=MME010064193091 t[5]    t[5]    0 0 0 0 0
TermPointToMme=MME010064193101 t[6] =   t[6] =
TermPointToMme=MME010064193101 t[0]    t[0]    262 20 32768 80 2
TermPointToMme=MME010064193101 t[1]    t[1]    0 0 0 0 0
TermPointToMme=MME010064193101 t[2]    t[2]    0 0 0 0 0
TermPointToMme=MME010064193101 t[3]    t[3]    0 0 0 0 0
TermPointToMme=MME010064193101 t[4]    t[4]    0 0 0 0 0
TermPointToMme=MME010064193101 t[5]    t[5]    0 0 0 0 0
=====
=====

```

Total: 2 MOs

Added 2 MOs to group: hget_group

Tracing on S1 interface:



```
enba> fte e bus_send bus_receive S1AP
```

```
enba> te log read | ltedecoder | lteflowfox.pl -l
```

```

Timestamp  LH   eNBid UE   eNB  TeNB  MME  racUeRef  Message
[01:18:38.296]  |   |=====>|   (S1AP) S1SetupRequest plmnId:20022 eNBName:enba
[01:18:38.420]  |   |<=====|   (S1AP) S1SetupFailure cause:misc:unknown-PLMN

```

3.7 X2AP

ENB0621> momt eutranetwork

MO classes under EUltraNetwork (systemCreated)

EUtranFrequency[0-24]
ExternalENodeBFunction[0-**256**]
 ExternalEUtranCellFDD[0-24]
 ExternalEUtranCellTDD[0-24]
 TermPointToENB[0-1]

ENB3012> momc eutranet

MO Class Attributes/Actions

EUtranNetwork EUtranNetworkId,userLabel
This managed object is a container for Managed Objects related to EUTRA networks.
Note: Instances of this MO class are SystemCreated.

EUtranFrequency EUtranFrequencyId,arfcnValueEUtranDI,reservedBy,userLabel
This Managed Object contains information of a specific EUtran frequency.

ExternalENodeBFunction
ExternalENodeBFunctionId,anrCreated,ctrlMode,eNBId,eNodeBPlmnId,gUGroupIdList,masterEnbFunctionId,removingMonitoringStart,timeOfAnrCreation,timeOfAnrModification
,userLabel
This managed object represents another ENodeB.

ExternalEUtranCellFDD
ExternalEUtranCellFDDId,anrCreated,bPlmnList,ctrlMode,dIChannelBandwidth,eutranFrequencyRef,isRemoveAllowed,localCellId,masterEUtranCellFDDId,physicalLayerCellIdGroup,physicalLayerSubCellId,removingMonitoringStart,reservedBy,tac,timeOfAnrCreation,timeOfAnrModification,ulChannelBandwidth,userLabel
 changeFrequency,pnpChangeFrequency
This managed object represents a neighbor EUTRAN cell (FDD) in another ENodeB in any MME pool.

ExternalEUtranCellTDD
ExternalEUtranCellTDDId,anrCreated,bPlmnList,channelBandwidth,ctrlMode,eutranFrequencyRef,isRemoveAllowed,localCellId,masterEUtranCellTDDId,physicalLayerCellIdGroup,physicalLayerSubCellId,removingMonitoringStart,reservedBy,tac,timeOfAnrCreation,timeOfAnrModification,userLabel
 changeFrequency,pnpChangeFrequency
This managed object represents a neighbor EUTRAN cell (TDD) in another ENodeB in any MME pool.

TermPointToENB
TermPointToENBId,administrativeState,anrCreated,availabilityStatus,ctrlMode,domainName,ipAddress,operationalState,timeOfAnrCreation,timeOfAnrModification,usedIpAddress,x2locallyInitiated
Models the local eNB termination point of an X2 link between the eNB and a neighbour eNB.

ENB3012> momda . . . x2

#####			
MO Class	Attributes		
#####			
SecurityHandling			
SecurityHandlingId,cipheringAlgorithms,countWrapSupervisionActive,countWrapThreshold,integrityProtectionActive,integrityProtectionAlgorithms,rblSupervisionActive			
TermPointToENB			
TermPointToENBId,administrativeState,anrCreated,availabilityStatus,ctrlMode,domainName,ipAddress,operationalState,timeOfAnrCreation,timeOfAnrModification,usedIpAddress,x2locallyInitiated			
#####			
#####			
MO Class	Attribute	Type	Flags
#####			
#####			
AnrFunction	x2SetupPolicy	boolean	
ENodeBFunction	sctpRef	moRef:Sctp	
ENodeBFunction	upIpAccessHostRef	moRef:IpAccessHostEt	
ENodeBFunction	x2BlackList	sequence:structRef-GlobalEnbId	
ENodeBFunction	x2WhiteList	sequence:structRef-GlobalEnbId	
ENodeBFunction	x2retryTimerMaxAuto	long	
ENodeBFunction	x2retryTimerStart	long	
ExternalENodeBFunction	gUGroupIdList	sequence:structRef-GUGroupId	readOnly
ExternalEUtranCellFDD	bPlmnList	sequence:structRef-PlmnIdentity	readOnly
ExternalEUtranCellFDD	dIChannelBandwidth	long	readOnly
ExternalEUtranCellFDD	uIChannelBandwidth	long	readOnly
ExternalEUtranCellTDD	bPlmnList	sequence:structRef-PlmnIdentity	readOnly
ExternalEUtranCellTDD	channelBandwidth	long	
TermPointToENB	domainName	string	
TermPointToENB	x2locallyInitiated	boolean	readOnly

ENB3012> momda . . . (\x020)anr|automatic.neigh

#####			
#####			
MO Class	Attribute	Type	Flags
#####			
#####			
Anr	featureStateAnr	enumRef:ActivationVals	
Anr	keyIdAnr	string	readOnly,nonPersistent
Anr	licenseStateAnr	enumRef:StateVals	readOnly,nonPersistent
Anr	serviceStateAnr	enumRef:OperVals	readOnly,nonPersistent
AnrFunctionEUTran	anrInterFreqState	enumRef:ActivationVals	
AnrFunctionEUTran	anrIntraFreqState	enumRef:ActivationVals	
AnrFunctionEUTran	anrUesEUTraIntraFDcr	long	

AnrFunctionEUTran	anrUesEUtraIntraFlncrAnr	long	
AnrFunctionEUTran	anrUesEUtraIntraFlncrHo	long	
AnrFunctionEUTran	anrUesEUtraIntraFMax	long	
AnrFunctionEUTran	anrUesEUtraIntraFMin	long	
AnrFunctionEUTran	anrUesThreshInterFDecr	long	
AnrFunctionEUTran	anrUesThreshInterFlncrAnr	long	
AnrFunctionEUTran	anrUesThreshInterFlncrHo	long	
AnrFunctionEUTran	anrUesThreshInterFMax	long	
AnrFunctionEUTran	anrUesThreshInterFMin	long	
AnrFunctionEUTran	hoAllowedEutranPolicy	boolean	
AnrFunctionEUTran	x2SetupPolicy	boolean	
AnrFunctionGeran	anrStateGsm	enumRef:ActivationVals	
AnrFunctionUtran	anrStateUtran	enumRef:ActivationVals	
ENodeBFunction	sctpRef	moRef:Sctp	
ENodeBFunction	upIpAccessHostRef	moRef:IpAccessHostEt	
ENodeBFunction	x2BlackList	sequence:structRef-GlobalEnbId	
ENodeBFunction	x2IpAddrViaS1Active	boolean	
ENodeBFunction	x2WhiteList	sequence:structRef-GlobalEnbId	
ENodeBFunction	x2retryTimerMaxAuto	long	
ENodeBFunction	x2retryTimerStart	long	
EUTranCellRelation	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
EUTranCellRelation	isRemoveAllowed	boolean	
EUTranCellRelation	lastModification	enumRef:LastModificationEutran	readOnly
EUTranCellRelation	removingMonitoringStart	string	readOnly,noNotification,EricssonOnly
EUTranFreqRelation	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
EUTranFreqRelation	lastModification	enumRef:LastModificationEutran	readOnly
ExternalENodeBFunction	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
ExternalENodeBFunction	gUGroupIdList	sequence:structRef-GUGroupId	readOnly
ExternalENodeBFunction	lastModification	enumRef:LastModificationEutran	readOnly
ExternalENodeBFunction	removingMonitoringStart	string	readOnly,noNotification,EricssonOnly
ExternalEUtranCellFDD	activePlmnList	sequence:structRef-PlmnIdentity	
ExternalEUtranCellFDD	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
ExternalEUtranCellFDD	dIChannelBandwidth	long	readOnly
ExternalEUtranCellFDD	isRemoveAllowed	boolean	
ExternalEUtranCellFDD	lastModification	enumRef:LastModificationEutran	readOnly
ExternalEUtranCellFDD	removingMonitoringStart	string	readOnly,noNotification,EricssonOnly
ExternalEUtranCellFDD	uIChannelBandwidth	long	readOnly
ExternalEUtranCellTDD	activePlmnList	sequence:structRef-PlmnIdentity	
ExternalEUtranCellTDD	channelBandwidth	long	readOnly
ExternalEUtranCellTDD	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
ExternalEUtranCellTDD	isRemoveAllowed	boolean	
ExternalEUtranCellTDD	lastModification	enumRef:LastModificationEutran	readOnly
ExternalEUtranCellTDD	removingMonitoringStart	string	readOnly,noNotification,EricssonOnly
ReportConfigA5Anr	a5Threshold1RsrpAnrDelta	long	
ReportConfigA5Anr	a5Threshold1RsrqAnrDelta	long	
ReportConfigA5Anr	a5Threshold2RsrpAnrDelta	long	
ReportConfigA5Anr	a5Threshold2RsrqAnrDelta	long	
ReportConfigEUtraBestCellAnr	a3offsetAnrDelta	long	
TermPointToENB	createdBy	enumRef:CreatedByEutran	readOnly,noNotification

TermPointToENBdomainNamestring
TermPointToENBlastModificationenumRef:LastModificationEutranreadOnly
TermPointToENBx2locallyInitiatedbooleanreadOnly

L11A

ENB3012> moma . anrcreated

MO ClassAttributeTypeFlags

EUTranCellRelationanrCreatedbooleanrestricted,noNotification

Indicates whether the MO has been created by the ANR (automatic neighbor relations) function.
Takes effect: Immediately.
Default=false

ExternalENodeBFunctionanrCreatedbooleanrestricted,noNotification

Indicates whether the MO has been created by the ANR (automatic neighbor relations) function.
Takes effect: Immediately.
Default=false

ExternalEUTranCellFDDanrCreatedbooleanrestricted,noNotification

Indicates whether the MO has been created by the ANR (automatic neighbor relations) function.
Takes effect: Immediately.
Default=false

ExternalEUTranCellTDDanrCreatedbooleanrestricted,noNotification

Indicates whether the MO has been created by the ANR (automatic neighbor relations) function.
Takes effect: Immediately.
Default=false

TermPointToENBanrCreatedbooleanrestricted,noNotification

Indicates whether the MO has been created by the ANR (automatic neighbor relations) function.
Takes effect: Immediately.
Default=false

L11B

ENB3020> moma . createdby

#####

#####

MO Class	Attribute	Type	Flags
#####	#####	#####	#####
#####	#####	#####	#####
EUtranCellRelation	createdBy	enumRef:CreatedByEutran	readOnly,noNotification

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

EUtranFreqRelation	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
--------------------	-----------	-------------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

ExternalENodeBFunction	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
------------------------	-----------	-------------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

ExternalEUtranCellFDD	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
-----------------------	-----------	-------------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

ExternalEUtranCellTDD	createdBy	enumRef:CreatedByEutran	readOnly,noNotification
-----------------------	-----------	-------------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

ExternalGeranCell	createdBy	enumRef:CreatedByIrat	readOnly,noNotification
-------------------	-----------	-----------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator.

Disturbances: None

Takes effects: Immediately

ExternalUtranCellFDD	createdBy	enumRef:CreatedByIrat	readOnly,noNotification
----------------------	-----------	-----------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator.

Disturbances: None

Takes effects: Immediately

GeranCellRelation	createdBy	enumRef:CreatedByIrat	readOnly,noNotification
-------------------	-----------	-----------------------	-------------------------

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator.

Disturbances: None

Takes effects: Immediately

TermPointToENB createdBy enumRef:CreatedByEutran readOnly,noNotification

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator or X2

Disturbances: None

Takes effects: Immediately

UtranCellRelation createdBy enumRef:CreatedByIrat readOnly,noNotification

Indicates whether the MO has been created by the Automated Neighbor Relations (ANR) function or operator.

Disturbances: None

Takes effects: Immediately

ENB3020> mom createdBy

Enum Values

CreatedByEutran 0:ANR, 1:X2, 2:OPERATOR
CreatedByIrat 0:OPERATOR, 1:ANR

ENB3020> get . createdBy

=====
=====
MO Attribute Value
=====

EutraNetwork=1,ExternalENodeBFunction=5010	createdBy	2 (OPERATOR)
EutraNetwork=1,ExternalENodeBFunction=5010,TermPointToENB=10.62.14.20	createdBy	2 (OPERATOR)
EutraNetwork=1,ExternalENodeBFunction=5010,ExternalEUTranCellFDD=73	createdBy	2 (OPERATOR)
EutraNetwork=1,ExternalENodeBFunction=5002	createdBy	2 (OPERATOR)
EutraNetwork=1,ExternalENodeBFunction=5002,ExternalEUTranCellFDD=9	createdBy	2 (OPERATOR)
EUTranCellFDD=72,EUTranFreqRelation=1	createdBy	2 (OPERATOR)
EUTranCellFDD=72,EUTranFreqRelation=_3000	createdBy	2 (OPERATOR)
EUTranCellFDD=72,EUTranFreqRelation=_3000,EUTranCellRelation=9	createdBy	2 (OPERATOR)
EUTranCellFDD=72,EUTranFreqRelation=_3000,EUTranCellRelation=_3000	createdBy	2 (OPERATOR)

=====
=====
Total: 9 MOs

ENB3012> lpr eutranet

=====

```
Proxy MO
=====
998 ENodeBFunction=1,EUtraNetwork=1
999 ENodeBFunction=1,EUtraNetwork=1,EUtranFrequency=1
1000 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017
1001 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165
1002 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017
1003 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016
1004 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179
1005 ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016
1006 ENodeBFunction=1,EUtraNetwork=1,EUtranFrequency=_3150
=====
Total: 9 MOs

ENB3012> lget eutranet !list

=====
=====
MO                               Attribute      Value
=====
=====
EUtraNetwork=1                  EUtraNetworkId 1
EUtraNetwork=1                  userLabel
EUtraNetwork=1,EUtranFrequency=1 EUtranFrequencyId 1
EUtraNetwork=1,EUtranFrequency=1 arfcnValueEUtranDI 5230
EUtraNetwork=1,EUtranFrequency=1 reservedBy      [2] =
>>> reservedBy = ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=1
>>> reservedBy = ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179
EUtraNetwork=1,EUtranFrequency=1 userLabel
EUtraNetwork=1,ExternalENodeBFunction=4017 ExternalENodeBFunctionId 4017
EUtraNetwork=1,ExternalENodeBFunction=4017 anrCreated      false
EUtraNetwork=1,ExternalENodeBFunction=4017 ctrlMode       0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4017 eNBId           104017
EUtraNetwork=1,ExternalENodeBFunction=4017 eNodeBPlmnId   Struct{3}
>>> 1.mcc = 262
>>> 2.mnc = 80
>>> 3.mncLength = 2
EUtraNetwork=1,ExternalENodeBFunction=4017 masterEnbFunctionId 1
EUtraNetwork=1,ExternalENodeBFunction=4017 removingMonitoringStart
EUtraNetwork=1,ExternalENodeBFunction=4017 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4017 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4017 userLabel
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 ExternalEUtranCellFDDId 4017_165
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 anrCreated      false
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 ctrlMode       0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 dlChannelBandwidth 20000
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 eutranFrequencyRef EUtraNetwork=1,EUtranFrequency=_3150
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 isRemoveAllowed false
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165 localCellId    165
```

```

EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 masterEUTranCellFDDId kienb4017_1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 physicalLayerCellIdGroup 55
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 physicalLayerSubCellId 0
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 removingMonitoringStart
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 reservedBy [1] =
>>> reservedBy = ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranFreqRelation=_3150,EUTranCellRelation=_26280104017165
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 tac 5120
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 ulChannelBandwidth 20000
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 userLabel kienb4017
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 TermPointToENBId 4017
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 administrativeState 1 (UNLOCKED)
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 anrCreated false
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 availabilityStatus 0 (NO_STATUS)
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 ctrlMode 0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 domainName
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 ipAddress 10.62.11.27
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 operationalState 1 (ENABLED)
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 usedIpAddress 10.62.11.27
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 x2locallyInitiated false
EUtraNetwork=1,ExternalENodeBFunction=4016 ExternalENodeBFunctionId 4016
EUtraNetwork=1,ExternalENodeBFunction=4016 anrCreated false
EUtraNetwork=1,ExternalENodeBFunction=4016 ctrlMode 0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4016 eNBId 104016
EUtraNetwork=1,ExternalENodeBFunction=4016 eNodeBPlmnId Struct{3}
>>> 1.mcc = 262
>>> 2.mnc = 80
>>> 3.mncLength = 2
EUtraNetwork=1,ExternalENodeBFunction=4016 masterEnbFunctionId 1
EUtraNetwork=1,ExternalENodeBFunction=4016 removingMonitoringStart
EUtraNetwork=1,ExternalENodeBFunction=4016 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4016 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4016 userLabel
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 ExternalEUTranCellFDDId 4016_179
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 anrCreated false
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 ctrlMode 0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 dlChannelBandwidth 0
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 eutraFrequencyRef EUtraNetwork=1,EutraFrequency=1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 isRemoveAllowed false
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 localCellId 179
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 masterEUTranCellFDDId kienb4016_3
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 physicalLayerCellIdGroup 59
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 physicalLayerSubCellId 2
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 removingMonitoringStart
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 reservedBy [1] =
>>> reservedBy = ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranFreqRelation=1,EUTranCellRelation=4016_179

```

```
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179 tac 3584
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179 ulChannelBandwidth 0
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUtranCellFDD=4016_179 userLabel kienb4016
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 TermPointToENBId 4016
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 administrativeState 0 (LOCKED)
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 anrCreated false
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 availabilityStatus 0 (NO_STATUS)
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 ctrlMode 0 (MANUAL)
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 domainName
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 ipAddress 10.62.11.26
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 operationalState 0 (DISABLED)
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 timeOfAnrCreation
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 timeOfAnrModification
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 usedIpAddress 0.0.0.0
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 x2locallyInitiated true
EUtraNetwork=1,EUtranFrequency=_3150 EUtranFrequencyId _3150
EUtraNetwork=1,EUtranFrequency=_3150 arfcnValueEUtranDI 3150
EUtraNetwork=1,EUtranFrequency=_3150 reservedBy [2] =
>>> reservedBy = ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUtranCellFDD=4017_165
>>> reservedBy = ENodeBFunction=1,EUtranCellFDD=kienb3012_1,EUtranFreqRelation=_3150
EUtraNetwork=1,EUtranFrequency=_3150 userLabel
=====
=====
Total: 9 MOs
```

ENB3012> lhget eutranet list

```
=====
=====
MO gUGroupIdList mcc mmeGI mnc mncLength
=====
=====
EUtraNetwork=1,ExternalENodeBFunction=4016 t[16] =
EUtraNetwork=1,ExternalENodeBFunction=4016 t[0] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[1] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[2] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[3] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[4] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[5] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[6] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[7] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[8] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[9] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[10] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[11] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[12] 0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[13] 0 0 0 2
```

```

EUtraNetwork=1,ExternalENodeBFunction=4016 t[14]    0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4016 t[15]    0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[16] =
EUtraNetwork=1,ExternalENodeBFunction=4017 t[0]      262 32768 80 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[1]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[2]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[3]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[4]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[5]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[6]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[7]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[8]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[9]      0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[10]     0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[11]     0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[12]     0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[13]     0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[14]     0 0 0 2
EUtraNetwork=1,ExternalENodeBFunction=4017 t[15]     0 0 0 2

```

```

=====
=====
Total: 2 MOs

```

Added 2 MOs to group: hget_group

```

.
=====
=====
MO                                bPlmnList mcc mnc mncLength
=====
=====
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[6] =
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[0]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[1]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[2]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[3]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[4]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179 t[5]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[6] =
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[0]  262 80 2
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[1]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[2]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[3]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[4]  -1 -1 -1
EUtraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165 t[5]  -1 -1 -1

```

```

=====
=====
Total: 2 MOs

```

Added 2 MOs to group: hget_group

ENB3012> mom . x2

#####

MO Class	Attribute	Type	Flags
#####	#####	#####	#####
AnrFunction	x2SetupPolicy	boolean	

Indicates if X2 is to be set up when an ExternalEnbFunction that is not in the x2BlackList is created by ANR (Automatic Neighbor Relations).
Takes effect: Immediately.
Default=true

ENodeBFunction	x2BlackList	sequence:structRef-GlobalEnbId
----------------	-------------	--------------------------------

A list of blacklisted eNBId. X2 may not be set up to any neighbor eNodeB in this list.
Takes effect: Immediately.
Disturbances: If ANR is active and an eNB is added to the list, any termPointToEnb for this external eNB is removed.
MaxLength=64

ENodeBFunction	x2WhiteList	sequence:structRef-GlobalEnbId
----------------	-------------	--------------------------------

A list of whitelisted eNBId. ANR (Automatic Neighbor Relations) is not allowed to disconnect X2 to any neighbor eNodeB in this list.
Takes effect: Immediately.
MaxLength=64

ENodeBFunction	x2retryTimerMaxAuto	long
----------------	---------------------	------

This parameter specifies the maximum retry interval for X2 setup when ctrlMode=Auto for the TermPointToEnb. See parameter x2RetryTimerStart.
Unit: 1 minute
Resolution: -
Takes effect: Immediately.
Range: 0 to 60000, Default=1440

ENodeBFunction	x2retryTimerStart	long
----------------	-------------------	------

This parameter is, together with the parameter x2retryTimerMaxAuto and the value timeToWait received in message x2SetupFail, used to determine what value to use for the x2RetryTimer. This is the timer that controls the time until next retry of X2 setup after failed X2 setup or X2 link break. It is used for SCTP and X2AP retries. The timer value is calculated as follows (W = timeToWait, 0 if not received):
1) At link break and first retry: x2RetryTimer is set to a random value, unique for each eNodeB, in the range of [W.. x2RetryTimerStart+W].
2) At subsequent retries when the eNB is whitelisted: x2RetryTimer = x2RetryTimerStart.
3) At subsequent retries when the eNB is not whitelisted : x2RetryTimer = min[2^(n-2)*x2RetryTimerStart, x2retryTimerMaxAuto] where n is retry number.
Unit: 1 s
Resolution: 1
Takes effect: Immediately.
Range: 0 to 1000, Default=30

TermPointToENB x2locallyInitiated boolean readOnly

Indicates if the local eNB initiated the SCTP association and X2 Setup Procedure, and not the remote eNB. The initiator is responsible for initiating SCTP association and X2 Setup Procedure after an X2 failure.

ENB3012> get !enodeb x2

=====		
=====		
MO	Attribute	Value
=====		
=====		
AnrFunction=1	x2SetupPolicy	true
EUtraNetwork=1,ExternalENodeBFunction=4016,TermPointToENB=4016 x2locallyInitiated true		
EUtraNetwork=1,ExternalENodeBFunction=4017,TermPointToENB=4017 x2locallyInitiated false		
=====		
=====		
Total: 3 MOs		

ENB3012> hget enodebf black

=====				
=====				
MO	x2BlackList enbld mcc mnc mncLength			
=====				
=====				
ENodeBFunction=1 t[64] =				
ENodeBFunction=1 t[0]	0	1	1	2
ENodeBFunction=1 t[1]	0	1	1	2
ENodeBFunction=1 t[2]	0	1	1	2
ENodeBFunction=1 t[3]	0	1	1	2
ENodeBFunction=1 t[4]	0	1	1	2
ENodeBFunction=1 t[5]	0	1	1	2
ENodeBFunction=1 t[6]	0	1	1	2
ENodeBFunction=1 t[7]	0	1	1	2
ENodeBFunction=1 t[8]	0	1	1	2
ENodeBFunction=1 t[9]	0	1	1	2
ENodeBFunction=1 t[10]	0	1	1	2
ENodeBFunction=1 t[11]	0	1	1	2
ENodeBFunction=1 t[12]	0	1	1	2
ENodeBFunction=1 t[13]	0	1	1	2
ENodeBFunction=1 t[14]	0	1	1	2
ENodeBFunction=1 t[15]	0	1	1	2
ENodeBFunction=1 t[16]	0	1	1	2
ENodeBFunction=1 t[17]	0	1	1	2
ENodeBFunction=1 t[18]	0	1	1	2
ENodeBFunction=1 t[19]	0	1	1	2

ENodeBFunction=1 t[20] 0 1 1 2
ENodeBFunction=1 t[21] 0 1 1 2
ENodeBFunction=1 t[22] 0 1 1 2
ENodeBFunction=1 t[23] 0 1 1 2
ENodeBFunction=1 t[24] 0 1 1 2
ENodeBFunction=1 t[25] 0 1 1 2
ENodeBFunction=1 t[26] 0 1 1 2
ENodeBFunction=1 t[27] 0 1 1 2
ENodeBFunction=1 t[28] 0 1 1 2
ENodeBFunction=1 t[29] 0 1 1 2
ENodeBFunction=1 t[30] 0 1 1 2
ENodeBFunction=1 t[31] 0 1 1 2
ENodeBFunction=1 t[32] 0 1 1 2
ENodeBFunction=1 t[33] 0 1 1 2
ENodeBFunction=1 t[34] 0 1 1 2
ENodeBFunction=1 t[35] 0 1 1 2
ENodeBFunction=1 t[36] 0 1 1 2
ENodeBFunction=1 t[37] 0 1 1 2
ENodeBFunction=1 t[38] 0 1 1 2
ENodeBFunction=1 t[39] 0 1 1 2
ENodeBFunction=1 t[40] 0 1 1 2
ENodeBFunction=1 t[41] 0 1 1 2
ENodeBFunction=1 t[42] 0 1 1 2
ENodeBFunction=1 t[43] 0 1 1 2
ENodeBFunction=1 t[44] 0 1 1 2
ENodeBFunction=1 t[45] 0 1 1 2
ENodeBFunction=1 t[46] 0 1 1 2
ENodeBFunction=1 t[47] 0 1 1 2
ENodeBFunction=1 t[48] 0 1 1 2
ENodeBFunction=1 t[49] 0 1 1 2
ENodeBFunction=1 t[50] 0 1 1 2
ENodeBFunction=1 t[51] 0 1 1 2
ENodeBFunction=1 t[52] 0 1 1 2
ENodeBFunction=1 t[53] 0 1 1 2
ENodeBFunction=1 t[54] 0 1 1 2
ENodeBFunction=1 t[55] 0 1 1 2
ENodeBFunction=1 t[56] 0 1 1 2
ENodeBFunction=1 t[57] 0 1 1 2
ENodeBFunction=1 t[58] 0 1 1 2
ENodeBFunction=1 t[59] 0 1 1 2
ENodeBFunction=1 t[60] 0 1 1 2
ENodeBFunction=1 t[61] 0 1 1 2
ENodeBFunction=1 t[62] 0 1 1 2
ENodeBFunction=1 t[63] 0 1 1 2

=====

Total: 1 MOs

Added 1 MOs to group: hget_group

ENB3012> hget enodebf white

=====				
=====				
MO	x2WhiteList enbld mcc mnc mncLength			
=====				
=====				
ENodeBFunction=1 t[64] =				
ENodeBFunction=1 t[0]	0	1	1	2
ENodeBFunction=1 t[1]	0	1	1	2
ENodeBFunction=1 t[2]	0	1	1	2
ENodeBFunction=1 t[3]	0	1	1	2
ENodeBFunction=1 t[4]	0	1	1	2
ENodeBFunction=1 t[5]	0	1	1	2
ENodeBFunction=1 t[6]	0	1	1	2
ENodeBFunction=1 t[7]	0	1	1	2
ENodeBFunction=1 t[8]	0	1	1	2
ENodeBFunction=1 t[9]	0	1	1	2
ENodeBFunction=1 t[10]	0	1	1	2
ENodeBFunction=1 t[11]	0	1	1	2
ENodeBFunction=1 t[12]	0	1	1	2
ENodeBFunction=1 t[13]	0	1	1	2
ENodeBFunction=1 t[14]	0	1	1	2
ENodeBFunction=1 t[15]	0	1	1	2
ENodeBFunction=1 t[16]	0	1	1	2
ENodeBFunction=1 t[17]	0	1	1	2
ENodeBFunction=1 t[18]	0	1	1	2
ENodeBFunction=1 t[19]	0	1	1	2
ENodeBFunction=1 t[20]	0	1	1	2
ENodeBFunction=1 t[21]	0	1	1	2
ENodeBFunction=1 t[22]	0	1	1	2
ENodeBFunction=1 t[23]	0	1	1	2
ENodeBFunction=1 t[24]	0	1	1	2
ENodeBFunction=1 t[25]	0	1	1	2
ENodeBFunction=1 t[26]	0	1	1	2
ENodeBFunction=1 t[27]	0	1	1	2
ENodeBFunction=1 t[28]	0	1	1	2
ENodeBFunction=1 t[29]	0	1	1	2
ENodeBFunction=1 t[30]	0	1	1	2
ENodeBFunction=1 t[31]	0	1	1	2
ENodeBFunction=1 t[32]	0	1	1	2
ENodeBFunction=1 t[33]	0	1	1	2
ENodeBFunction=1 t[34]	0	1	1	2
ENodeBFunction=1 t[35]	0	1	1	2
ENodeBFunction=1 t[36]	0	1	1	2
ENodeBFunction=1 t[37]	0	1	1	2
ENodeBFunction=1 t[38]	0	1	1	2
ENodeBFunction=1 t[39]	0	1	1	2

ENodeBFunction=1 t[40]	0	1	1	2
ENodeBFunction=1 t[41]	0	1	1	2
ENodeBFunction=1 t[42]	0	1	1	2
ENodeBFunction=1 t[43]	0	1	1	2
ENodeBFunction=1 t[44]	0	1	1	2
ENodeBFunction=1 t[45]	0	1	1	2
ENodeBFunction=1 t[46]	0	1	1	2
ENodeBFunction=1 t[47]	0	1	1	2
ENodeBFunction=1 t[48]	0	1	1	2
ENodeBFunction=1 t[49]	0	1	1	2
ENodeBFunction=1 t[50]	0	1	1	2
ENodeBFunction=1 t[51]	0	1	1	2
ENodeBFunction=1 t[52]	0	1	1	2
ENodeBFunction=1 t[53]	0	1	1	2
ENodeBFunction=1 t[54]	0	1	1	2
ENodeBFunction=1 t[55]	0	1	1	2
ENodeBFunction=1 t[56]	0	1	1	2
ENodeBFunction=1 t[57]	0	1	1	2
ENodeBFunction=1 t[58]	0	1	1	2
ENodeBFunction=1 t[59]	0	1	1	2
ENodeBFunction=1 t[60]	0	1	1	2
ENodeBFunction=1 t[61]	0	1	1	2
ENodeBFunction=1 t[62]	0	1	1	2
ENodeBFunction=1 t[63]	0	1	1	2

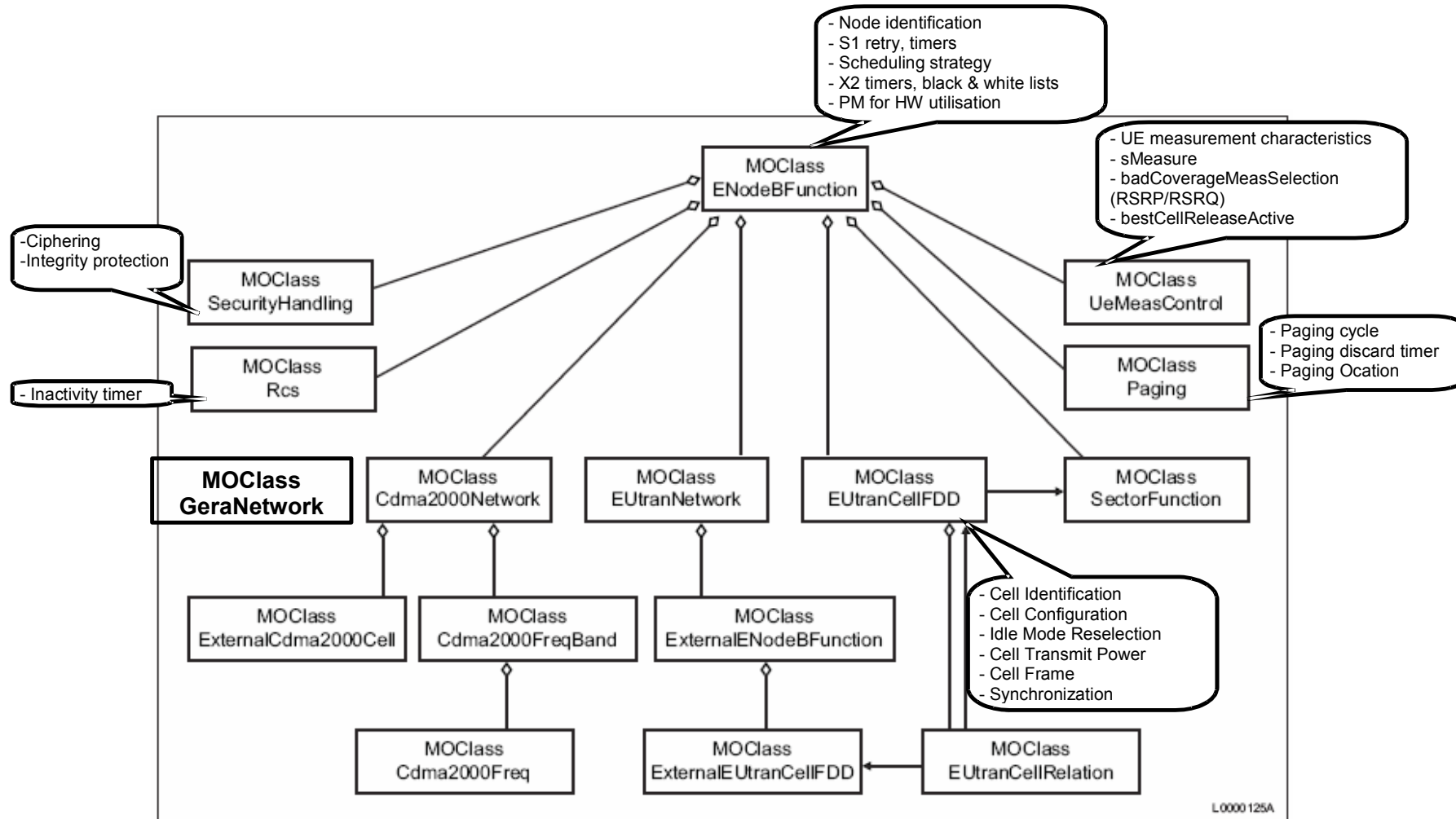
=====

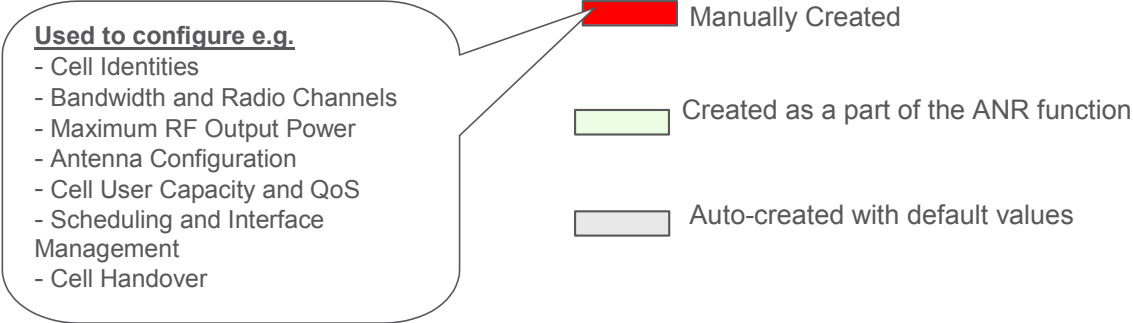
=====

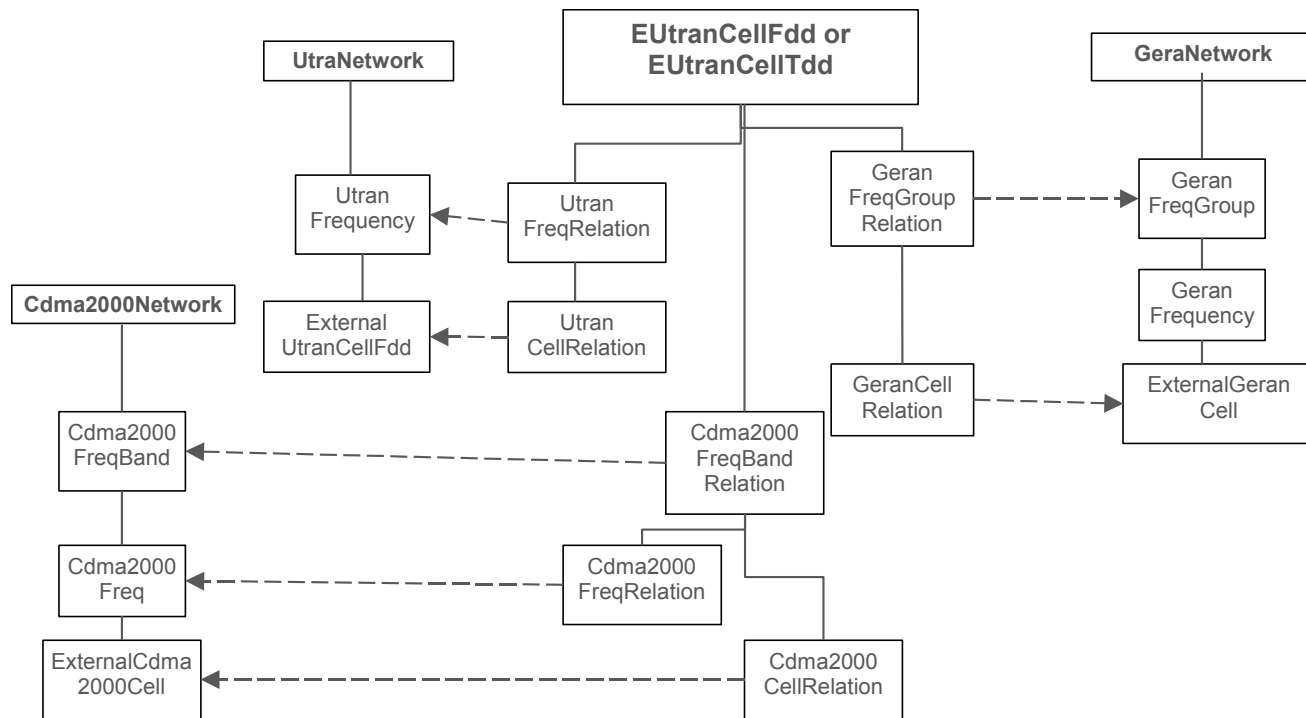
Total: 1 MOs

Added 1 MOs to group: hget_group

3.8 Radio network/Air interface







ENB3012> lma traffic enodebf

Added 52 MOs to group: traffic

ENB3012> lmr traffic eutranet|mme=|pmeventser|rbsconfigu|systemconst|uctool

Removed 15 MOs from group: traffic

ENB3012> pr traffic

```
=====
Proxy MO
=====
979 ENodeBFunction=1
1027 ENodeBFunction=1,AnrFunction=1
1017 ENodeBFunction=1,EUTranCellFDD=kienb3012_1
1020 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranFreqRelation=1
1021 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranFreqRelation=1,EUTranCellRelation=4016_179
1018 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranFreqRelation=_3150
1019 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,EUTranCellRelation=_3150,EUTranCellRelation=_26280104017165
1022 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,UeMeasControl=1
1025 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBadCovPrim=1
1023 ENodeBFunction=1,EUTranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBadCovSec=1
```

```

1024 ENodeBFunction=1,EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBestCell=1
1011 ENodeBFunction=1,Paging=1
984 ENodeBFunction=1,QciTable=default
990 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=1
992 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=2
996 ENodeBFunction=1,QciTable=default,LogicalChannelGroup=3
994 ENodeBFunction=1,QciTable=default,QciProfilePredefined=default
985 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci1
989 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci2
993 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci3
997 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci4
987 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci5
988 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci6
991 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci7
995 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci8
986 ENodeBFunction=1,QciTable=default,QciProfilePredefined=qci9
980 ENodeBFunction=1,RadioBearerTable=default
982 ENodeBFunction=1,RadioBearerTable=default,DataRadioBearer=1
983 ENodeBFunction=1,RadioBearerTable=default,MACConfiguration=1
981 ENodeBFunction=1,RadioBearerTable=default,SignalingRadioBearer=1
1028 ENodeBFunction=1,Rcs=1
1012 ENodeBFunction=1,Rrc=1
1009 ENodeBFunction=1,SecurityHandling=1
1013 ENodeBFunction=1,SrbTable=default
1016 ENodeBFunction=1,SrbTable=default,Srb1Profile=1
1014 ENodeBFunction=1,SrbTable=default,Srb2Profile=1
1015 ENodeBFunction=1,SrbTable=default,SrbLogicalChannelGroup=1

```

```

=====
Total: 37 MOs

```

Checking all MOs connected to a Cell

ENB3012> lk eutrancellfdd=kienb3012_1

```

=====
Proxy  Adm State   Op. State   MOs linked to 1017:EUtranCellFDD=kienb3012_1
=====
1017 1 (UNLOCKED) 1 (ENABLED) EUtranCellFDD=kienb3012_1
1022      EUtranCellFDD=kienb3012_1,UeMeasControl=1
1020      EUtranCellFDD=kienb3012_1,EUtranFreqRelation=1
1018      EUtranCellFDD=kienb3012_1,EUtranFreqRelation=_3150
1024      EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBestCell=1
1023      EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBadCovSec=1
1025      EUtranCellFDD=kienb3012_1,UeMeasControl=1,ReportConfigEutraBadCovPrim=1
1021      EUtranCellFDD=kienb3012_1,EUtranFreqRelation=1,EUtranCellRelation=4016_179
1019      EUtranCellFDD=kienb3012_1,EUtranFreqRelation=_3150,EUtranCellRelation=_26280104017165
1032 1 (UNLOCKED) 1 (ENABLED) SectorEquipmentFunction=S1
157      AntennaUnitGroup=1,RfBranch=A

```

```

158           AntennaUnitGroup=1,RfBranch=B
194       1 (ENABLED)  RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1
195       0 (DISABLED) RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_2
190 1 (UNLOCKED) 1 (ENABLED)  RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
192 1 (UNLOCKED) 1 (ENABLED)  RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=B
188 0 (LOCKED) 1 (ENABLED)  RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXA_IO
189 0 (LOCKED) 1 (ENABLED)  RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=RXB_IO
=====

```

Total: 18 MOs

Added 18 MOs to group: lk_group

ENB3012> get lk_group ref\$

```

=====
=====
MO                               Attribute      Value
=====
=====
EUTranCellFDD=kienb3012_1        qciTableRef
EUTranCellFDD=kienb3012_1        radioBearerTableRef
EUTranCellFDD=kienb3012_1        sectorFunctionRef SectorEquipmentFunction=S1
EUTranCellFDD=kienb3012_1        srbTableRef
EUTranCellFDD=kienb3012_1,EUTranFreqRelation=1      eutraFrequencyRef EutraNetwork=1,EUTranFrequency=1
EUTranCellFDD=kienb3012_1,EUTranFreqRelation=1,EUTranCellRelation=4016_179 neighborCellRef
EutraNetwork=1,ExternalENodeBFunction=4016,ExternalEUTranCellFDD=4016_179
EUTranCellFDD=kienb3012_1,EUTranFreqRelation=_3150  eutraFrequencyRef EutraNetwork=1,EUTranFrequency=_3150
EUTranCellFDD=kienb3012_1,EUTranFreqRelation=_3150,EUTranCellRelation=_26280104017165 neighborCellRef
EutraNetwork=1,ExternalENodeBFunction=4017,ExternalEUTranCellFDD=4017_165
AntennaUnitGroup=1,RfBranch=A      auPortRef      [1] =
>>> auPortRef = Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=A
AntennaUnitGroup=1,RfBranch=A      rfPortRef      RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=A
AntennaUnitGroup=1,RfBranch=A      tmaRef
AntennaUnitGroup=1,RfBranch=B      auPortRef      [1] =
>>> auPortRef = Equipment=1,AntennaUnitGroup=1,AntennaUnit=1,AntennaSubunit=1,AuPort=B
AntennaUnitGroup=1,RfBranch=B      rfPortRef      RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,DeviceGroup=ru,RfPort=B
AntennaUnitGroup=1,RfBranch=B      tmaRef
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_1 remoteRiPortRef Subrack=1,Slot=1,PlugInUnit=1,RiPort=C
RbsSubrack=1,RbsSlot=1,AuxPlugInUnit=RU-1-1,RiPort=DATA_2 remoteRiPortRef
SectorEquipmentFunction=S1        rfBranchRef     [2] =
>>> rfBranchRef = Equipment=1,AntennaUnitGroup=1,RfBranch=A
>>> rfBranchRef = Equipment=1,AntennaUnitGroup=1,RfBranch=B
=====
=====
Total: 10 MOs

```

Checking the PCI of a cell

PCI = 3 x physicalLayerCellIdGroup [0-167] + physicalLayerSubCellId [0-2] -> 504 Unique Cell Identities.

ENB89> hget fdd cellid

MO	cellId	physicalLayerCellIdGroup	physicalLayerSubCellId
----	--------	--------------------------	------------------------

EUtranCellFDD=DXLT89A 1	79	0	=> PCI=3x79+0=237
EUtranCellFDD=DXLT89B 2	79	1	=> PCI=3X79+1=238
EUtranCellFDD=DXLT89C 3	79	2	=> PCI=3X79+2=239

Total: 3 MOs

Checking DL output Power

$$\text{Power in sector (W)} = \text{sectorPower} = \min [\# \text{ RU} \times \text{HWcap} \times \text{partOfRadioPower}, \text{sum of power capacity licenses} / \# \text{ sectors}, \text{confOutputPower}]$$

SectorEquipmentFunction	sectorPower	long	readOnly,nonPersistent
-------------------------	-------------	------	------------------------

The available sector power.

The value represents the sum of the power for all Radio Units used by the sector and is the minimum of either of; sum of the RU capabilities, sum of the allocated output power capacity licenses, confOutputPower.

Unit: 1 Watt

```
DXLT89 > hget fdd|sector power
```

MO maximumTransmissionPower partOfRadioPower partOfSectorPower

EUtranCellFDD=DXLT89B 430	50	50
EUtranCellFDD=DXLT89A 460	100	100
EUtranCellFDD=DXLT89C 460	100	100

Total: 3 MOs

MO confOutputPower sectorPower

```
SectorEquipmentFunction=1 40      40
SectorEquipmentFunction=2 40      40
SectorEquipmentFunction=3 40      40
```

```
=====
=====
Total: 3 MOs

DXLT89 > invl power

=====
=====
Capacity          keyId    licenseState licenseCapacity capacityUnit      hardLimit percentileConf
=====
=====
OutputPower=40Watt      CXC4010625 1 (ENABLED) 3          Nr of 40 Watt Licenses
OutputPower=60Watt      CXC4010626 0 (DISABLED) 0          Nr of 60 Watt Licenses
=====
=====
```

Changing the Cell tracking area code

Currently the tac attribute must be the same on all cells, therefore they must be set simultaneously to avoid inconsistencies

```
ENB32> set1 ,eutrancellfdd= tac 5120
```

```
=====
=====
Id MO              tac      Result
=====
=====
911 EUtranCellFDD=32_1      5120    >>> Set.
923 EUtranCellFDD=32_2      5120    >>> Set.
941 EUtranCellFDD=32_3      5120    >>> Set.
=====
=====
Total: 3 MOs attempted, 3 MOs set
```

Changing the plmnid

the plmn info in ENodeBFunction and EUtranCell are interdependent, therefore we must change both at the same time, using option “1”. Since the attribute name is different we use eset command to do pattern matching.

```
kienb3003> momd . . plmnid !deprecated|readonly
```

```
#####
#####
MO Class      Attribute      Type      Flags
#####
#####
```

ENodeBFunction	eNodeBPlmnId	structRef:PlmnIdentity	
EUtranCellFDD	additionalPlmnList	sequence:structRef-PlmnIdentity	
EUtranCellTDD	additionalPlmnList	sequence:structRef-PlmnIdentity	
EUtranFreqRelation	allowedPlmnList	sequence:structRef-PlmnIdentity	
ExternalENodeBFunction	eNodeBPlmnId	structRef:PlmnIdentity	mandatory
ExternalEUtranCellFDD	activePlmnList	sequence:structRef-PlmnIdentity	
ExternalEUtranCellTDD	activePlmnList	sequence:structRef-PlmnIdentity	
ExternalGeranCell	plmnIdentity	structRef:PlmnIdentity	mandatory
ExternalUtranCellFDD	plmnIdentity	structRef:PlmnIdentity	mandatory
GeranFreqGroupRelation	allowedPlmnList	sequence:structRef-PlmnIdentity	
UtranFreqRelation	allowedPlmnList	sequence:structRef-PlmnIdentity	

ENB32> get . plmnid|plmnlist

=====		
MO	Attribute	Value
=====		
ENodeBFunction=1	eNodeBPlmnId	Struct{3}
>>> 1.mcc = 262		
>>> 2.mnc = 80		
>>> 3.mncLength = 2		
EUtranCellFDD=kienb4016_2	bPlmnList	t[1] =
>>> Struct[0] has 3 members:		
>>> 1.mcc = 262		
>>> 2.mnc = 80		
>>> 3.mncLength = 2		
EUtranCellFDD=kienb4016_1	bPlmnList	t[1] =
>>> Struct[0] has 3 members:		
>>> 1.mcc = 262		
>>> 2.mnc = 80		
>>> 3.mncLength = 2		
EUtranCellFDD=kienb4016_3	bPlmnList	t[1] =
>>> Struct[0] has 3 members:		
>>> 1.mcc = 262		
>>> 2.mnc = 80		
>>> 3.mncLength = 2		
=====		
=====		
Total: 4 MOs		

ENB32> eset1 . plmnid|plmnlist mcc=262,mnc=2,mnclength=2

Set following 4 attributes?

=====			
=====			
899	ENodeBFunction=1	eNodeBPlmnId	

924 EUTranCellFDD=kienb4016_2 bPlmnList
932 EUTranCellFDD=kienb4016_1 bPlmnList
942 EUTranCellFDD=kienb4016_3 bPlmnList

=====
Set 4 attributes. Are you Sure [y/n] ? y

=====
=====

Id MO	Attribute	Value	Result
899	ENodeBFunction=1	eNodeBPlmnId	mcc:i=240,mnc:i=81,mncLength:i=2 >>> Set.
924	EUTranCellFDD=kienb4016_2	bPlmnList	mcc:i=240,mnc:i=81,mncLength:i=2 >>> Set.
932	EUTranCellFDD=kienb4016_1	bPlmnList	mcc:i=240,mnc:i=81,mncLength:i=2 >>> Set.
942	EUTranCellFDD=kienb4016_3	bPlmnList	mcc:i=240,mnc:i=81,mncLength:i=2 >>> Set.

=====
=====

=====
Total: 4 attributes attempted, 4 attributes set

ENB32> get ^enodebf|^eutrancellfdd plmn

=====
=====

MO	Attribute	Value
ENodeBFunction=1	eNodeBPlmnId	Struct{3}
>>> 1.mcc = 240		
>>> 2.mnc = 81		
>>> 3.mncLength = 2		
EUTranCellFDD=kienb4016_2	bPlmnList	t[1] =
>>> Struct[1] has 3 members:		
>>> 1.mcc = 240		
>>> 2.mnc = 81		
>>> 3.mncLength = 2		
EUTranCellFDD=kienb4016_1	bPlmnList	t[1] =
>>> Struct[1] has 3 members:		
>>> 1.mcc = 240		
>>> 2.mnc = 81		
>>> 3.mncLength = 2		
EUTranCellFDD=kienb4016_3	bPlmnList	t[1] =
>>> Struct[1] has 3 members:		
>>> 1.mcc = 240		
>>> 2.mnc = 81		
>>> 3.mncLength = 2		

=====
=====

Total: 4 MOs

Differences FDD/TDD

Compare the printout of :

momd eutrancellfdd .

and

momd eutrancelltdd .

We can see:

<u>EUtranCellFDD attributes</u>	<u>EUtranCellTDD attributes</u>
earfcndl/earfcnul	earfcn
dlChannelBandwidth/ulChannelBandwidth	channelBandwidth
symbolOffsetTest/timeOffsetTest	specialSubframePattern/subframeAssignment

4 Performance Monitoring

4.1 Scanner handling

Checking what counters are monitored

ENB0621> pst

=====	
PROXY	SCANNER-NAME
=====	
STATE	
=====	
1	PREDEF.STATS
2	PREDEF.10000.CELLTRACE
3	PREDEF.10001.CELLTRACE
4	PREDEF.10002.CELLTRACE
5	PREDEF.10003.CELLTRACE
6	PREDEF.10004.CELLTRACE
7	PREDEF.10005.CELLTRACE
=====	
>>> Total: 7 Scanners	

kienb4016> pgets stats

=====

1 PREDEF.STATS ACTIVE 900 115

```
=====
EUTranCellFDD      39 pmCellDowntimeAuto
pmCellDowntimeMan
pmRrcConnEstabAtt
pmRrcConnEstabSucc
pmS1SigConnEstabAtt
pmS1SigConnEstabSucc
pmPrbUsedUI
pmPrbUsedDI
pmPrbAvailUI
pmPrbAvailDI
pmSessionTimeUe
pmRrcConnEstabFailLic
pmErabEstabAttInit
pmErabEstabAttAdded
pmErabEstabSuccInit
pmErabEstabSuccAdded
pmErabEstabFailAddedLic
pmErabEstabFailInitLic
pmErabRelAbnormalEnbAct
pmUeCtxtRelAbnormalEnbAct
pmPdcPVolDIDrbLastTTI
pmUeThpTimeDI
pmPdcPVolDISrb
pmPdcPVolDIDrb
pmPdcPLatTimeDI
pmPdcPLatPktTransDI
pmPdcPVolUIDrbLastTTI
pmUeThpTimeUI
pmPdcPVolUISrb
pmPdcPVolUIDrb
pmPdcPpktTransDI
pmPdcPpktDiscDIPelr
pmPdcPpktReceivedUI
pmPdcPpktLostUI
pmHoPrepRejInLicConnUsers
pmHoPrepRejInLicMob
pmPdcPpktDiscDIPelrUu
pmErabRelMmeAct
pmUeCtxtRelMmeAct
EUTranCellRelation 4 pmHoPrepSuccLteIntraF
pmHoPrepAttLteIntraF
pmHoExeSuccLteIntraF
pmHoExeAttLteIntraF
DIBasebandCapacity 22 pmLicDICapDistr [20]
pmLicDICapLicense
pmLicDICapActual
UIBasebandCapacity 22 pmLicUICapDistr [20]
```

```

    pmLicUICapLicense
    pmLicUICapActual
CapacityConnectedUsers      28 pmLicConnectedUsersDistr [24]
    pmLicConnectedUsersLicense
    pmLicConnectedUsersHardLimit
    pmLicConnectedUsersTimeCong
    pmLicConnectedUsersActual
=====
>>> Total: 1 Scanners

```

Checking what counters are available

```

ENB4016 > pmomc nodeb

#####
MO Class      Pm Counters
#####
ENodeBFunction      2
    pmHwUtilDI
    pmHwUtilUI
-----
EUTranCellFDD      182
    pmActiveDrbDISum
    pmActiveDrbUISum
    pmActiveUeDISum
....
    pmZtemporary8
    pmZtemporary9
-----
PmUeMeasControl      4
    pmUeMeasRsrpDeltaIntraFreq1
    pmUeMeasRsrpServIntraFreq1
    pmUeMeasRsrqDeltaIntraFreq1
    pmUeMeasRsrqServIntraFreq1
-----
SecurityHandling      2
    pmRrcSecFailIntegrity
    pmRrcSecFailUnexpectedMsg
-----

```

Enter a second argument in the pmom command for description of a counter (or type "h pmom" for help).

Total: 383 counters

Adding more counters to the scanners

```

ENB300> pcr allcounters .

```

```
>>> scannerId:7672

ENB300> pgets 7672

=====
7672  USERDEF.allcounters.STATS          ACTIVE   900 704
=====
CapacityConnectedUsers      28 pmLicConnectedUsersActual
                               pmLicConnectedUsersDistr [24]
                               pmLicConnectedUsersHardLimit
                               pmLicConnectedUsersLicense
                               pmLicConnectedUsersTimeCong
DIBasebandCapacity          23 pmLicDIBCapActual
                               pmLicDIBCapDistr [20]
....
                               pmSctpStatSentChunksDropped
                               pmSctpStatSentControlChunks
                               pmSctpStatSentPackages
SecurityHandling            2 pmRrcSecFailIntegrity
                               pmRrcSecFailUnexpectedMsg
Synchronization             4 pmHDelayVarBest10Pct
                               pmHDelayVarBest1Pct
                               pmHDelayVarBest50Pct
                               pmMaxDelayVariation
UIBasebandCapacity          23 pmLicUICapActual
                               pmLicUICapDistr [20]
                               pmLicUICapLicense
                               pmLicUICapMax
VpnInterface                 1 pmOutDroppedPacketsPolicyControl
=====
>>> Total: 1 Scanners
```

4.2 Checking stats via ROP files

```
[~] moshell exercises/lte/kienb3001/KIENB3001_modump.zip

#####
#      Welcome to MoShell 8.0q      #
#      Finn Magnusson, Jan Pettersson      #
#      http://utran01.au.ao.ericsson.se/moshell      #
#      Contact: Finn.Magnusson@ericsson.com      #
#      David.Smith@ericsson.com      #
#####

unzip -ojq exercises/lte/kienb3001/KIENB3001_modump.zip -d /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/modump
```

Found MO dump: /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/modump/KIENB3001_dcg_k.log.gz

Found logfiles: exercises/lte/kienb3001/KIENB3001_logfiles.zip

Found ropfiles: exercises/lte/kienb3001/KIENB3001_ropfiles.zip

Found dcg CV: exercises/lte/kienb3001/KIENB3001_DCG_20101205_065111_duringfault.zip

Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_A_9_53_COMPLETE.xml.cache.gzDone.
.Connected to OFFLINE_KIENB3001_modump.zip (SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)
Last MO: 1141. Loaded 1141 MOs. Total: 1142 MOs.
Preparing offline MIB:
0% ~50% ~100%

.....

HELP MENU : h
QUIT : q

For offline browsing of PM ropfiles, run "pmr/pmx".
For offline browsing of CPP logfiles, run "lg[options]".

Printing counter values:

ENB3001> pmx . .

gzip -dc /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0900-0915.1.xml.gz | /home/eanzmagn/moshell/pmExtract -u ". " " | /home/eanzmagn/moshell/pmXtab -cols time -fmt txt -m "(?:\w+=[^,]+,){1,2}((\w+=[^,]+,)+\$)"

Report from 2010-11-12 09:00 UTC to 2010-11-12 09:14 UTC

INFO: The ROP files contain suspected faulty counter values.
They have been discarded but can be kept with pmr/pmx option "k" (pmrk/pmxk) or highlighted with pmx option "s" (pmxs)

INFO: The ROP files contain 147 empty counter values.
To print the empty counters, run command "pmxs".

Date: 2010-11-12		
Object	Counter	09:00
DummyMo=1	pmRopCounter	1
ENodeBFunction=1	pmHwUtilDI	
ENodeBFunction=1	pmHwUtilUI	
EUtranCellFDD=113	pmActiveDrbDISum	444950
EUtranCellFDD=113	pmActiveDrbUISum	295307
EUtranCellFDD=113	pmActiveUeDISum	954019
EUtranCellFDD=113	pmActiveUeUISum	554774
EUtranCellFDD=113	pmAnrNeighbreIAdd	0
EUtranCellFDD=113	pmAnrNeighbreIRem	0

EUtranCellFDD=113	pmBadCovEvalReport	0
EUtranCellFDD=113	pmBestCellEvalReport	19
EUtranCellFDD=113	pmCellDowntimeAuto	0
EUtranCellFDD=113	pmCellDowntimeMan	0
EUtranCellFDD=113	pmContDI	
EUtranCellFDD=113	pmContDICapLic	
EUtranCellFDD=113	pmContDIHw	
EUtranCellFDD=113	pmContDIPdcch	
EUtranCellFDD=113	pmContUI	
EUtranCellFDD=113	pmContUICapLic	
.....		
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmIfStatsIpInReceives	3044
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmIfStatsIpOutDiscards	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmIfStatsIpOutRequests	10525
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmIfStatsIpUnknownProtos	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmInDiscPolicy	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmInEsp	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmInPassedPolicy	3045
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmNoOfFailedPingsDefaultRouter0	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmNoOfFailedPingsDefaultRouter1	0
Subrack=1,Slot=1,PlugInUnit=1,ExchangeTerminalIp=1,GigaBitEthernet=1,IpInterface=2	pmNoOfFailedPingsDefaultRouter2	0
Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1	pmNoOfDot3StatsFCSErrors	0
Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1	pmNoOfDot3StatsLateCollisions	0
Synchronization=1	pmHDelayVarBest10Pct	
Synchronization=1	pmHDelayVarBest1Pct	
Synchronization=1	pmHDelayVarBest50Pct	
Synchronization=1	pmMaxDelayVariation	

Printing KPIs:

ENB3001> pmrg

unzip -oq exercises/lte/kienb3001/KIENB3001_ropfiles.zip -d /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles

Using formulafile /home/eanzmagn/moshell/commonjars/pm/FORMULA_ERBS_A_1_0.txt

Using configfile /home/eanzmagn/moshell/commonjars/pm/CONFIG_ERBS_A_1_0.txt

```
gzip -dc /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0815-0830.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0830-0845.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0845-0900.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0900-0915.1.xml.gz | /home/eanzmagn/moshell/pmExtract -u
"ManagedElement" "^ (pmActiveDrbDISum|pmActiveDrbUISum|pmActiveUeDISum|pmActiveUeUISum|pmAnrNeighbrelAdd|pmAnrNeighbrelRem|pmCellDowntimeAuto|
pmCellDowntimeMan|pmErabEstabAttAdded|pmErabEstabAttInit|pmErabEstabFailInit|pmErabEstabFailInitLic|pmErabEstabSuccAdded|pmErabEstabSuccInit|
pmErabRelAbnormalEnbAct|pmErabRelAbnormalEnbActCdt|pmErabRelAbnormalEnbActHo|pmErabRelAbnormalEnbActHpr|pmErabRelAbnormalEnbActTnFail|
pmErabRelAbnormalEnbActUeLost|pmErabRelMmeAct|pmErabRelNormalEnbAct|pmHoExeAttLteIntraF|pmHoExeSuccLteIntraF|pmHoPrepAttLteIntraF|
pmHoPrepRejInLicConnUsers|pmHoPrepRejInLicMob|pmHoPrepRejInLicMultiErab|pmHoPrepSuccLteIntraF|pmIfInOctetsLink1Hi|pmIfInOctetsLink1Lo|pmIfOutOctetsLink1Hi|
pmIfOutOctetsLink1Lo|pmLicConnectedUsersActual|pmLicConnectedUsersDistr|pmLicConnectedUsersHardLimit|pmLicConnectedUsersLicense|
pmLicConnectedUsersTimeCong|pmMacDelayTimeDI|pmMacHarqDIAck16qam|pmMacHarqDIAck64qam|pmMacHarqDIAckQpsk|pmMacHarqDIDtx16qam|
```

pmMacHarqDIDtx64qam|pmMacHarqDIDtxQpsk|pmMacHarqDINack16qam|pmMacHarqDINack64qam|pmMacHarqDINackQpsk|pmMacHarqUIDtx16qam|
pmMacHarqUIDtxQpsk|pmMacHarqUIFail16qam|pmMacHarqUIFailQpsk|pmMacHarqUISucc16qam|pmMacHarqUISuccQpsk|pmPagDiscarded|pmPagReceived|
pmPdcplLatPktTransDI|pmPdcplLatTimeDI|pmPdcplPktDiscDIHo|pmPdcplPktLostUI|pmPdcplPktReceivedDI|pmPdcplPktReceivedUI|pmPdcplPktTransDI|pmPdcplVolDIDrb|
pmPdcplVolDIDrbLastTTI|pmPdcplVolUIDrb|pmPdcplVolUIDrbLastTTI|pmRaAttCbra|pmRaFailCbraMsg2Disc|pmRaSuccCbra|pmRadioThpResDI|pmRadioThpResUI|
pmRadioThpVolDI|pmRadioThpVolUI|pmRadioTxRankDistr|pmRadioUeRepCqiDistr|pmRadioUeRepRankDistr|pmRlcArqDIack|pmRlcArqDINack|pmRlcArqUIack|
pmRlcArqUINack|pmRlcDelayPktTransDI|pmRlcDelayTimeDI|pmRopCounter|pmRrcConnEstabAtt|pmRrcConnEstabAttEm|pmRrcConnEstabAttHpa|pmRrcConnEstabAttMod|
pmRrcConnEstabAttMos|pmRrcConnEstabAttMta|pmRrcConnEstabFailLic|pmRrcConnEstabSucc|pmRrcConnLevSamp|pmRrcConnLevSum|pmRrcConnMax|
pmRrcSecFailIntegrity|pmRrcSecFailUnexpectedMsg|pmS1SigConnEstabAtt|pmS1SigConnEstabSucc|pmSchedActivityCellDI|pmSchedActivityCellUI|pmSessionTimeDrb|
pmSessionTimeUe|pmUeCtxtEstabAtt|pmUeCtxtEstabSucc|pmUeCtxtRelAbnormalEnb|pmUeCtxtRelAbnormalEnbAct|pmUeCtxtRelAbnormalEnbActCdt|
pmUeCtxtRelAbnormalEnbActHo|pmUeCtxtRelAbnormalEnbActTnFail|pmUeCtxtRelAbnormalEnbActUeLost|pmUeCtxtRelMme|pmUeCtxtRelMmeAct|pmUeCtxtRelNormalEnb|
pmUeCtxtRelSCCdma|pmUeCtxtRelSCEutra|pmUeCtxtRelSCWcdma|pmUeThpTimeDI|pmUeThpTimeUI)\$"

INFO: The ROP files contain 140 empty counter values.
To print the empty counters, run command "pmxs".

1) ERBS Node Traffic Performance, Whole Period
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Start Time: 2010-11-12 08:15:00 End Time: 2010-11-12 09:00:00

Object Counter

Acc_AddedERabEstabFailRateDueToMultipleLicense		N/A
Acc_AddedERabEstabSuccRate	N/A	
Acc_InitialERabEstabFailureRateDueToMultipleLicense		0
Acc_InitialERabEstabSuccRate	93.3	
Acc_InitialERabSetupSuccRate	1.0	
Acc_InitialUEContextEstabSuccRate	1.0	
Acc_PagingDiscardRate	0	
Acc_RandomAccessDecodingRate	0.4	
Acc_RandomAccessMSG2Congestion	0	
Acc_RrcConnSetupFailureRateDueToLackOfConnectedUsersLicense		0
Acc_RrcConnSetupRatioForEmergency	0	
Acc_RrcConnSetupRatioForHighPrioAccess	0	
Acc_RrcConnSetupRatioForMOData	0.1	
Acc_RrcConnSetupRatioForMOSignalling	0.8	
Acc_RrcConnSetupRatioForMobileTerminating	0.0	
Acc_RrcConnSetupSuccRate	0.9	
Acc_S1SigEstabSuccRate	1	
Av_CellAvail	100	
Av_CellDownAuto	0	
Av_CellDownMan	0	
Int_ActiveDRBsDI	0.8	
Int_ActiveDRBsUI	1.3	
Int_ActiveUEsDI	2.1	
Int_ActiveUEsUI	1.6	
Int_AverageDIMacDelay	N/A	
Int_AverageDIRlcDelay	N/A	
Int_DIlatency	4.4	

Int_DIPacketErrorLoss	0.1	
Int_DIPacketLossDueToHo	2.00025603277219e-05	
Int_DIRadioMeasCqiDistr	3226228	
Int_DIRadioMeasTxRankDistr	3221500	
Int_DIRadioMeasUeReportedTxRankDistr	3226372	
Int_DIRadioThroughput	0.1	
Int_DIThroughput	7309.2	
Int_MacHarqDISuccRate	N/A	
Int_MacHarqUISuccRate	N/A	
Int_RlcArqDISuccRate	185.3	
Int_RlcArqUISuccRate	510.2	
Int_UIPacketLoss	0.0	
Int_UIRadioThroughput	0.0	
Int_UIThroughput	2044.0	
Mob_AnrrNeighbreAdd	0	
Mob_AnrrNeighbreRemove	0	
Mob_HoExecSuccRate	1	
Mob_HoPrepRejInLicConnUsers	0	
Mob_HoPrepRejInLicMob	0	
Mob_HoPrepRejInLicMultiErab	0	
Mob_HoPrepSuccRate	1.0	
Mob_MobilitySuccRate	99.6	
Mob_SessionContinuityRel	0	
Oth_DrbVsUeSessionTimeRatio	0	
Oth_Msg3RachRrcConsistencyCheck	0.5	
Oth_RrcSecFailIntegrity	0	
Oth_RrcSecFailUnexpectedMsg	0	
Oth_UeCtxtEstablishmentAndReleaseConsistency	1.2	
Res_AverageLicConnectedUsers	16	
Res_AvgNrOfRrcConnectedUsers	N/A	
Res_LicConnectedUsersCapacityRatio	2.5	
Res_LicConnectedUsersDistr	3235852	
Res_PeakNrOfRrcConnectedUsers	0	
Res_TimeCongestionLicConnectedUsers	0	
Ret_ERabRelAbnormalENB	0.0	
Ret_ERabRelAbnormalENBCdt	0	
Ret_ERabRelAbnormalENBHoExec	0	
Ret_ERabRelAbnormalENBHoPrep	0	
Ret_ERabRelAbnormalENBTnFail	0	
Ret_ERabRelAbnormalENBUeLost	0.0	
Ret_ERabRelMME	0	
Ret_ERabRelNormalENB	0	
Ret_ERabRetainability	0.0	
Ret_ERabRelAbnormal	0.0	
Ret_MinPerDrop	20700	
Ret_UeCtxtRelAbnormal	0.0	
Ret_UeCtxtRelAbnormalENB	0.0	
Ret_UeCtxtRelAbnormalENBCdt	0	
Ret_UeCtxtRelAbnormalENBHoExec	0	

Ret_UeCtxtRelAbnormalENBTnFail	0
Ret_UeCtxtRelAbnormalENBUeLost	0.0
Ret_UeCtxtRelAbnormal_2	0.2
Ret_UeCtxtRelMME	0

2) ERBS Node Traffic Performance, Hour by Hour
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Date: 2010-11-12

Object Counter	08:00	09:00		
Acc_AddedERabEstabFailRateDueToMultipleLicense			N/A	N/A
Acc_AddedERabEstabSuccRate			N/A	N/A
Acc_InitialERabEstabFailureRateDueToMultipleLicense			0	0
Acc_InitialERabEstabSuccRate	92.7	95.5		
Acc_InitialERabSetupSuccRate	1.0	1		
Acc_InitialUEContextEstabSuccRate		1.0	1	
Acc_PagingDiscardRate	0	N/A		
Acc_RandomAccessDecodingRate		0.4	N/A	
Acc_RandomAccessMSG2Congestion		0	N/A	
Acc_RrcConnSetupFailureRateDueToLackOfConnectedUsersLicense			0	0
Acc_RrcConnSetupRatioForEmergency		0	0	
Acc_RrcConnSetupRatioForHighPrioAccess		0	0	
Acc_RrcConnSetupRatioForMOData		0.1	0.1	
Acc_RrcConnSetupRatioForMOSignalling		0.9	0.8	
Acc_RrcConnSetupRatioForMobileTerminating		0.0	0.0	
Acc_RrcConnSetupSuccRate	0.9	1.0		
Acc_S1SigEstabSuccRate		1	1	
Av_CellAvail	100	100		
Av_CellDownAuto	0	0		
Av_CellDownMan	0	0		
Int_ActiveDRBsDI	0.8	0.9		
Int_ActiveDRBsUI	1.3	1.3		
Int_ActiveUEsDI	2.2	2.1		
Int_ActiveUEsUI	1.6	1.7		
Int_AveragedDlMacDelay		N/A	N/A	
Int_AveragedDlRlcDelay		N/A	N/A	
Int_DlLatency	4.5	4.0		
Int_DlPacketErrorLoss	0.1	0.2		
Int_DlPacketLossDueToHo		1.91612058517705e-05	2.53009105408459e-05	
Int_DlRadioMeasCqiDistr	3226228	3244656		
Int_DlRadioMeasTxRankDistr	3221500	3244608		
Int_DlRadioMeasUeReportedTxRankDistr		3226372	3244740	
Int_DlRadioThroughput		N/A	0.0	
Int_DlThroughput	8176.8	4321.0		
Int_MacHarqDISuccRate		N/A	N/A	
Int_MacHarqUISuccRate		N/A	N/A	
Int_RlcArqDISuccRate	253.9	72.0		
Int_RlcArqUISuccRate	514.0	486.6		

Int_UIPacketLoss	0.0	0.0		
Int_UIRadioThroughput	0.0	0.0		
Int_UIThroughput	1770.4	2822.9		
Mob_AnrrNeighbrelAdd	0	0		
Mob_AnrrNeighbrelRemove	0	0		
Mob_HoExecSuccRate	1	1		
Mob_HoPrepRejInLicConnUsers	0	0		
Mob_HoPrepRejInLicMob	0	0		
Mob_HoPrepRejInLicMultiErab	0	0		
Mob_HoPrepSuccRate	1.0	1		
Mob_MobilitySuccRate	99.5	100		
Mob_SessionContinuityRel	0	0		
Oth_DrbVsUeSessionTimeRatio	0	N/A		
Oth_Msg3RachRrcConsistencyCheck	0.5	0.6		
Oth_RrcSecFailIntegrity	0	0		
Oth_RrcSecFailUnexpectedMsg	0	0		
Oth_UeCtxtEstablishmentAndReleaseConsistency	1.3	1.1		
Res_AverageLicConnectedUsers	12	4		
Res_AvgNrOfRrcConnectedUsers	N/A	N/A		
Res_LicConnectedUsersCapacityRatio	2.5	2.5		
Res_LicConnectedUsersDistr	3235852	3243876		
Res_PeakNrOfRrcConnectedUsers	0	0		
Res_TimeCongestionLicConnectedUsers	0	0		
Ret_ERabRelAbnormalENB	0.0	N/A		
Ret_ERabRelAbnormalENBCdt	0	N/A		
Ret_ERabRelAbnormalENBHoExec	0	N/A		
Ret_ERabRelAbnormalENBHoPrep	0	N/A		
Ret_ERabRelAbnormalENBTnFail	0	N/A		
Ret_ERabRelAbnormalENBUeLost	0.0	N/A		
Ret_ERabRelIMME	0	N/A		
Ret_ERabRelNormalENB	0	N/A		
Ret_ERabRetainability	0.0	N/A		
Ret_ERabRelAbnormal	0.0	N/A		
Ret_MinPerDrop	27069.2	N/A		
Ret_UeCtxtRelAbnormal	0.0	N/A		
Ret_UeCtxtRelAbnormalENB	0.0	N/A		
Ret_UeCtxtRelAbnormalENBCdt	0	N/A		
Ret_UeCtxtRelAbnormalENBHoExec	0	N/A		
Ret_UeCtxtRelAbnormalENBTnFail	0	N/A		
Ret_UeCtxtRelAbnormalENBUeLost	0.0	N/A		
Ret_UeCtxtRelAbnormal_2	0.1	0.2		
Ret_UeCtxtRelIMME	0	N/A		

3) ERBS Node Traffic Performance, ROP by ROP

Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Date: 2010-11-12

Object Counter 08:15 08:30 08:45 09:00

Acc_AddedERabEstabFailRateDueToMultipleLicense			N/A	N/A	N/A	N/A	
Acc_AddedERabEstabSuccRate		N/A	N/A	N/A	N/A		
Acc_InitialERabEstabFailureRateDueToMultipleLicense			0	0	0	0	
Acc_InitialERabEstabSuccRate		100	86.4	95.5	95.5		
Acc_InitialErabSetupSuccRate		1	1.0	1	1		
Acc_InitialUEContextEstabSuccRate			1	1.0	1	1	
Acc_PagingDiscardRate		N/A	0	0	N/A		
Acc_RandomAccessDecodingRate			N/A	0.4	0.2	N/A	
Acc_RandomAccessMSG2Congestion			N/A	0	0	N/A	
Acc_RrcConnSetupFailureRateDueToLackOfConnectedUsersLicense					0	0	0 0
Acc_RrcConnSetupRatioForEmergency			0	0	0	0	
Acc_RrcConnSetupRatioForHighPrioAccess			0	0	0	0	
Acc_RrcConnSetupRatioForMOData			0.1	0.1	0.0	0.1	
Acc_RrcConnSetupRatioForMOSignalling			0.8	0.8	0.9	0.8	
Acc_RrcConnSetupRatioForMobileTerminating			0.1	0.0	0.0	0.0	
Acc_RrcConnSetupSuccRate		1	0.9	1.0	1.0		
Acc_S1SigEstabSuccRate		1	1	1	1		
Av_CellAvail	100	100	100	100			
Av_CellDownAuto		0	0	0	0		
Av_CellDownMan		0	0	0	0		
Int_ActiveDRBsDI		1.0	0.6	0.7	0.9		
Int_ActiveDRBsUI		1.2	1.4	1.4	1.3		
Int_ActiveUEsDI		2.6	2.1	1.7	2.1		
Int_ActiveUEsUI		1.7	1.5	1.4	1.7		
Int_AverageDIMacDelay			N/A	N/A	N/A	N/A	
Int_AverageDIRlcDelay			N/A	N/A	N/A	N/A	
Int_DILatency		N/A	4.0	5.2	N/A		
Int_DIPacketErrorLoss			N/A	0.1	0.1	N/A	
Int_DIPacketLossDueToHo			N/A	1.90610085121843e-05	1.92765125996936e-05	N/A	
Int_DIRadioMeasCqiDistr		3226196	3244608	3254476	3265860		
Int_DIRadioMeasTxRankDistr		3221468	3244560	3254428	3265812		
Int_DIRadioMeasUeReportedTxRankDistr			3226340	3244692	3254560	3265944	
Int_DIRadioThroughput			N/A	N/A	N/A	N/A	
Int_DIThroughput		-31.6	14125.9	17223.6	-40.1		
Int_MacHarqDISuccRate			N/A	N/A	N/A	N/A	
Int_MacHarqUISuccRate			N/A	N/A	N/A	N/A	
Int_RlcArqDISuccRate			N/A	221.9	304.0	N/A	
Int_RlcArqUISuccRate			400.9	612.7	702.9	N/A	
Int_UIPacketLoss			N/A	0.0	0.0	N/A	
Int_UIRadioThroughput			0.0	0.0	0.0	0.0	
Int_UIThroughput		2889.3	-1605.6	3183.0	2822.9		
Mob_AnTimerNeighbreAdd		0	0	0	0		
Mob_AnTimerNeighbreRemove			0	0	0	0	
Mob_HoExecSuccRate		1	1	1	1		
Mob_HoPrepRejInLicConnUsers			0	0	0	0	
Mob_HoPrepRejInLicMob			0	0	0	0	
Mob_HoPrepRejInLicMultiErab			0	0	0	0	
Mob_HoPrepSuccRate		1	1.0	1	1		
Mob_MobilitySuccRate		100	98.7	100	100		

Mob_SessionContinuityRel	0	0	0	0
Oth_DrbVsUeSessionTimeRatio	N/A	0	0	N/A
Oth_Msg3RachRrcConsistencyCheck		1	0.4	0.6 0.6
Oth_RrcSecFailIntegrity	0	0	0	0
Oth_RrcSecFailUnexpectedMsg		0	0	0
Oth_UeCtxtEstablishmentAndReleaseConsistency			1.2	1.4 1.2 1.1
Res_AverageLicConnectedUsers	4	4	4	4
Res_AvgNrOfRrcConnectedUsers	N/A	N/A	N/A	N/A
Res_LicConnectedUsersCapacityRatio		2.5	2.5	2.5 2.5
Res_LicConnectedUsersDistr	3235820	3243828	3220044	3273704
Res_PeakNrOfRrcConnectedUsers	0	0	0	0
Res_TimeCongestionLicConnectedUsers		0	0	0 0
Ret_ERabRelAbnormalENB	N/A	0.0	0.0	N/A
Ret_ERabRelAbnormalENBCdt	N/A	0	0	N/A
Ret_ERabRelAbnormalENBHoExec	N/A	0	0	N/A
Ret_ERabRelAbnormalENBHoPrep	N/A	0	0	N/A
Ret_ERabRelAbnormalENBTnFail	N/A	0	0	N/A
Ret_ERabRelAbnormalENBUeLost	N/A	0.0	0.0	N/A
Ret_ERabRelMME	N/A	0	0	N/A
Ret_ERabRelNormalENB	N/A	0	0	N/A
Ret_ERabRetainability	N/A	0.0	0.0	N/A
Ret_ERabRelAbnormal	N/A	0.0	0.0	N/A
Ret_MinPerDrop	N/A	29357.1	36600	N/A
Ret_UeCtxtRelAbnormal	N/A	0.0	0.0	N/A
Ret_UeCtxtRelAbnormalENB	N/A	0.0	0.0	N/A
Ret_UeCtxtRelAbnormalENBCdt	N/A	0	0	N/A
Ret_UeCtxtRelAbnormalENBHoExec	N/A	0	0	N/A
Ret_UeCtxtRelAbnormalENBTnFail	N/A	0	0	N/A
Ret_UeCtxtRelAbnormalENBUeLost	N/A	0.0	0.0	N/A
Ret_UeCtxtRelAbnormal_2	0.1	0.2	0.2	0.2
Ret_UeCtxtRelMME	N/A	0	0	N/A

4) ERBS EUTranCell Traffic Performance, Whole Period
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Start Time: 2010-11-12 08:15:00 End Time: 2010-11-12 09:00:00

Counter	CellFDD=113	CellFDD=114	CellFDD=115	
Acc_AddedERabEstabFailRateDueToMultipleLicense		N/A	N/A	N/A
Acc_AddedERabEstabSuccRate	N/A	N/A	N/A	
Acc_InitialERabEstabFailureRateDueToMultipleLicense		0	0	0
Acc_InitialERabEstabSuccRate	100	95.8	89.8	
Acc_InitialERabSetupSuccRate	1	1	1.0	
Acc_InitialUEContextEstabSuccRate	1	1	1.0	
Acc_PagingDiscardRate	0	0	0	
Acc_RandomAccessDecodingRate	0.6	0.6	0.4	
Acc_RandomAccessMSG2Congestion	0	0	0	
Acc_RrcConnSetupFailureRateDueToLackOfConnectedUsersLicense		0	0	0
Acc_RrcConnSetupRatioForEmergency	0	0	0	

Acc_RrcConnSetupRatioForHighPrioAccess		0	0	0
Acc_RrcConnSetupRatioForMOData		0.0	0.1	0.1
Acc_RrcConnSetupRatioForMOSignalling		1.0	0.9	0.8
Acc_RrcConnSetupRatioForMobileTerminating		0	0	0.1
Acc_RrcConnSetupSuccRate		1	1.0	0.9
Acc_S1SigEstabSuccRate		1	1	1
Av_CellAvail	100	100	100	
Av_CellDownAuto	0	0	0	
Av_CellDownMan	0	0	0	
Int_ActiveDRBsDI	1.0	0.7	0.7	
Int_ActiveDRBsUI	1.3	1.3	1.4	
Int_ActiveUEsDI	2.5	1.5	2.2	
Int_ActiveUEsUI	1.8	1.4	1.5	
Int_AverageDlMacDelay		N/A	N/A	N/A
Int_AverageDIrIcDelay		N/A	N/A	N/A
Int_DlLatency	4.0	3.9	4.6	
Int_DIpacketErrorLoss		0.1	0.1	0.2
Int_DIpacketLossDueToHo		7.34258057931492e-07 5.02166114458304e-05 1.81596963698767e-05		
Int_DIRadioMeasCqiDistr		3233192	3228764	3219052
Int_DIRadioMeasTxRankDistr		3233144	3228692	3218944
Int_DIRadioMeasUeReportedTxRankDistr		3233276	3228872	3219196
Int_DIRadioThroughput		N/A	0.0	N/A
Int_DlThroughput	7997.4	11816.9	5453.4	
Int_MacHarqDISuccRate		N/A	N/A	N/A
Int_MacHarqUISuccRate		N/A	N/A	N/A
Int_RlcArqDISuccRate		9586.5	7479.6	77.5
Int_RlcArqUISuccRate		540.3	784.5	429.5
Int_UIPacketLoss	0.0	0.0	0.0	
Int_UIRadioThroughput	0.0	0.0	0.0	
Int_UIThroughput	1657.7	2565.6	2070.8	
Mob_AnTimerNeighbreAdd	0	0	0	
Mob_AnTimerNeighbreRemove	0	0	0	
Mob_HoExecSuccRate	1	1	1	
Mob_HoPrepRejInLicConnUsers		0	0	0
Mob_HoPrepRejInLicMob	0	0	0	
Mob_HoPrepRejInLicMultiErab	0	0	0	
Mob_HoPrepSuccRate	1	1	1.0	
Mob_MobilitySuccRate	100	100	99.3	
Mob_SessionContinuityRel	0	0	0	
Oth_DrbVsUeSessionTimeRatio		0	0	0
Oth_Msg3RachRrcConsistencyCheck		0.9	1	0.4
Oth_RrcSecFailIntegrity	0	0	0	
Oth_RrcSecFailUnexpectedMsg		0	0	0
Oth_UeCtxtEstablishmentAndReleaseConsistency			1.2	1.2 1.2
Res_AverageLicConnectedUsers		0	0	0
Res_AvgNrOfRrcConnectedUsers		N/A	N/A	N/A
Res_LicConnectedUsersCapacityRatio		N/A	N/A	N/A
Res_LicConnectedUsersDistr	0	0	0	
Res_PeakNrOfRrcConnectedUsers		0	0	0

Res_TimeCongestionLicConnectedUsers	0	0	0
Ret_ERabRelAbnormalENB	0	0	0.0
Ret_ERabRelAbnormalENBCdt	0	0	0
Ret_ERabRelAbnormalENBHoExec	0	0	0
Ret_ERabRelAbnormalENBHoPrep	0	0	0
Ret_ERabRelAbnormalENBTnFail	0	0	0
Ret_ERabRelAbnormalENBUeLost	0	0	0.0
Ret_ERabRelMME	0	0	0
Ret_ERabRelNormalENB	0	0	0
Ret_ERabRetainability	0	0	0.0
Ret_ErabRelAbnormal	0	0	0.0
Ret_MinPerDrop	N/A	N/A	9607.1
Ret_UeCtxtRelAbnormal	0	0	0.0
Ret_UeCtxtRelAbnormalENB	0	0	0.0
Ret_UeCtxtRelAbnormalENBCdt	0	0	0
Ret_UeCtxtRelAbnormalENBHoExec	0	0	0
Ret_UeCtxtRelAbnormalENBTnFail	0	0	0
Ret_UeCtxtRelAbnormalENBUeLost	0	0	0.0
Ret_UeCtxtRelAbnormal_2	0	0	0.3
Ret_UeCtxtRelMME	0	0	0

5) ERBS EUTranCell Traffic Performance, Hour by Hour
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Date: 2010-11-12

Time Counter	CellFDD=113	CellFDD=114	CellFDD=115	
08:00 Acc_AddedERabEstabFailRateDueToMultipleLicense		N/A	N/A	N/A
08:00 Acc_AddedERabEstabSuccRate	N/A	N/A	N/A	
08:00 Acc_InitialERabEstabFailureRateDueToMultipleLicense		0	0	0
08:00 Acc_InitialERabEstabSuccRate	100	94.7	89.8	
08:00 Acc_InitialERabSetupSuccRate	1	1	1.0	
08:00 Acc_InitialUEContextEstabSuccRate	1	1	1.0	
08:00 Acc_PagingDiscardRate	0	0	0	
08:00 Acc_RandomAccessDecodingRate	0.4	0.5	0.3	
08:00 Acc_RandomAccessMSG2Congestion	0	0	0	
08:00 Acc_RrcConnSetupFailureRateDueToLackOfConnectedUsersLicense		0	0	0
08:00 Acc_RrcConnSetupRatioForEmergency	0	0	0	
....				
09:00 Ret_ERabRelAbnormalENBTnFail	N/A	N/A	N/A	
09:00 Ret_ERabRelAbnormalENBUeLost	N/A	N/A	N/A	
09:00 Ret_ERabRelMME	N/A	N/A	N/A	
09:00 Ret_ERabRelNormalENB	N/A	N/A	N/A	
09:00 Ret_ERabRetainability	N/A	N/A	N/A	
09:00 Ret_ErabRelAbnormal	N/A	N/A	N/A	
09:00 Ret_MinPerDrop	N/A	N/A	N/A	
09:00 Ret_UeCtxtRelAbnormal	N/A	N/A	N/A	
09:00 Ret_UeCtxtRelAbnormalENB	N/A	N/A	N/A	
09:00 Ret_UeCtxtRelAbnormalENBCdt	N/A	N/A	N/A	

09:00 Ret_UeCtxtRelAbnormalENBHoExec		N/A	N/A	N/A
09:00 Ret_UeCtxtRelAbnormalENBTnFail		N/A	N/A	N/A
09:00 Ret_UeCtxtRelAbnormalENBUeLost		N/A	N/A	N/A
09:00 Ret_UeCtxtRelAbnormal_2	0	0	0.3	
09:00 Ret_UeCtxtRelMME	N/A	N/A	N/A	

6) ERBS EUTranCell Traffic Performance, ROP by ROP
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Date: 2010-11-12
Time Counter

	CellFDD=113	CellFDD=114	CellFDD=115	
08:15 Acc_AddedERabEstabFailRateDueToMultipleLicense		N/A	N/A	N/A
08:15 Acc_AddedERabEstabSuccRate	N/A	N/A	N/A	
08:15 Acc_InitialERabEstabFailureRateDueToMultipleLicense		0	0	0
08:15 Acc_InitialERabEstabSuccRate	100	100	100	
08:15 Acc_InitialERabSetupSuccRate	1	1	1	
08:15 Acc_InitialUEContextEstabSuccRate	1	1	1	
08:15 Acc_PagingDiscardRate	N/A	N/A	N/A	
08:15 Acc_RandomAccessDecodingRate	N/A	N/A	N/A	
08:15 Acc_RandomAccessMSG2Congestion	N/A	N/A	N/A	
....				
09:00 Ret_UeCtxtRelAbnormalENBUeLost		N/A	N/A	N/A
09:00 Ret_UeCtxtRelAbnormal_2	0	0	0.3	
09:00 Ret_UeCtxtRelMME	N/A	N/A	N/A	

7) GigabitEthernet Tput in Mbps, Whole Period
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Start Time: 2010-11-12 08:15:00 End Time: 2010-11-12 09:00:00
Object Ip_GigaPortIn Ip_GigaPortOut Ip_GigaPortTot
33.8 27.4 61.1

8) GigabitEthernet Tput in Mbps, ROP by ROP
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

Date: 2010-11-12
Time Object Ip_GigaPortIn Ip_GigaPortOut Ip_GigaPortTot

08:15	39.1	30.1	69.2
08:30	34.8	27.3	62.1
08:45	30.5	25.4	56.0
09:00	30.6	26.6	57.2

Making a web-based KPI report:

ENB3001> pmrgw

Using formulafile /home/eanzmagn/moshell/commonjars/pm/FORMULA_ERBS_A_1_0.txt

Using configfile /home/eanzmagn/moshell/commonjars/pm/CONFIG_ERBS_A_1_0.txt

```
gzip -dc /home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0815-0830.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0830-0845.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0845-0900.1.xml.gz
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/ropfiles/A20101112.0900-0915.1.xml.gz | /home/eanzmagn/moshell/pmExtract -w
/home/eanzmagn/moshell_logfiles/logs_moshell/tempfiles/20101206-141920_12211/pmrweb.log -u "ManagedElement" "^ (pmActiveDrbDISum|pmActiveDrbUISum|
pmActiveUeDISum|pmActiveUeUISum|pmAnrNeighbrelAdd|pmAnrNeighbrelRem|pmCellDowntimeAuto|pmCellDowntimeMan|pmErabEstabAttAdded|pmErabEstabAttInit|
pmErabEstabFailAddedLic|pmErabEstabFailInitLic|pmErabEstabSuccAdded|pmErabEstabSuccInit|pmErabRelAbnormalEnbAct|pmErabRelAbnormalEnbActCdt|
pmErabRelAbnormalEnbActHo|pmErabRelAbnormalEnbActHpr|pmErabRelAbnormalEnbActTnFail|pmErabRelAbnormalEnbActUeLost|pmErabRelMmeAct|
pmErabRelNormalEnbAct|pmHoExeAttLteIntraF|pmHoExeSuccLteIntraF|pmHoPrepAttLteIntraF|pmHoPrepRejInLicConnUsers|pmHoPrepRejInLicMob|
pmHoPrepRejInLicMultiErab|pmHoPrepSuccLteIntraF|pmIfInOctetsLink1Hi|pmIfInOctetsLink1Lo|pmIfOutOctetsLink1Hi|pmIfOutOctetsLink1Lo|pmLicConnectedUsersActual|
pmLicConnectedUsersDistr|pmLicConnectedUsersHardLimit|pmLicConnectedUsersLicense|pmLicConnectedUsersTimeCong|pmMacDelayTimeDI|pmMacHarqDIAck16qam|
pmMacHarqDIAck64qam|pmMacHarqDIAckQpsk|pmMacHarqDIDtx16qam|pmMacHarqDIDtx64qam|pmMacHarqDIDtxQpsk|pmMacHarqDINack16qam|
pmMacHarqDINack64qam|pmMacHarqDINackQpsk|pmMacHarqUIDtx16qam|pmMacHarqUIDtxQpsk|pmMacHarqUIFail16qam|pmMacHarqUIFailQpsk|
pmMacHarqUISucc16qam|pmMacHarqUISuccQpsk|pmPagDiscarded|pmPagReceived|pmPdcPktLatPktTransDI|pmPdcPktLatTimeDI|pmPdcPktDiscDIHo|pmPdcPktLostUI|
pmPdcPktReceivedDI|pmPdcPktReceivedUI|pmPdcPktTransDI|pmPdcPktVolDIDrb|pmPdcPktVolDIDrbLastTTI|pmPdcPktVolUIDrb|pmPdcPktVolUIDrbLastTTI|pmRaAttCbra|
pmRaFailCbraMsg2Disc|pmRaSuccCbra|pmRadioThpResDI|pmRadioThpResUI|pmRadioThpVolDI|pmRadioThpVolUI|pmRadioTxRankDistr|pmRadioUeRepCqiDistr|
pmRadioUeRepRankDistr|pmRlcArqDIAck|pmRlcArqDINack|pmRlcArqUIAck|pmRlcArqUINack|pmRlcDelayPktTransDI|pmRlcDelayTimeDI|pmRopCounter|pmRrcConnEstabAtt|
pmRrcConnEstabAttEm|pmRrcConnEstabAttHpa|pmRrcConnEstabAttMod|pmRrcConnEstabAttMos|pmRrcConnEstabAttMta|pmRrcConnEstabFailLic|pmRrcConnEstabSucc|
pmRrcConnLevSamp|pmRrcConnLevSum|pmRrcConnMax|pmRrcSecFailIntegrity|pmRrcSecFailUnexpectedMsg|pmS1SigConnEstabAtt|pmS1SigConnEstabSucc|
pmSchedActivityCellDI|pmSchedActivityCellUI|pmSessionTimeDrb|pmSessionTimeUe|pmUeCtxtEstabAtt|pmUeCtxtEstabSucc|pmUeCtxtRelAbnormalEnb|
pmUeCtxtRelAbnormalEnbAct|pmUeCtxtRelAbnormalEnbActCdt|pmUeCtxtRelAbnormalEnbActHo|pmUeCtxtRelAbnormalEnbActTnFail|pmUeCtxtRelAbnormalEnbActUeLost|
pmUeCtxtRelMme|pmUeCtxtRelMmeAct|pmUeCtxtRelNormalEnb|pmUeCtxtRelSCCdma|pmUeCtxtRelSCEutra|pmUeCtxtRelSCWcdma|pmUeThpTimeDI|pmUeThpTimeUI)$"
```

1) ERBS Node Traffic Performance, Whole Period
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

2) ERBS Node Traffic Performance, Hour by Hour
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

3) ERBS Node Traffic Performance, ROP by ROP
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

4) ERBS EUTRAN Cell Traffic Performance, Whole Period
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC

5) ERBS EUTRAN Cell Traffic Performance, Hour by Hour
Report from 2010-11-12 08:15 UTC to 2010-11-12 09:14 UTC


```

Licensing=1,CapacityLicenses=1,UIBasebandCapacity=1   pmLicUICapMax   -2
Synchronization=1                               currentPmRegister s[4] = pmMaxDelayVariation=-2 pmHDelayVarBest50Pct=-2 pmHDelayVarBest1Pct=-2
pmHDelayVarBest10Pct=-2
Synchronization=1                               pmHDelayVarBest10Pct -2
Synchronization=1                               pmHDelayVarBest1Pct -2
Synchronization=1                               pmHDelayVarBest50Pct -2
Synchronization=1                               pmMaxDelayVariation -2
Sctp=1                                           pmSctpAborted   0
Sctp=1                                           pmSctpActiveEstab 3
Sctp=1                                           pmSctpCurrEstab  1
Sctp=1                                           pmSctpInErrors   1
Sctp=1                                           pmSctpInNoPorts  0
Sctp=1                                           pmSctpPassiveEstab 0
Sctp=1                                           pmSctpShutdowns  1
Sctp=1                                           pmSctpStatAssocOutOfBlue 1
Sctp=1                                           pmSctpStatChecksumErrorCounter 0
Sctp=1                                           pmSctpStatCommResume 0
Sctp=1                                           pmSctpStatCommStop 0
Sctp=1                                           pmSctpStatFragmentedUserMsg 0
Sctp=1                                           pmSctpStatOutOfOrderRecChunks 0
Sctp=1                                           pmSctpStatOutOfOrderSendChunks 0
Sctp=1                                           pmSctpStatReassembledUserMsg 0
Sctp=1                                           pmSctpStatRecChunks 64392
Sctp=1                                           pmSctpStatRecChunksDropped 1588
Sctp=1                                           pmSctpStatReceivedControlChunks 64651
Sctp=1                                           pmSctpStatReceivedPackages 113316
Sctp=1                                           pmSctpStatRetransChunks 715
Sctp=1                                           pmSctpStatSentChunks 42189
Sctp=1                                           pmSctpStatSentChunksDropped 0
Sctp=1                                           pmSctpStatSentControlChunks 78380
Sctp=1                                           pmSctpStatSentPackages 117912
Subrack=1,Slot=1,PlugInUnit=1                   pmProcessorLoad  2
Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1 pmNoOfDot3StatsFCSErrors 0
Subrack=1,Slot=1,PlugInUnit=1,GeneralProcessorUnit=1,MediumAccessUnit=1 pmNoOfDot3StatsLateCollisions 0
....
.....
EUtranCellFDD=115                               pmZtemporary14   0
EUtranCellFDD=115                               pmZtemporary15   0
EUtranCellFDD=115                               pmZtemporary2    0
EUtranCellFDD=115                               pmZtemporary3    0
EUtranCellFDD=115                               pmZtemporary4    178667
EUtranCellFDD=115                               pmZtemporary5    0
EUtranCellFDD=115                               pmZtemporary6    0
EUtranCellFDD=115                               pmZtemporary7    0
EUtranCellFDD=115                               pmZtemporary8    0
EUtranCellFDD=115                               pmZtemporary9    0
EUtranCellFDD=115,EUtranFreqRelation=1,EUtranCellRelation=1 pmHoExeAttLteIntraF 0
EUtranCellFDD=115,EUtranFreqRelation=1,EUtranCellRelation=1 pmHoExeSuccLteIntraF 0
EUtranCellFDD=115,EUtranFreqRelation=1,EUtranCellRelation=1 pmHoPrepAttLteIntraF 0

```

```

EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=1 pmHoPrepSuccLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=2 pmHoExeAttLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=2 pmHoExeSuccLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=2 pmHoPrepAttLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=2 pmHoPrepSuccLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=3 pmHoExeAttLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=3 pmHoExeSuccLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=3 pmHoPrepAttLteIntraF 0
EUTranCellFDD=115,EUTranFreqRelation=1,EUTranCellRelation=3 pmHoPrepSuccLteIntraF 0
=====
=====

```

Total: 27 MOs

4.4 Checking instantaneous counter values via COLI

```
kienb4016> getstat -h
```

```

$ getstat -h
==== getstat ====
getstat -h | [-r/reset | [-f/filter <filter>]][-a/all][--t/tabs <tabs>][--l/long | -c/cellid <cellid>]
Arguments:
h          This help text
reset      Reset all Internal Event Counters
filter     Serch string for counter name. Counters containing the filter string in its name are printed
all        Print all counters. Default only counters != 0 are printed
tabs       Number of collumns in printout
long       Print counters for each cellId/agentId separately
cellid     Print counters for one cellId/agentId
           Pre defined agentIds:
           Central LM   700
           Monitor LM   800
Done
$

```

```
kienb4016> getstat -reset
```

```
$ getstat -reset
```

```
kienb4016> getstat
```

```

$ getstat
Counted from Mon Oct 18 12:55:12 2010
until Mon Oct 18 13:40:10 2010
RrcConnectionSetup          27 RrcConnectionRequest          27
RrcConnectionReEstablishmentRequest 116 RrcConnectionReEstablishmentReject 116

```

RrcConnectionRelease	17	RrcDllInformationTransfer	24	
RrcConnectionReconfiguration	20	RrcSecurityModeCommand		20
RrcUeCapabilityEnquiry	11	RrcConnectionSetupComplete	27	
RrcConnectionReconfigurationComplete	20	RrcUllInformationTransfer		27
RrcSecurityModeComplete	20	RrcUeCapabilityInformation		11
RrcMasterInformationBlock	6	RrcSystemInformation	6	
RrcSystemInformationBlockType1	6	RrcConnSetupAttempt		27
RrcConnSetupReady	27	DownlinkNasTransport	24	
S1InitialContextSetupRequest	20	S1InitialContextSetupResponse		20
S1InitialUeMessage	27	InitialCtxtSetupAttempt	20	
InitialCtxtSetupReady	20	Paging	1098	
S1SetupRequest	1	S1SetupResponse	1	
UeCapabilityInfoIndication	11	S1UeContextReleaseCommand		27
S1UeContextReleaseComplete	27	S1UeContextReleaseRequest		10
UeCtxtReleaseAttempt	27	UeCtxtReleaseReady	27	
UplinkNasTransport	27	ErabSetupQci	20	
ErabDrbRelease	20	PerBbCellEvent	6414	
PerBbUeEvent	1058	PerBbRbEvent	1073	
ErabDrbSetupReject	20	EventMeasurementConfig		20
PerBbBbmEvent	2140	Srb1Setup	27	
ErabSetupInfo	20	ErabReleaseInfo	27	
ReverseDnsLookupAttempt	1	ReverseDnsLookupResult		1
SctpSetupAttempt	1	SctpSetupResult	1	
S1SetupAttempt	1	S1SetupResult	1	
UeCtxtReleaseAttemptEnb	10			
\$				

kienb4016> getstat -t 1

\$ getstat -t 1

Counted from Mon Oct 18 12:55:12 2010
until Mon Oct 18 13:40:18 2010

RrcConnectionSetup	27
RrcConnectionRequest	27
RrcConnectionReEstablishmentRequest	116
RrcConnectionReEstablishmentReject	116
RrcConnectionRelease	17
RrcDllInformationTransfer	24
RrcConnectionReconfiguration	20
RrcSecurityModeCommand	20
RrcUeCapabilityEnquiry	11
RrcConnectionSetupComplete	27
RrcConnectionReconfigurationComplete	20
RrcUllInformationTransfer	27
RrcSecurityModeComplete	20
RrcUeCapabilityInformation	11
RrcMasterInformationBlock	6
RrcSystemInformation	6
RrcSystemInformationBlockType1	6

RrcConnSetupAttempt 27
RrcConnSetupReady 27
DownlinkNasTransport 24
S1InitialContextSetupRequest 20
S1InitialContextSetupResponse 20
S1InitialUeMessage 27
InitialCtxtSetupAttempt 20
InitialCtxtSetupReady 20
Paging 1100
S1SetupRequest 1
S1SetupResponse 1
UeCapabilityInfoIndication 11
S1UeContextReleaseCommand 27
S1UeContextReleaseComplete 27
S1UeContextReleaseRequest 10
UeCtxtReleaseAttempt 27
UeCtxtReleaseReady 27
UplinkNasTransport 27
ErabSetupQci 20
ErabDrbRelease 20
PerBbCellEvent 6435
PerBbUeEvent 1058
PerBbRbEvent 1073
ErabDrbSetupReject 20
EventMeasurementConfig 20
PerBbBbmEvent 2147
Srb1Setup 27
ErabSetupInfo 20
ErabReleaseInfo 27
ReverseDnsLookupAttempt 1
ReverseDnsLookupResult 1
SctpSetupAttempt 1
SctpSetupResult 1
S1SetupAttempt 1
S1SetupResult 1
UeCtxtReleaseAttemptEnb 10

\$

kienb4016> cell list

\$ cell list

=====				
cellId	frold	froType	ldn	admState opState availabilityStatus
=====				
177	0	117506048	EUtranCellFDD=kienb4	1 (UNLOCKED) 1 (ENABLED) 0 (NO_STATUS)
178	1	117506048	EUtranCellFDD=kienb4	1 (UNLOCKED) 1 (ENABLED) 0 (NO_STATUS)

179 2 117506048 EUTranCellFDD=kienb4 1 (UNLOCKED) 1 (ENABLED) 0 (NO_STATUS)

=====
\$

kienb4016> getstat -t 1 -l

\$ getstat -t 1 -l

Counted from Mon Oct 18 12:55:12 2010
until Mon Oct 18 13:40:24 2010

Counters from Monitor LM, Agent Id 800

PerBbCellEvent	6447
PerBbUeEvent	1058
PerBbRbEvent	1073
PerBbBbmEvent	2151

Counters from Cell LM, Cell ID (Agent Id) 178

RrcConnectionSetup	14	
RrcConnectionRequest	14	
RrcConnectionReEstablishmentRequest		56
RrcConnectionReEstablishmentReject		56
RrcConnectionRelease	8	
RrcDlInformationTransfer	13	
RrcConnectionReconfiguration	11	
RrcSecurityModeCommand	11	
RrcUeCapabilityEnquiry	6	
RrcConnectionSetupComplete	14	
RrcConnectionReconfigurationComplete		11
RrcUlInformationTransfer	15	
RrcSecurityModeComplete	11	
RrcUeCapabilityInformation	6	
RrcMasterInformationBlock	2	
RrcSystemInformation	2	
RrcSystemInformationBlockType1		2
RrcConnSetupAttempt	14	
RrcConnSetupReady	14	
DownlinkNasTransport	13	
S1InitialContextSetupRequest	11	
S1InitialContextSetupResponse		11
S1InitialUeMessage	14	
InitialCtxtSetupAttempt	11	
InitialCtxtSetupReady	11	
UeCapabilityInfoIndication	6	
S1UeContextReleaseCommand		14
S1UeContextReleaseComplete		14
S1UeContextReleaseRequest		6
UeCtxtReleaseAttempt	14	

UeCtxtReleaseReady	14	
UplinkNasTransport	15	
ErabSetupQci	11	
ErabDrbRelease	11	
ErabDrbSetupReject	11	
EventMeasurementConfig		11
Srb1Setup	14	
ErabSetupInfo	11	
ErabReleaseInfo	14	
UeCtxtReleaseAttemptEnb		6

Counters from Cell LM, Cell ID (Agent Id) 177

RrcConnectionSetup	13	
RrcConnectionRequest	13	
RrcConnectionReEstablishmentRequest		60
RrcConnectionReEstablishmentReject		60
RrcConnectionRelease	9	
RrcDlInformationTransfer	11	
RrcConnectionReconfiguration	9	
RrcSecurityModeCommand	9	
RrcUeCapabilityEnquiry	5	
RrcConnectionSetupComplete		13
RrcConnectionReconfigurationComplete		9
RrcUlInformationTransfer	12	
RrcSecurityModeComplete	9	
RrcUeCapabilityInformation	5	
RrcMasterInformationBlock	2	
RrcSystemInformation	2	
RrcSystemInformationBlockType1		2
RrcConnSetupAttempt	13	
RrcConnSetupReady	13	
DownlinkNasTransport	11	
S1InitialContextSetupRequest		9
S1InitialContextSetupResponse		9
S1InitialUeMessage	13	
InitialCtxtSetupAttempt	9	
InitialCtxtSetupReady	9	
UeCapabilityInfoIndication	5	
S1UeContextReleaseCommand		13
S1UeContextReleaseComplete		13
S1UeContextReleaseRequest		4
UeCtxtReleaseAttempt	13	
UeCtxtReleaseReady	13	
UplinkNasTransport	12	
ErabSetupQci	9	
ErabDrbRelease	9	
ErabDrbSetupReject	9	
EventMeasurementConfig		9

Srb1Setup	13	
ErabSetupInfo	9	
ErabReleaseInfo	13	
UeCtxtReleaseAttemptEnb		4

Counters from Cell LM, Cell ID (Agent Id) 179

RrcMasterInformationBlock	2	
RrcSystemInformation	2	
RrcSystemInformationBlockType1		2

Counters from Central LM, Agent Id 700

Paging	1102	
S1SetupRequest	1	
S1SetupResponse	1	
ReverseDnsLookupAttempt		1
ReverseDnsLookupResult		1
SctpSetupAttempt	1	
SctpSetupResult	1	
S1SetupAttempt	1	
S1SetupResult	1	

\$

kienb4016> getstat -t 1 -l -a

\$ getstat -t 1 -l -a

Counted from Mon Oct 18 12:55:12 2010
until Mon Oct 18 13:41:51 2010

Counters from Monitor LM, Agent Id 800

EventFileStatusChanged		0
RrcError	0	
RrcConnectionSetup	0	
RrcConnectionReject	0	
RrcConnectionRequest	0	
RrcConnectionReEstablishmentRequest		0
RrcConnectionReEstablishmentReject		0
RrcConnectionRelease	0	
RrcDllInformationTransfer	0	
RrcConnectionReconfiguration		0
....		
EventEutranFrequencyAdd		0
EventFreqRelAdd	0	
X2SetupAttempt	0	
X2SetupResult	0	
IntraLteHoLicReject	0	
CsFallbackLicenseFail	0	

BbSecurityMode 0

Counters from Cell LM, Cell ID (Agent Id) 178

EventFileStatusChanged	0	
RrcError	0	
RrcConnectionSetup	14	
RrcConnectionReject	0	
RrcConnectionRequest	14	
RrcConnectionReEstablishmentRequest		56
RrcConnectionReEstablishmentReject		56
RrcConnectionRelease	8	
RrcDlInformationTransfer	13	
RrcConnectionReconfiguration	11	
RrcSecurityModeCommand	11	
RrcUeCapabilityEnquiry	6	
RrcMeasurementReport	0	
RrcConnectionSetupComplete	14	
RrcConnectionReconfigurationComplete	11	
...		
EventEutranFrequencyAdd	0	
EventFreqRelAdd	0	
X2SetupAttempt	0	
X2SetupResult	0	
IntraLteHoLicReject	0	
CsFallbackLicenseFail	0	
BbSecurityMode	0	

Counters from Cell LM, Cell ID (Agent Id) 177

EventFileStatusChanged	0	
RrcError	0	
RrcConnectionSetup	13	
RrcConnectionReject	0	
RrcConnectionRequest	13	
RrcConnectionReEstablishmentRequest		60
RrcConnectionReEstablishmentReject		60
RrcConnectionRelease	9	
RrcDlInformationTransfer	11	
RrcConnectionReconfiguration	9	
RrcSecurityModeCommand	9	
RrcUeCapabilityEnquiry	5	
RrcMeasurementReport	0	
...		
EventEutranFrequencyAdd	0	
EventFreqRelAdd	0	
X2SetupAttempt	0	
X2SetupResult	0	
IntraLteHoLicReject	0	

CsFallbackLicenseFail	0	
BbSecurityMode	0	
Counters from Cell LM, Cell ID (Agent Id) 179		
EventFileStatusChanged	0	
RrcError	0	
RrcConnectionSetup	0	
RrcConnectionReject	0	
RrcConnectionRequest	0	
RrcConnectionReEstablishmentRequest		0
RrcConnectionReEstablishmentReject		0
RrcConnectionRelease	0	
RrcDlInformationTransfer	0	
RrcConnectionReconfiguration		0
RrcSecurityModeCommand		0
....		
X2SetupResult	0	
IntraLteHoLicReject	0	
CsFallbackLicenseFail	0	
BbSecurityMode	0	

Counters from Central LM, Agent Id 700		
EventFileStatusChanged	0	
RrcError	0	
RrcConnectionSetup	0	
RrcConnectionReject	0	
RrcConnectionRequest	0	
RrcConnectionReEstablishmentRequest		0
RrcConnectionReEstablishmentReject		0
RrcConnectionRelease	0	
RrcDlInformationTransfer	0	
RrcConnectionReconfiguration		0
RrcSecurityModeCommand		0
...		
EventInvalidCountOfConnUsers		0
EventEutranFrequencyAdd		0
EventFreqRelAdd	0	
X2SetupAttempt	0	
X2SetupResult	0	
IntraLteHoLicReject	0	
CsFallbackLicenseFail	0	
BbSecurityMode	0	

4.5 Cell Trace

ENB30> h pset

```
*****
pset[d]
*****
```

Set the contents of an event-based scanner (RNC/RBS/LTE only).

Following syntaxes apply:

- * UETR/UETRACE: pset[d] [-s/-f <ip>:<port>] <scan-filter>|<scan-proxy> <event-filter>|<event-file>|all <imsi>
- * CTR: pset[d] [-s/-f <ip>:<port>] <scan-filter>|<scan-proxy> <event-filter>|<event-file>|all <moGroup>|<moFilter> [<trigger-event>]
- * GPEH/CELLTRACE: pset[d] [-s/-f <ip>:<port>] <scan-filter>|<scan-proxy> <event-filter>|<event-file>|all [<moGroup>|<moFilter>|all] [<ue-fraction>]

Use the "emom" command to view the list of events that apply for each measurement type.

The following fields are optional, if no value is entered (or "all" in the case of GPEH/CELLTRACE utrancell-filter), no filter will be sent to the node who will then use a default setting:

- trigger-event: default=RRC_RRC_CONNECTION_SETUP
- ue-fraction: default=200
- utrancell-filter in GPEH/CELLTRACE: default= all cells

A negative filter (!) can be used on the event-filter in order to exclude certain events. See more info about regular expressions used in the filters in chapter 3.2 of the README (or command "h syntax").

An event-file can be specified instead of an event-filter. The event-file should list all the events required, one per line, in a similar format to the event files found in moshell/commonjars/pm

The options -s/-f can be used to specify the output mode of the scanner:

- s: output mode "stream"
- f: output mode "file and stream"

If these options are used then the ip address and port for the stream must be given as argument to the option, example: -f 10.12.45.38:3402

If these options are not specified the the output of the scanner will go to file only.

Examples:

```
>> pset 10000 S1 cell=2A 300 ---> set a CELLTRACE scanner for S1 events on cell=2A, UE fraction=300
>> pset 20001 ranap cell=30456 ---> set a CTR scanner for ranap events on cell=30456 using the default triggering event
>> pset 30006 all ---> set a GPEH scanner for all events using no cell filter and no ue-fraction filter ==> all cells will be selected and the default ue-fraction value of 200 (?) will be used
>> pset 30006 all all 1000 ---> set a GPEH scanner for all events on all cells using the ue-fraction 1000
>> pset 30004 handover 304[0-6] 1000 ---> set a GPEH scanner for all events matching "handover" on cells 3040 to 3046 with ue-fraction=1000
>> pset 30004 nbap mycellgroup ---> set a GPEH scanner for all nbap events on all cells of the MO-group "mycellgroup"
>> pset 10002 rrc|nbap!connection 123456789012345 --> set a UETR scanner on imsi 123456789012345, for all events matching "rrc" or "ranap" but not "connection".
>> pset 30005 .!rrc_paging_type_1 ---> set a GPEH scanner for all events except RRC_PAGING_TYPE_1.
>> pset 30005 ~/myevents.txt ---> set a GPEH scanner for all events listed in ~/myevents.txt, no filter to be used for the cells nor the ue-fraction.
>> pset 10004 -s 10.34.75.12:5443 . all 1000 --> set a CELLTRACE scanner for all events, without a cell filter and with UE fraction=1000, output stream to ip 10.34.75.12 and port 5443
```

....

kienb3001> emom celltra

The node's MOM version is: B_1_30_COMPLETE. Using following event files:
- /home/eanzmagn/jarxml/event/EVENT_ERBS_UETRACE_B_1_30_COMPLETE.txt
- /home/eanzmagn/jarxml/event/EVENT_ERBS_CELLTRACE_B_1_30_COMPLETE.txt

=====

CELLTRACE EVENTS

=====

INTERNAL 93 INTERNAL_TESTEVENT_BASIC
INTERNAL_TESTEVENT_CELL1
INTERNAL_TESTEVENT_CELL2
INTERNAL_TESTEVENT_UE
INTERNAL_TESTEVENT_EXT
INTERNAL_TESTEVENT_BB_CELL
INTERNAL_TESTEVENT_BB_RB
INTERNAL_TESTEVENT_BB_UE
INTERNAL_TESTEVENT_BB_BBM
INTERNAL_TESTEVENT_PROC_BASE_1
INTERNAL_TESTEVENT_PROC_BASE_2
INTERNAL_TESTEVENT_PROC_BASE_3
INTERNAL_TESTEVENT_PROC_BASE_4
INTERNAL_TESTEVENT_PROC_BASE_5
INTERNAL_TESTEVENT_PROC_BASE_6
INTERNAL_TESTEVENT_PROC_BASE_7
INTERNAL_TESTEVENT_PROC_BASE_8
INTERNAL_TESTEVENT_PROC_BASE_9
INTERNAL_TESTEVENT_PROC_BASE_10
INTERNAL_TESTEVENT_PROC_BASE_11
INTERNAL_TESTEVENT_PROC_BASE_12
INTERNAL_TESTEVENT_PROC_BASE_13
INTERNAL_TESTEVENT_PROC_BASE_14
INTERNAL_TESTEVENT_PROC_BASE_15
INTERNAL_TESTEVENT_PROC_BASE_16
INTERNAL_TESTEVENT_PROC_BASE_17
INTERNAL_TESTEVENT_PROC_BASE_18
INTERNAL_TESTEVENT_PROC_BASE_19
INTERNAL_TESTEVENT_PROC_BASE_20
INTERNAL_TESTEVENT_PROC_BASE_21
INTERNAL_TESTEVENT_PROC_BASE_22
INTERNAL_TESTEVENT_PROC_BASE_23
INTERNAL_TESTEVENT_PROC_BASE_24
INTERNAL_TESTEVENT_L3
INTERNAL_PROC_TESTEVENT_MANY_START
INTERNAL_PROC_TESTEVENT_POST
INTERNAL_PROC_TESTEVENT_MANY_STOP
INTERNAL_PROC_TESTEVENT_NOPARAM_START
INTERNAL_PROC_TESTEVENT_COMPLEX
INTERNAL_EVENT_RRC_ERROR
INTERNAL_EVENT_NO_RESET_ACK_FROM_MME
INTERNAL_EVENT_S1AP_PROTOCOL_ERROR
INTERNAL_PROC_RRC_CONN_SETUP

INTERNAL_EVENT_PM_RECORDING_FAULT_JVM
INTERNAL_EVENT_MAX_UETRACES_REACHED
INTERNAL_EVENT_UNEXPECTED_RRC_MSG
INTERNAL_PROC_S1_SIG_CONN_SETUP
INTERNAL_PROC_ERAB_RELEASE
INTERNAL_PROC_ERAB_SETUP
INTERNAL_EVENT_MSG_1_2_3
INTERNAL_EVENT_PM_EVENT_SUSPECTMARKED
INTERNAL_EVENT_INTEGRITY_VER_FAIL_RRC_MSG
INTERNAL_EVENT_BEST_CELL_EVAL
INTERNAL_EVENT_X2_CONN_RELEASE
INTERNAL_EVENT_X2AP_PROTOCOL_ERROR
INTERNAL_PROC_HO_PREP_S1_OUT
INTERNAL_PROC_HO_PREP_S1_IN
INTERNAL_PROC_HO_EXEC_S1_OUT
INTERNAL_PROC_HO_EXEC_S1_IN
INTERNAL_PROC_HO_PREP_X2_OUT
INTERNAL_PROC_HO_PREP_X2_IN
INTERNAL_PROC_HO_EXEC_X2_OUT
INTERNAL_PROC_HO_EXEC_X2_IN
INTERNAL_EVENT_MAX_STORAGESIZE_REACHED
INTERNAL_EVENT_MAX_FILESIZE_REACHED
INTERNAL_EVENT_MAX_FILESIZE_RECOVERY
INTERNAL_EVENT_BAD_COV_EVAL
INTERNAL_EVENT_MEASUREMENT_CONFIG
INTERNAL_EVENT_PM_DATA_COLLECTION_LOST
INTERNAL_EVENT_NEIGHBCELL_CHANGE
INTERNAL_EVENT_NEIGHBENB_CHANGE
INTERNAL_EVENT_NEIGHBREL_ADD
INTERNAL_EVENT_NEIGHBREL_REMOVE
INTERNAL_EVENT_UE_ANR_CONFIG_PCI
INTERNAL_EVENT_UE_ANR_PCI_REPORT
INTERNAL_EVENT_ANR_CONFIG_MISSING
INTERNAL_EVENT_UE_PCI_COLLISION
INTERNAL_EVENT_UE_MEAS_REJECT
INTERNAL_PROC_UE_CTXT_RELEASE_ENB
INTERNAL_PROC_INITIAL_CTXT_SETUP
INTERNAL_PROC_DNS_LOOKUP
INTERNAL_PROC_REVERSE_DNS_LOOKUP
INTERNAL_PROC_SCTP_SETUP
INTERNAL_PROC_S1_SETUP
INTERNAL_PROC_ANR_CGI_REPORT
INTERNAL_EVENT_LIC_GRACE_PERIOD_STARTED
INTERNAL_EVENT_LIC_GRACE_PERIOD_RESET
INTERNAL_EVENT_LIC_GRACE_PERIOD_EXPIRED
INTERNAL_EVENT_LIC_GRACE_PERIOD_EXPIRING
INTERNAL_EVENT_EUTRAN_FREQUENCY_ADD
INTERNAL_EVENT_FREQ_REL_ADD
INTERNAL_EVENT_SCTP_SHUTDOWN

EXTERNAL INTERNAL_PROC_X2_SETUP
85 RRC_RRC_CONNECTION_SETUP
RRC_RRC_CONNECTION_REJECT
RRC_RRC_CONNECTION_REQUEST
RRC_RRC_CONNECTION_RE_ESTABLISHMENT_REQUEST
RRC_RRC_CONNECTION_RE_ESTABLISHMENT_REJECT
RRC_RRC_CONNECTION_RELEASE
RRC_DL_INFORMATION_TRANSFER
RRC_RRC_CONNECTION_RECONFIGURATION
RRC_SECURITY_MODE_COMMAND
RRC_UE_CAPABILITY_ENQUIRY
RRC_MEASUREMENT_REPORT
RRC_RRC_CONNECTION_SETUP_COMPLETE
RRC_RRC_CONNECTION_RECONFIGURATION_COMPLETE
RRC_UL_INFORMATION_TRANSFER
RRC_SECURITY_MODE_COMPLETE
RRC_SECURITY_MODE_FAILURE
RRC_UE_CAPABILITY_INFORMATION
RRC_MASTER_INFORMATION_BLOCK
RRC_SYSTEM_INFORMATION
RRC_SYSTEM_INFORMATION_BLOCK_TYPE_1
S1_DOWNLINK_S1_CDMA2000_TUNNELING
S1_DOWNLINK_NAS_TRANSPORT
S1_ENB_STATUS_TRANSFER
S1_ERROR_INDICATION
S1_HANDOVER_CANCEL
S1_HANDOVER_CANCEL_ACKNOWLEDGE
X2_HANDOVER_CANCEL
S1_HANDOVER_COMMAND
S1_HANDOVER_FAILURE
S1_HANDOVER_NOTIFY
S1_HANDOVER_PREPARATION_FAILURE
S1_HANDOVER_REQUEST
S1_HANDOVER_REQUEST_ACKNOWLEDGE
S1_HANDOVER_REQUIRED
S1_INITIAL_CONTEXT_SETUP_FAILURE
S1_INITIAL_CONTEXT_SETUP_REQUEST
S1_INITIAL_CONTEXT_SETUP_RESPONSE
S1_INITIAL_UE_MESSAGE
S1_MME_STATUS_TRANSFER
S1_NAS_NON_DELIVERY_INDICATION
S1_PAGING
S1_PATH_SWITCH_REQUEST
S1_PATH_SWITCH_REQUEST_ACKNOWLEDGE
S1_PATH_SWITCH_REQUEST_FAILURE
S1_RESET
S1_RESET_ACKNOWLEDGE
S1_ERAB_MODIFY_REQUEST
S1_ERAB_MODIFY_RESPONSE

S1_ERAB_RELEASE_COMMAND
 S1_ERAB_RELEASE_RESPONSE
 S1_ERAB_RELEASE_REQUEST
 S1_ERAB_SETUP_REQUEST
 S1_ERAB_SETUP_RESPONSE
 S1_S1_SETUP_FAILURE
 S1_S1_SETUP_REQUEST
 S1_S1_SETUP_RESPONSE
 S1_UE_CAPABILITY_INFO_INDICATION
 S1_UE_CONTEXT_MODIFICATION_FAILURE
 S1_UE_CONTEXT_MODIFICATION_REQUEST
 S1_UE_CONTEXT_MODIFICATION_RESPONSE
 S1_UE_CONTEXT_RELEASE_COMMAND
 S1_UE_CONTEXT_RELEASE_COMPLETE
 S1_UE_CONTEXT_RELEASE_REQUEST
 S1_UPLINK_S1_CDMA2000_TUNNELING
 S1_UPLINK_NAS_TRANSPORT
 X2_RESET_REQUEST
 X2_RESET_RESPONSE
 X2_X2_SETUP_REQUEST
 X2_X2_SETUP_RESPONSE
 X2_ERROR_INDICATION
 X2_ENB_CONFIGURATION_UPDATE
 X2_ENB_CONFIGURATION_UPDATE_ACKNOWLEDGE
 X2_ENB_CONFIGURATION_UPDATE_FAILURE
 X2_X2_SETUP_FAILURE
 S1_ENB_CONFIGURATION_UPDATE
 S1_ENB_CONFIGURATION_UPDATE_ACKNOWLEDGE
 S1_ENB_CONFIGURATION_UPDATE_FAILURE
 S1_MME_CONFIGURATION_UPDATE
 S1_MME_CONFIGURATION_UPDATE_ACKNOWLEDGE
 S1_MME_CONFIGURATION_UPDATE_FAILURE
 X2_HANDOVER_REQUEST
 X2_HANDOVER_REQUEST_ACKNOWLEDGE
 X2_SN_STATUS_TRANSFER
 X2_UE_CONTEXT_RELEASE
 X2_HANDOVER_PREPARATION_FAILURE
 UE_MEASUREMENTS_5 UE_MEAS_INTRAFREQ1
 UE_MEAS_INTRAFREQ2
 UE_MEAS_EVENT_FEAT_NOT_AVAIL
 UE_MEAS_EVENT_NOT_CONFIG
 UE_MEAS_MEASUREMENT_CONFIG_EUTRA_PM
 INTERNAL_PERIODIC_10 INTERNAL_PER_RADIO_UTILIZATION
 INTERNAL_PER_UE_ACTIVE_SESSION_TIME
 INTERNAL_PER_RADIO_UE_MEASUREMENT
 INTERNAL_PER_UE_TRAFFIC_REP
 INTERNAL_PER_UE_RB_TRAFFIC_REP
 INTERNAL_PER_CAP_LICENSE_UTIL_REP
 INTERNAL_PER_CELL_TRAFFIC_REPORT

```
INTERNAL_PER_HW_UTIL
INTERNAL_PER_RADIO_CELL_MEASUREMENT
INTERNAL_PER_RADIO_CELL_MEASUREMENT_TDD
```

Setup a cell trace with output to file

```
ENB30> pset 9 radio all 1000
```

```
=====
  9 PREDEF.10000.CELLTRACE          >>> Done.
=====
```

```
ENB30> pgets 9
```

```
=====
  9 PREDEF.10000.CELLTRACE          SUSPENDED 4
=====
UE_FRACTION      1000
-----
INTERNAL_PERIODIC 4 INTERNAL_PER_RADIO_UTILIZATION
INTERNAL_PER_RADIO_UE_MEASUREMENT
INTERNAL_PER_RADIO_CELL_MEASUREMENT
INTERNAL_PER_RADIO_CELL_MEASUREMENT_TDD
=====
>>> Total: 1 Scanners
```

Collect and decode cell trace ROP files

```
ENB30> pmefd
```

```
.....
```

Setup a cell trace with output to file, on all cells

```
ENB30> pset -s 150.132.81.127:51543 9 radio all 1000
```

```
=====
  9 PREDEF.10000.CELLTRACE          >>> Done.
=====
```

```
ENB30> pgets 9
```

```
100829-10:44:38 10.75.0.141 8.0j ERBS_NODE_MODEL_A_9_50_COMPLETE stopfile=/tmp/28736
=====
  9 PREDEF.10000.CELLTRACE          SUSPENDED 4 (Stream to 150.132.81.127:51543)
=====
```

```
UE_FRACTION      1000
=====
INTERNAL_PERIODIC 4  INTERNAL_PER_RADIO_UTILIZATION
                    INTERNAL_PER_RADIO_UE_MEASUREMENT
                    INTERNAL_PER_RADIO_CELL_MEASUREMENT
                    INTERNAL_PER_RADIO_CELL_MEASUREMENT_TDD
=====
>>> Total: 1 Scanners
```

Setup a cell trace with output to file and stream, on one particular cell

Note: This functionality requires the optional feature RbsPmEventStreamer:

```
ENB30> inv streamer

=====
Feature            keyId    licenseState  featureState  serviceState  description
=====
RbsEventStreamer=1      CXC4010856  1 (ENABLED)  1 (ACTIVATED)  1 (OPERABLE)
=====
```

```
ENB30> pset -f 150.132.81.127:51543 10 radio fdd 20

=====
10 PREDEF.10001.CELLTRACE          >>> Done.
=====
```

```
ENB30> pgets 10

=====
10  PREDEF.10001.CELLTRACE          SUSPENDED 4 (File_and_stream to 150.132.81.127:51543)
=====
UE_FRACTION      20
CELL             ManagedElement=1,ENodeBFunction=1,EUtranCellFDD=141
=====
INTERNAL_PERIODIC 4  INTERNAL_PER_RADIO_UTILIZATION
                    INTERNAL_PER_RADIO_UE_MEASUREMENT
                    INTERNAL_PER_RADIO_CELL_MEASUREMENT
                    INTERNAL_PER_RADIO_CELL_MEASUREMENT_TDD
=====
>>> Total: 1 Scanners
```

```
ENB30> pdeb 9
```

```
=====
  9 PREDEF.10000.CELLTRACE                >>> Done.
=====
>>> Total: 1 Scanners
```

ENB30> pdeb 10

```
=====
 10 PREDEF.10001.CELLTRACE                >>> Done.
=====
>>> Total: 1 Scanners
```

Check Cell Trace status

ENB30> hget pmevent stream.*cell

```
=====
=====
MO      streamStatusPmCellTrace fileStatus  ipAddress  portNumber scannerId streamStatus  traceReference
=====
=====
PmEventService=1 t[6] =
PmEventService=1 t[0]      0 (INACTIVE) 150.132.81.127 51543    10000    3 (RECONNECTING) 0
PmEventService=1 t[1]      1 (ACTIVE)  150.132.81.127 51543    10001    3 (RECONNECTING) 17592186044416
PmEventService=1 t[2]      0 (INACTIVE) 0.0.0.0    51543    10002    0 (INACTIVE)    -1
PmEventService=1 t[3]      1 (ACTIVE)  150.132.81.127 51543    10003    3 (RECONNECTING) 41985465450594
PmEventService=1 t[4]      0 (INACTIVE) 0.0.0.0    51543    10004    0 (INACTIVE)    -1
PmEventService=1 t[5]      0 (INACTIVE) 0.0.0.0    51543    10005    0 (INACTIVE)    -1
=====
=====
Total: 1 MOs
```

5 Multimode

Put the list of nodes in a sitefile. If the node names were given then the node addresses should be listed in the ipdatabase.

```
**:mframe131@~> cat moshell/sitefiles/lte_sites
kienb3001
kienb3002
kienb3003
kienb3004
kienb3005
```

```
**mframe131@~> cat moshell/sitefiles/ipdatabase
```

#node	ipaddress	password
kienb3001	10.62.7.11	kienb3001
kienb3002	10.62.7.12	kienb3002
kienb3003	10.62.7.13	kienb3003
kienb3004	10.62.7.14	kienb3004
kienb3005	10.62.7.15	kienb3005

```
**ws6148@~> moshell -m moshell_logfiles/lte_sites
```

```
#####  
#      Welcome to MoShell 8.0t (LPA108514/1_R8T)      #  
#      Finn Magnusson, Jan Pettersson                  #  
#      http://utran01.au.ao.ericsson.se/moshell        #  
#      Contact: Finn.Magnusson@ericsson.com            #  
#      David.Smith@ericsson.com                        #  
#####
```

```
Fetching IOR file from 10.62.7.11 (kienb3001)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.12 (kienb3002)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.13 (kienb3003)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.14 (kienb3004)...Failed! Unable to connect to 10.62.7.14:80.  
Fetching IOR file from 10.62.7.15 (kienb3005)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
```

```
HELP MENU      : h  
QUIT           : q
```

```
MULTI_4>
```

It is also possible to list the nodes on the command line:

```
**ws6148@~> moshell -m kienb3001,kienb3002,kienb3003,kienb3004,kienb3005
```

```
#####  
#      Welcome to MoShell 8.0t (LPA108514/1_R8T)      #  
#      Finn Magnusson, Jan Pettersson                  #  
#      http://utran01.au.ao.ericsson.se/moshell        #  
#      Contact: Finn.Magnusson@ericsson.com            #  
#      David.Smith@ericsson.com                        #  
#####
```

```
Fetching IOR file from 10.62.7.11 (kienb3001)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.12 (kienb3002)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.13 (kienb3003)...Done. (CorbaPort=56834, CorbaSecurity=OFF)  
Fetching IOR file from 10.62.7.14 (kienb3004)...Failed! Unable to connect to 10.62.7.14:80.
```

Fetching IOR file from 10.62.7.15 (kienb3005)...Done. (CorbaPort=56834, CorbaSecurity=OFF)

HELP MENU : h
QUIT : q

MULTI_4>

The help menu shows only the commands that are available in this mode:

MULTI_4> h

```
----- COMMANDS SUPPORTED IN MULTI MODE -----  
mom[aptcdbrfrou]      Print description of MO classes, CM/FM attributes, actions, enums and structs.  
lt/clt/ltc[1-9]       Load MO tree (full or partial) and build proxy table.  
lc[1-9]/lcc           Load MO tree (full or partial) and build proxy table.  
lu/llu               Unload MOs from MO tree.  
pr/lpr               Print MO LDNs and proxy ids for all or part of the MO tree currently loaded in moshell.  
ma/lma               Add MO(s) to an MO group.  
mr/lmr               Remove an MO group or remove MOs from an MO group (MOs will NOT be deleted, only the group).  
mp                   Print all defined MO groups.  
get/lget              Read CM/FM attribute(s) from MO(s).  
hget[c][m]/lhget[c][m] Read CM/FM attribute(s) from MO(s), print horizontally one line per MO (instead of one line per attribute).  
kget/lkget            Display CM/FM attributes in exportable printout format.  
st/lst               Print state of MOs (operationalState and administrativeState when applicable).  
prod                 Print productData of MO(s).  
lk/lk                View all MO's linked to an MO, and their states (admState and opState).  
set[m][c][1]/lset[m][c][1] Set an attribute value on one or several MO's.  
eset[c][1]/leset[c][1] Set one or several attributes on one or several MO's, using regexp matching on the attribute name.  
bl[s]/lbl[s]         Lock or soft-lock MO(s).  
deb/ldeb             Unlock MO(s).  
acl/lacI             Lists available MO actions.  
acc[e]/lacc[e]       Execute an MO action.  
cr[e]                Create an MO.  
del[b]/ldel[b]       Delete MO(s).  
rdel/lrdel           Delete MO(s) together with children and reserving MOs.  
safe+/safe-/safe?    Apply strict MO matching rules on MO WRITE commands  
s+/s-/s?             Sort MO list in alphabetical order instead of proxy order.  
u+[s]/u-/u?/u!       Handling of undo mode (for cr/del/rdel/set/bl/deb/acc commands). Can be used for generation of MO scripts as well.  
run                  Run a command file in moshell format.  
trun[is1cr]          Run a command file in EMAS/MoTester format.  
ctrl-z               Abort an MO command or a "for" loop. Type "touch /tmp/<stopfile>;fg" to resume the moshell session.  
pol[s][h][c][u][m][k] Poll the node until the MO service is up or until an operation has completed.  
re[i]                Disconnect and reconnect to the CM service (mobrowser) and/or the PM service (pmtester).  
getmom               Check the MOM version currently stored on the node.  
parsemom              Parse an xml MOM file.  
flt/fltc             Load proxys for an MO type that is not defined in the MOM. ("Force" lt/ltc).  
fget/lfget           Read attributes that are not listed in the MOM (f="Force").
```

eget/leget	Read attributes that are not listed in the MOM (e="Extended").
sget/lsgget	Read CM/FM attributes from MO(s), one by one ("Slow" get).
fset/lfset	Set an attribute that is not described in the MOM ("Force" set).
facc/lfacc	Perform actions that are not defined in the MOM ("Force" action).
fdel/lfdel	Delete MO(s), including systemCreated MOs.
diff[o][m]/ldiff[m]	Parameter auditing or MO dump comparisons.
al[atkcl]	Print the list of active alarms. Acknowledge/Unacknowledge an alarm.
uv	Print or change moshell configuration settings (also called "user variables").
pv	Print scripting variables.
!/l	Execute a unix command on the PC/workstation.
l+[m][m][s][o]/l-/l?	Open/close moshell logfiles.
hi	Print history of moshell commands entered during the current session.
time[t]	Measure time taken by an moshell command or by each command in a moshell command file.
lmid[c]/upid[om]	Print translation of loadmodule/upgradepackage product number or T&E error codes.
p/w/pw/b	Change moshell prompt and/or window title.
prox[+-]	Toggle display of proxy identities in printout of get <mo> <attribute> command.
ul	Toggle display of userlabel in st/lst and pget/lpget printout.
conf[bld][+-]	Toggle confirmation on various MO commands.
gs[+-]/gsg[+-]	Toggle display of old/new attribute value in set/bl/deb commands.
ip2d/d2ip	Convert an IP address into the format used in the fRO (sql database) or vice-versa.
h2d/d2h	Convert an integer to hexadecimal or viceversa.
h2b/b2h	Convert a binary to hexadecimal or viceversa.
wait	Specify a delay in hrs, mins, secs, or rops. Similar to the unix "sleep" command (scripting).
return	Exit from a command file without exiting from moshell (scripting).
print	Print a line or variable (scripting).
alias/unalias	Print or define command aliases.
smd[slcr]	Server Maintenance - disk usage
q/by/exit/quit	Exit moshell.
pmom[acd]/lmom[c]	Print description of PM counters (pmom) or log attributes (lmom, CDMA only).
pget/lpget	Read PM attribute(s) from MO(s).
spget/lspget	Read PM attribute(s) one by one ("slow pget").
hpget[c][m]/lhpget[c][m]	Read PM attribute(s) from MO(s), print horizontally one line per MO (instead of one line per attribute).
pdiff/lpdiff	Print incrementation of PM attributes.
pst	List all PM scanners and their state.
pgets[n][m][r]	Print scanner contents.
pbl	Suspend a scanner.
pdeb	Resume a scanner.
pdel	Delete a scanner.
emom	Display list of events available for each kind of event-based scanner.
pset[d]	Set the contents of an event-based scanner (RNC/RBS/LTE only).

----- HELP CHAPTERS -----

0	Revision History
1	Introduction
2	Installation, and user settings
3	Command syntax, regular expressions
4	Command descriptions
5	Lazy
6	Scripting
7	Utilities

8 Server Maintenance
9 Offline Mode and Multi Mode

Type: - h <command> to view command description, e.g: h pget
- h <pattern> to view commands whose description match a string, e.g: h change.*prompt
- h <chapter> to view a chapter, e.g: h 3

Loading all MOs:

MULTI_4> It all

110602-13:54:08 4_NODES 8.0t stopfile=/tmp/26002

Starting NealBrowser with corba_class=2, java=1.6.0, neal=R72M06, jarcorb=R71T31, jacsec=R71BC07

**** Welcome to the Neal Browser (version 1.0)!

Connecting to 10.62.7.11 (kienb3001)... OK

Connecting to 10.62.7.12 (kienb3002)... OK

Connecting to 10.62.7.13 (kienb3003)... OK

Connecting to 10.62.7.15 (kienb3005)... OK

\$nealbrowser_pid = 26137

Connected to 10.62.7.11 (Me=kienb3001,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)

Connected to 10.62.7.12 (Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1)

Connected to 10.62.7.13 (Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1)

Connected to 10.62.7.15 (Me=kienb3005,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3005,ManagedElement=1)

Last MO: 3. Loaded 3 MOs. Total: 4 MOs.

>>> 1/4: 10.62.7.11 (kienb3001)

Checking MOM version...ERBS_NODE_MODEL_B_1_51

Using MOM version: ERBS_NODE_MODEL_B_1_51 COMPLETE

Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gzDone.

>>> 2/4: 10.62.7.12 (kienb3002)

Checking MOM version...ERBS_NODE_MODEL_B_1_51

Using MOM version: ERBS_NODE_MODEL_B_1_51 COMPLETE

>>> 3/4: 10.62.7.13 (kienb3003)

Checking MOM version...ERBS_NODE_MODEL_B_1_51

Using MOM version: ERBS_NODE_MODEL_B_1_51 COMPLETE

>>> 4/4: 10.62.7.15 (kienb3005)

Checking MOM version...ERBS_NODE_MODEL_B_1_51

Using MOM version: ERBS_NODE_MODEL_B_1_51 COMPLETE

Parsing 1 MOM files...

Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gzDone.

Last MO: 4096. Loaded 4096 MOs. Total: 4097 MOs.

It is possible to unload some MOs from the session:

```
MULTI_4> llw swmanagement=1
```

```
110602-14:00:49 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/26798
Unloaded 2893 MOs
```

It is also possible to load only certain types of MOs:

```
**ws6148@~> moshell -m kienb3001,kienb3002,kienb3003,kienb3004,kienb3005
```

```
#####
#      Welcome to MoShell 8.0t (LPA108514/1_R8T)      #
#      Finn Magnusson, Jan Pettersson                #
#      http://utran01.au.ao.ericsson.se/moshell        #
#      Contact: Finn.Magnusson@ericsson.com           #
#      David.Smith@ericsson.com                      #
#####
```

```
Fetching IOR file from 10.62.7.11 (kienb3001)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.12 (kienb3002)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.13 (kienb3003)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.14 (kienb3004)...Failed! Unable to connect to 10.62.7.14:80.
```

```
Fetching IOR file from 10.62.7.15 (kienb3005)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
```

```
HELP MENU      : h
QUIT           : q
```

```
MULTI_4> lt root
```

```
110602-14:02:50 4_NODES 8.0t stopfile=/tmp/27222
```

```
Starting NealBrowser with corba_class=2, java=1.6.0, neal=R72M06, jarcorb=R71T31, jacsec=R71BC07
```

```
**** Welcome to the Neal Browser (version 1.0)!
```

```
****
```

```
Connecting to 10.62.7.11 (kienb3001)... OK
Connecting to 10.62.7.12 (kienb3002)... OK
Connecting to 10.62.7.13 (kienb3003)... OK
Connecting to 10.62.7.15 (kienb3005)... OK
```

```
$nealbrowser_pid = 27294
```

```
Connected to 10.62.7.11 (Me=kienb3001,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)
Connected to 10.62.7.12 (Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1)
Connected to 10.62.7.13 (Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1)
```

Connected to 10.62.7.15 (Me=kienb3005,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3005,ManagedElement=1)
Last MO: 3. Loaded 3 MOs. Total: 4 MOs.

>>> 1/4: 10.62.7.11 (kienb3001)
Checking MOM version...ERBS_NODE_MODEL_B_1_51
Using MOM version: ERBS_NODE_MODEL_B_1_51_COMPLETE
Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gzDone.
>>> 2/4: 10.62.7.12 (kienb3002)
Checking MOM version...ERBS_NODE_MODEL_B_1_51
Using MOM version: ERBS_NODE_MODEL_B_1_51_COMPLETE
>>> 3/4: 10.62.7.13 (kienb3003)
Checking MOM version...ERBS_NODE_MODEL_B_1_51
Using MOM version: ERBS_NODE_MODEL_B_1_51_COMPLETE
>>> 4/4: 10.62.7.15 (kienb3005)
Checking MOM version...ERBS_NODE_MODEL_B_1_51
Using MOM version: ERBS_NODE_MODEL_B_1_51_COMPLETE

Parsing 1 MOM files...
Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gzDone.

Connected to 10.62.7.11 (Me=kienb3001,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)
Connected to 10.62.7.12 (Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1)
Connected to 10.62.7.13 (Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1)
Connected to 10.62.7.15 (Me=kienb3005,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3005,ManagedElement=1)
Last MO: 3. Loaded 3 MOs. Total: 4 MOs.

MULTI_4> It eutrancellfdd

110602-14:03:05 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27222

Load Proxys for MOs of following type...
=====

ExternalEUTranCellFDD
EUTranCellFDD

=====

Please Confirm [y/n]: n

MULTI_4> It ^eutrancellfdd

110602-14:03:16 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27222

Load Proxys for MOs of following type...
=====

EUTranCellFDD

=====

Please Confirm [y/n]: y

Last MO: 13. Loaded 10 MOs. Total: 14 MOs. MO Class: EUTranCellFDD.

MULTI_4> pr

```
110602-14:03:20 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27222
=====
Proxy MO
=====
0 Me=kienb3001,ManagedElement=1
1 Me=kienb3002,ManagedElement=1
2 Me=kienb3003,ManagedElement=1
3 Me=kienb3005,ManagedElement=1
4 Me=kienb3001,ENodeBFunction=1,EUTranCellFDD=113
5 Me=kienb3001,ENodeBFunction=1,EUTranCellFDD=114
6 Me=kienb3001,ENodeBFunction=1,EUTranCellFDD=115
7 Me=kienb3002,ENodeBFunction=1,EUTranCellFDD=104
8 Me=kienb3002,ENodeBFunction=1,EUTranCellFDD=102
9 Me=kienb3002,ENodeBFunction=1,EUTranCellFDD=103
10 Me=kienb3003,ENodeBFunction=1,EUTranCellFDD=kienb3003_1
11 Me=kienb3003,ENodeBFunction=1,EUTranCellFDD=kienb3003_2
12 Me=kienb3003,ENodeBFunction=1,EUTranCellFDD=kienb3003_3
13 Me=kienb3005,ENodeBFunction=1,EUTranCellFDD=1
=====
Total: 14 MOs
```

If all the nodes have the same MOM version then it is quicker to parse the MOM before running the “lt” command, this will avoid checking the MOM version from every single node.

**:ws6148@~> moshell -m moshell_logfiles/lte_sites

```
#####
#      Welcome to MoShell 8.0t (LPA108514/1_R8T)      #
#      Finn Magnusson, Jan Pettersson                #
#      http://utran01.au.ao.ericsson.se/moshell        #
#      Contact: Finn.Magnusson@ericsson.com           #
#      David.Smith@ericsson.com                       #
#####
```

Fetching IOR file from 10.62.7.11 (kienb3001)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.12 (kienb3002)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.13 (kienb3003)...Done. (CorbaPort=56834, CorbaSecurity=OFF)
Fetching IOR file from 10.62.7.14 (kienb3004)...Failed! Unable to connect to 10.62.7.14:80.

Fetching IOR file from 10.62.7.15 (kienb3005)...Done. (CorbaPort=56834, CorbaSecurity=OFF)

HELP MENU : h
QUIT : q

```
MULTI_4> parsemom ~/jarxml/ERBS_NODE_MODEL_B_1_51_COMP
ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gz ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.gz
MULTI_4> parsemom /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.gz
Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gz .....Done.
```

```
MULTI_4> lt all
```

```
110602-14:05:36 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440
```

```
Starting NealBrowser with corba_class=2, java=1.6.0, neal=R72M06, jarcorb=R71T31, jacsec=R71BC07
**** Welcome to the Neal Browser (version 1.0)!
****
```

```
Connecting to 10.62.7.11 (kienb3001)... OK
Connecting to 10.62.7.12 (kienb3002)... OK
Connecting to 10.62.7.13 (kienb3003)... OK
Connecting to 10.62.7.15 (kienb3005)... OK
```

```
$nealbrowser_pid = 27821
```

```
Connected to 10.62.7.11 (Me=kienb3001,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)
Connected to 10.62.7.12 (Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1)
Connected to 10.62.7.13 (Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1)
Connected to 10.62.7.15 (Me=kienb3005,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3005,ManagedElement=1)
Last MO: 3. Loaded 3 MOs. Total: 4 MOs.
```

```
>>> 1/4: 10.62.7.11 (kienb3001)
Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gz .....Done.
>>> 2/4: 10.62.7.12 (kienb3002)
>>> 3/4: 10.62.7.13 (kienb3003)
>>> 4/4: 10.62.7.15 (kienb3005)
```

```
Parsing 1 MOM files...
Parsing MOM (cached): /home/eanzmagn/jarxml/ERBS_NODE_MODEL_B_1_51_COMPLETE.xml.cache.gz .....Done.
```

```
Last MO: 4096. Loaded 4096 MOs. Total: 4097 MOs.
```

Printing alarm list from all nodes:

```
MULTI_4> al
```

```
110512-14:38:13 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366
```

Sever	Specific Problem	Cause Mo-Reference

Min	Password File Fault	CONFIGURATION_OR_CUSTOMIZING_ERROR Me=kienb3001,Security=1

Maj ResourceConfigurationFailure CONFIGURATION_OR_CUSTOMIZING_ERROR Me=kienb3002,EUtranCellFDD=102
Maj ResourceConfigurationFailure CONFIGURATION_OR_CUSTOMIZING_ERROR Me=kienb3002,EUtranCellFDD=103
Maj Disk Volume C Full DISK_PROBLEM Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1
Maj Disk Volume C Full DISK_PROBLEM Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1

Node	Crit	Major	Minor	Warn	?	Total
10.62.7.11 (kienb3001)	0	0	1	0	0	1
10.62.7.12 (kienb3002)	0	3	0	0	0	3
10.62.7.13 (kienb3003)	0	1	0	0	0	1
10.62.7.14 (kienb3004)	0	0	0	0	0	0

Printing the whole MO tree:

MULTI_4> pr

110512-14:38:18 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

=====

Proxy MO

=====

0 Me=kienb3001,ManagedElement=1
1 Me=kienb3001,ManagedElementData=1
2 Me=kienb3001,SystemFunctions=1
3 Me=kienb3001,SystemFunctions=1,PmService=1
4 Me=kienb3001,SystemFunctions=1,WebServer=1
5 Me=kienb3001,SystemFunctions=1,Ncli=1
6 Me=kienb3001,SystemFunctions=1,Licensing=1
7 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1
8 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityConnectedUsers=1
9 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=20MHz
10 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityOutputPower=60Watt
11 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=3MHz
12 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityOutputPower=40Watt
13 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=5MHz
14 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=1p4Mhz
15 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,DlBasebandCapacity=1
16 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=10MHz
17 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,DlPrbCapacity=1
18 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,UlPrbCapacity=1
19 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,CapacityChannelBandwidth=15MHz
20 Me=kienb3001,SystemFunctions=1,Licensing=1,CapacityLicenses=1,UlBasebandCapacity=1
21 Me=kienb3001,SystemFunctions=1,Licensing=1,OptionalFeatures=1
22 Me=kienb3001,SystemFunctions=1,Licensing=1,OptionalFeatures=1,SharedNetworkSupport=1
23 Me=kienb3001,SystemFunctions=1,Licensing=1,OptionalFeatures=1,Dl64Qam=1
24 Me=kienb3001,SystemFunctions=1,Licensing=1,OptionalFeatures=1,MixedMode=1
....<cut>.....
1175 Me=kienb3001,SectorEquipmentFunction=1

1176 Me=kienb3001,SectorEquipmentFunction=2
 1177 Me=kienb3001,EquipmentSupportFunction=1
 1178 Me=kienb3001,SectorEquipmentFunction=3
 1179 Me=kienb3002,ManagedElement=1
 1180 Me=kienb3002,ManagedElementData=1
 1181 Me=kienb3002,SystemFunctions=1
 1182 Me=kienb3002,SystemFunctions=1,PmService=1
 1183 Me=kienb3002,SystemFunctions=1,WebServer=1
 1184 Me=kienb3002,SystemFunctions=1,Ncli=1
 ...<cut>.....
 2581 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,UeMeasControl=1,ReportConfigEUtraBestCell=1,ReportConfigEUtraBestCellAnr=1
 2582 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,UeMeasControl=1,ReportConfigA1Sec=1
 2583 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,UeMeasControl=1,ReportConfigB2Geran=1
 2584 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,EUtranFreqRelation=1
 2585 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,EUtranFreqRelation=1,EUtranCellRelation=to_3016_3
 2586 Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103,EUtranFreqRelation=1,EUtranCellRelation=to_104
 2587 Me=kienb3002,ENodeBFunction=1,AdmissionControl=1
 2588 Me=kienb3002,ENodeBFunction=1,Rcs=1
 2589 Me=kienb3002,ENodeBFunction=1,PmEventService=1
 2590 Me=kienb3002,SupportSystemConfiguration=1
 2591 Me=kienb3002,SectorEquipmentFunction=1
 2592 Me=kienb3002,SectorEquipmentFunction=2
 2593 Me=kienb3002,EquipmentSupportFunction=1
 2594 Me=kienb3002,SectorEquipmentFunction=3
 2595 Me=kienb3003,ManagedElement=1
 2596 Me=kienb3003,ManagedElementData=1
 2597 Me=kienb3003,SystemFunctions=1
 2598 Me=kienb3003,SystemFunctions=1,PmService=1
 2599 Me=kienb3003,SystemFunctions=1,WebServer=1
 2600 Me=kienb3003,SystemFunctions=1,Ncli=1
 2601 Me=kienb3003,SystemFunctions=1,Licensing=1
 ...<cut>.....
 3615 Me=kienb3003,ENodeBFunction=1,Rrc=1
 3616 Me=kienb3003,ENodeBFunction=1,SrbTable=default
 3617 Me=kienb3003,ENodeBFunction=1,SrbTable=default,Srb2Profile=1
 3618 Me=kienb3003,ENodeBFunction=1,SrbTable=default,SrbLogicalChannelGroup=1
 3619 Me=kienb3003,ENodeBFunction=1,SrbTable=default,Srb1Profile=1
 3620 Me=kienb3003,ENodeBFunction=1,RbsConfiguration=1
 3621 Me=kienb3003,ENodeBFunction=1,AnrFunction=1
 3622 Me=kienb3003,ENodeBFunction=1,AnrFunction=1,AnrFunctionGeran=1
 3623 Me=kienb3003,ENodeBFunction=1,AnrFunction=1,AnrFunctionUtran=1
 3624 Me=kienb3003,ENodeBFunction=1,AnrFunction=1,AnrFunctionEUtran=1
 3625 Me=kienb3003,ENodeBFunction=1,AdmissionControl=1
 3626 Me=kienb3003,ENodeBFunction=1,Rcs=1
 3627 Me=kienb3003,ENodeBFunction=1,PmEventService=1
 3628 Me=kienb3003,SupportSystemConfiguration=1
 3629 Me=kienb3003,SectorEquipmentFunction=S1
 3630 Me=kienb3003,SectorEquipmentFunction=2
 3631 Me=kienb3003,EquipmentSupportFunction=1

```

3632 Me=kienb3003,SectorEquipmentFunction=3
3633 Me=kienb3004,ManagedElement=1
3634 Me=kienb3004,ManagedElementData=1
3635 Me=kienb3004,SystemFunctions=1
3636 Me=kienb3004,SystemFunctions=1,PmService=1
3637 Me=kienb3004,SystemFunctions=1,WebServer=1
3638 Me=kienb3004,SystemFunctions=1,Ncli=1
3639 Me=kienb3004,SystemFunctions=1,Licensing=1
...<cut>.....
4485 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigA5=1
4486 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigA5=1,ReportConfigA5Anr=1
4487 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigEutraBadCovPrim=1
4488 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigB2Utra=1
4489 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigB2Geran=1
4490 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigEutraBadCovSec=1
4491 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigA1Sec=1
4492 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigB2Cdma2000=1
4493 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigA1Prim=1
4494 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigEutraBestCell=1
4495 Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164,UeMeasControl=1,ReportConfigEutraBestCell=1,ReportConfigEutraBestCellAnr=1
4496 Me=kienb3004,ENodeBFunction=1,SrbTable=default
4497 Me=kienb3004,ENodeBFunction=1,SrbTable=default,Srb2Profile=1
4498 Me=kienb3004,ENodeBFunction=1,SrbTable=default,SrbLogicalChannelGroup=1
4499 Me=kienb3004,ENodeBFunction=1,SrbTable=default,Srb1Profile=1
4500 Me=kienb3004,ENodeBFunction=1,RbsConfiguration=1
4501 Me=kienb3004,ENodeBFunction=1,AnrFunction=1
4502 Me=kienb3004,ENodeBFunction=1,AnrFunction=1,AnrFunctionGeran=1
4503 Me=kienb3004,ENodeBFunction=1,AnrFunction=1,AnrFunctionUtran=1
4504 Me=kienb3004,ENodeBFunction=1,AnrFunction=1,AnrFunctionEUTRAN=1
4505 Me=kienb3004,ENodeBFunction=1,TermPointToMme=MME010045132026
4506 Me=kienb3004,ENodeBFunction=1,AdmissionControl=1
4507 Me=kienb3004,ENodeBFunction=1,Rcs=1
4508 Me=kienb3004,ENodeBFunction=1,PmEventService=1
4509 Me=kienb3004,SupportSystemConfiguration=1
4510 Me=kienb3004,SectorEquipmentFunction=1
4511 Me=kienb3004,SectorEquipmentFunction=2
4512 Me=kienb3004,EquipmentSupportFunction=1
4513 Me=kienb3004,SectorEquipmentFunction=3
=====

```

Total: 4514 MOs

Printing all RRC counters on all cells:

```
MULTI_4> pget utrancellfdd rrc
```

```
110512-14:38:50 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366
```

```

=====
=====
MO                               Attribute      Value

```

```

=====
=====
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAtt 13
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAttEm 0
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAttHpa 0
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAttMod 4
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAttMos 7
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabAttMta 2
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabFailLic 0
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabSucc 13
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabSuccEm 0
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabSuccHpa 0
Me=kienb3001,EUtranCellFDD=114      pmRrcConnLevSamp 106
Me=kienb3001,EUtranCellFDD=114      pmRrcConnLevSum 90
Me=kienb3001,EUtranCellFDD=114      pmRrcConnMax 4
Me=kienb3001,EUtranCellFDD=114      pmRrcConnReconfAttNoMob 20
Me=kienb3001,EUtranCellFDD=114      pmRrcConnReconfSuccNoMob 20
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAtt 9
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAttEm 0
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAttHpa 0
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAttMod 1
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAttMos 6
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabAttMta 2
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabFailLic 0
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabSucc 9
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabSuccEm 0
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabSuccHpa 0
Me=kienb3001,EUtranCellFDD=113      pmRrcConnLevSamp 106
Me=kienb3001,EUtranCellFDD=113      pmRrcConnLevSum 86
Me=kienb3001,EUtranCellFDD=113      pmRrcConnMax 4
Me=kienb3001,EUtranCellFDD=113      pmRrcConnReconfAttNoMob 17
Me=kienb3001,EUtranCellFDD=113      pmRrcConnReconfSuccNoMob 17
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAtt 21
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAttEm 0
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAttHpa 0
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAttMod 4
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAttMos 13
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabAttMta 4
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabFailLic 0
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabSucc 21
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabSuccEm 0
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabSuccHpa 0
Me=kienb3001,EUtranCellFDD=115      pmRrcConnLevSamp 106
Me=kienb3001,EUtranCellFDD=115      pmRrcConnLevSum 224
Me=kienb3001,EUtranCellFDD=115      pmRrcConnMax 10
Me=kienb3001,EUtranCellFDD=115      pmRrcConnReconfAttNoMob 42
Me=kienb3001,EUtranCellFDD=115      pmRrcConnReconfSuccNoMob 42
Me=kienb3002,EUtranCellFDD=104      pmRrcConnEstabAtt 6
Me=kienb3002,EUtranCellFDD=104      pmRrcConnEstabAttEm 0

```


Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabFailLic 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabSuccEm 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabSuccHpa -1
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnLevSamp 106
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnLevSum 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnMax 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnReconfAttNoMob 0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnReconfSuccNoMob 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAtt 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAttEm 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAttHpa 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAttMod 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAttMos 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabAttMta 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabFailLic 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabSuccEm 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabSuccHpa -1
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnLevSamp 106
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnLevSum 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnMax 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnReconfAttNoMob 0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnReconfSuccNoMob 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAtt 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAttEm 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAttHpa 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAttMod 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAttMos 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabAttMta 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabFailLic 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabSuccEm 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabSuccHpa -1
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnLevSamp 106
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnLevSum 106
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnMax 1
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnReconfAttNoMob 0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnReconfSuccNoMob 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAtt 2
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAttEm 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAttHpa 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAttMod 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAttMos 2
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabAttMta 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabFailLic 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabSucc 2
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabSuccEm 0
Me=kienb3004,EUtranCellFDD=163	pmRrcConnEstabSuccHpa 0

Me=kienb3004,EUtranCellFDD=163	pmRrcConnLevSamp 106
Me=kienb3004,EUtranCellFDD=163	pmRrcConnLevSum 1
Me=kienb3004,EUtranCellFDD=163	pmRrcConnMax 1
Me=kienb3004,EUtranCellFDD=163	pmRrcConnReconfAttNoMob 2
Me=kienb3004,EUtranCellFDD=163	pmRrcConnReconfSuccNoMob 2
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAtt 9
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAttEm 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAttHpa 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAttMod 9
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAttMos 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabAttMta 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabFailLic 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabSucc 9
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabSuccEm 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnEstabSuccHpa 0
Me=kienb3004,EUtranCellFDD=1	pmRrcConnLevSamp 106
Me=kienb3004,EUtranCellFDD=1	pmRrcConnLevSum 2706
Me=kienb3004,EUtranCellFDD=1	pmRrcConnMax 27
Me=kienb3004,EUtranCellFDD=1	pmRrcConnReconfAttNoMob 9
Me=kienb3004,EUtranCellFDD=1	pmRrcConnReconfSuccNoMob 9
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAtt 2
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAttEm 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAttHpa 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAttMod 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAttMos 2
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabAttMta 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabFailLic 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabSucc 2
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabSuccEm 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnEstabSuccHpa 0
Me=kienb3004,EUtranCellFDD=164	pmRrcConnLevSamp 106
Me=kienb3004,EUtranCellFDD=164	pmRrcConnLevSum 1
Me=kienb3004,EUtranCellFDD=164	pmRrcConnMax 1
Me=kienb3004,EUtranCellFDD=164	pmRrcConnReconfAttNoMob 2
Me=kienb3004,EUtranCellFDD=164	pmRrcConnReconfSuccNoMob 2

=====
Total: 12 MOs

Printing a specific counter on all cells:

MULTI_4> pget eutrancellfdd pmRrcConnEstabSucc\$

110602-14:09:09 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440

=====		
=====		
MO	Attribute	Value
=====		
=====		

```
Me=kienb3001,EUtranCellFDD=114      pmRrcConnEstabSucc 4
Me=kienb3001,EUtranCellFDD=113      pmRrcConnEstabSucc 4
Me=kienb3001,EUtranCellFDD=115      pmRrcConnEstabSucc 14
Me=kienb3002,EUtranCellFDD=104      pmRrcConnEstabSucc 0
Me=kienb3002,EUtranCellFDD=102      pmRrcConnEstabSucc 0
Me=kienb3002,EUtranCellFDD=103      pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_2  pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_3  pmRrcConnEstabSucc 0
Me=kienb3003,EUtranCellFDD=kienb3003_1  pmRrcConnEstabSucc 0
Me=kienb3005,EUtranCellFDD=1      pmRrcConnEstabSucc 0
=====
=====
Total: 10 MOs
```

Checking for counter increase in the past 25 seconds:

```
MULTI_4> pdiff eutrancellfdd pmRrcConnEstabSucc$

110602-14:09:16 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440
.
waiting 24 seconds before next check...
```

```
=====
=====
```

MO	Counter	DiffValue
=====		
Me=kienb3001,EUtranCellFDD=114	pmRrcConnEstabSucc	0
Me=kienb3001,EUtranCellFDD=113	pmRrcConnEstabSucc	2
Me=kienb3001,EUtranCellFDD=115	pmRrcConnEstabSucc	0
Me=kienb3002,EUtranCellFDD=104	pmRrcConnEstabSucc	0
Me=kienb3002,EUtranCellFDD=102	pmRrcConnEstabSucc	0
Me=kienb3002,EUtranCellFDD=103	pmRrcConnEstabSucc	0
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabSucc	0
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabSucc	0
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabSucc	0
Me=kienb3005,EUtranCellFDD=1	pmRrcConnEstabSucc	0
=====		
=====		
Total: 10 MOs		

Checking for counter increase in the past 60 seconds:

```
MULTI_4> uv pm_wait=60

pm_wait=60

MULTI_4> pdiff eutrancellfdd pmRrcConnEstabSucc$
```

waiting 59 seconds before next check...

=====			
=====			
MO	Counter	DiffValue	
=====			
=====			
Me=kienb3001,EUtranCellFDD=114	pmRrcConnEstabSucc	0	
Me=kienb3001,EUtranCellFDD=113	pmRrcConnEstabSucc	5	
Me=kienb3001,EUtranCellFDD=115	pmRrcConnEstabSucc	3	
Me=kienb3002,EUtranCellFDD=104	pmRrcConnEstabSucc	0	
Me=kienb3002,EUtranCellFDD=102	pmRrcConnEstabSucc	0	
Me=kienb3002,EUtranCellFDD=103	pmRrcConnEstabSucc	0	
Me=kienb3003,EUtranCellFDD=kienb3003_2	pmRrcConnEstabSucc	0	
Me=kienb3003,EUtranCellFDD=kienb3003_3	pmRrcConnEstabSucc	0	
Me=kienb3003,EUtranCellFDD=kienb3003_1	pmRrcConnEstabSucc	0	
Me=kienb3005,EUtranCellFDD=1	pmRrcConnEstabSucc	0	
=====			
=====			
Total: 10 MOs			

Printing all cell states

MULTI_4> st utrancellf

=====			
Proxy	Adm State	Op. State	MO
=====			
1108	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=114
1132	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=113
1156	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=115
2520	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=104
2558	1 (UNLOCKED)	0 (DISABLED)	Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=102
2571	1 (UNLOCKED)	0 (DISABLED)	Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103
3562	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_2
3580	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_3
3599	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_1
4412	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=163
4447	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=1
4479	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164
=====			
Total: 12 MOs			

MULTI_4>

Printing all cells power settings:

```
MULTI_4> hget utrancellf power

110512-14:39:21 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366
.....
=====
=====
MO                maximumTransmissionPower partOfRadioPower partOfSectorPower
=====
=====
Me=kienb3001,EUtranCellFDD=114      430          100          100
Me=kienb3001,EUtranCellFDD=113      430          100          100
Me=kienb3001,EUtranCellFDD=115      430          100          100
Me=kienb3002,EUtranCellFDD=104      430          100          100
Me=kienb3002,EUtranCellFDD=102      -1           100          100
Me=kienb3002,EUtranCellFDD=103      -1           100          100
Me=kienb3003,EUtranCellFDD=kienb3003_2 430          100          100
Me=kienb3003,EUtranCellFDD=kienb3003_3 430          100          100
Me=kienb3003,EUtranCellFDD=kienb3003_1 430          100          100
Me=kienb3004,EUtranCellFDD=163      430          100          100
Me=kienb3004,EUtranCellFDD=1        430          100          100
Me=kienb3004,EUtranCellFDD=164      430          100          100
=====
=====
Total: 12 MOs

Added 12 MOs to group: hget_group
```

Restarting all the nodes:

```
MULTI_4> facc managedelement=1 manualrestart 0 0 -

110512-14:40:31 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366
Call Action manualrestart on following 4 MOs ?
=====
0 Me=kienb3001,ManagedElement=1
1179 Me=kienb3002,ManagedElement=1
2595 Me=kienb3003,ManagedElement=1
3633 Me=kienb3004,ManagedElement=1
=====
Call action manualrestart on 4 MOs. Are you Sure [y/n] ? n

MULTI_4>

MULTI_4>

MULTI_4>
```

Reconnecting the corba to all nodes (in case some nodes restarted and we lost connectivity):

MULTI_4> re

Starting NealBrowser with corba_class=2, java=1.6.0, neal=R72M06, jarcorb=R71T31, jacsec=R71BC07

**** Welcome to the Neal Browser (version 1.0)!

Connecting to 10.62.7.11 (kienb3001)... OK

Connecting to 10.62.7.12 (kienb3002)... OK

Connecting to 10.62.7.13 (kienb3003)... OK

Connecting to 10.62.7.14 (kienb3004)... OK

\$nealbrowser_pid = 9904

Connected to 10.62.7.11 (Me=kienb3001,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3001,ManagedElement=1)

Connected to 10.62.7.12 (Me=kienb3002,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3002,ManagedElement=1)

Connected to 10.62.7.13 (Me=kienb3003,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3003,ManagedElement=1)

Connected to 10.62.7.14 (Me=kienb3004,SubNetwork=ONRM_ROOT_MO_R,SubNetwork=LTEKi,MeContext=kienb3004,ManagedElement=1)

Last MO: 3. Loaded 3 MOs. Total: 4 MOs.

MULTI_4> It all

110512-14:43:28 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

Last MO: 4513. Loaded 4513 MOs. Total: 4514 MOs.

Printing current CV and upgrade package for all nodes:

MULTI_4> hget configurationv executing|currentup

110512-14:44:07 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

.

```
=====
=====
MO                currentUpgradePackage    executingCv
=====
=====
```

Me=kienb3001,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R14L CXP102051%12_R14L_MME14_2

Me=kienb3002,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R13V Fi_CXP102051%12_R13V_param1_rcs_10

Me=kienb3003,ConfigurationVersion=1 UpgradePackage=R14U selfconfig_autocreated1

Me=kienb3004,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R14U TransferBackupCv1

```
=====
=====
Total: 4 MOs
```

Added 4 MOs to group: hget_group

MULTI_4>
MULTI_4>
MULTI_4>

Configuring hget to show the proxy id:

MULTI_4> prox

Display of proxy in get <mo> <attr> = enabled

MULTI_4> hget configurationv executing|currentup

110512-14:44:35 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

.

=====			
=====			
Proxy MO	currentUpgradePackage	executingCv	
=====			
=====			
214	Me=kienb3001,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R14L CXP102051%12_R14L_MME14_2		
1384	Me=kienb3002,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R13V Fi_CXP102051%12_R13V_param1_rcs_10		
2816	Me=kienb3003,ConfigurationVersion=1 UpgradePackage=R14U selfconfig_autocreated1		
3847	Me=kienb3004,ConfigurationVersion=1 UpgradePackage=CXP102051%12_R14U TransferBackupCv1		
=====			
=====			
Total: 4 MOs			

Added 4 MOs to group: hget_group

MULTI_4>
MULTI_4>

Checking state of all S1/X2 termpoints:

MULTI_4> st termpoint

110602-14:12:50 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440

=====				
Proxy	Adm	State	Op. State	MO
=====				
1086	1	(UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,TermPointToMme=MME010064193081
2476	0	(LOCKED)	0 (DISABLED)	Me=kienb3002,ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=3016,TermPointToENB=26280-103016
2479	1	(UNLOCKED)	1 (ENABLED)	Me=kienb3002,ENodeBFunction=1,TermPointToMme=MME010064193091
3329	1	(UNLOCKED)	1 (ENABLED)	Me=kienb3003,ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4026,TermPointToENB=4026
3366	1	(UNLOCKED)	1 (ENABLED)	Me=kienb3003,ENodeBFunction=1,TermPointToMme=MME010064193081

4085 1 (UNLOCKED) 1 (ENABLED) Me=kienb3005,ENodeBFunction=1,TermPointToMme=MME010064193081

=====

Total: 6 MOs

MULTI_4> st termpointtomme

110602-14:13:10 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440

=====

Proxy Adm State Op. State MO

=====

1086 1 (UNLOCKED) 1 (ENABLED) Me=kienb3001,ENodeBFunction=1,TermPointToMme=MME010064193081

2479 1 (UNLOCKED) 1 (ENABLED) Me=kienb3002,ENodeBFunction=1,TermPointToMme=MME010064193091

3366 1 (UNLOCKED) 1 (ENABLED) Me=kienb3003,ENodeBFunction=1,TermPointToMme=MME010064193081

4085 1 (UNLOCKED) 1 (ENABLED) Me=kienb3005,ENodeBFunction=1,TermPointToMme=MME010064193081

=====

Total: 4 MOs

MULTI_4> st termpointtoenb

110602-14:13:13 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440

=====

Proxy Adm State Op. State MO

=====

2476 0 (LOCKED) 0 (DISABLED) Me=kienb3002,ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=3016,TermPointToENB=26280-103016

3329 1 (UNLOCKED) 1 (ENABLED) Me=kienb3003,ENodeBFunction=1,EUtraNetwork=1,ExternalENodeBFunction=4026,TermPointToENB=4026

=====

Total: 2 MOs

Checking state ip address of all S1/X2 termpoints:

MULTI_4> hget termpoint ipadd

110512-14:45:56 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

.

=====

=====

Proxy MO ipAddress usedIpAddress

=====

=====

2540 Me=kienb3002,EUtraNetwork=1,ExternalENodeBFunction=3016,TermPointToENB=26280-103016 10.62.8.26 0.0.0.0

3561 Me=kienb3003,EUtraNetwork=1,ExternalENodeBFunction=4026,TermPointToENB=4026 10.62.11.36 10.62.11.36

4465 Me=kienb3004,EUtraNetwork=1,ExternalENodeBFunction=kienb4005,TermPointToENB=26280-104005 10.62.11.15 0.0.0.0

4469 Me=kienb3004,EUtraNetwork=1,ExternalENodeBFunction=kienb4006,TermPointToENB=26280-104006 10.62.11.16

=====

=====

Total: 4 MOs

Added 4 MOs to group: hget_group

...

=====				
Proxy MO	ipAddress1	ipAddress2	usedIpAddress	
=====				
=====				
1104	Me=kienb3001,TermPointToMme=MME010064193091	10.64.193.91	0.0.0.0	10.64.193.91
2543	Me=kienb3002,TermPointToMme=MME010064193091	10.64.193.91	0.0.0.0	10.64.193.92
3598	Me=kienb3003,TermPointToMme=MME010064193081	10.64.193.81	0.0.0.0	10.64.193.81
4471	Me=kienb3004,TermPointToMme=MME010064193091	10.64.193.91	0.0.0.0	0.0.0.0
4476	Me=kienb3004,TermPointToMme=MME010064193081	10.64.193.81	0.0.0.0	0.0.0.0
4478	Me=kienb3004,TermPointToMme=MME010064193111	10.64.193.111	0.0.0.0	0.0.0.0/::
4505	Me=kienb3004,TermPointToMme=MME010045132026	10.45.132.26	0.0.0.0	10.45.132.26
=====				
=====				
Total: 7 MOs				

Checking state and ip address of all S1/X2 termpoints:

MULTI_4> hgetm termpoint usedip|state

110602-14:14:28 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/27440

=====				
MO	administrativeState	operationalState	usedIpAddress	
=====				
Me=kienb3001,TermPointToMme=MME010064193081	1 (UNLOCKED)	1 (ENABLED)	10.64.193.81	
Me=kienb3002,EUtraNetwork=1,ExternalENodeBFunction=3016,TermPointToENB=26280-103016	0 (LOCKED)	0 (DISABLED)	0.0.0.0	
Me=kienb3002,TermPointToMme=MME010064193091	1 (UNLOCKED)	1 (ENABLED)	10.64.193.91	
Me=kienb3003,EUtraNetwork=1,ExternalENodeBFunction=4026,TermPointToENB=4026	1 (UNLOCKED)	1 (ENABLED)	10.62.11.36	
Me=kienb3003,TermPointToMme=MME010064193081	1 (UNLOCKED)	1 (ENABLED)	10.64.193.81	
Me=kienb3005,TermPointToMme=MME010064193081	1 (UNLOCKED)	1 (ENABLED)	10.64.193.81	
=====				
Total: 6 MOs				

Comparing MO data between several MOs belonging to different nodes:

MULTI_4> st eutrancellfdd

110512-14:46:32 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

Proxy	Adm State	Op. State	MO
=====			
1108	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=114
1132	1 (UNLOCKED)	1 (ENABLED)	Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=113

```

1156 1 (UNLOCKED) 1 (ENABLED) Me=kienb3001,ENodeBFunction=1,EUtranCellFDD=115
2520 1 (UNLOCKED) 1 (ENABLED) Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=104
2558 1 (UNLOCKED) 0 (DISABLED) Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=102
2571 1 (UNLOCKED) 0 (DISABLED) Me=kienb3002,ENodeBFunction=1,EUtranCellFDD=103
3562 1 (UNLOCKED) 1 (ENABLED) Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_2
3580 1 (UNLOCKED) 1 (ENABLED) Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_3
3599 1 (UNLOCKED) 1 (ENABLED) Me=kienb3003,ENodeBFunction=1,EUtranCellFDD=kienb3003_1
4412 1 (UNLOCKED) 1 (ENABLED) Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=163
4447 1 (UNLOCKED) 1 (ENABLED) Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=1
4479 1 (UNLOCKED) 1 (ENABLED) Me=kienb3004,ENodeBFunction=1,EUtranCellFDD=164
=====
Total: 12 MOs

```

MULTI_4> diff 1108 2520 3562

110512-14:51:01 4_NODES 8.0t ERBS_NODE_MODEL_B_1_51_COMPLETE stopfile=/tmp/9366

```

=====
MO          Me=kienb3001,EUtranCellFDD=114 Me=kienb3002,EUtranCellFDD=104 Me=kienb3003,EUtranCellFDD=kienb3003_2
=====
noOfRxAntennas      2          0          0
dlChannelBandwidth  10000      10000      1400
sectorFunctionRef   SectorEquipmentFunction=2 SectorEquipmentFunction=3 SectorEquipmentFunction=2
EUtranCellFDDId     114        104        kienb3003_2
noOfUsedTxAntennas  2          1          2
acBarringInfo.acBarringSpecialAcForMoSignalling [Z@dc57db [Z@104faf8 [Z@5e179a
cellSimulated       false      true      false
acBarringInfo.acBarringSpecialAcForMoData [Z@c24c0 [Z@1f8c6df [Z@15fadcf
drxActive           true       false    true
ulChannelBandwidth  10000      10000      1400
tac                 3584      3584      2304
physicalLayerCellIdGroup 125      34        111
noOfTxAntennas      2          0          0
reservedBy          [2] =      [1] =      [1] =
noOfPucchCqiUsers   160        160        50
cellId              114        104        36
physicalLayerSubCellId 1          2          1
noOfPucchSrUsers    160        160        50
=====

```

6 Tracing

6.1 te/fte commands

Refer to chapter 8.5 in Moshell Basic

6.2 Install decoder and flow

- General tracing info: refer to “MoshellBasic” training document , chapter 8 <http://utran01.epa.ericsson.se/moshell/training>
- LTE monitors and decoders can be downloaded from: <http://utran01.au.ao.ericsson.se/utranwiki/LteSvnToolbox>

LteSvnToolbox - GSDC Australia UTRAN Wiki - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://utran01.au.ao.ericsson.se/utranwiki/LteSvnToolbox

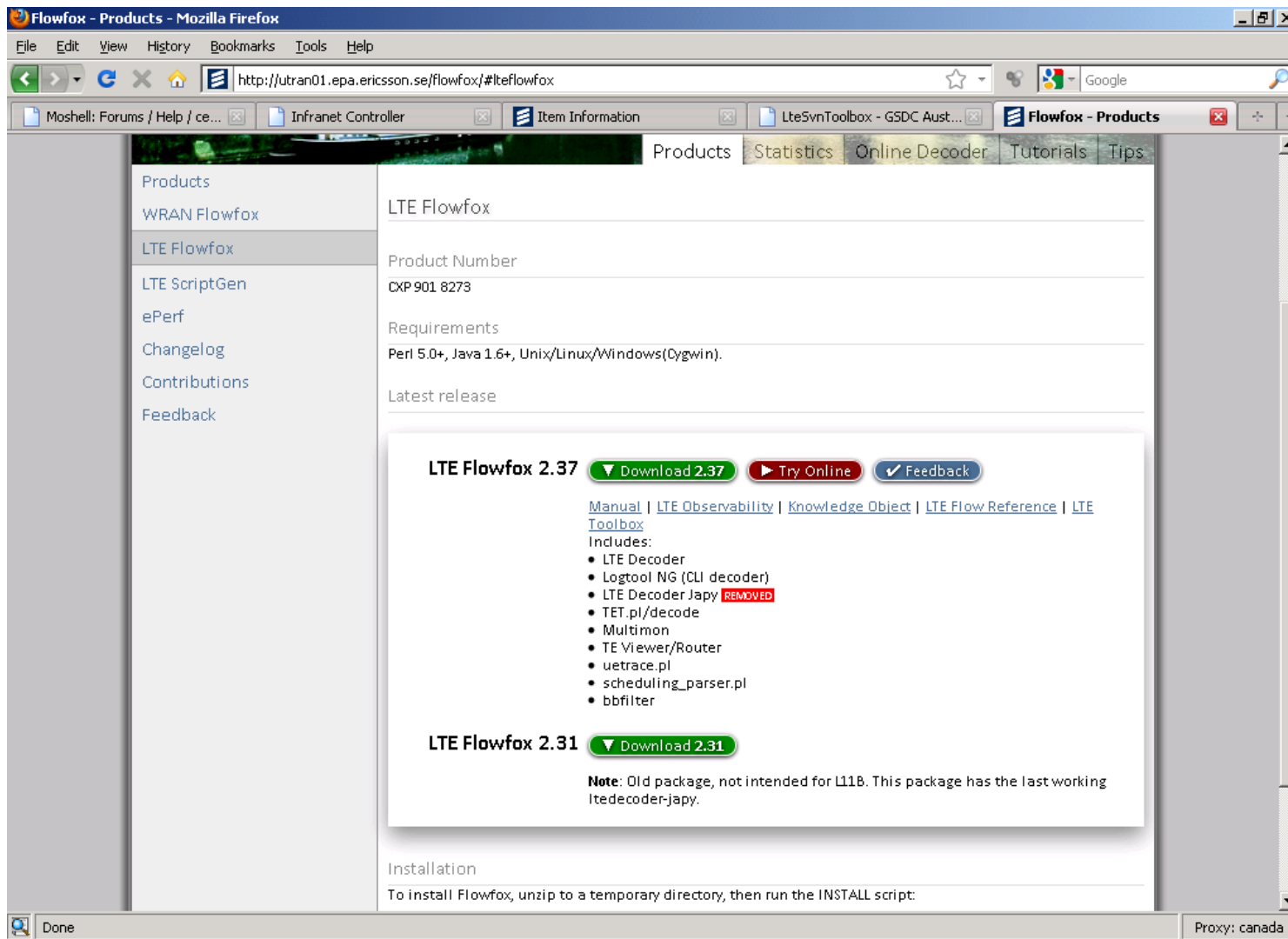
Moshell: Forums / Help / cedh showin... Infranet Controller Item Information LteSvnToolbox - GSDC Australia...

Toolbox Contents

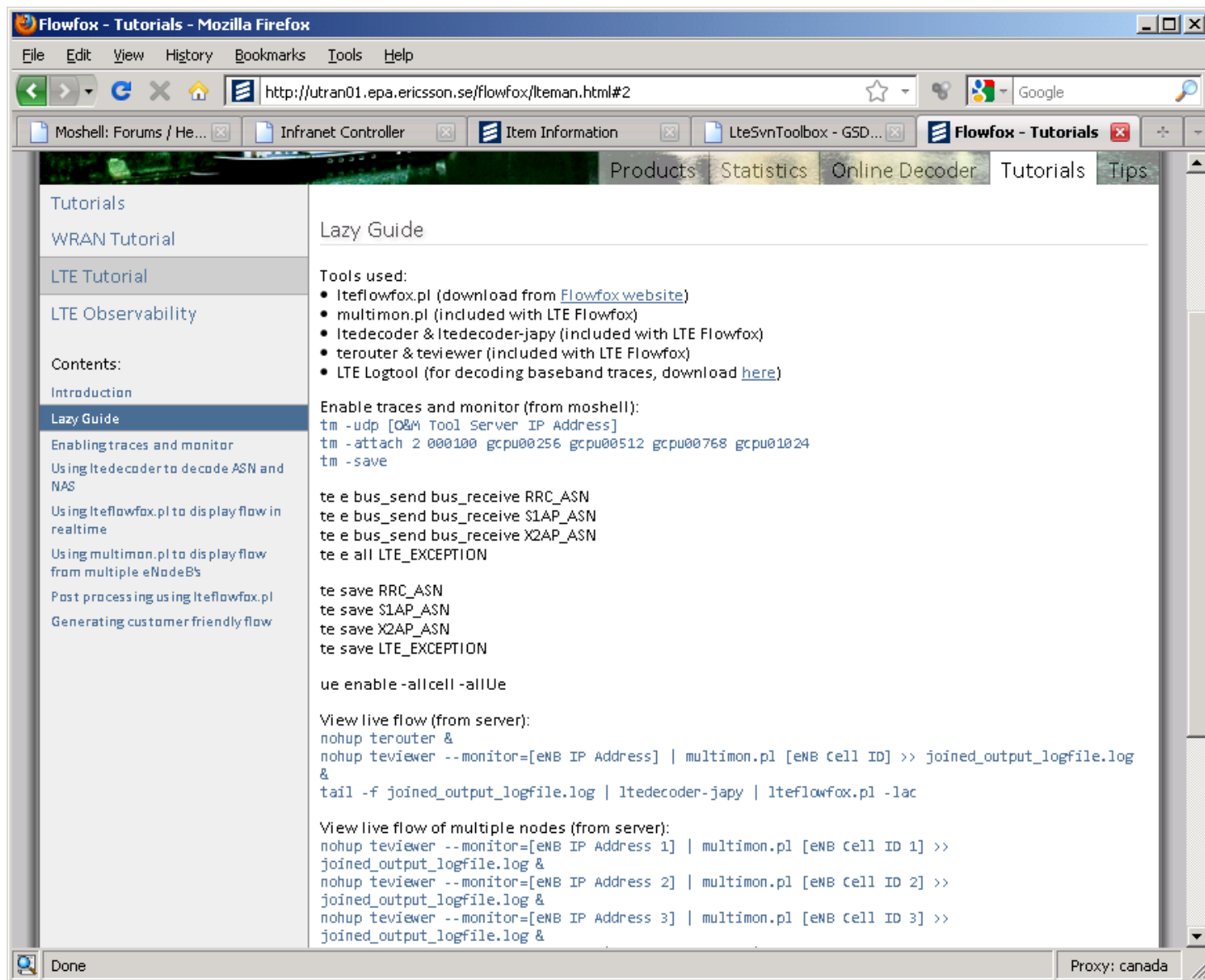
SVN Toolbox Contents			
Tool Name	Basic Description	Area	Author
bbfilter	Useful tool for analysing baseband traces	baseband tracing	Henrik Åhlander
bbfilter12	Useful tool for analysing baseband traces	baseband tracing	Henrik Åhlander
capture	Trace Capture is a tool similar to tcpdump. Capture is part of the Itetrace tools suite	tracing	
checkPaths.pl	Utility to adapt this toolbox to the target environment it is being installed on. Should only be called indirectly via setpaths.sh	Toolbox Installation	Paul Stewart
convert_sysconst.pl	Utility that takes the system constants string from the system constants mo and converts to a formatted readable output	System Constants	Paul Stewart
decode	Tool for decoding MAC / RLC PDCP / MTD / RDR and CDA traces	baseband tracing	Henrik Åhlander
decode_bfn	Decodes radio time stamps and shows bfn, sfn, sf and bf	tracing	Henrik Åhlander
extract_nodeinfo_oss.awk	Useful tool to query the oss server via corba to generate an up-to-date ipdatabase file that can be used with moshell	create ipdatabase	David Smith
frame4Wireshark.pl			Simon Lumb
getUISf.pl	This script will calculate in which subframes the UE is allowed to initiate scheduling requests and / or send CQI information to the enodeb	SR / CQI Configuration	Paul Stewart
lmAudit.pl	A script to check that the correct versions of loadmodules are executing on the node. Works on mobatch output and input from Release notes	Upgrade	Margaret Chen
logsplit	Manage large tracefiles from any node by splitting / rotating the logfiles based on size or time or even matched string	tracing	David Markham
litedecoder	Decodes L3 ASN traces (S1AP_ASN, X2AP_ASN, RRC_ASN) as well as LTE Exceptions, UE Trace and Cell Trace events	DUL Tracing and event decoding	
litedecoder-japy	Decodes L3 ASN traces (S1AP_ASN, X2AP_ASN, RRC_ASN) as well as LTE Exceptions, UE Trace and Cell Trace events	DUL Tracing and event decoding	
lteflowfox.pl	L3 (S1AP_ASN, X2AP_ASN, RRC_ASN) flow analyser	DUL Tracing	Dusan Simic
lte_max_L1_L2_thpt_calc.pl	Calculates the achievable L1 and L2 throughput in UL and DL	Throughput	Alex Perez
make_system_constants.pl	Makes a moscript from the recommended system constants parameter settings excel file	System Constants	Conor Kelly
multimon.pl	Simple script to add the nodeb ID to the lteflowfox.pl trace flow	tracing	Dusan Simic
parse_ul_harq.awk	This tool display HARQ info in a useful format, making it possible to see throughput related issues	HARQ tracing	David Smith
rdr_prep.pl	Reformat RDR CSV files (output from LteLogTool RDR CSV writer) so they can be imported into microsoft excel 2003 (due to limitation in number of columns)	RDR	Paul Stewart

Done Proxy: canada

- or: <http://utran01.epa.ericsson.se/flowfox>



- LTE tracing tutorial <http://utran01.epa.ericsson.se/flowfox/lteman.html> and <http://utran01.epa.ericsson.se/flowfox/lteobservability.html>



Installing flowfox decoder package

```
[~] unzip lteflowfox2.25.zip
Archive: lteflowfox2.25.zip
replace FlowfoxWebsite.url? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
```

```
inflating: FlowfoxWebsite.url
replace INSTALL? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
inflating: INSTALL
replace ltepack.zip? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
inflating: ltepack.zip      y
replace README.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
inflating: README.txt
[~] bash INSTALL
```

```
=====
                LTE Flowfox v2.25
    Designed by: Dusan Simic (dusan.simic@ericsson.com)
            *** INSTALLATION IN PROGRESS ***
=====
```

Contents of this package:

```
- LTE Flowfox      v2.25
- LTE Decoder      vR6C03
- Japy             v1064
- TE Router        vR2A/D
- TET/decode       vR1A
- Multimon         vPA3
- uetrace.pl       v1.5
- scheduling_parser.pl v1.5
```

Requirements:

```
- Java v1.6+
- Perl v5.0+
```

Terms of use:

Usage of LTE Flowfox is confined to the Ericsson applications. Taking this out of Ericsson usage is considered as breach of Internal Policy. This tool is strictly for informational use.

Do you agree with the above terms? (y/n)? y

This is not your first Flowfox installation.

These settings were used last time:

```
- Directory /home/eanzmagn/decoder/
- Perl    /opt/as/bin/perl
- Java    /home/eanzmagn/jre1.6.0_12/bin/java
```

UPGRADE with previous settings (y/n)? y

Installation directory: /home/eanzmagn/decoder/

Java path: /home/eanzmagn/jre1.6.0_12/bin/java

Perl path: /opt/as/bin/perl

=====

Unpacking LTE decoder

Archive: ltepack.zip

inflating: /home/eanzmagn/decoder/decode
inflating: /home/eanzmagn/decoder/fap.pm
inflating: /home/eanzmagn/decoder/lib/commons-cli-1.2.jar
inflating: /home/eanzmagn/decoder/lib/ltedecoder-japy.jar
inflating: /home/eanzmagn/decoder/lib/ltedecoder.jar
inflating: /home/eanzmagn/decoder/lib/ltetraetools.jar
inflating: /home/eanzmagn/decoder/lib/oss.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r1.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r2.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r3.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r4.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r5.jar
inflating: /home/eanzmagn/decoder/lib/rrc-r6.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r1.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r2.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r3.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r4.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r5.jar
inflating: /home/eanzmagn/decoder/lib/s1ap-r6.jar
inflating: /home/eanzmagn/decoder/lib/x2ap-r1.jar
inflating: /home/eanzmagn/decoder/lib/x2ap-r2.jar
inflating: /home/eanzmagn/decoder/lib/x2ap-r3.jar
inflating: /home/eanzmagn/decoder/lib/x2ap-r4.jar
inflating: /home/eanzmagn/decoder/lib/x2ap-r5.jar
inflating: /home/eanzmagn/decoder/ltedecoder
inflating: /home/eanzmagn/decoder/ltedecoder-japy
inflating: /home/eanzmagn/decoder/lteflowfox.pl
inflating: /home/eanzmagn/decoder/multimon.pl
inflating: /home/eanzmagn/decoder/scheduling_parser.pl
inflating: /home/eanzmagn/decoder/terouter
inflating: /home/eanzmagn/decoder/TET.pl
inflating: /home/eanzmagn/decoder/teviewer
creating: /home/eanzmagn/decoder/traceLib/
inflating: /home/eanzmagn/decoder/traceLib/rev2verLib.pl
inflating: /home/eanzmagn/decoder/uetrace.pl
extracting: /home/eanzmagn/decoder/wrapoff
extracting: /home/eanzmagn/decoder/wrapon
creating: /home/eanzmagn/decoder/XML/
inflating: /home/eanzmagn/decoder/XML/Namespacesupport.pm
creating: /home/eanzmagn/decoder/XML/SAX/
inflating: /home/eanzmagn/decoder/XML/SAX.pm
inflating: /home/eanzmagn/decoder/XML/SAX/Base.pm
inflating: /home/eanzmagn/decoder/XML/SAX/DocumentLocator.pm

inflating: /home/eanzmagn/decoder/XML/SAX/Exception.pm
inflating: /home/eanzmagn/decoder/XML/SAX/Intro.pod
inflating: /home/eanzmagn/decoder/XML/SAX/ParserFactory.pm
extracting: /home/eanzmagn/decoder/XML/SAX/placeholder.pl
creating: /home/eanzmagn/decoder/XML/SAX/PurePerl/
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/DebugHandler.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/DocType.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/DTDDecls.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/EncodingDetect.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Exception.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/NoUnicodeExt.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Productions.pm
creating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/NoUnicodeExt.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/Stream.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/String.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/UnicodeExt.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/Reader/URI.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/UnicodeExt.pm
inflating: /home/eanzmagn/decoder/XML/SAX/PurePerl/XMLDecl.pm
creating: /home/eanzmagn/decoder/XML/Simple/
inflating: /home/eanzmagn/decoder/XML/Simple.pm
inflating: /home/eanzmagn/decoder/XML/Simple/FAQ.pod

=====
*** INSTALLATION COMPLETE ***
=====

Using the following settings:

Directory /home/eanzmagn/decoder/
Perl /opt/as/bin/perl
Java /home/eanzmagn/jre1.6.0_12/bin/java

Support:

LTE Flowfox: Dusan Simic (dusan.simic@ericsson.com)
 Alex Perez (alex.perez@ericsson.com)

LTE Decoder: Marie Rööf (marie.roor@ericsson.com)

UE Trace: Conor Kelly (conor.kelly@ericsson.com)

Scheduling Parser: Ratanasiri Sodcoksung (ratanasiri.sodcoksung@ericsson.com)

Usage instructions:

Visit <http://utran01.epa.ericsson.se/flowfox/>

6.3 Setup traces

Layer 3

```
ENB30> fte e bus_send bus_receive ASN
```

```
$ te e bus_send bus_receive Ft_RRC_ASN
$ te e bus_send bus_receive Ft_S1AP_ASN
$ te e bus_send bus_receive Ft_X2AP_ASN
$
```

```
ENB30> fte e all LTE_EXCEPTION
```

```
$ te e all Ft_LTE_EXCEPTION
$
```

```
ENB30> fte save ASN|LTE_EXCEPTION
```

```
$ te save Ft_LTE_EXCEPTION
$ te save Ft_RRC_ASN
$ te save Ft_S1AP_ASN
$ te save Ft_X2AP_ASN
```

```
ENB30> fte s
```

Process	Status	AddedTraceConditions
Ft_LTE_EXCEPTION	ena&saved	all
Ft_S1AP_ASN	ena&saved	bus_send bus_receive
Ft_X2AP_ASN	ena&saved	bus_send bus_receive
Ft_RRC_ASN	ena&saved	bus_send bus_receive

```
ENB30> ue
```

```
$ ue
```

```
==== UE Identity Register COLI Commands ====
```

```
ue cap -racueref <ueld> -cellid <cellId>
```

- Prints a list of capabilities for a specific Ue.

When racUeRef is specified as idType, cellId needs to be entered.

```
ue disable -ue -traceref <traceRef>
```

- Deactivate Ue selective RBS Ue trace for specific trace ref

<traceref> is specified in hexcode (max 6 bytes)

```
ue disable -cellid <cellId>
```

- Deactivate all cell selective RBS Ue traces in specific cell

```
ue disable -allcell
```

- Deactivate all cell selective RBS Ue traces in all cells

```
ue enable -ue -traceref <traceRef> [-timeout <min>]
```

- Activates Ue selective RBS Ue trace for specific traceRef

ue enable -cellid <cellId> <maxUeInCell> [-timeout <min>] - Activates maxUeInCell [1..5]
 number of cell selective RBS Ue traces in specific cell
 Optional -timeout <min> specified in minutes [1..720]
 ue enable -allcell -allUe [-timeout <min>] - Activates all cell selective RBS Ue traces in all cells
 Optional -timeout <min> specified in minutes [1..720]
 ue meas -racueref <ueld> -cellid <cellId> [-detailed] - For racUeRef cellId needs to be entered.
 -detailed gives more detailed information
 ue print -ue -cellid <cellId> [-v] - Print all active Ue:s identities in a specific cell.
 -v adds more Ue data to printout
 ue print -ue -allcell [-v] - Print all active Ue:s identities in all cells.
 -v adds more Ue data to printout
 ue print -pending - Print all Ue and Cell pending lists
 ue print -admitted - Print all admitted Ue:s and Radio Bearers in all cells
 ue reset -traceref <traceRef> - Removes Ue selective RBS Ue trace for specific Ue on specific cell.
 <traceref> is specified in hexcode (max 6 bytes)
 ue set -racueref <Ueld> -cellid <cellId> -traceref <traceRef> - Sets Ue selective RBS Ue trace for specific Ue on specific cell.

ENB30> ue print -ue

```

$ ue print -ue
CellId RacUeRef BbUeRef {traceRef,interfaces,traceDepth,ipAddress} TypeOfActiveTrace SetByColi CTsess
115 51 1929381120 {0x3000000000001,[s1,uu,x2],2,0.0.0.0} PUT false 50237
115 69 1929381248 {0x3000000000016,[s1,uu,x2],2,0.0.0.0} PUT false 50240
$
  
```

ENB30> ue print -ue -allcell -v

```

$ ue print -ue -allcell -v
CellId RacUeRef {mmeCode,mmeGi,[mcc,mnc,mncLen]} S1ApEnbUeld S1ApMmeUeld mmeRef Stmsi
115 51 {0x9,0x8003,[0x106,0x50,0x2]} 1139 62327533 4 0x0000000000
115 69 {0x9,0x8003,[0x106,0x50,0x2]} 874 52920802 4 0x0000000000
$
  
```

ENB30> ue enable -allcell -allUe

```

$ ue enable -allcell -allUe
Enable Cell OK!
$
  
```

Baseband

ENB621> lh gcpu te s

```

=====
$ lhsh gcpu00256 te s
gcpu00256:    pid name                      enabled groups
gcpu00256:    - LPP_TRACE_BIN              check error info interface object
gcpu00256:    - UpUIPdcpPeBI               check error info interface object
gcpu00256:    - UpDIPdcpPeFt_MCS_CONFIGURATION check error info interface object
gcpu00256:    - ElibPapBIXio               check error info interface object
gcpu00256:    - BbmcBbUnitFMtdMeBI         check error info interface object
gcpu00256:    - UpUIMacPeBI_leis            check error info interface object
gcpu00256:    - ElibPalBIRbPtp             check error info interface object
gcpu00256:    - UpUICellPeBIMaster          check error info interface object
gcpu00256:    - ElibPapBIEth               check error info interface object
gcpu00256:    - ElibPalBIAomDsp            check error info interface object
gcpu00256:    - ElibPapBIIUInh             check error info interface object
gcpu00256:    - UpUIL1PeBIMaster            check error info interface object
gcpu00256:    - ElibPapBIIIfCmRb           check error info interface object
.....
gcpu01024: 00010030 UPP_UCM_BPtmo        check error info interface object
gcpu01024: 00010009 main                 check error info interface object
gcpu01024: 0001001e UPP_UTE_RBServer      check error info interface object
gcpu01024: 00010011 UPP_UHT_test          check error info interface object
gcpu01024: 0001002a UPP_ULM_LM            check error info interface object
gcpu01024: 00010029 UPP_ULM_LD            check error info interface object
gcpu01024: 00010028 UPP_ULM              check error info interface object
gcpu01024: 00010027 UPP_URB               check error info interface object
gcpu01024: 00010026 UPP_UCM_RBServer      check error info interface object
gcpu01024: 00010022 UPP_URS_Subscribe     check error info interface object
gcpu01024: 00010021 UPP_URS_FaultServer   check error info interface object
gcpu01024: 00010020 UPP_URS               check error info interface object
gcpu01024: 0001001a Cs_capiServer_proc    check error info interface object
gcpu01024: 00010019 UPP_USS_prof           check error info interface object
gcpu01024: 00010031 UPP_UCM_BPint          check error info interface object
gcpu01024: 00010025 UPP_UCM_bpcom          check error info interface object
gcpu01024: 00010023 UPP_URS_RBServer      check error info interface object
gcpu01024: 0001001f UPP_UTE_OMCSFServer    check error info interface object
gcpu01024: 0001001d Sys_OMCSF_teLogMain    check error info interface object
gcpu01024: 0001001c Sys_OMCSF_teGlobal     check error info interface object
gcpu01024: 00010018 UPP_UOS_Watchdog       check error info interface object
gcpu01024: 0001002b Sys_OMCSF_teLocal     check error info interface object
gcpu01024: 00010010 SHELL                  check error info interface object
gcpu01024: 00010010 UPAI                   check error info interface object
gcpu01024: - -                          check error info interface object
$

```

6.4 Monitoring and decoding

ENB30> monu mp gcpu

..... (will be implemented in version 8.0...)

Shows:

To start the monitoring, open a terminal window and run the command:
/home/user/decoder/teviewer --monitor=(nodeip) --router=(routerip)

Example: no decoding, the protocol traces are in hex

```
[~]$ decoder/teviewer --monitor=137.58.159.176 --router=137.58.158.220
```

```
Listening @ 137.58.158.220:34764
```

```
Connection status : Successful
```

```
[2010-10-18 18:53:44.196] 000100/LmCentralPT(Ft_S1AP_ASN) /vobs/erbs/elib/insBl/s1apLU/src/elibInsS1apProtocolD.cc:436 BUS_RECEIVE:Decode S1AP PDU S1Paging (buf length = 43 bytes)
```

```
0000 00 0A 40 27 00 00 04 00 50 40 02 14 00 00 2B 40  '..@'....P@....+@'
```

```
0010 06 01 40 F0 00 46 07 00 6D 40 01 00 00 2E 40 0B  '..@..F..m@....@.'
```

```
0020 00 00 2F 40 06 00 62 F2 08 14 00  '.../...b....'
```

```
[2010-10-18 18:53:44.196] 000100/LmCentralPT(Ft_S1AP_ASN) /vobs/erbs/elib/insBl/s1apLU/src/elibInsS1apProtocolD.cc:436 BUS_RECEIVE:Decode S1AP PDU S1Paging (buf length = 43 bytes)
```

```
0000 00 0A 40 27 00 00 04 00 50 40 02 14 00 00 2B 40  '..@'....P@....+@'
```

```
0010 06 01 40 F0 00 46 07 00 6D 40 01 00 00 2E 40 0B  '..@..F..m@....@.'
```

```
0020 00 00 2F 40 06 00 62 F2 08 14 00  '.../...b....'
```

```
[2010-10-18 18:53:47.560] 000100/sshd_handler_10.62.158.218:38125 serverloop.c:1471 INFO:SSH server has no support for port forwarding.
```

Example: pipe the output of the monitor to a log and to the decoder and flow

```
**ws5798@~> decoder/teviewer --monitor=137.58.159.176 --router=137.58.158.220 | tee trafficlog.raw.txt | decoder/ltedecoder-japy | decoder/lteflowfox.pl -lac
```

```
#=====
```

```
# LTE Flowfox v2.23 #
```

```
# Designed by: Dusan Simic (dusan.simic@ericsson.com) #
```

```
# *** This is only list view, to create an HTML document, remove -l option *** #
```

```
#=====
```

```
Timestamp LH eNBid UE eNB TeNB MME racUeRef Message
```

```
[18:55:47.292]000100 | | |<=====| (S1AP) UEContextReleaseCommand mmeUeS1ApId:77993949 cause:radioNetwork:release-due-to-eutran-generated-reason
```

```
[18:55:47.772]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
[18:55:47.772]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
[18:55:47.772]000100 |<=====| | | (RRC) rrcConnectionReestablishmentReject
```

```
[18:55:47.844]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
[18:55:47.844]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
[18:55:47.844]000100 |<=====| | | (RRC) rrcConnectionReestablishmentReject
```

```
[18:55:47.912]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
[18:55:47.912]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
```

```
.....
```

```
[18:57:35.012]000100 |=====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
```

```

[18:57:35.012]000100 |====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
[18:57:35.012]000100 |<====| | | (RRC) rrcConnectionReestablishmentReject
[18:57:35.080]000100 |====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
[18:57:35.080]000100 |====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
[18:57:35.080]000100 |<====| | | (RRC) rrcConnectionReestablishmentReject
[18:57:35.152]000100 |====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
[18:57:35.152]000100 |====>| | | (RRC) rrcConnectionReestablishmentRequest cRNTI:511 phCellId:179 estCause:otherFailure
[18:57:35.152]000100 |<====| | | (RRC) rrcConnectionReestablishmentReject
..... RRC Connection Request
[18:57:35.372]000100 |====>| | | (RRC) rrcConnectionRequest mTMSI:E0009981 estCause:mo-Signalling
[18:57:35.500]000100 | |<=====| (S1AP) DownlinkNASTransport enbUeS1Apld:498
[18:57:35.500]000100 | |<=====| (S1AP) UEContextReleaseCommand mmeUeS1Apld:79443625 cause:nas:normal-release
[18:57:35.500]000100 |<====| | | (RRC) dlInformationTransfer
[18:57:35.500]000100 |<=====| (NAS) TrackingAreaUpdateAccept
..... RRC Connection Request
[18:57:37.640]000100 |====>| | | (RRC) rrcConnectionRequest mTMSI:E0009981 estCause:mo-Data
^C** Logging is terminated

```

6.5 Processing logs offline

```
[~] decoder/lteflowfox.pl -h
#=====
# LTE Flowfox v2.23                                     #
# Designed by: Dusan Simic (dusan.simic@ericsson.com)    #
#=====
Visit the Flowfox website for the latest release:
http://utran01.epa.ericsson.se/flowfox
```

Usage:

```
./lteflowfox.pl -f <logfile> [-DINURabl|-o <outfile>|-x <ueref>|-i <imsi>]
```

Options with parameter requirements:

```
-f | --file <file> Input file
-o | --output <file> Output file
-x | --ueref <no.> Filter by UE Reference
-i | --imsi <no.> Filter by IMSI Number (req. S1AP)
-s | --start <time> Start timestamp (hh:mm:ss.mil)
-e | --end <time> End timestamp (hh:mm:ss.mil)
-F | --filter <patt> Filtering include T&E messages, comma separated patt.
-Z | --zfilter <patt> Filter exclude T&E messages, comma separated patt.
```

Options allowed for bundling:

```
-h | --help      Show Help
-v | --version   Show Version
-l | --printimsi Print IMSIs in the log - **no report**
-D | --drops     Show dropped calls only (requires S1AP)
```

- U | --uehrep Show UEH Exception Report
- R | --noflow Report mode, no flow is generated
- N | --nodec No decoded messages are shown in the flow
- C | --cust Customer friendly (no details in flow)
- a | --asn_only Only displays ASN messages
- g | --gcpu Show GCPU traces in flow format
- l | --list List flow on command line (only with piping)
- b | --browse View result with default web browser
- c | --colour Show flow in colour (List mode only)
- csv Command line flow in CSV format
- hrep Header repeat (every 100 lines)

Recommended Traces:

```
te e bus_send bus_receive RRC_ASN
te e bus_send bus_receive S1AP_ASN
te e bus_send bus_receive X2AP_ASN
te e all LTE_EXCEPTION
ue enable -allcell -allUe
```

Examples:

Create HTML report, and browse automatically

```
lteflowfox.pl -f <decoded_file> -b
```

Live monitoring ASN only

```
tail -f <monitored_file> | ltedecoder | lteflowfox.pl -lac
```

Create customer friendly report, and browse automatically

```
lteflowfox.pl -f <decoded_file> -Cb
```

```
[~] cat modumps/lock_unlock.log | decoder/ltedecoder-japy | decoder/lteflowfox.pl -lac
```

```
#=====#
# LTE Flowfox v2.23                                     #
# Designed by: Dusan Simic (dusan.simic@ericsson.com)    #
# *** This is only list view, to create an HTML document, remove -l option *** #
#=====#
Timestamp  LH   eNBid UE   eNB  TeNB  MME  racUeRef  Message
[13:30:08.960]000100 |<====| | | (RRC) systemInformation sib:2
[13:30:08.960]000100 |<====| | | (RRC) systemInformation sib:2
[13:30:08.960]000100 |<====| | | (RRC) systemInformationBlockType1 tac:1280 cellId:51371523 sib-MappingInfo:sib-MappingInfo
[13:30:08.960]000100 |<====| | | (RRC) RRCBCH_BCH_Message BW:(DL-10-MHz)
```

```
[~] cat modumps/trafficlog.raw.txt | decoder/ltedecoder-japy | decoder/lteflowfox.pl -lac
```

```
#=====#
# LTE Flowfox v2.23                                     #
# Designed by: Dusan Simic (dusan.simic@ericsson.com)    #
# *** This is only list view, to create an HTML document, remove -l option *** #
#=====#
Timestamp  LH   eNBid UE   eNB  TeNB  MME  racUeRef  Message
```

[18:55:47.292]000100		<=====	(S1AP) UEContextReleaseCommand mmeUeS1ApId:77993949 cause:radioNetwork:release-due-
to-eutran-generated-reason			
[18:55:47.772]000100	=====>		(RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
[18:55:47.772]000100	=====>		(RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
[18:55:47.772]000100	<=====		(RRC) rrcConnectionReestablishmentReject
[18:55:47.844]000100	=====>		(RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFailure
[18:55:47.844]000100	=====>		(RRC) rrcConnectionReestablishmentRequest cRNTI:498 phCellId:179 estCause:otherFai

6.6 Examples signaling flow

<http://utran01.epa.ericsson.se/flowfox/lteobservability.html>



lte-post.html

7 References

- Troubleshooting Wiki: https://plm-lte.rnd.ki.sw.ericsson.se/lte_trsh_wiki/index.php
- Knowledge base: https://knowledgebase.internal.ericsson.com/LTE_RAN/default.aspx
- LTE toolbox: <http://utran01.au.ao.ericsson.se/utranwiki/LteSvnToolbox>
- Flowfox: <http://utran01.epa.ericsson.se/flowfox/index.php#lteflowfox>
- LTE tracing tutorial: <http://utran01.epa.ericsson.se/flowfox/lteman.html> and <http://utran01.epa.ericsson.se/flowfox/lteobservability.html>
- Layer 3 Signalling flow reference: <http://utran01.au.ao.ericsson.se/~esimlum/lte-ref/>
- PLM Melbourne: <http://utran01.au.ao.ericsson.se/utranwiki/LtePlmMelbourne>
- Melbourne Wiki: <http://utran01.epa.ericsson.se/utranwiki/LteInformation>
- Toolbox: https://ericoll.internal.ericsson.com/sites/PLM_LTE_Toolbox_in_field/Delivery%20page/default.aspx
- Toolkit: <http://utran01.epa.ericsson.se/ltetoolkit>
- CPI L11A: <http://cpi.al.sw.ericsson.se/alexserv?id=27094>
- GCC : https://ericoll.internal.ericsson.com/sites/Global_Deployment_for_Competence_Domains/LTERAN/Pages/LTERANGCCWiki.aspx

- **Melbourne lab setup:** http://utran01.epa.ericsson.se/utranwiki/BETE_LTE_Lab