BreezeMAX Extreme 5000 – Centralized Provisioning

Technical Note

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DN1110

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Written By: Adrian Stefan **Title:** BreezeMAX Extreme Product Expert	**No. of pages:** 35 **Rev:** D
Approved By:	**Name:**
R&D PM	Ionel Ghita
PLM	Yaniv Benami
Product Experts Team Leader	Johnny Croitoru

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Contents

1 Scope

This document provides general guidelines to the centralized provisioning scheme of BreezeMAX PRO 5000 CPEs using an AAA RADIUS server, and BreezeMAX Extreme 5000 BTSs operating under centralized provisioning. In the example detailed here, a Radiator AAA server is used.

NOTE

"Centralized Provisioning" means that authentication is performed versus an AAA RADIUS server (central entity) and that the authentication is based on USER NAME and PASSWORD that are configured on the SU. This is in contrast to "Local Provisioning" under which authentication is performed on the BTS, and is based on the CPE-MAC address (wireless port MAC address).

This document should be used as a supplement to the system manual.

Not all the configurable parameters are mentioned in this document.

2 Site Description

A basic site configuration is illustrated in Figure 1.

Figure 1: Basic Setup

The minimum required equipment comprises a Base Transceiver Station (BTS), a PRO 5000 Customer Premises Equipment (CPE), a server running Radiator radius server and a router capable of serving as the Default Gateway and DHCP server. The network structure can be modified according to the available equipment, without restraining the generality of this document (i.e. the radius server can be used also as the Default Gateway and the DHCP server).

3 Configuring the BTS – via Monitor

The first step in building the setup is to commission the BTS. This step involves configuring a management connection to the BTS, radio settings (the wireless connection to the CPE) and available service management.

3.1 Configuring the Management Connection

1. Connect a PC with an IP address from the 1.1.1.0/24 subnet to the Ethernet port of the IDU (or directly to the Ethernet port of the BTS, if the unit has a DC power supply) and telnet to 1.1.1.23. The Monitor telnet application opens.
   The default admin password is “admin” (see Figure 2).
   The default BTS IP is 1.1.1.23.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
Main
====
1 - BTS
2 - ASN GW
3 - Sector
4 - BS
5 - Radio Channel
6 - Antenna
7 - GPS
8 - MS
X - Exit
```

Figure 2: Main Menu

2. Select 1.BTS > 4.Configuration > 3.Connectivity > 2.Update and fill in all the necessary information (management IP, Subnet, Default Gateway and VLAN – if applicable).

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
BTS-Configuration-Connectivity
==============================
1 - Show
2 - Update
>2

BTS-Configuration-Connectivity-Update
=====================================
Management IP Address                : 10.1.200.5
Management Subnet Mask               : 255.255.255.0
Management Default Gateway           : 10.1.200.1
Management VLAN ID                   : 200
Management VLAN Priority             : 0

Reboot the BTS for the changes to take effect
```

Figure 3: Configure Connectivity

3. Verify the connection settings by selecting 1.Show (see Figure 4). Incorrect configuration may result in connectivity loss.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
BTS-Configuration-Connectivity
==============================
1 - Show
2 - Update
>1

BTS-Configuration-Connectivity-Show
===================================
Current IP Address                  : 10.1.200.5
Configured IP Address               : 10.1.200.5
Current Subnet Mask                 : 255.255.255.0
Configured Subnet Mask              : 255.255.255.0
Current Default Gateway             : 10.1.200.1
Configured Default Gateway          : 10.1.200.1
Current VLAN ID                     : 200
Configured VLAN ID                  : 200
Current VLAN Priority               : 0
Configured VLAN Priority            : 0
>
```

Figure 4: Verifying Connection Settings

4. After confirming the configured values are accurate, reboot the unit by selecting 1.BTS > 5.Unit Control > 2.Reset BTS > Confirm Reset and telnet again using those values.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
BTS-Unit Control
================
1 - Change Password
2 - Reset BTS
3 - Reset to BTS Factory Defaults
4 - SW Version Control
5 - Configuration Files Control
6 - License Files Control
7 - Monitor Inactivity Timeout
>2

BTS-Unit Control-Reset BTS
==========================
The unit will reset.
Do you want to continue? [Y/N] y
```

Figure 5: Rebooting the Unit

3.2 Configuring the Radio Parameters

1. From the main menu select 1.BTS > 4.Configuration. It is not mandatory to set the parameters in the General Parameters menu.

NOTE

When using AlvariSTAR or AlvariCRAFT, make sure the BTS Number (1.General Parameters > 2.Update > 1.BTS Number) is different for each unit commissioned.

2. For centralized provisioning, select 1.BTS > 4.Configuration > 2.BTS Working Mode > 2.Update >1 (1 - Embedded Distributed ASN-GW Centralized Authentication). In the Monitor application use the TAB key to see the available options.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
BTS-Configuration-BTS Working Mode
==================================
1 - Show
2 - Update
>2

BTS-Configuration-BTS Working Mode-Update
=========================================
BTS Working Mode                      : 1
Enter
 1 - Embedded Distributed ASN-GW Centralized Authentication
 2 - Embedded Distributed ASN GW Local Authentication
 3 - External ASN GW
BTS Working Mode                      : 2
```

Figure 6: Configuring the Working Mode

3. Navigate back to the BTS > Configuration menu. Configuring the Authorized Managers is not mandatory.

NOTE

If default values are changed, only the NMS stations explicitly added will be able to access the unit using SNMP.

4. Select 1.BTS > 4.Configuration > 5.Radio > 2.Update menu. It is mandatory to set the Operator ID and Service Zone ID options with non default values. The Operation mode menu parameters (options depend on HW type and applied licenses), Band Name menu parameters and the DFS menu parameters (if applicable) must be the same as the parameters set on the CPE unit. The DFS specific parameters (CAC, Detection threshold etc) are the ones specified by the Regulatory Authority for the chosen Frequency Band and they cannot be changed. The only country code that allows creating/modifying DFS related parameters is “Universal”.

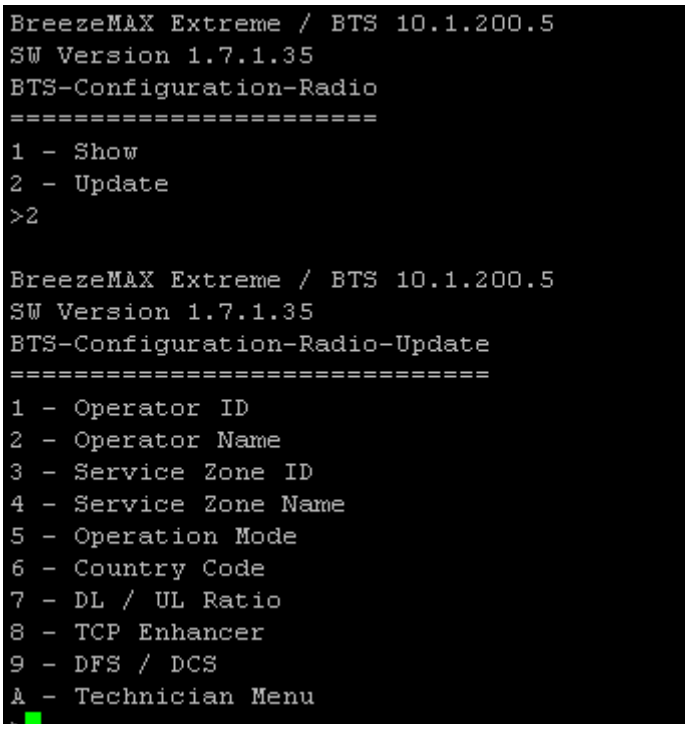

Figure 7: Radio Channel Parameters

5. Navigate back to the main menu and then select 3.Sector > 2.Select >1 (Sector1) 2.Configuration > 1.General Parameters.

6. Select 2.Update and set the mandatory parameters (Sector Heading, Bandwidth, Frequency and Tx Power), and the optional descriptive parameters (Sector Name and Sector Location).
   When selecting the Tx Power consider local regulation, and the saturation threshold (-16dBm) of the CPE. Exceeding the saturation threshold could damage the unit.

NOTE

For ease of installation, remembering the selected frequency value can be helpful in narrowing the search band when configuring the PRO 5000 unit.

The DFS options should be set according to local regulation and are not the object of this document.

7. Return to the main menu. The options in the BS menu should be set, but the process is straightforward and leaving the default values will not affect the scenario presented in this document.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
Sector
======
1 - Show Summary
2 - Select
>2

Sector-Select
=============
Select Sector Id                    : 1

BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
Sector-1
========
1 - Show
2 - Configuration
>2

BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
Sector-1-Configuration
======================
1 - General Parameters
2 - DFS / DCS
3 - Spectrum Analyzer
```

Figure 8: Sector Configuration

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
Sector-1-Configuration-General Parameters
=========================================
1 - Show
2 - Update
>2

Sector-1-Configuration-General Parameters-Update
================================================
Sector Name                         : Sector 1
Sector Location                     : PeLab
Sector Heading (degrees)            : 0
Bandwidth                           : 5
Frequency (MHz)                     : 5550
Enter a decimal number in the range(s): [5475;5945], in steps of 5.000 MHz.
Frequency (MHz)                     : 5550
TX Power (dBm)                      : 20

Reboot the BTS for the changes to take effect
```

Figure 9: Sector General Parameters Configuration

8. From the main menu select 5.Radio Chanel > 2.Select > 1 > 2.Update > Admin Status: 1 (Enable).

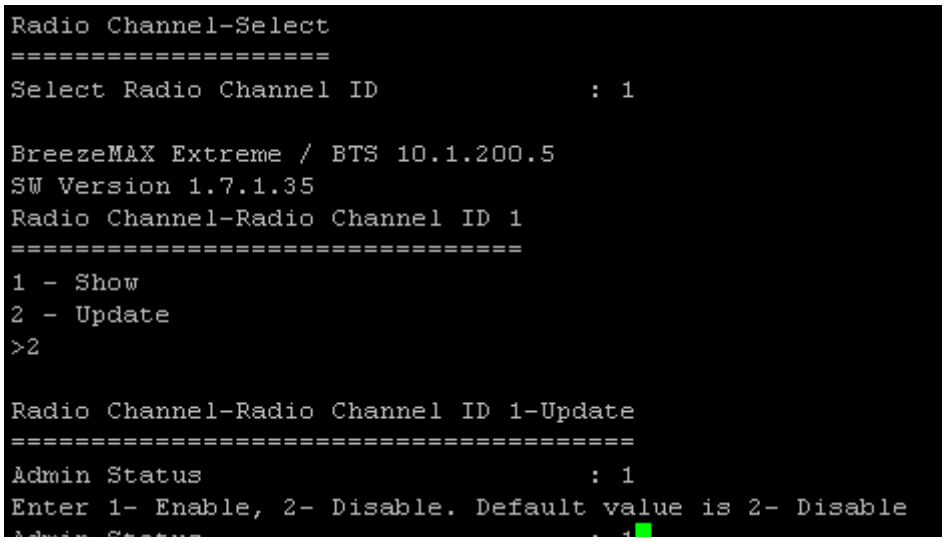

Figure 10: Configuring Radio Channel Admin Status

9. Return to the main menu and then select 6.Antenna > 2.Select > 1 >2.Update and set all the required options.

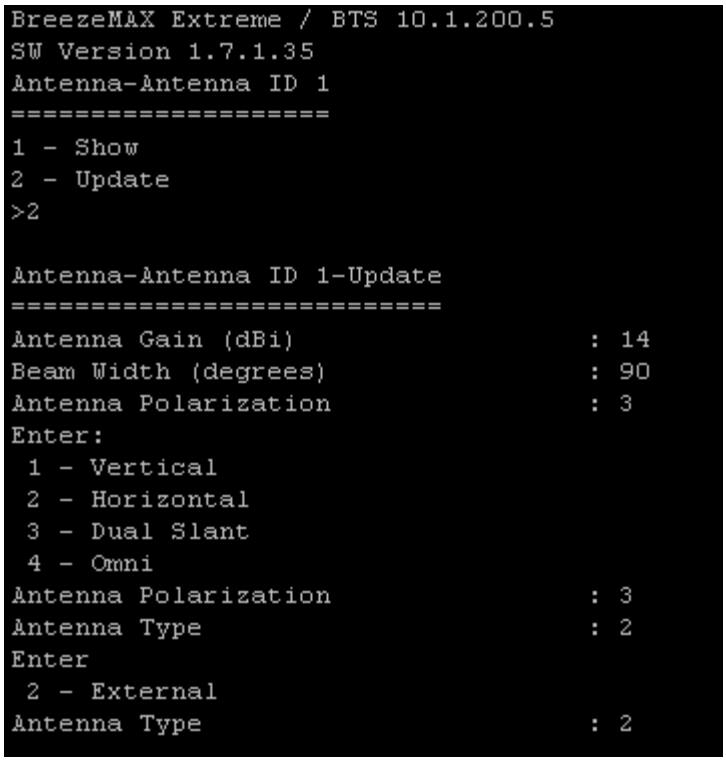

Figure 11: Configuring Antenna Parameters

Make sure the antenna parameters, correspond to the parameters actually used (integral/external, polarization etc).The antenna gain parameter is configurable for BTSs with external antennas only

10. Return to the main menu and select 7.GPS > 2.Configuration > 1.Chain Parameters > 2.Update.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
GPS-Configuration-Chain Parameters
==================================
1 - Show
2 - Update
>2

GPS-Configuration-Chain Parameters-Update
=========================================
Chain Number                        : 1
GPS Type                            : 0
Enter 0 - None, 1 - Trimble. Default value is 1 - Trimble
GPS Type                            : 1

Reboot the BTS for the changes to take effect
Hold Over Passed Timeout (min)      : 30
Stop Tx After Hold Over Timeout     : 2
Enter 1 - Enable, 2 - Disable. Default value is  2 - Disable.
Stop Tx After Hold Over Timeout     : 2
Time Zone Offset From UTC           : +00:00
Local Time Zone offset from UTC
Enter a value in the range '-12:00' to +'13:00' in 30 minutes resolution.
Time Zone Offset From UTC           : +00:00
Daylight Saving                     : 2
```

Figure 12: Configuring GPS

If the setup is carried out in laboratory conditions (no GPS satellites available) make sure the GPS type is set to 0 (None) otherwise the radio channel will not go UP. If satellites are detected, the system needs at least four of them in order to start and at least two in order for the BTS to be synchronized.

NOTE

The GPS chain must be different from the default value.

3.3 Configuring Services

The mechanism of selecting flows of data and offer quality of service (QoS) according to predefined criteria is realized through the “Services”. In order to offer maximum flexibility and modularity, the services are broken in several interlaced modules.

To configure “Services” select 2.ASN GW > 2.Services.
Because some modules depend on other modules in order to create a Service, start from the bottom of the list (6.Forwarding Rule) and work your way up to the top (2.Service Profile). For example, in order to define a Service Interface, a Forwarding Rule must be created first.
In order to delete a Service, start from the top down (one cannot delete a module unless all the dependencies on that module are deleted). A synthetic list of all the necessary modules to be configured is presented in Figure 13.

NOTE

After rebooting the unit in order to change the BTS working mode, a new menu appears under 2.ASN GW: 1.AAA. In addition, the “Add” option under 1.MSs Services disappears. This will be discussed further in Section 5 Provisioning the CPE.

Figure 13: Services Menu

3.3.1 Forwarding Rules

Forwarding Rules refers to Multicast and Broadcast traffic and how it should be treated by the ASN. To create a Forwarding Rule, from the main menu select 2.ASN GW > 1.Services >6.Forwarding Rules > 4.Add. A configuration model is presented below (see Figure 14).

```
ASN GW-Services-Forwarding Rules-fr_data-Update
================================================
Forwarding Rule Name                    : fr_data
Relay Mode                              : 1
Enter 1 - Enable, 2 - Disable
Relay Mode                              : 1
Unknown Packet Forwarding Mode          : 1
Enter 1 - Forward, 2 - Discard
Unknown Packet Forwarding Mode          : 1
QoS Type                                : 1
Enter 1 - BE, 3 - NRT
QoS Type                                : 1
MIR (kbps)                              : 512
Enter a decimal number in the range 32 to 54000
MIR (kbps)                              : 512


Transaction succeeded
```

Figure 14: Forwarding Rule Creation

3.3.2 Service Interfaces

The Service Interfaces menu deals with the transition between the network side of the service (the backbone link) and the wireless side. This is where the VLAN (for the network side) and Convergence Sublayer type (for the wireless side) are defined. In order to configure a Service Interface at least one Forwarding Rule must be preconfigured. An example of Service Interface configuration is available in the Figure 15. From the Service (2.ASN GW > 2.Services) menu select 5.Service Interfaces > 4.Add and fill in the requested information.

```
ASN GW-Services-Service Interfaces-si_data-Update
=================================================
Service Interface Name              : si_data
Forwarding Rule Name                : fr_data
CS Type                             : 1
Enter 1 - Ethernet CS, 2 - IP CS. Default value is 2 - IP CS.
CS Type                             : 1
Inner DSCP Marking                  : 2
Enter 1 - Enable, 2 - Disable
Inner DSCP Marking                  : 2
Transparency                        : 1
Enter 1 - Enable, 2 - Disable. Default value is 2 - Disable.
Transparency                        : 1
VLAN (1Q) List                      : 201
Enter up to 16 decimals numbers in the range 0 to 4096 separated by commas. The value 4096 means Untagged. Empty Input means All VLANs
VLAN (1Q) List                      : 201
VLAN (1P) Marking                   : 2
Enter 1 - Enable, 2 - Disable
VLAN (1P) Marking                   : 2


Transaction succeeded
```

Figure 15: Service Interface Creation

3.3.3 Service Group

A Service Group defines the DHCP mode to be used for acquiring IP address configurations for the CPE, and for other devices behind the CPE. To create a Service Group, from the Services menu select 4.Service Groups > 4.Add. A configuration model is presented below (see Figure 16).

```
ASN GW-Services-Service Groups-sg_data-Update
=============================================
Service Group Name                  : sg_data
Dhcp Type                           : 4
Enter 1 - None, 2 - Relay With Option 82, 3 - Forward With Option 82, 4 - Transparent, 5 - Server
Dhcp Type                           : 4
Nomadic Mode                        : 2
Interface IP Address                : 10.1.201.3
Interface Subnet Mask               : 255.255.255.0

AAA Attribute 31                    : 1
AAA Attribute 32                    : 2
Default Gateway                     : 10.1.201.1
VLAN ID                             : 201
VLAN Priority                       : 0

In order to apply the settings, all MSs using this Service Group may be deregistered.
Are you sure you want to continue? [Y/N] y

Transaction succeeded
```

Figure 16: Service Group Creation

Starting with release 1.5, an internal DHCP server can be used and Relay functionalities are enabled. The DHCP Relay and Forward capabilities imply complex settings on network and DHCP side and they are not the object of this document.

In order to setup an internal DHCP server select DHCP type 5 (server) and fill in the desired values. A configuration model is presented in the figure below (Figure 18).

```
ASN GW-Services-Service Groups-sg_srv-Update
============================================
Service Group Name                  : sg_srv
Dhcp Type                           : 5
Enter 1 - None, 2 - Relay With Option 82, 3 - Forward With Option 82, 4 - Transparent, 5 - Server
Dhcp Type                           : 5
Nomadic Mode                        : 2
DHCP Pool IP Address                : 10.11.11.0
Dhcp Pool Subnet Mask               : 255.255.255.0
DHCP IP Address                     : 10.11.11.1
DHCP Pool Dns Ip Address 1          : 1.1.1.1
DHCP Pool Dns Ip Address 2          : 2.2.2.2
DHCP Lease time                     : 3600
CPE Management Server               : http://ACSIP:8080/dps/TR069

AAA Attribute 31                    : 1
AAA Attribute 32                    : 1
Default Gateway                     : 10.11.11.254
VLAN ID                             : 11
VLAN Priority                       : 0

In order to apply the settings, all MSs using this Service Group may be deregistered.
Are you sure you want to continue? [Y/N] y

Transaction succeeded
```

Figure 18: Service Group – Internal DHCP Server

DHCP Pool IP represents the subnet pool for the DHCP Clients, DHCP IP Address is the Server's IP (the IP of the subinterface in the served subnet), the CPE Management Server is the ACS server address, the Default GW is the Default GW address sent in the DHCP Offer and the VLAN ID is the VLAN of the Service Interface used for the clients.

3.3.4 Multiple Service Flows

Multiple Service Flows is where the ASN behavior regarding data flows belonging to certain Service Groups is defined. In order to create a Multiple Service Flow (MSF) at least one Service Group should be already defined.

1. To create an MSF, from the Services menu select 3.Multiple Service Flows > 4.Add.

2. After the new MSF is created, navigate to 2.Select from list or 3.Select by name option to select the newly created MSF. The Service Rules menu allows a new Service Rule to be created for the selected MSF. The rules apply to the Service Interface defined in the menu. After the Service Rule is created, a Classifiers menu becomes available under the newly created Service Rule.

   The Classifiers are used to classify the Downlink and Uplink streams of each defined service flow. The next figures show a configuration model for each of the previously discussed parameters.

```
ASN GW-Services-Multiple Service Flows-Add
==========================================
Multiple Service Flow Name          : msf_test
Service Group Name                  : sg_srv
Service Operation Mode              :
Enter 2 - Router, 3 - Bridge.
Service Operation Mode              : 3

Transaction succeeded
```

Figure 17: MSF Creation

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-Services-Multiple Service Flows-msf_test-Service Rules
=============================================================
1 - Show Summary
2 - Select From List
3 - Select By ID
4 - Add
>4

ASN GW-Services-Multiple Service Flows-msf_test-Service Rules-Add
=================================================================
Service Interface Name              : si_srv

Transaction succeeded
```

Figure 20: Service Rule Creation

```
ASN GW-Services-Multiple Service Flows-msf_data-Service Rules-1-Classifiers-1-Update
====================================================================================
Uplink Classifier Type              : 2
Enter 0 - Any, 1 - DSCP, 2 - Vlan1Q, 3 - 1P.
Uplink Classifier Type              : 2
Uplink Classifier Parameter 1       : 201
Enter a decimal number in the range 1 to 4094
Uplink Classifier Parameter 1       : 201

Downlink Classifier Type            : 2
Enter 0 - Any, 1 - DSCP, 2 - Vlan1Q, 3 - 1P.
Downlink Classifier Type            : 2
Downlink Classifier Parameter 1     : 201
Enter a decimal number in the range 1 to 4094. Empty or 4096 input means Untagged
Downlink Classifier Parameter 1     : 201


Transaction succeeded
```

Figure 18: Classifiers Creation

3.3.5 Service Profile

The Service Profile Menu (2.Service Profiles > 4.Add from the services menu) enables QoS treatment for defined service flows. The current software version supports six types of service profiles (1 - Data, 2 - VoIP, 3 - Management, 4 - PPPoE, 6 – Reliable Video, 7 – Optimized Video).

1. In order to create a QoS profile a Service Profile must be first created.

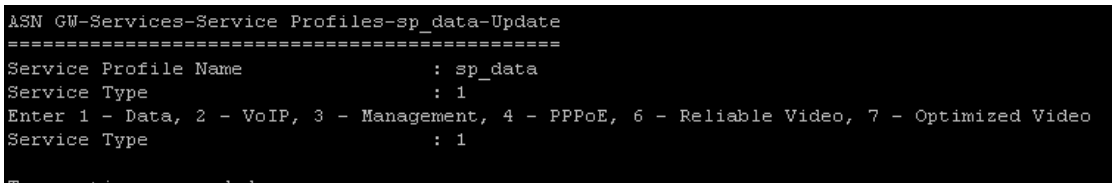

Figure 19: Service Profile Creation

2. After the profile is created, navigate to 2.Select from list or 3.Select by name to select the profile.

3. Select 4.QoS Profiles > 4.Add to add a new QoS profile. A configuration model is presented below (see Figure 20).

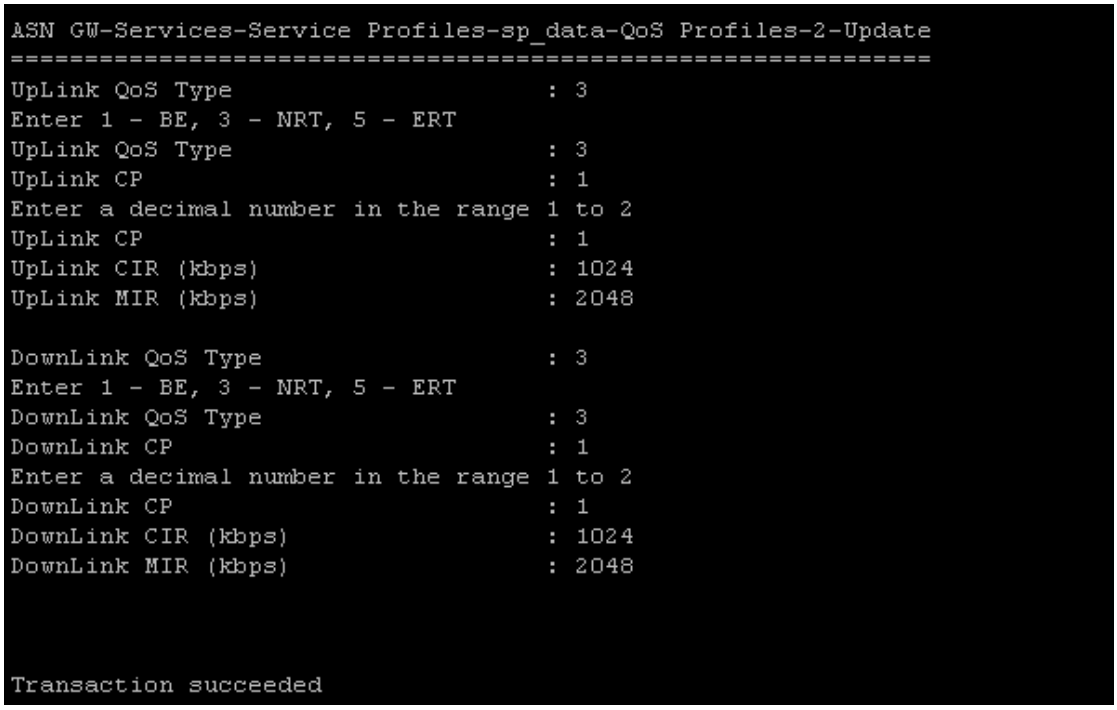

Figure 20: Configuring a QoS Profile

If needed, other services can be created using the same pattern.

3.3.6 Default Services

Starting with release 1.5 the BTS can be provisioned with Default Services. This method is recommended for quick setups for trials or where complex network settings are not available.

There is one provisioning scenario available: ETH CS Management and Data.ETH CS Data is using a Service Interface with VLAN ID 1234 (the BTS Management should be configured on the same 1234 VLAN).

In order to use Default Services, they have to be first created. Go to 2. ASN GW -> 1. Services -> 7. MSs Default Services and select option 2. Create Default Services.

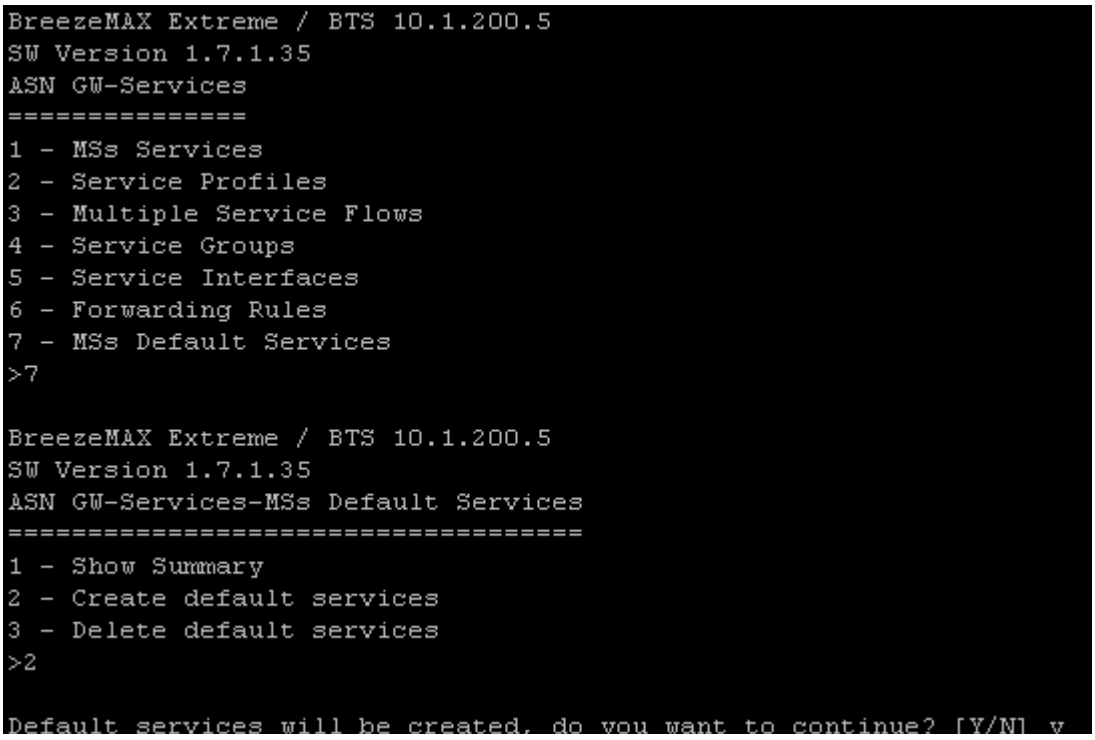

Figure 24: Default Services

After the services are created (a list of successful transactions should be displayed), you can check them by browsing each category (Forwarding Rules, Service Interfaces etc) – you can identify them by the naming convention: ***[[ServiceName]]***.

4 Configuring the CPE – via the WEB

Configuring the Customer Premises Equipment (CPE) from the web browser implies having direct access to the device.

1. The default IP address of the CPE is 192.168.254.251. Therefore, first assign an IP of the same class to the managing computer (192.168.254.250 is the default TFTP server for the CPE, so if other operation are considered this would be the preferred choice of an IP).
2. After the IP is configured on the management machine, open a browser window and go to http://192.168.254.251. The default login password is “installer”.

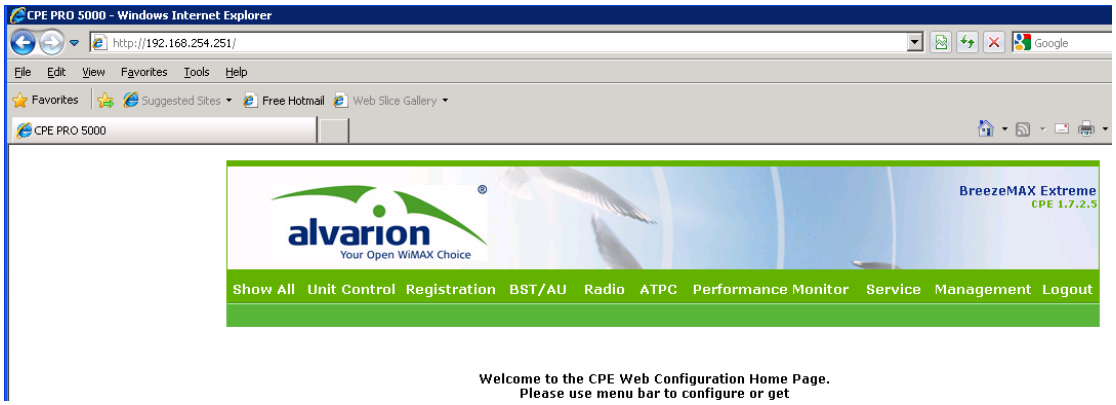

Figure 21: CPE Default Screen

3. From the main menu select Radio > Frequency Scanning and select an appropriate start and end frequency for the scanning and also the scanning main step and bandwidth.

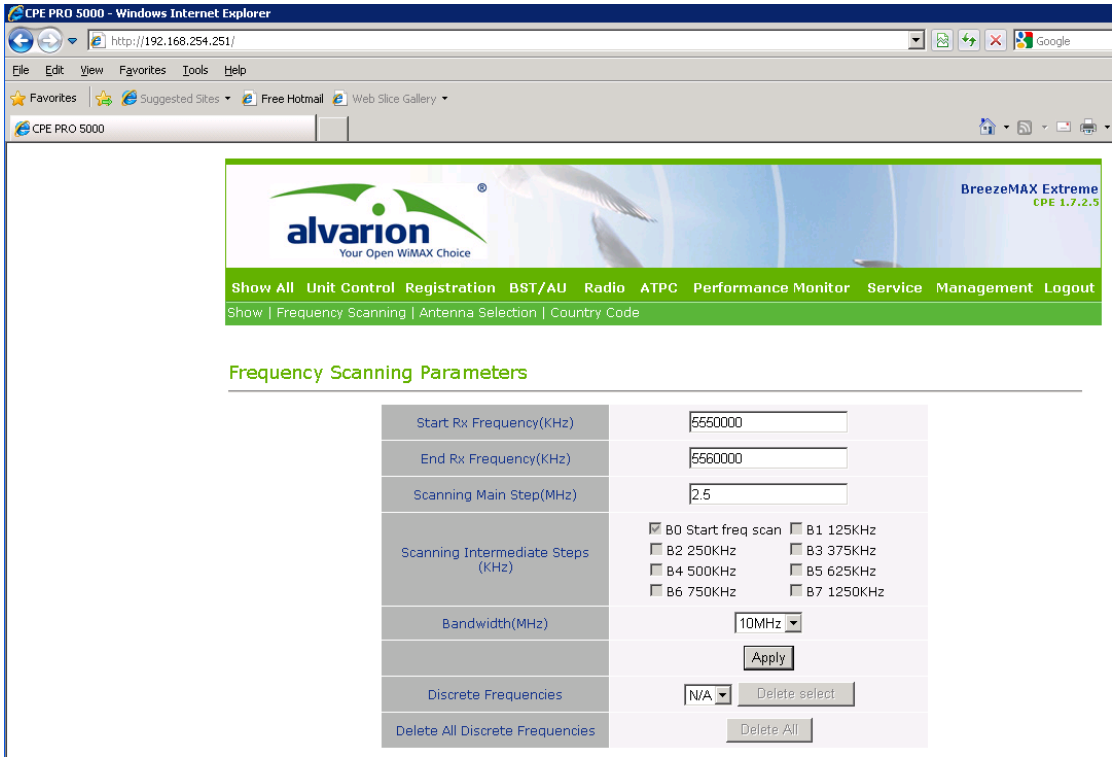

Figure 22: Configuring Scanning Parameters

4. Click Apply and make sure that the scanning table list is updated. If the range is correctly chosen, after few minutes the Best BS scanning table should also be populated (see Figure 23).

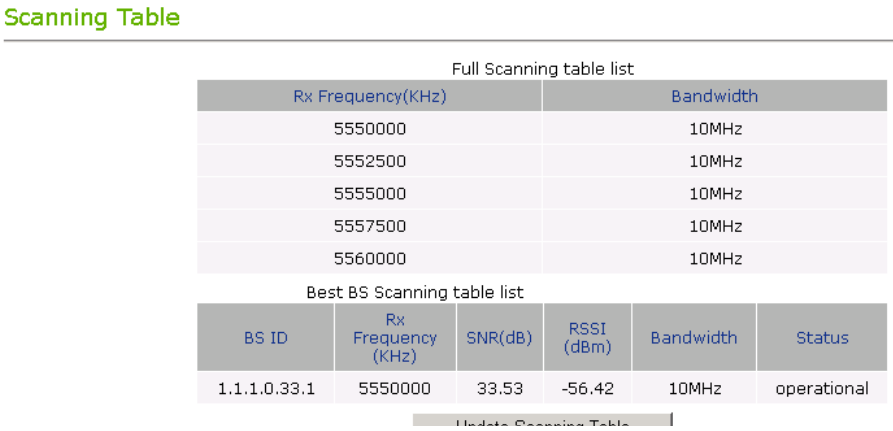

Figure 23: Scanning Table

The same information is also available in the BST/AU menu.

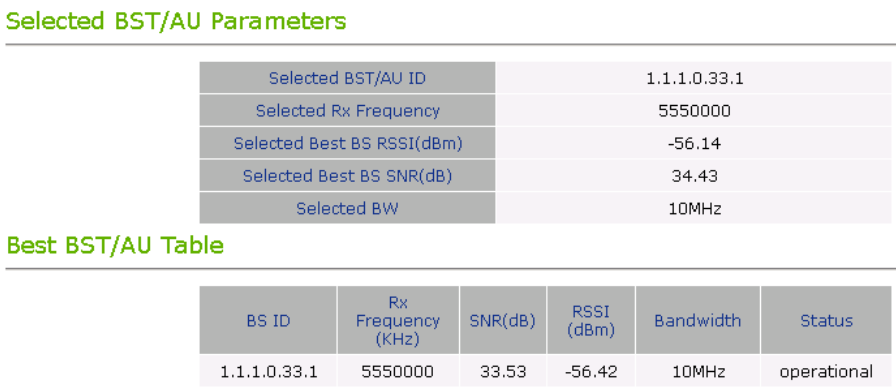

Figure 24: BST/AU Menu

5. In the Registration menu, select Registration submenu. Fill in the user name and password (also retype the password) and check the “EAP TTLS” radio button. Reset the unit whenever requested to.

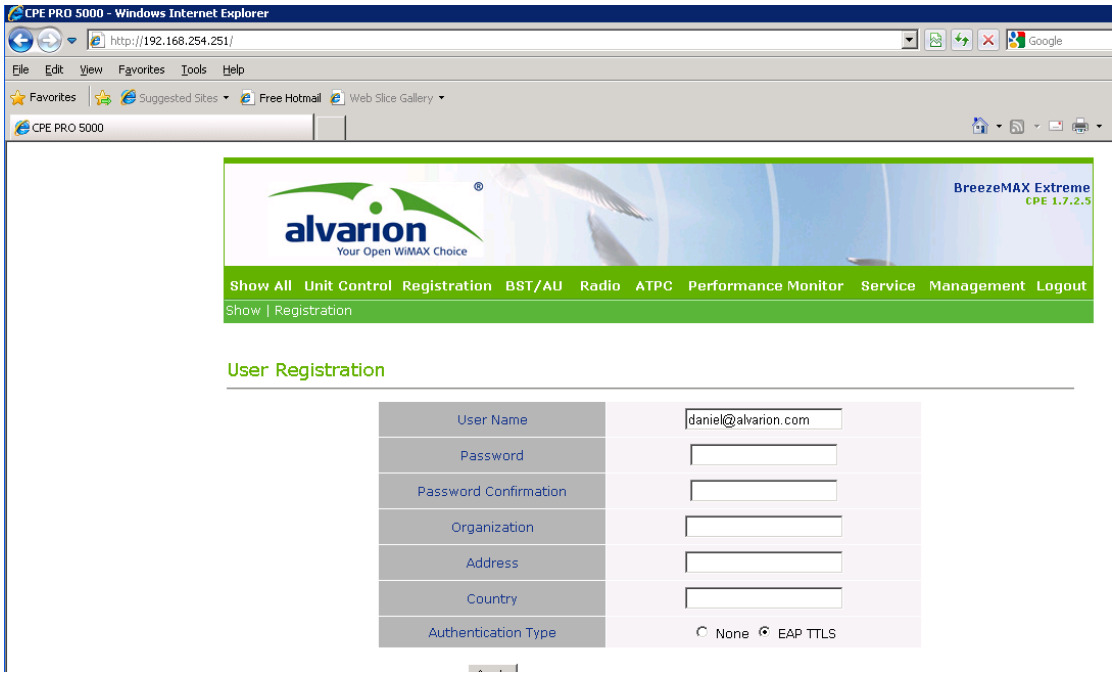

Figure 25: Registration Menu

6. Click “Show all”.

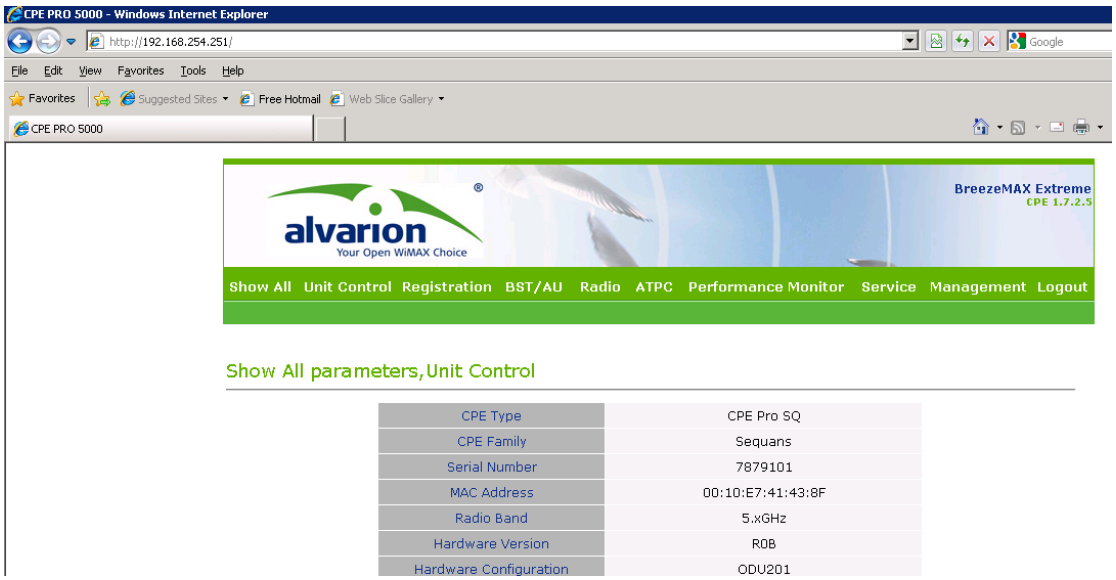

Figure 26: Identifying the CPE MAC

NOTE

The printed MAC Address (as shown in Figure 26) is the MAC used for the Ethernet link of the CPE. The MAC address used on air (the one seen by the BTS) is hexadecimal incremented by 1 (in the above example the air MAC would be 00:10:E7:41:43:90).

5 Provisioning the CPE

The process of provisioning the service flows to each CPE for centralized provisioning is handled by the AAA server (release 1.7 supports Aradial and Bridgewater in addition to supported AAA servers in 1.5 release).

1. Before configuring the radius server to handle the provisioning requests, the user must specify the way in which the BTS is to reach it. Select 2.ASN GW > 1AAA > 2.Configuration.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA
==========
1 - Show Summary
2 - Configuration
>2

BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA-Configuration
=======================
1 - AAA Client
2 - Authentication Servers
3 - Accounting Servers
>
```

Figure 30: AAA configuration Menu

The default values for the 1.AAA Client are shown in Figure 27. If the default parameters are not suitable for your setup, they can be changed by selecting the "2. Update" option.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA-Configuration-AAA Client
===================================
1 - Show
2 - Update
>1

ASN GW-AAA-Configuration-AAA Client-Show
========================================
Retry Interval (sec)                : 5
Maximum Number of Retries           : 3
Keep Alive Timeout (sec)            : 60
>
```

Figure 27: Default AAA Client Configuration

2. Point to the intended AAA server. Select 2.Authentication Server > 3.Add and fill in the information as shown in Figure 28.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA-Configuration-Authentication Servers
================================================
1 - Show Summary
2 - Select
3 - Add
>3

ASN GW-AAA-Configuration-Authentication Servers-Add
================================================
Server IP Address                    : 10.1.200.2
Server Alias                         : AAAServer
Shared Secret                        : ********
Re-enter Shared Secret               : ********
UDP Port Number                      : 1812
```

Figure 28: Authentication Server Designation

3. Select an accounting server by navigating to 3.Accounting Servers > 3.Add and fill in the required information.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA-Configuration-Accounting Servers
===========================================
1 - Show Summary
2 - Select
3 - Add
>3

ASN GW-AAA-Configuration-Accounting Servers-Add
===============================================
Server IP Address                    : 10.1.200.2
Server Alias                         : AAAServer
Shared Secret                        : ********
Re-enter Shared Secret               : ********
UDP Port Number                      : 1813
```

Figure 29: Accounting Server Designation

4. Check that the appointed radius server is up and running by selecting “1.Show Summary”. This is correlated with the AAA Client setting mentioned previously.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
ASN GW-AAA-Configuration-Authentication Servers
===============================================
1 - Show Summary
2 - Select
3 - Add
>1

ASN GW-AAA-Configuration-Authentication Servers-Show Summary
============================================================
IP Address                          : 10.1.200.2
Server Alias                        : AAA
UDP Port                            : 1812
Operational Status                  : Up
------------------------------------
```

Figure 30: Authentication Server Status

5. Upon successfully adding all the required services (see sections 5.1,5.20 for basic guidelines for configuring AAA server), check that the CPE is up and running, by selecting 8.MS > 1.Show Summary from the BTS main menu.

```
BreezeMAX Extreme / BTS 10.1.200.5
SW Version 1.7.1.35
MS
==
1 - Show Summary
2 - Show Summary By BS
3 - Show Concise Summary
4 - Show Concise Summary By BS
5 - Select By MAC
6 - Add
>1

MS-Show Summary
===============
MS MAC Address                      : 00-10-e7-41-43-90
MS IP Address                       : 10.1.200.91
BS ID                               : 1
Operational Status                  : In Service
------------------------------------

Total Number Of MSs                  : 1
Total Number Of MSs Connected to BS 1: 1
Total Number Of MSs Connected to BS 2: 0
>
```

Figure 31: CPE Status Checking

5.1 Radiator

1. Edit the file */opt/Radiator/config/include/Clients.inc*

   The declaration format for the file is:

   ```
   <Client <BTS_IP>>
           Secret <secret>
           DupInterval 0
           NasType unknown
   </Client>
   ```

   <BTS_IP> is the BTS IP, and <secret> is the chosen secret (the one set in the previous paragraph).

2. Edit the file*/opt/Radiator/etc/wimax_users*

   The Declaration format for this file is:

   ```
   <user>@<realm>              Password=<user_password>
           Reply-Message="<custom reply message>",
           Session-Timeout=2000,
           Filter-
   Id="SP=sp_ip_cs_mng:MSF=msf_ip_cs_mng;SP=sp_eth_cs_data:MSF
   =msf_eth_cs_data;"
   ```

   <user>@<realm> is the user set on the CPE under the Registration TAB.

   <user_password> is the Registration password

   sp_ip_cs_mng, msf_ip_cs_mng, sp_eth_cs_data and msf_eth_cs_data are the services defined for the BTS.

5.2 Freeradius

Access the Radiator server and edit the significant configuration files.

1. Edit the file */usr/local/etc/raddb/Clients.conf*

   The declaration format for the file is:

   ```
   client <BTS_IP> {
           secret = <secret>
           shortname = justaname
   }
   ```

<BTS_IP> is the BTS IP, and <secret> is the chosen secret (the one set in the previous paragraph).

2. Edit the *//usr/local/etc/raddb/ users*

   The Declaration format for this file is:

```
<user>@<realm>      Cleartext-Password := "<user_password>"

        Filter-ID = "
SP=sp_ip_cs_mng:MSF=msf_ip_cs_mng;SP=sp_eth_cs_data:MSF=msf
_eth_cs_data;",

        Session-Timeout = 1200,

        Termination-Action = RADIUS-Request
```

   <user>@<realm> is the user set on the CPE under the Registration TAB.

   <user_password> is the Registration password

   sp_ip_cs_mng, msf_ip_cs_mng, sp_eth_cs_data and msf_eth_cs_data are the services defined for the BTS (the Default Services created can be used also).

5.3 Aradial

5.3.1 Network Access Server Definition

From the NAS&Proxy tab of the Aradial web page open the Add/Edit Network Access Server to add a NAS client. Include the IP address of the Extreme BS and a shared secret code that is also defined on the BTS side. Define Model type: Alvarion_4Motion.

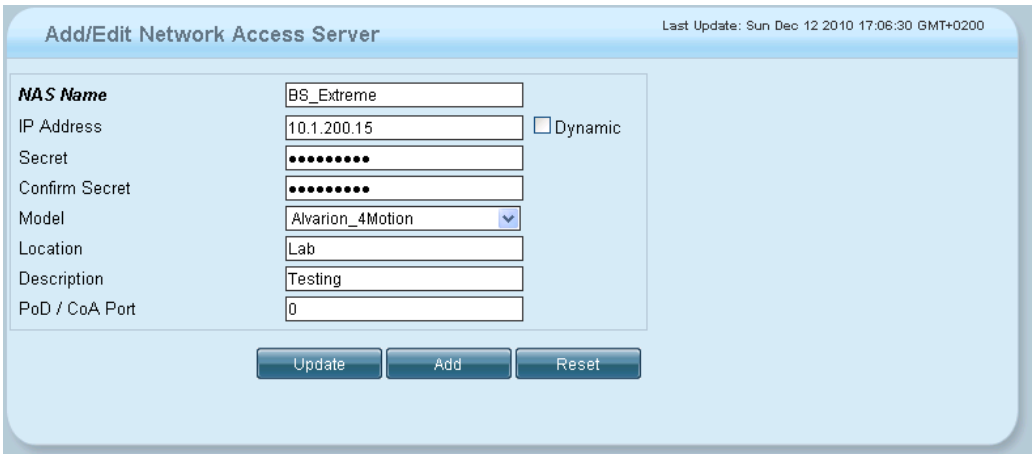

Figure 32: Add/Edit Network Access Server

5.3.2 Group Definition

1. From the User Manager menu of the Aradial web page open the Add/Edit Group to define groups (see Figure 33).

2. In the Extended Radius Attributes field configure all the SP and MSF pairs as follows (see Figure 33):

```
FID=SP=sp1:MSF=msf1;SP=sp2:MSF=msf2;SP=sp3:MSF=msf3;
```

NOTE

The filter ID for the Extreme BTS has the following format SP=sp1:MSF=msf1;SP=sp2:MSF=msf2;SP=sp3:MSF=msf3;.

The Aradial AAA server does not allow this string to be updated into the Filter ID field in the Add/Edit Group window due to the maximum length of this filed. Therefore, in order to have a filter ID that is compliant with the Extreme ASN-GW, configure all the SP and MSF pairs in the Extended Radius Attributes as described in Step 2 above.

This is interpreted as a filter ID and will be sent to the BS as it is defined.

3. Define the Service Type from the group you create as PPP.

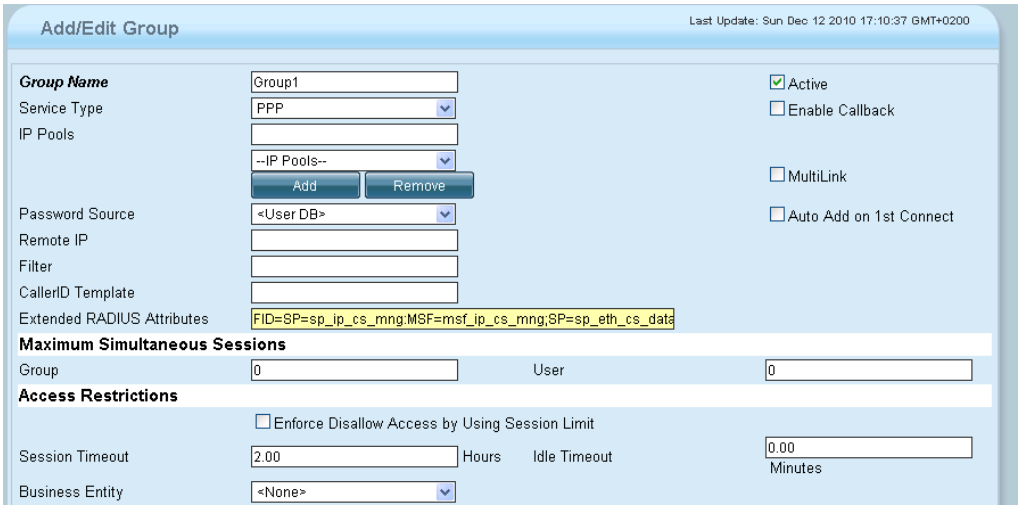

Figure 33: Add/Edit Group

5.3.3 Users Definition

1. From the User Manager menu of the Aradial web page open the Add/Edit User window (see Figure 34).

2. In the Association field select the defined group to associate.

3. Set the Service Type to None in order to use the settings for the filter ID and Session Timeout defined for each group (refer to section 5.3.2).

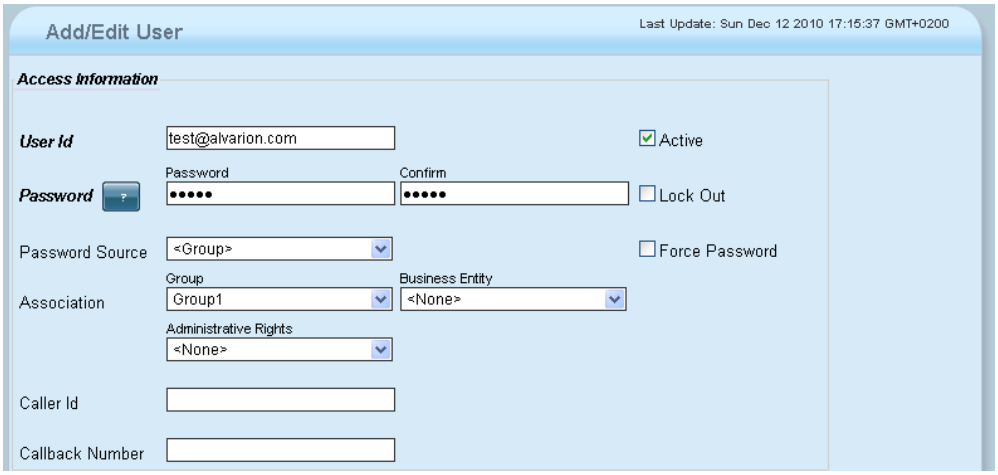

Figure 34: Add/Edit User

6 Configuring the BTS – via AlvariCRAFT

All the above configurations can also be carried out via a Graphic User Interface (GUI) using AlvariCRAFT. Launch AlvariCRAFT for the selected BTS. (For information on installing and using AlvariCRAFT see the AlvariCRAFT user manual). Make sure that the BTS is manageable from AlvariCRAFT. The state of the BST must be Up.

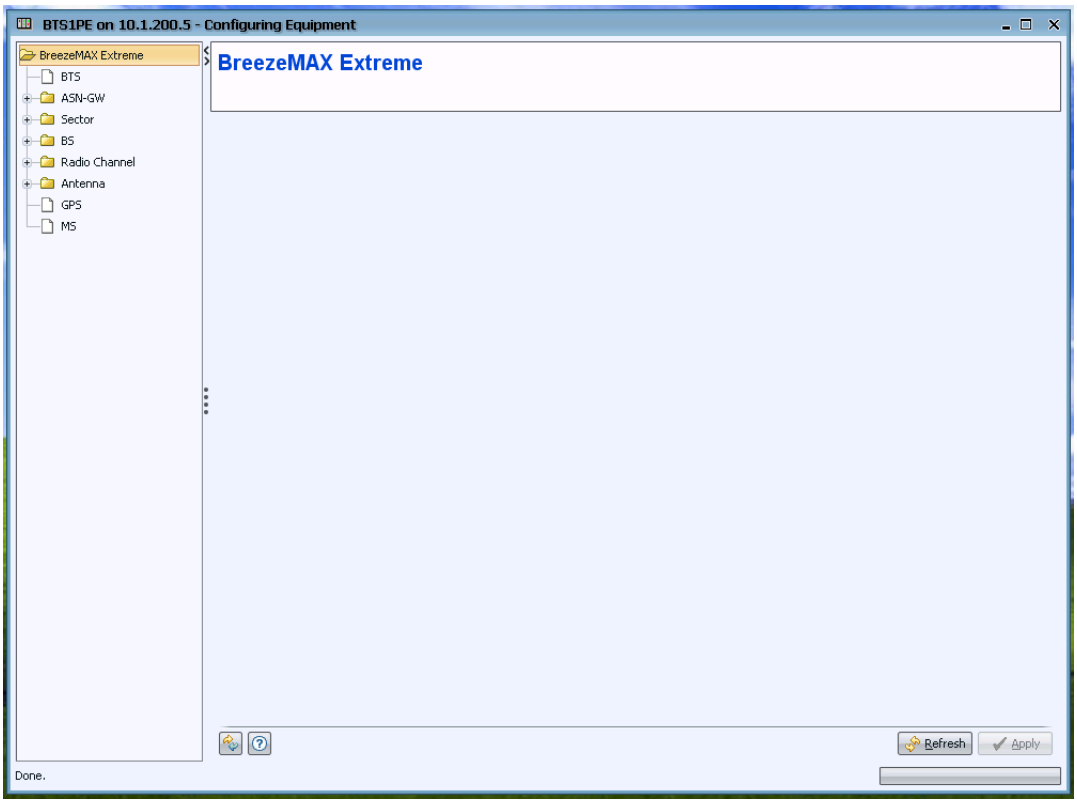

Figure 35: AlvariCRAFT Default Screen

The general connectivity options (as discussed in section 3.1) can be configured using the various tabs of the BTS menu.

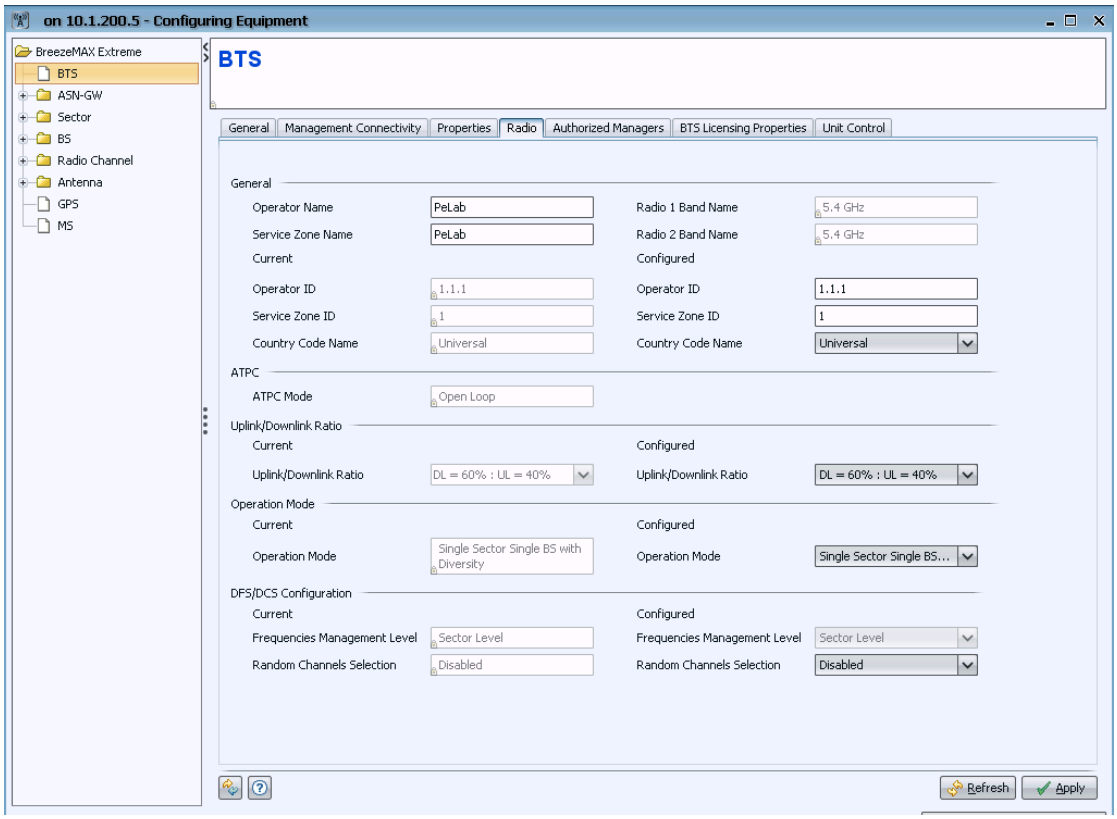

Figure 36: BTS Menu

The radio parameters (as discussed in section 3.2) can be configured using SECTOR, BS, RADIO CHANNEL, ANTENNA and GPS screens and their various tabs. The process is straight forward and the parameters are the same as those discussed for the “Monitor” application (see the following figures).

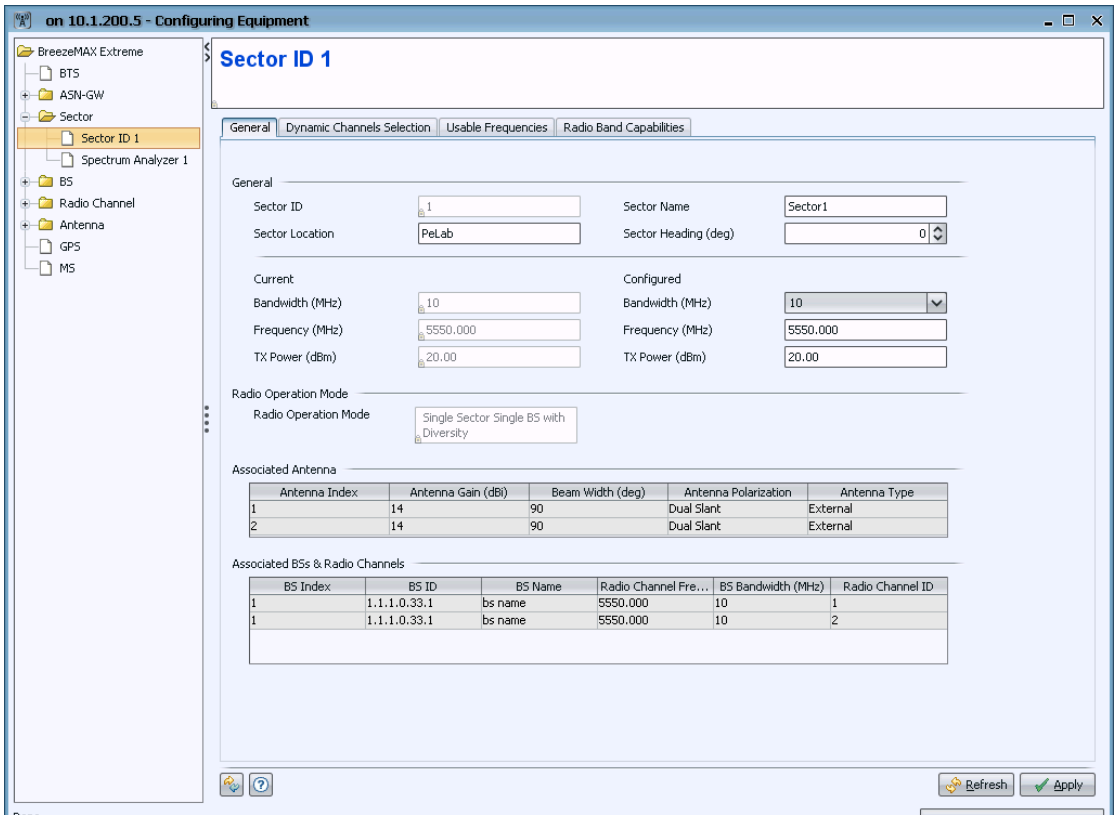

Figure 37: Sector ID menu

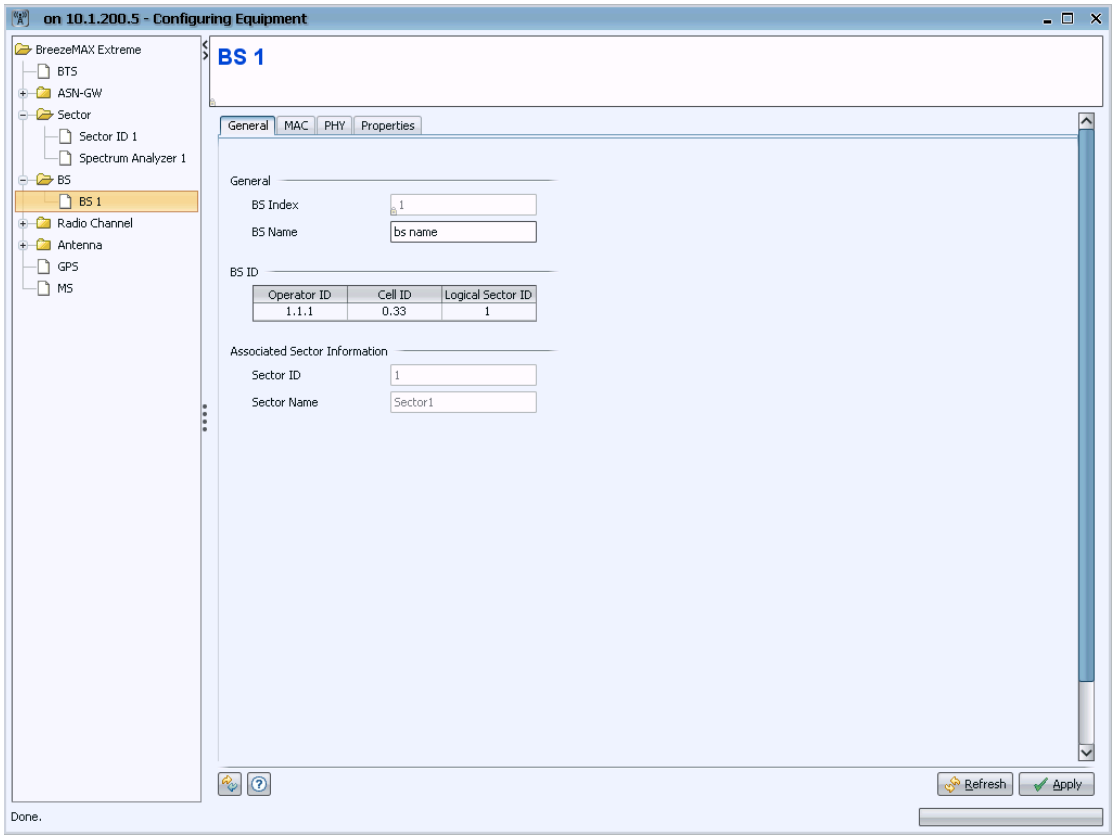

Figure 38: BS Menu

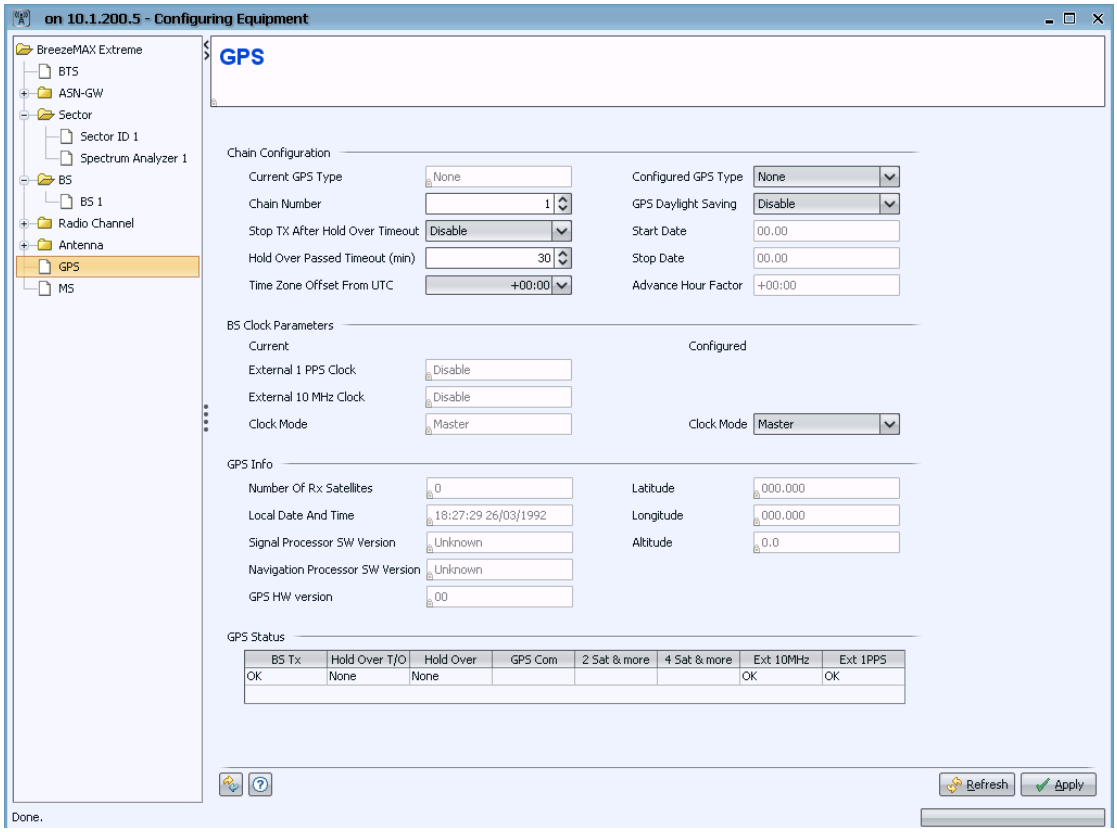

Figure 40: GPS Menu

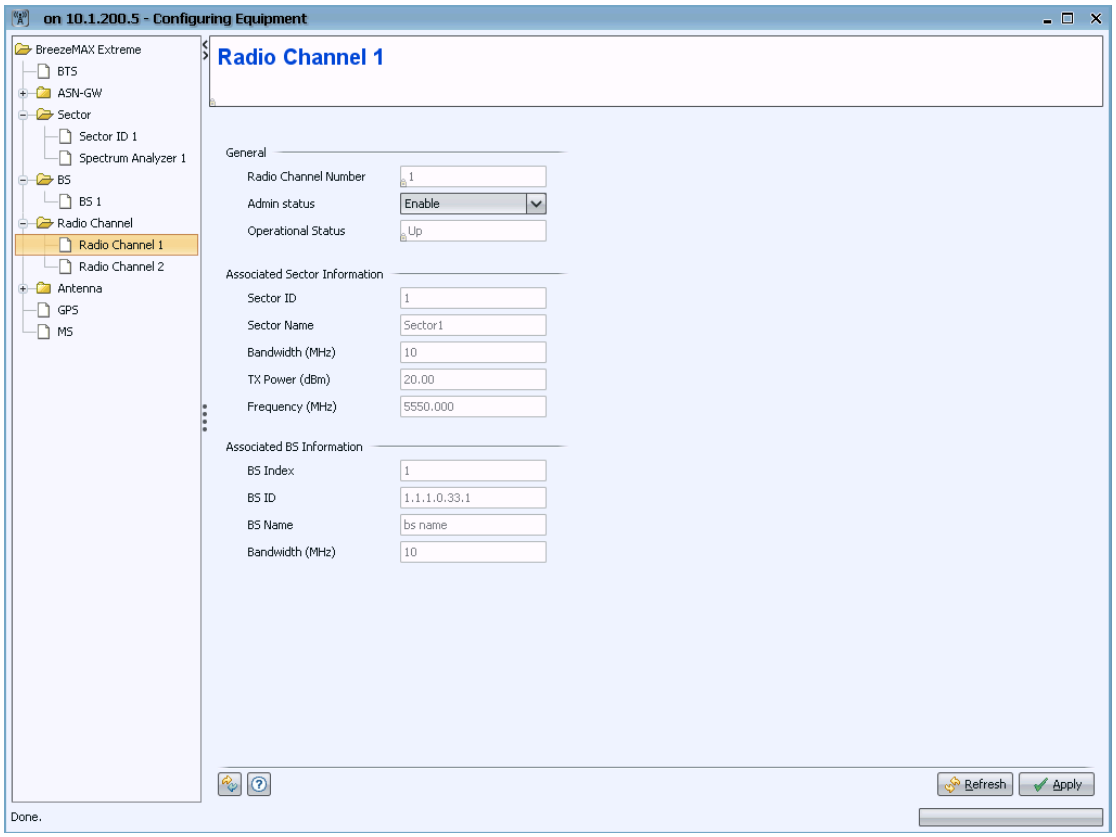

Figure 39: Radio Channel Menu

The AAA configuration is carried out by selecting ASN GW >AAA >Radius Client menu.

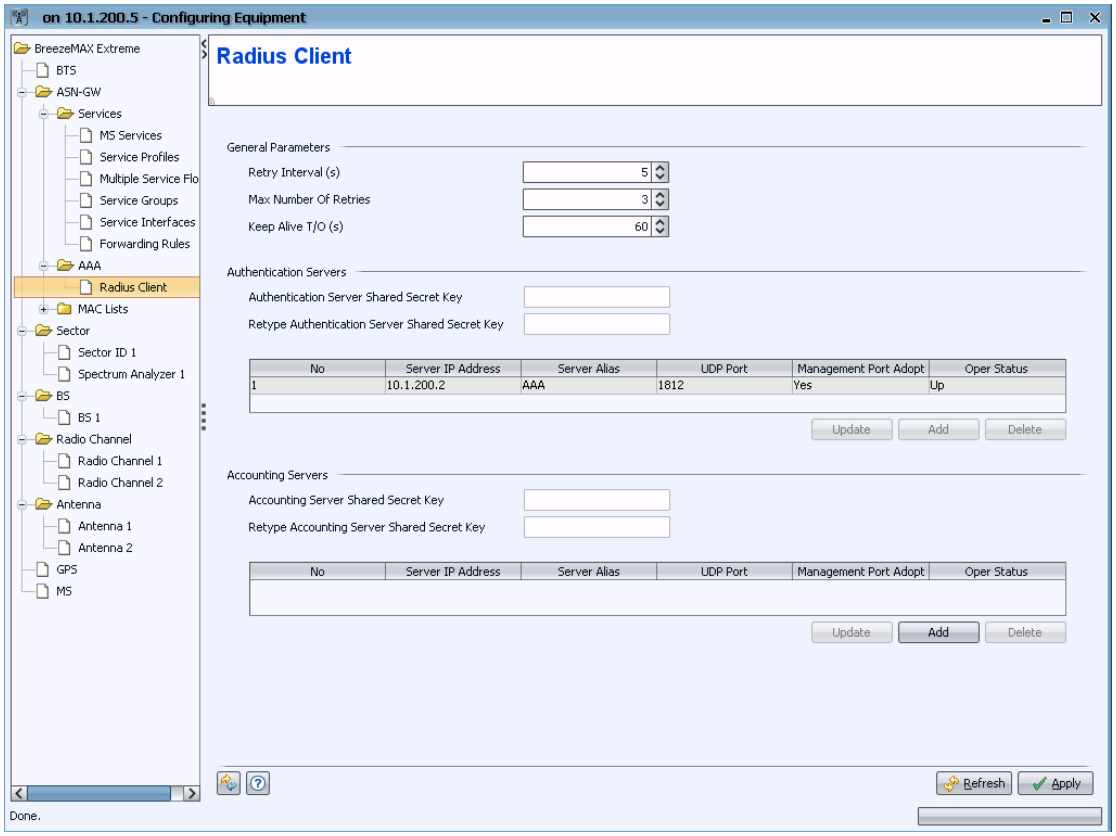

Figure 40: Radius Client Menu

To create a service select ASN GW >Services menu.

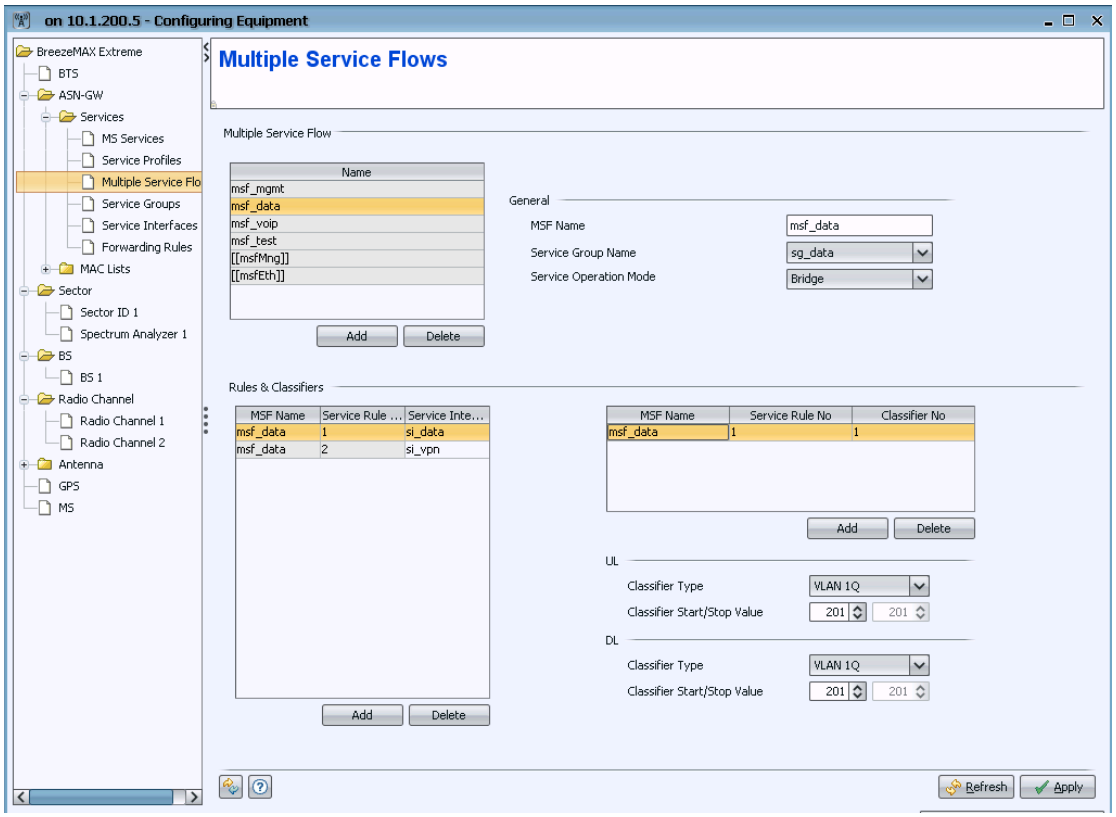

Figure 41: MSF Menu

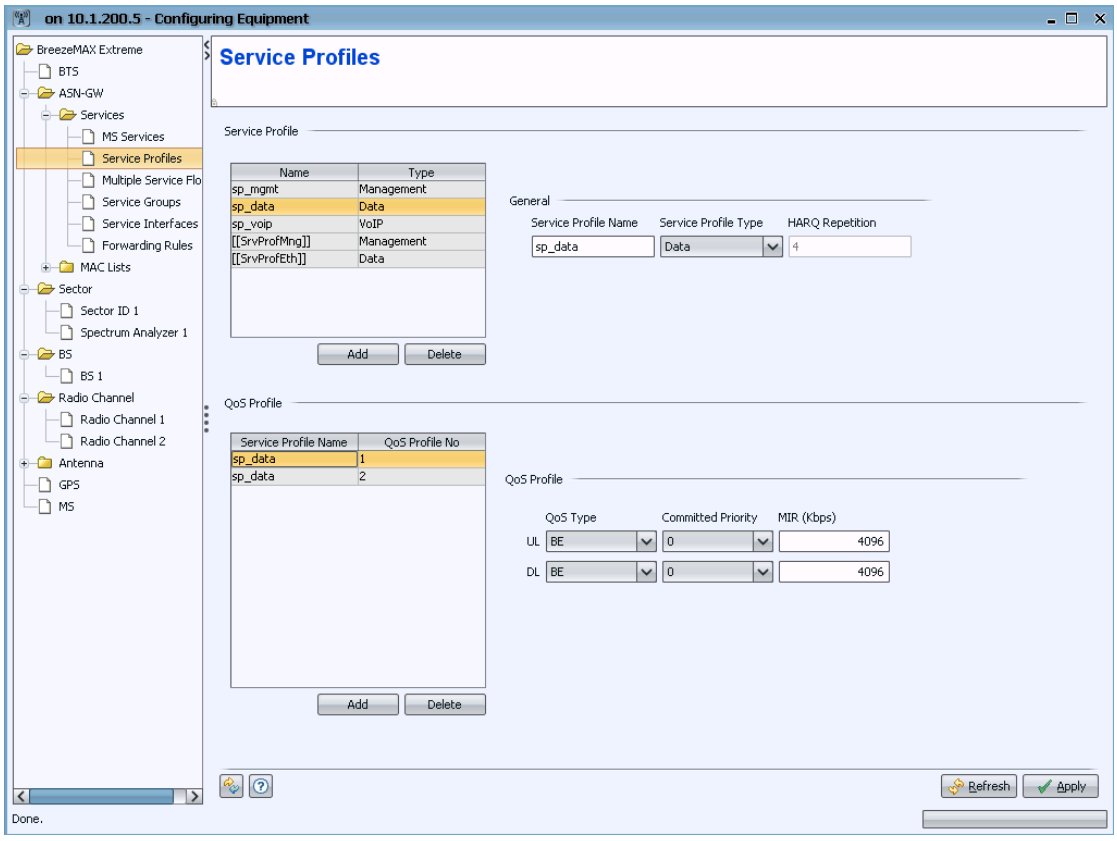

Figure 42: SP Menu

The rules described in section 3.3 still apply for creating the services. Modules should be configured bottom up: from Forwarding Rules to Service Profiles, and deleted top down. After creating objects under each menu, double click on them to expand, if needed.