



Flexi WCDMA BTS Commissioning

Legal notice Intellectual Property Rights

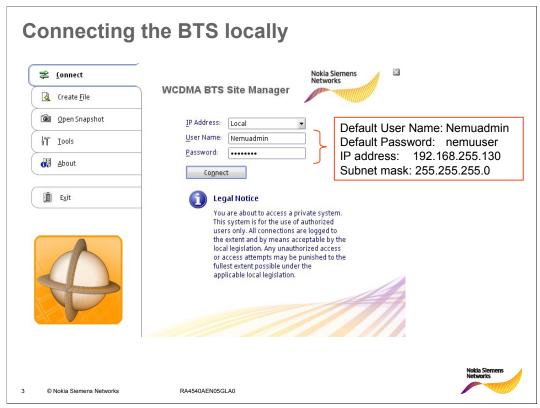
All copyrights and intellectual property rights for NSN training documentation, product documentation and slide presentation material, all of which are forthwith known as NSN training material, are the exclusive property of NSN. NSN owns the rights to copying, modification, translation, adaptation or derivatives including any improvements or developments. NSN has the sole right to copy, distribute, amend, modify, develop, license, sublicense, sell, transfer and assign the NSN training material. Individuals can use the NSN training material for their own personal self-development only, those same individuals cannot subsequently pass on that same Intellectual Property to others without the prior written agreement of NSN. The NSN training material cannot be used outside of an agreed NSN training session for development of groups without the prior written agreement of NSN.

© Nokia Siemens Networks

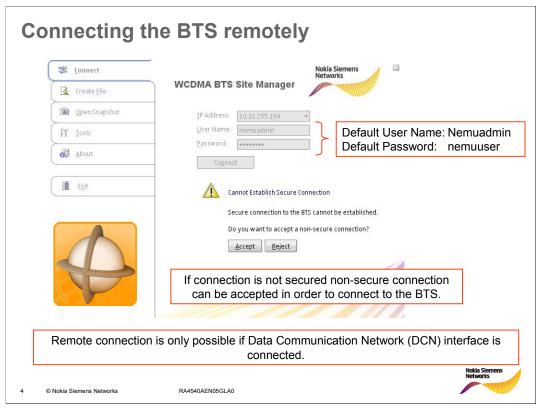
RA4540AEN05GLA0



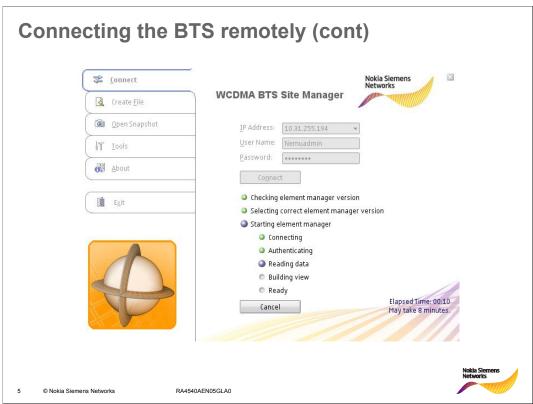




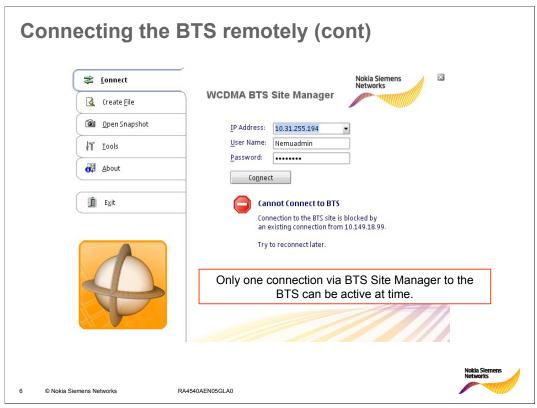




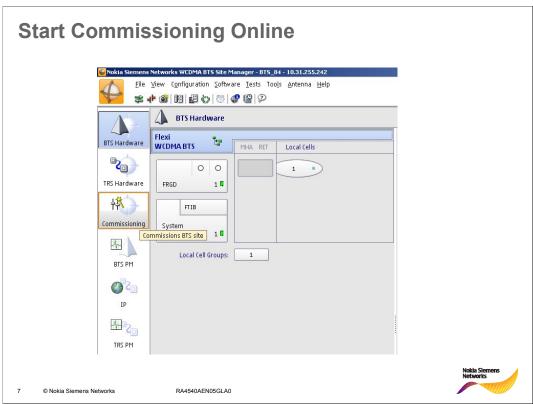




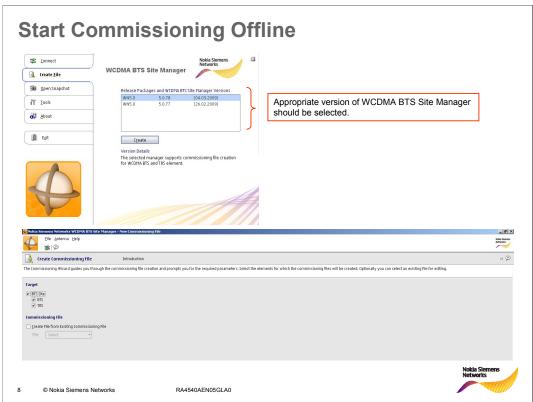




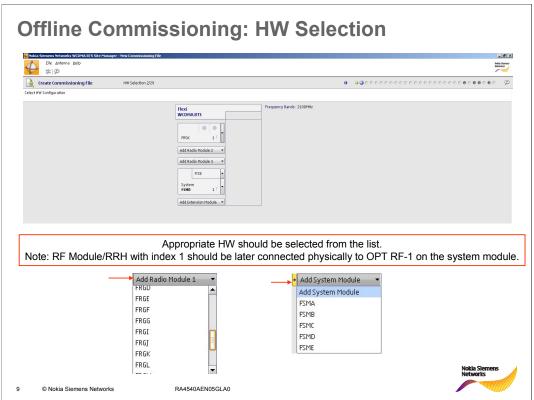




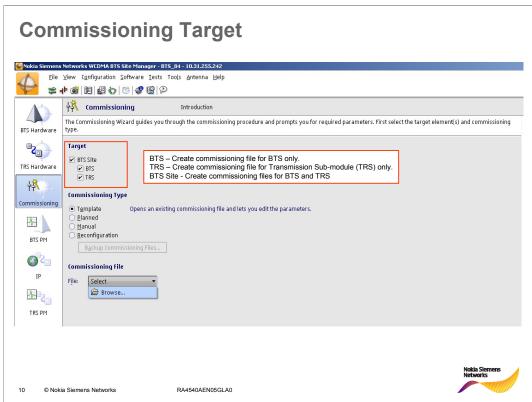




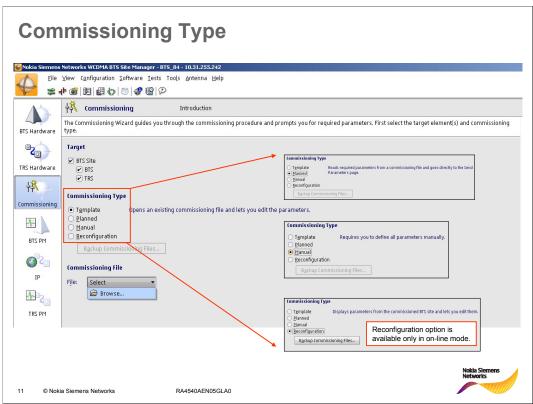




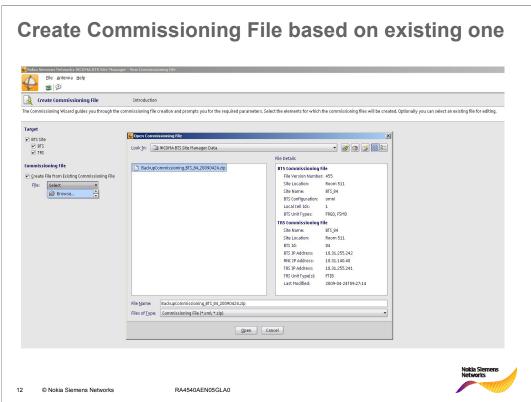




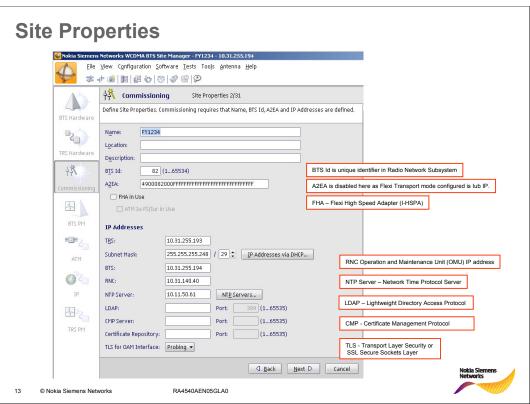












Configuring CMP and CR server IP address

A Certificate Management Protocol (CMP) is used to fetch the CA signed BTS certificate and CA certificates automatically and to perform it in a secure manner.

To do so BTS must be configured with:

are downloaded over a local connection.

- •Reference Number (RefNum) and Pre Share Key (PSK).
- •CMP server IP address and TCP port number.
- •Certificate repository (CR) IP address and TCP port number.

RefNum and PSK are used for the initial encryption of CMP messages between the CMP client and CMP server. At the initial configuration these values shall be made out-of-band and using the Site Element Manager the values

The CMP server IP address and TCP port number is configured using the Element Manager or by deploying a BTS Site Configuration File or via the NMS.

This configuration is used by the BTS embedded CMP client to exchange messages with the CMP server.

The CR IP address and TCP port number is configured using the Element Manager, by deploying a BTS Site Configuration File or via the NMS.

This configuration is used by the BTS embedded CMP client to retrieve the CA certificate from the certificate repository (CR). The CA certificate retrieval uses the LDAPv3 protocol.

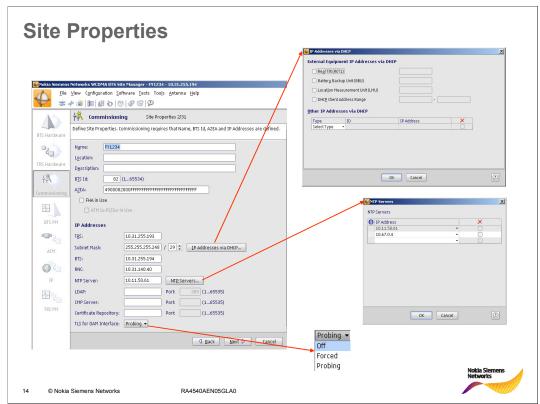
PSK and RefNum must be generated in the same CMP server which will be used to get BTS and CA certificates. These values also need to be made available for the CMP server in order to allow the establishment of a secure CMP message exchange.

Configuring CMP and CR server IP addresses and PSK and RefNum triggers to take CMP into use for this particular BTS.

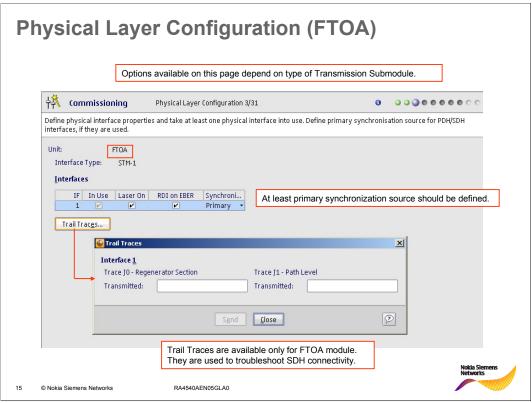
This causes the creation of a new private and public keypair, followed by a CMP Initialize sequence to obtain a valid and CA signed BTS certificate

as well as the CA certificate to be used by the BTS.

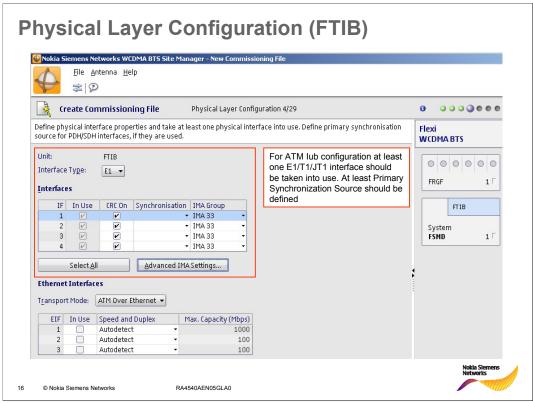




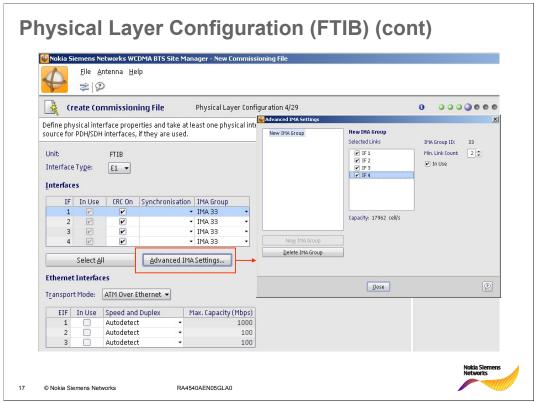




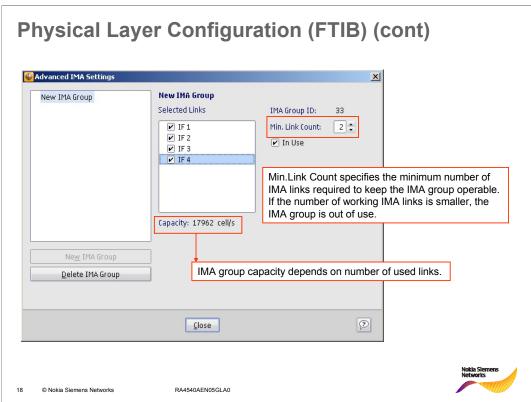












Upon the failure of one or more links or interfaces of an IMA group, the IMA Engine is able to recover and reassign the distribution of ATM cells to the remaining working PDH links within the IMA group. Only the capacity of this IMA group is reduced but the IMA group remains operational.

The recovery time of the IMA engine upon PDH link failure is 2 s, all existing calls will be terminated.

The minimum number of active IMA links that enable a group remaining active is specified by an IMA parameter and simultaneously the bandwidth available for that IMA group. This parameter describes until what limit the IMA group continuous working in case one or more E1s drop out.

Example:

IMA group with 4 E1 links

An ATM interface with a VP of 17000 cps is assigned to that group

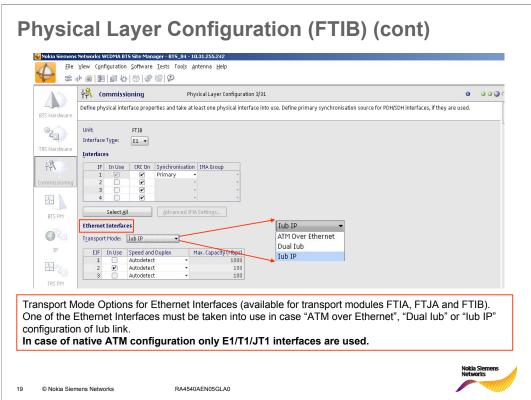
Note: IMA group with 4 E1s provides a capacity of 17961 cps

Minimum number of links is set to 2

In case 1 or 2 E1s drop out the IMA group continuous operating after restart with a limited bandwidth even if the logical interface cannot provide anymore the assigned VP capacity

In case traffic increases available capacity cells are dropped, active connections might be released due to cell loss.

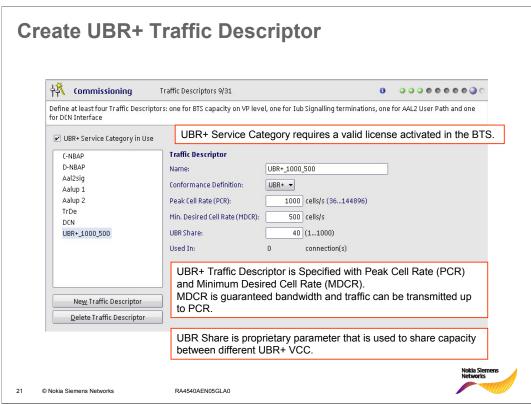












Traffic Descriptors

Traffic Descriptors page you can create traffic descriptors that specify capacities and types for ATM based connections between the BTS and RNC.

This page is not available if the Flexi HSPA Adapter (I-HSPA Adapter) is selected to be in use but the ATM lu-PS/lur is not in use

If the I-HSPA Adapter is not in use, you need to define at least four traffic descriptors:

one for the BTS capacity on the VP level,

one for the IUB signalling terminations,

one for the AAL2 user path and one for the DCN interface.

If the I-HSPA Adapter is in use and the ATM lu-PS/lur is in use, you need to define at least five traffic descriptors: one traffic descriptor for each lu-PS/lur termination (lu-PS Control Plane, lu-PS User Plane, lur Control Plane, and lur User Plane),

one for the DCN interface.

In total, you can create 32 traffic descriptors: a maximum of 16 CBR traffic descriptors and a maximum of 16 UBR/UBR+ traffic descriptors.

If you want to enable the UBR+ feature, select the UBR+ Service Category check box.

Note

You need to have a valid licence before the UBR+ feature can be activated. For more information on licences, see the *Licence Management* document in the Nokia WCDMA RAN System Document and the *New Features* document in the BTS SW release documentation.

Click the New Traffic Descriptor button.

Enter the name of the traffic descriptor in the Name field.

Select the conformance definition of the ATM service category from the Conformance Definition list.

Enter the peak cell rate in the Peak Cell Rate (PCR) field.

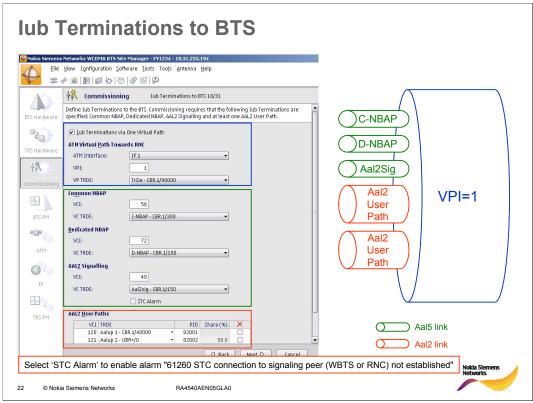
If the UBR+ is enabled, enter the minimum desired cell rate in the Min. Desired Cell Rate field and the UBR share in the UBR Share field.

Click the New Traffic Descriptor button to save the changes and create another traffic descriptor.

Repeat the procedure for all needed traffic descriptors.

If you want to delete an existing traffic descriptor or cancel the creation of a new traffic descriptor, click the Delete Traffic Descriptor button.

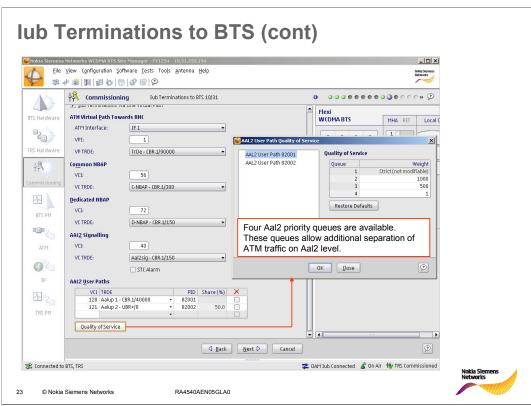




signalling transport converter (STC)

sublayer on top of the message transfer part (MTP), providing the service that the generic signalling transport service requests





AAL2 transport Quality of Service

This feature provides additional AAL2 layer traffic separation, with 4 AAL2 priorities per AAL2 VCC.

The standard AAL2 path type selected for the transport bearer is used in the AAL2 VCC selection and the priority queue information is signaled to the adjacent AAL2 node via ALCAP signaling (ITU Q.2630.2). The AAL2 traffic differentiation information is carried over NBAP messaging to the Flexi WCDMA BTS for uplink traffic prioritization.

The VCC separation to RT DCH, NRT DCH and HSxPA VCCs provided by the Path Selection feature is extended with having a VCC selection controlled over the air interface channel type and AAL2 path type (Stringent, Stringent-bi-level and Tolerant). Different combinations with the air interface channel types (DCH / HSxPA) and the AAL2 path types are possible in the AAL2 VCC (AAL2 path, ATM end point) configuration.

With ATM lub, the feature can be used together with Path selection, which supports the basic traffic differentiation into ATM VCs. ATM VCs provide then differentiated treatment with CBR and UBR+ service categories and additional AAL2 level traffic separation is provided by ATM Transport Quality of Service.

Each AAL2 user path has four queues. The first queue is a strict priority queue, for which weight can not be modified and displays the weight as Strict (not modifiable).

The QoS queues 2 to 4 will have default weights of 1000, 500 & 1 respectively and the weights for the QoS queues 2 to 4 can be configured (or modified) with any value between 1 and 1000. Queues 2 to 4 will use weighted round robin algorithm to schedule the AAL2 CPS traffic. The strict priority queue will always have the highest weight among the 4 QoS queues.

Note that for Queues 2 to 4, Queue priority will be higher with higher configured weight.

Also note that maximum of 16 AAL2 user path VCs can be configured with a limit of maximum of 8 UBR/UBR+ VCs per ATM interface.

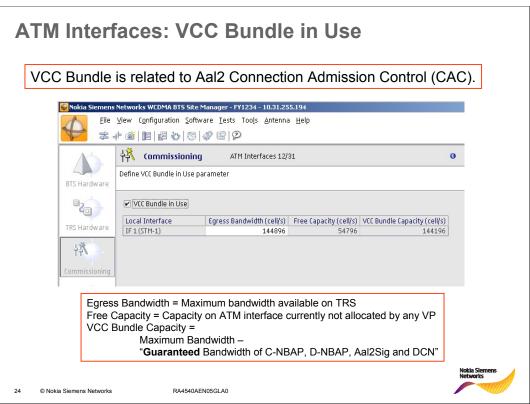
The following Performance Management counters are available for each of the 4 queues.

Dropped Octets: Number of bytes of Frame protocol payload dropped due to AAL2 prioritization buffer overflow (Number of Bytes).

Average delay: Average buffering delay of Frame protocol payload per AAL2 prioritization queue over a time period(Average Delay in terms of microseconds).

Peak Delay: Peak buffering delay of Frame protocol payload per AAL2 prioritization queue over a time period (Peak Delay in terms of microseconds).





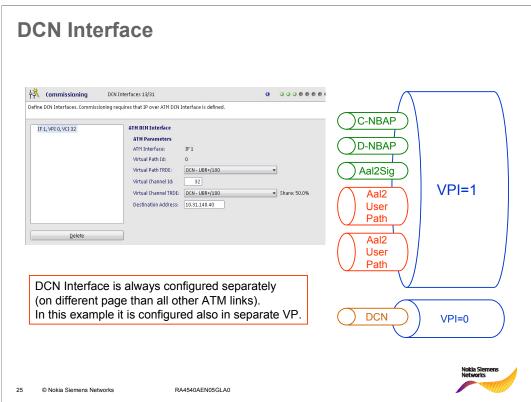
With the AAL2 CAC in **VCC bundle** mode, Flexi WCDMA BTS allows the overbooking of individual ATM VCCs in a controlled manner, especially for NRT DCH traffic in UBR+ VCCs. If the user sets the MDCR of the UBR+ connections to zero and the sum of RTDCH CBR VCC to the physical bandwidth, the network elements even allow to share the entire physical capacity of the ATM interface (minus some bandwidth reservation for control and management plane traffic).

With the introduction of this feature, Flexi WCDMA BTS provides two modes of AAL2 CAC:

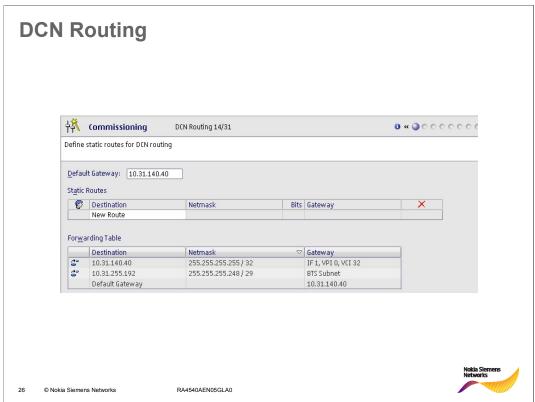
VCC mode: AAL2 CAC takes into account the capacity provided by individual ATM VCC (depending on CBR/UBR+ service category).

VCC bundle mode: AAL2 CAC takes the capacity provided by several ATM VCCs on the same ATM IF into account, i.e. the CAC function uses the physical layer bandwidth minus the amount of guaranteed bandwidth reserved for the control and management plane connections. Control and management plane connections are those dedicated to the transport of the AAL2 signaling, the NBAP control protocol and the DNC management channels.

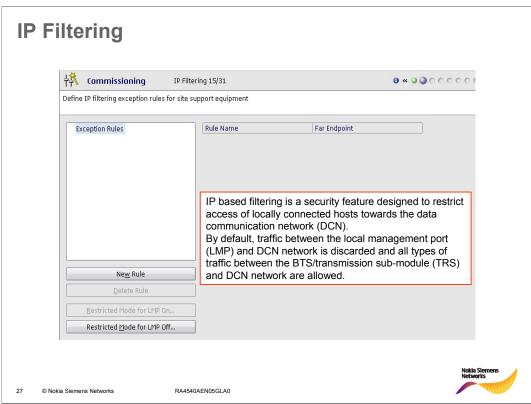












The feature implements the means of access protection to the Flexi WCDMA BTS's transmission. It is possible to filter IP traffic based on source and destination IP address and TCP/UDP port number.

IP traffic supervision is extended to all packet flows in WCDMA BTS.

It introduces a new mode to define more selectively the access to/from IP DCN. Since WAM offers also an LMP, this feature increases security with respect to all NodeB LMPs.

The operator can select between the following modes, independently for each of the three packet flows

- In unrestricted mode, all IP traffic is allowed to pass through
- In restricted mode, no IP traffic is allowed to pass through

(Only available for AXC LMP <> IP DCN packet flow because WAM/AXC need at least IP connectivity towards Netact/NEMU)

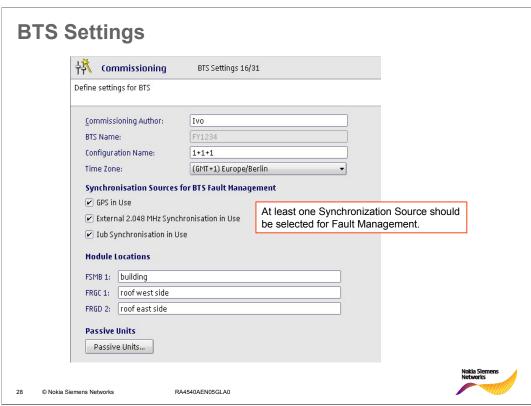
- In restricted mode with exceptions, the AXC IP routing function validates the source and destination information of each incoming IP packet against the configuration in the related table. IP packets not matching the criteria are discarded.

Whether only IP addresses or ports as well need to match is a matter of configuration. It is possible to configure IP filter rules for AXC/FlexiBTS locally or remotely with site configuration files or element manager.

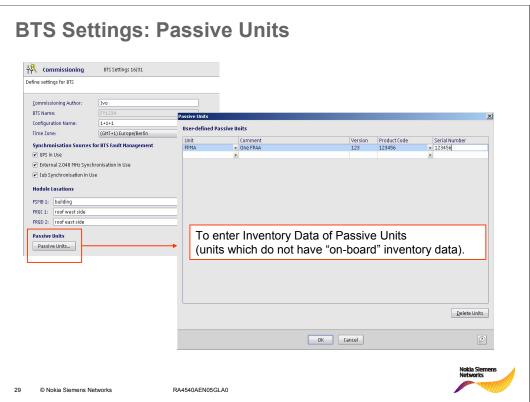
IP based filtering is a security feature designed to restrict access of locally connected hosts towards the data communication network (DCN). This technique allows communication between public IPs used in the BTS and remote network based on the rule sets configured in the BTS. The transmission sub-module blocks all other traffic coming from or going to the remote network.

By default, traffic between the local management port (LMP) and DCN network is discarded and all types of traffic between the BTS/transmission sub-module (TRS) and DCN network are allowed.







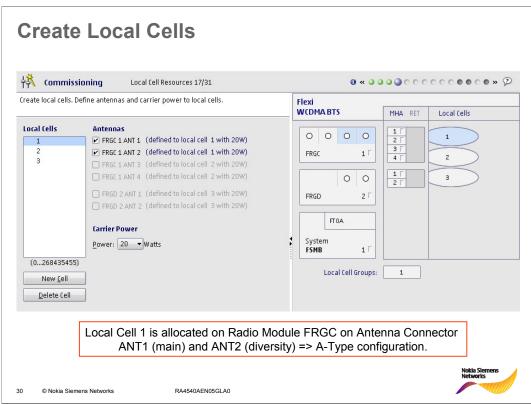


Bar code reading and site inventory

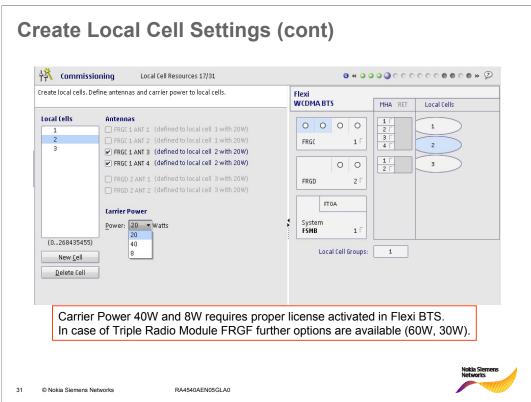
To be able to trace a given unit based on the serial number or the version number it is important to collect and keep the information about the unit version and serial numbers up to date. The most advanced units and their SW versions support the electronic serial and version number detection and recording. Some less advanced and passive units do not necessarily have this feature and those units need to be scanned. Most of the units installed on the BTS have a set of extra serial and version number labels which must be attached to the BTS cabinet door or in the inventory form in the site folder during the installation. During the bar code reading also these labels need to be scanned.

More information on the bar code reading is available in the Nokia NetAct documentation Using Bar Code Scanner and Using Asset Manager documents.

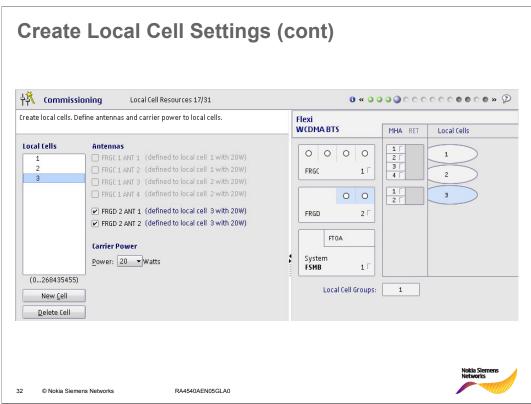




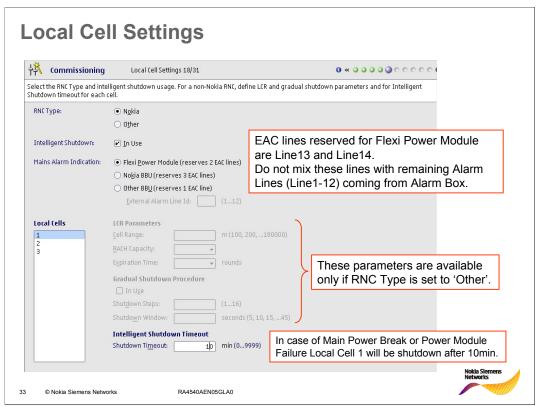




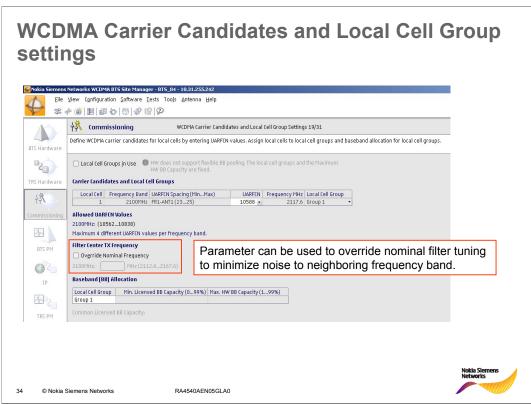




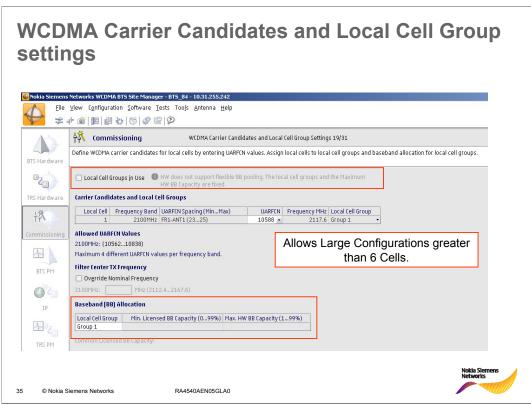












Baseband Pooling with Flexi BTS with MORAN (Multi Operator RAN) support

Allows Large Configurations greater than 6 Cells

Max amount of LCR = 12

Max amount of LCG (Rel1) = 2, (Rel2) = 4

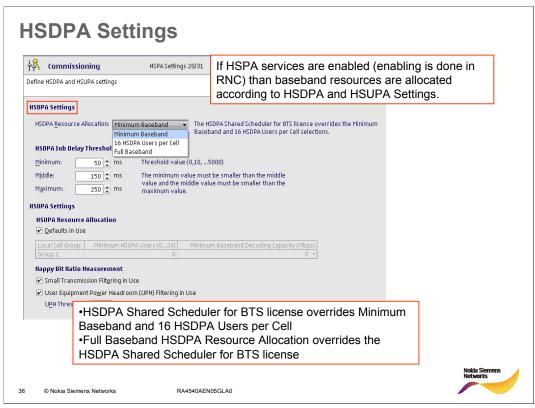
MORAN with Flexi -> Possibility to guarantee Baseband for each operators

In case of Release1 MSM (Master System Module), ESM (Extension System Module) or RF baseband is **FIXED**,

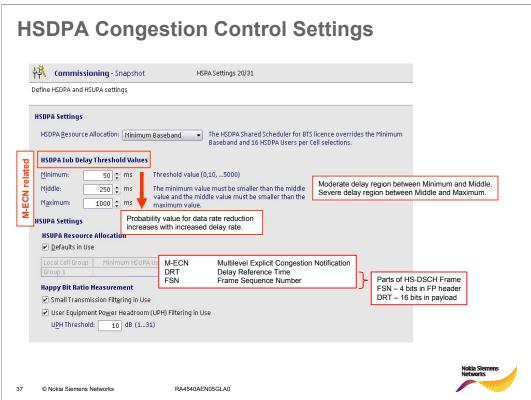
Other LCG is seen in Master System Module and Other in Extension System Module.

In case of Release 2 MSM, ESM and RF baseband is **FLEXIBLE**, all LCGs can be seen in Master System Module and Extension System Module.









With this feature the lub HSDPA congestion can be detected at the BTS and even proactively prevented, which makes higher statistical multiplexing ratios feasible.

HSDPA Congestion Control is implemented at the BTS. lub congestion detection is done at the BTS FP layer using:

build-up delay information (DRT) and

sequence numbering (FSN) field

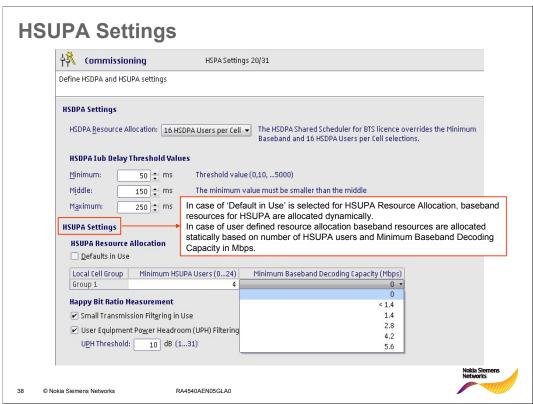
in the downlink FP frames which the RNC includes in the HS-DSCH Data Frame.

In addition, CRC field is also included in frame loss detection because FSN can only be monitored from intact frames.

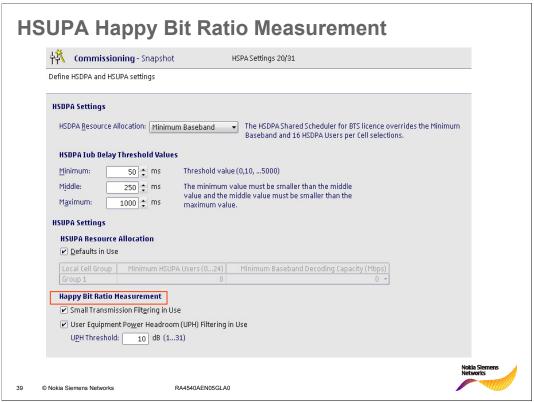
Frame Loss type congestion is detected from incorrect CRC in FP header or payload or from a discontinuity in Frame Sequence Numbering (FSN).

lub delay buildup based congestion is detected per MAC-d flow by using Multilevel ECN (Explicit Congestion Notification)









Small Transmission Filtering in Use

Parameter is used to to define filtering for Happy Bit -ratio measurement.

The target for filtering is to filter out small data bursts (such as ping) from Happy Bit -ratio measurement

as they do not give reliable information of UE allocation.

User Equipment Headroom (UPH) Threshold Filtering

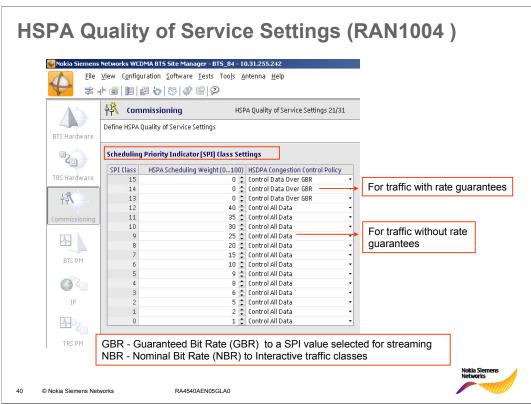
Parameter defines threshold value for UE Power Headroom (UPH) values in Happy Bit -ratio measurement.

UE sends to BTS a Happy Bit and Power Headroom information.

Happy Bits that are associated to UPH values that are below the defined threshold, are not taken into account in Happy Bit -ratio measurement.

The target for filtering is to filter out power limited situation from Happy Bit - ratio measurement as they do not give reliable information of UE allocation.





HSDPA Congestion Control Policy is an attribute which defines what kind of authority the congestion control mechanism has over an individual SPI class.

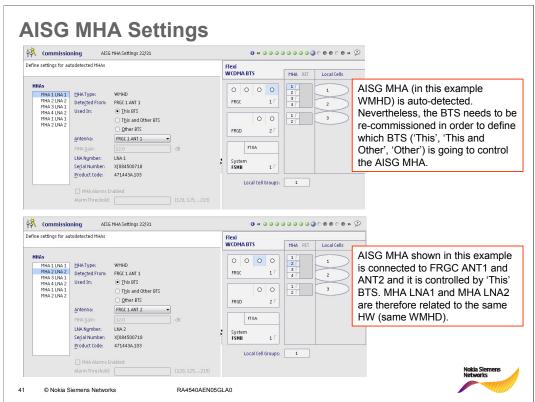
Control all data. In a risk of lub congestion situation, the HSDPA CC mechanisms are able to reduce the number of credits to zero. This setting is intended for traffic without bit rate guarantees.

Control the data over GBR if GBR is defined. This means that in a risk of lub congestion situation, the HSDPA CC mechanisms are able to reduce all the credits that exceed GBR rates.

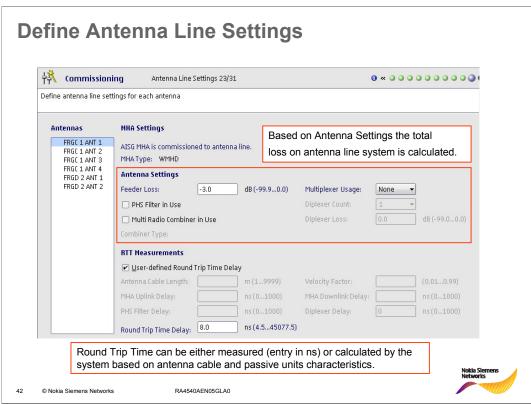
This setting is intended for traffic with bit rate guarantees. With this setting, it is also possible to define similar behaviour for NBR traffic, but this is not recommended.

No control over a SPI class. This means that HSDPA CC has no authority to reduce credit of defined SPI class.

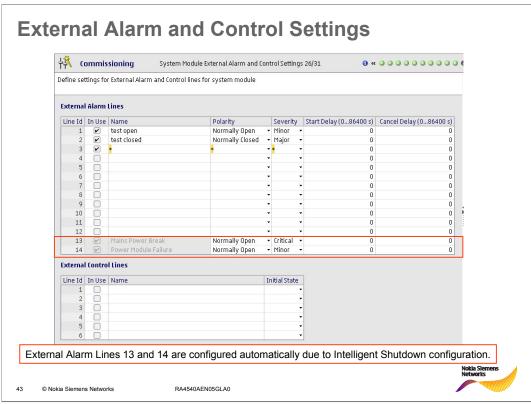




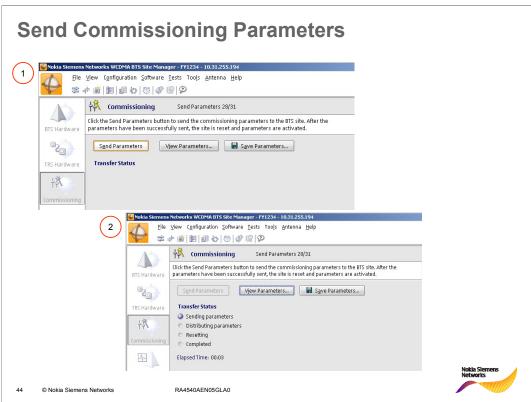




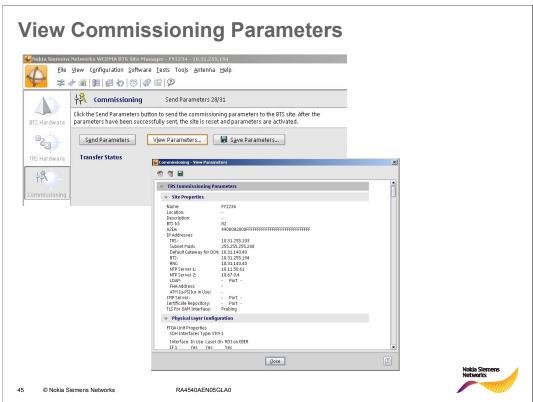




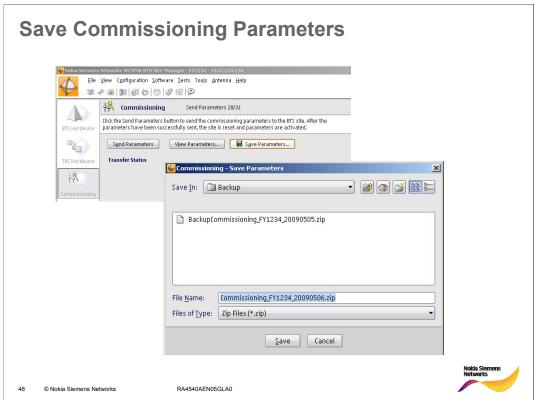




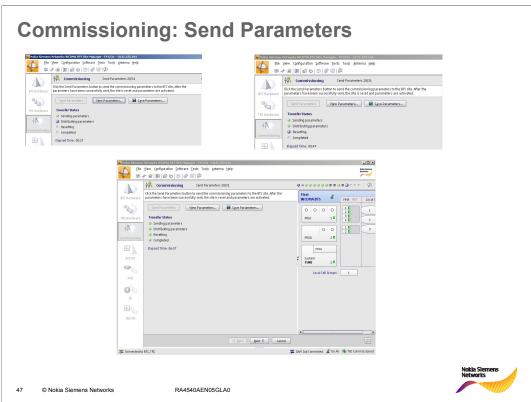




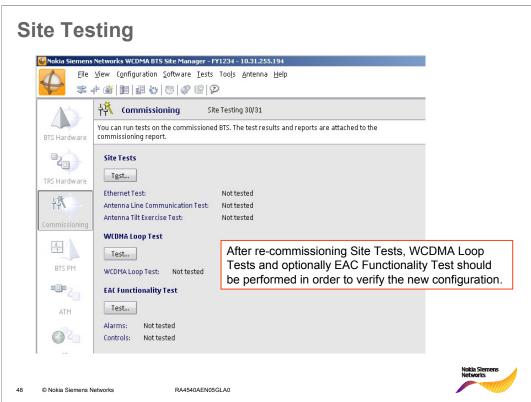




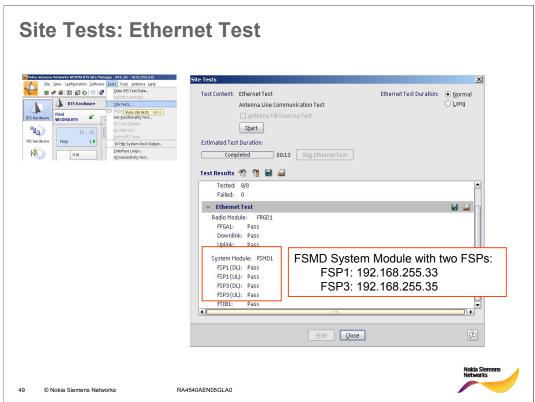




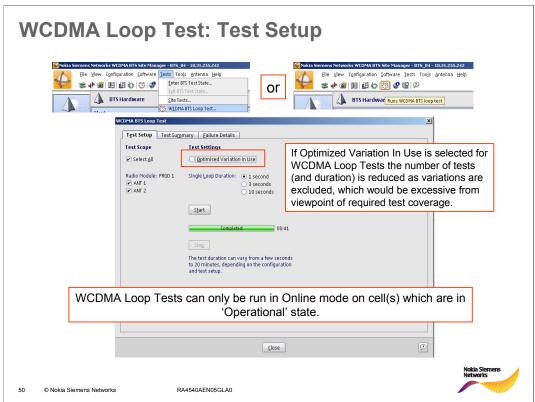




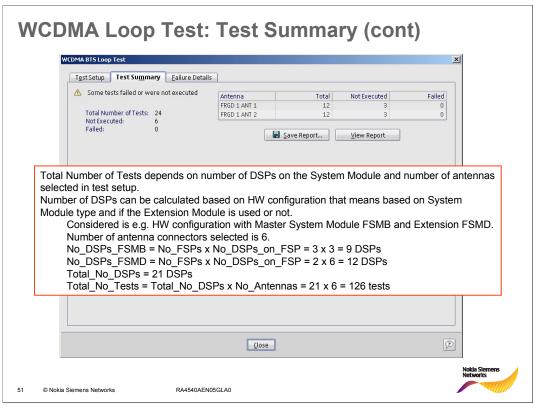




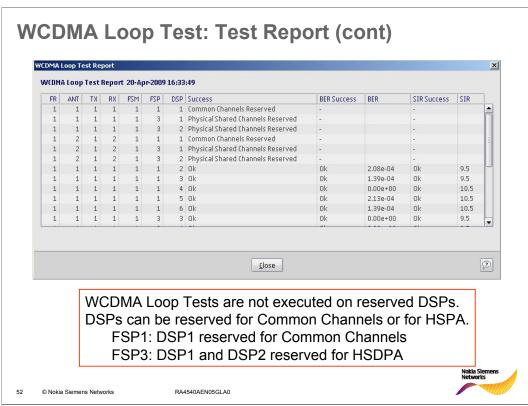




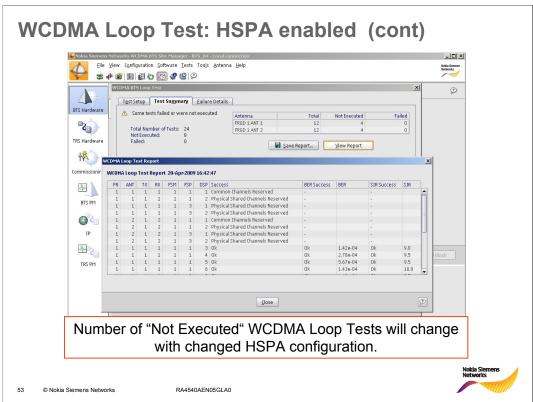












WCDMA Loop Test for BTS with HSDPA and HSUPA enabled. Number of reserved DSPs will change with changed HSPA configuration.

FSP1: DSP1 reserved for Common Channels

FSP1: DSP2 reserved for HSPA

FSP3: DSP1 and DSP2 reserved for HSDPA



