



Network Configuration Setup Guide

For

Air4G-W24 9.50

This document forms the release note relevant to the specific product release as stated above. It covers new features, performance and any limitations of the product known at the time of release.

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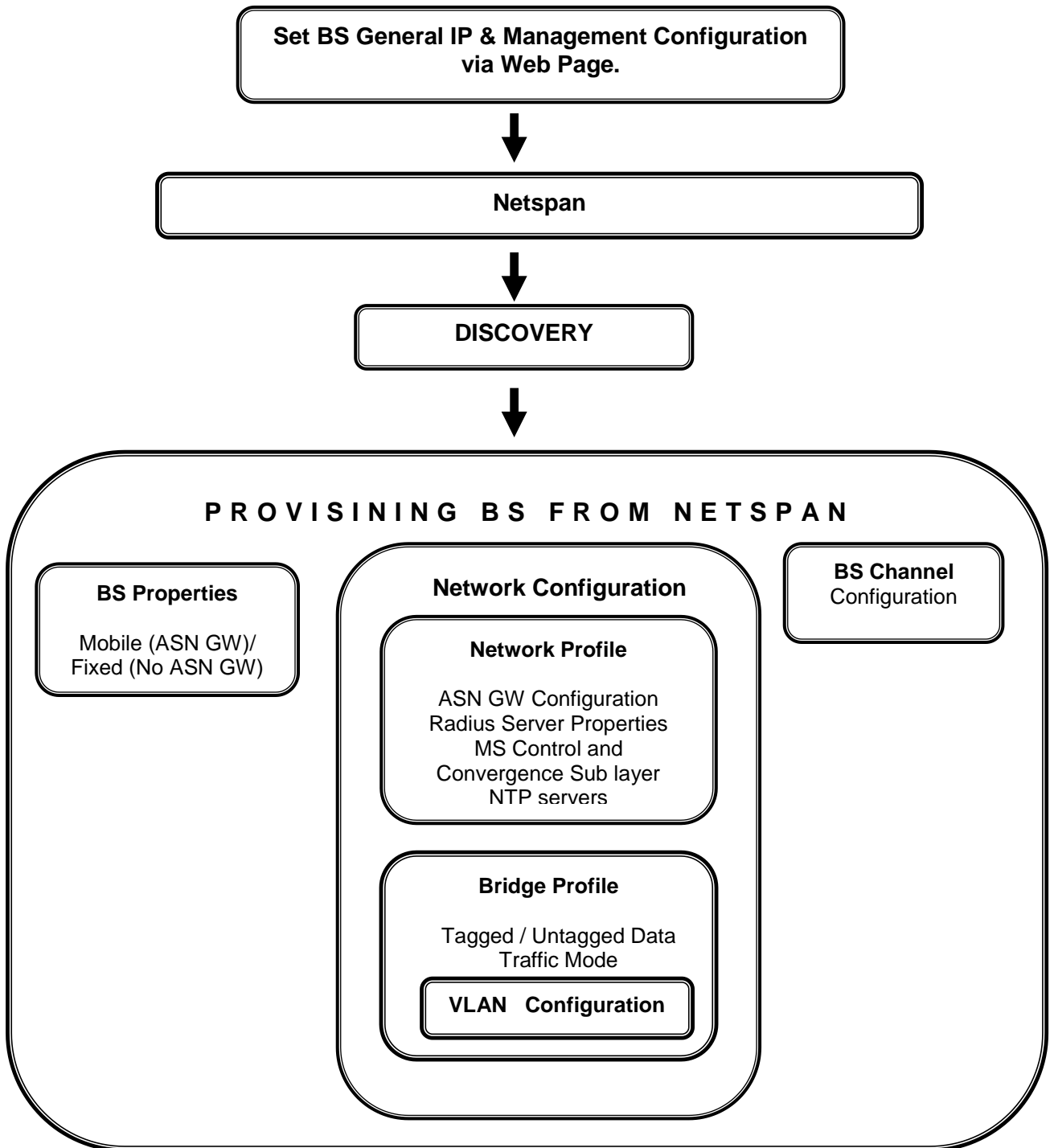
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Abbreviations:

| | |
|-------|--|
| AAS | Adaptive Antenna System |
| AP | Access Point |
| API | Application Programmers Interface |
| ATCA | Advanced Telecommunications Computing Architecture |
| BE | Best Effort Scheduling Service |
| BER | Bit Error Rate |
| BS | Base Station |
| BWA | Broadband Wireless Access |
| CIR | Committed Information Rate |
| CPE | Customer Premises Equipment (Interchangeable With ST) |
| CS | Convergence Sub layer |
| DL | Downlink |
| DHCP | Dynamic Host Configuration Protocol |
| EiRP | Effective Isotropic Radiated Power |
| FDD | Frequency Division Duplex |
| FEC | Forward Error Correction |
| FFT | Fast Fourier Transform |
| IDU | Indoor Unit |
| IP | Internet Protocol |
| Kb/s | Kilobits Per Second |
| MAC | The Next Layer Up From The PHY, Known As The Media Access Controller |
| Mb/s | Megabits Per Second |
| MIB | Management Information Base |
| MIR | Maximum Information Rate |
| NLOS | Non Line Of Sight Radio Propagation Path |
| nrtPS | Non Real Time Polling Service |
| OBSAI | Open Base Station Architecture Initiative |
| ODU | Out Door Unit |
| OFDM | Orthogonal Frequency Division Multiplexing |
| OFDMA | Orthogonal Frequency Division Multiple Access |
| PHY | The Physical Layer Associated With The Wimax Interconnection Stack |
| PTMP | Point To Multipoint Radio Systems Architecture |
| PoE | Power Over Ethernet |
| PtP | Point To Point Radio Systems Architecture |
| QoS | Quality Of Service |
| rtPS | Real Time Polling Service |
| Rx | Receiver |
| SDMA | Space Division Multiple Access |
| SDR | Software Defined Radio |
| SF | Service Flow |

| | |
|--------|---|
| SNMP | Simple Network Management Protocol |
| SNR | Signal To Noise Ratio |
| SOFDMA | Scaleable Orthogonal Frequency Division Multiple Access |
| SOHO | Small Office/Home Office |
| Tx | Transmitter |
| TDD | Time Division Duplex |
| UGS | Unsolicited Grant Service |
| VoIP | Voice over Internet protocol |
| WiMAX | Worldwide Interoperability for Microwave Access |

1 Netspan Provisioning BS Configuration Flow



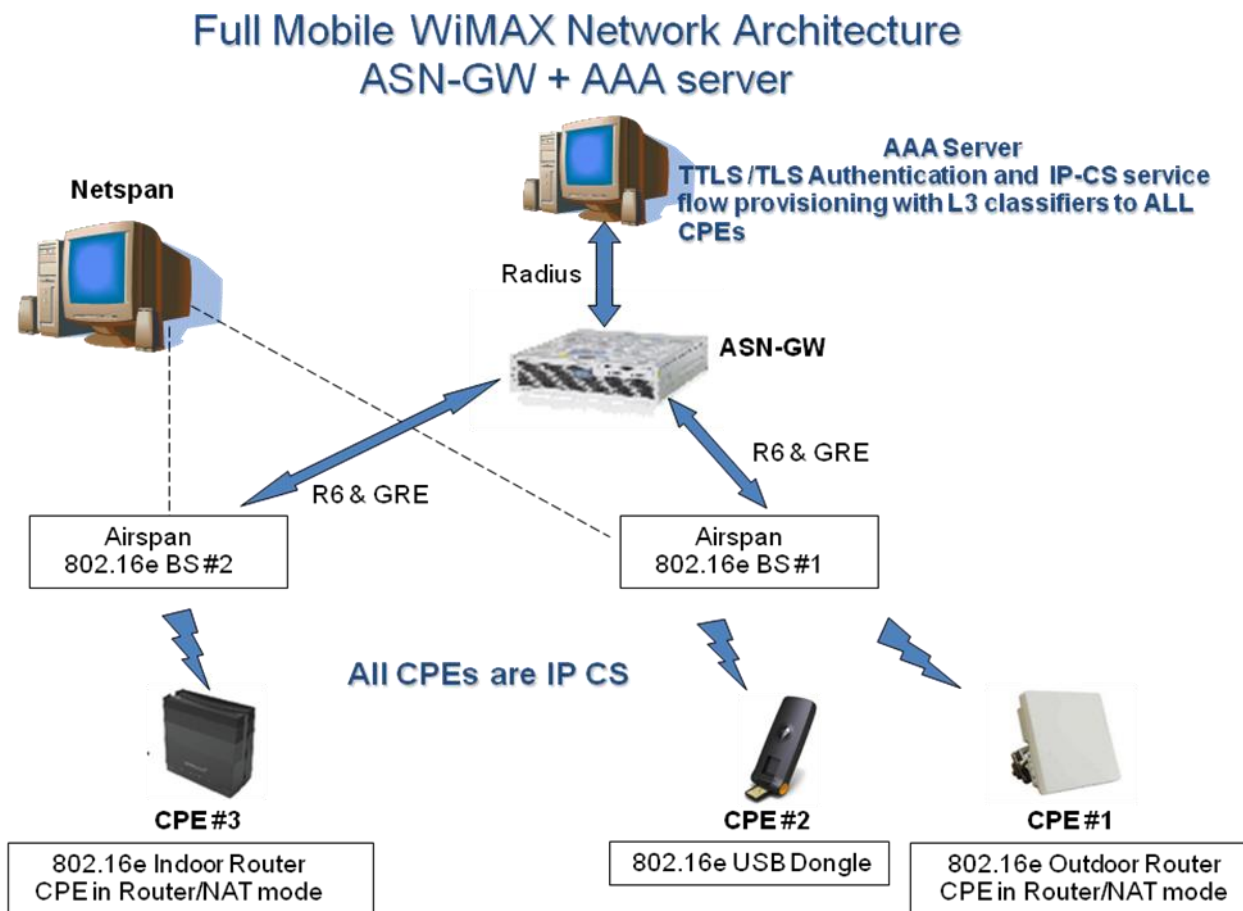
2 Setup Guide for WiMAX Network Architectures

This Supported Network Architecture for Air4G-W24 (MacroMaxe) BS Based on 802.16e BS Network Architecture.

This document describes the setup configuration regarding to the Network Profile and Network Interfaces (Bridge Profile (Vlan Tagged / untagged), ASN GW, Radius) within Net span.

(This document does not refer in details RF and system configuration profile).

2.1 Full Mobile WiMAX ASN-GW + AAA server



In this architecture the Air4G-W24 BS is operating in the full mobile WiMAX network architecture. This architecture includes an ASN Gateway and AAA server and suited for fully mobile CPE subscribers.


The following applies in the full mobile WiMAX network architecture:

- Data service flows between the BS and MSs are IP CS only.
- All traffic between the MSs and the CSN network is routed through the ASNGW. Each data service flow between the BS and MSs is mapped to a GRE tunnel connection between the BS and the ASNGW.
- Network entry process of the MS includes the ASNGW and AAA server for MS authentication.
- AES Encryption of the data service flows in the WiMAX air interface between the BS and the MS using PKMv2 is applicable as the BS derives encryption keys from the AAA server.
- The MSs are managed by the ASNGW and AAA server only, and not by Netspan. Data service flows to the MS are provisioned by the AAA and ASNGW.
- Since all data service flows are IP CS, only L3 classifiers are applicable.
- Mobile features of handover and idle mode are applicable (ASN-GW functionality).

2.1.1 Untagged Mode

In this Mode the Data Traffic and Management Traffic From / To BS are Untagged.

| # | From | Action | Description | Comment |
|----|--------------------------|---|--|----------|
| 1. | Base station Web page | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Browse default IP http://192.168.0.100 ▪ login: user= macromaxe ,password =macromaxe ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan =Untagged ▪ Set Read community = public, write community =private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot BS via “General BS configuration”: Set BS action to “All Reset “. | |
| 2. | Netspan | Discovery BS. | <ul style="list-style-type: none"> ▪ Go to Server → Select Discovery parameters, Add Discovery Task. ▪ Insert Discovery parameters and Target IP of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> ▪ Go To Configuration Management → Select BS → BS TRx. ▪ Select the configured BS and Press Edit | Figure 1 |

| # | From | Action | Description | Comment |
|----|--|--|---|----------|
| | | | Button down page to enter Edit Mode. | |
| 4. | Netspan: Edit BS TRx Provisioning | Set BS TRx Properties | <ul style="list-style-type: none"> ▪ Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (not editable). ▪ Set Mobility mode = Mobile. ▪ Check In Managed. ▪ Set Ready For Service = Ready For Service. ▪ Set System Profile with a Default Netspan Profile for Air4G-W24 (MMXe). ▪ Set Management Profile with a default Netspan Management Profile for Air4G-W24. ▪ Set VoIP Profile = not set. | Figure 2 |
| 5. | Netspan : Edit BS TRx Provisioning | Configure Network profile. | Press List Button  to open BS TRx Network Profiles (16e) List, Press Add button Located down the list. | Figure 3 |
| 6. | Netspan; Edit BS Network Profile | Add new BS Network Profile with ASN-GW Parameters. | <ul style="list-style-type: none"> ▪ Specify a Name for Network profile. ▪ Choose Target Hardware Category Any or Other if you want this profile to be associated also with another BS. <p><u>Network Servers Settings:</u></p> <ul style="list-style-type: none"> ▪ Check In Use ASN-GW Option. ▪ Uncheck Use RADIUS Server (Beta). ▪ ASN-GW Protocol Family= according ASN GW HW. ▪ ASN Gateway Protocol Version = R1.0.v1.2 (NWG version). ▪ Set ASN-GW IP Address ▪ ASN-GW Address (not editable), this address is set automatically with the ASNGW address). ▪ Set Paging Controller IP Address (required only for idle mode feature). <p><u>MS Control and Provisioning :</u></p> <ul style="list-style-type: none"> ▪ MS Control and Provisioning is Set to ASN-GW (R6) (Not editable). ▪ Allow MS MIB Provisioning Set NO. (In this setup the Traffic Service Flow | Figure 4 |

| # | From | Action | Description | Comment |
|-----|---------------------------------------|---------------------------|--|--------------|
| | | | Provisioning is done by ASN GW). <ul style="list-style-type: none"> Allow IP Convergence Sub layer is set to Yes (not editable). Allow Ethernet Convergence Sub layer set No. <p><u>NTP Servers:</u></p> <ul style="list-style-type: none"> Uncheck NTP Server 1 IP Address Press Ok to save settings. Back to Edit BS TRx Provisioning. | |
| 7. | Netspan : Edit BS TRx Provisioning | Configure Bridge Profile. | <ul style="list-style-type: none"> Press List Bottom to open Bridge Profile List and Select a System default Air4G-W24 bridge profile = SR9.0(V8.4) MMxe Default This Default Bridge profile is not editable, it contains the following parameters: <ul style="list-style-type: none"> Profile Type= System Profile (not Changeable) Mode=Basic. Data Traffic=Untagged. Data Vlan Id set to "VLAN ID4089 default ASN Traffic Vlan". This Vlan configuration is defined by Netspan Default configuration. | Figures 5, 6 |
| 8. | Netspan : Edit BS TRx Provisioning | Configure traffic Port. | <ul style="list-style-type: none"> Set traffic port = Traffic and management Ethernet. | |
| 9. | Netspan : Edit BS TRx Provisioning | Set ASN-GW Data Interface | <ul style="list-style-type: none"> Set IP address and Subnet mask according BS configuration as configured on the BS management web page. Router IP Address : <ol style="list-style-type: none"> Uncheck option If ASN-GW and BS is in same sub-network. Else, if there is a router between then, check in router IP address and enter the IP address of the router. | |
| 10. | Netspan : Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> Standalone RADIUS Client is automatically Uncheck. (Not editable). <p>Note: In this mode: The BS is not a client of the radius server; the Radius is accessed by</p> | |

| # | From | Action | Description | Comment |
|-----|---|------------------------|---|---------|
| | | | the ASN- GW. | |
| 11. | Netspan: Edit BS TRx Provisioning | Set paging group | <ul style="list-style-type: none"> Set paging Groups is <u>required only if using idle mode.</u> | |
| 12. | Netspan: Edit BS TRx Provisioning | Set channel Properties | <ul style="list-style-type: none"> Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. Be Aware to set a Suitable MAC Profile <u>with Authentication.</u> | |
| 13. | Netspan: Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> Verify SNMP properties are correct. | |
| 14. | Netspan: BS TRx State and Control | Re-provision | <ul style="list-style-type: none"> Re-provision BS TRx | |
| 15. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> Resetting BS | |

2.1.2 Tagged Mode

In this Mode the Data Traffic and Management Traffic From / To BS are tagged with same VLAN Id.

| # | From | Action | Description | Comment |
|----|-----------------------------------|---|--|----------|
| 1. | Base station web | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Navigate to default IP http://192.168.0.100 ▪ login: user= macomere ,password =macomere ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan =Tagged ▪ Enter required Vlan Id ▪ Set Read community = public, write community=private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot Bs via “General BS configuration”: Set BS action to “All Reset “. | |
| 2. | Netspan | Discovery BS. | <ul style="list-style-type: none"> ▪ Go to Server → Select Discovery parameters, Add Discovery Task. ▪ Insert Discovery parameters and Target IP of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> ▪ Go To Configuration Management → Select BS→ BS TRx. ▪ Select the configured BS and Press Edit Button down page to enter Edit Mode. | Figure 1 |
| 4. | Netspan Edit BS TRx Provisioning. | Set BS TRx Properties | <ul style="list-style-type: none"> ▪ Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (not editable). ▪ Set Mobility mode =Mobile. ▪ Check In Managed. ▪ Set Ready For Service = Ready For Service. ▪ Set System Profile with a Default Netspan Profile for Air4G-W24 (MMXe). ▪ Set Management Profile with a default Netspan Management Profile for Air4G-W24. ▪ Set VoIP Profile = not set. | Figure 2 |
| 5. | Netspan Edit BS TRx | Configure new Network profile. | Press List Button  to open BS TRx | Figure 3 |

| # | From | Action | Description | Comment |
|----|--|--|---|----------|
| | Provisioning | | Network Profiles (16e) List, Press Add button Located down the list. | |
| 6. | Netspan - Edit BS Network Profile | Add new BS Network Profile with ASN-GW Parameters. | <ul style="list-style-type: none"> ▪ Specify a Name for Network profile. ▪ Choose Target Hardware Category Any or other if you want this profile to be associated also with other BS. <p><u>Network Servers Settings:</u></p> <ul style="list-style-type: none"> ▪ Check In Use ASN-GW Option. ▪ Uncheck Use RADIUS Server (Beta). ▪ ASN-GW Protocol Family= According ASN-GW HW. ▪ ASN Gateway Protocol Version = R1.0.v1.2 (NWG version1.2). ▪ Set ASN-GW IP Address ▪ ASN-GW Address (not editable), this address is set automatically with the ASNGW address). ▪ Set Paging Controller IP Address (Required only for idle mode). <p><u>MS Control and Provisioning :</u></p> <ul style="list-style-type: none"> ▪ MS Control and Provisioning Set to ASN-GW (R6) - not editable. ▪ Allow MS MIB Provisioning Set No. (In this setup the Data Service Flow Provisioning is done by ASN GW). ▪ Allow IP Convergence Sub layer Set Yes (not changeable). ▪ Allow Ethernet Convergence Sub layer set No. <p><u>NTP Servers :</u></p> <ul style="list-style-type: none"> ▪ Uncheck NTP Server 1 IP Address. ▪ Press Ok to save settings. ▪ Back to Edit BS TRx Provisioning. | Figure 4 |
| 7. | Netspan - Edit BS TRx Provisioning | Configure Bridge Profile. i. Create a <u>Vlan Configuration</u> . ii. Create a <u>bridge profile</u> and associate it with the Vlan we just created. | <ul style="list-style-type: none"> ▪ Create a Vlan Configuration : <ol style="list-style-type: none"> 1. Go to services Profiles →Select Vlan Configuration. 2. Set the Vlan Id as configured on the BS via web (This Vlan is shared by management and data traffic as well). 3. Set Off DHCP Relay Agent Mode | |

| # | From | Action | Description | Comment |
|-----|------------------------------------|--|---|--|
| | | iii. Return back to BS provisioning and <u>select the bridge profile</u> you just configured with tagged mode. | <p>4. Uncheck single mode</p> <p>5. Uncheck MAC Forced Forwarding</p> <p>6. Flood Unknown Traffic set to enable</p> <p>7. Broadcast Mode Set to Drop.</p> <p>Press Ok to save.</p> <ul style="list-style-type: none"> ▪ Go To BS Profile → Select Vlan Bridge Profile to Create a <u>Vlan bridge profile</u>. Associate it with the VLAN Configuration you just created with setting: <ul style="list-style-type: none"> ▪ Mode= Basic. ▪ Data traffic=Tagged. ▪ Data Traffic User Priority=1(default) ▪ Return back to BS provisioning and Select from list the bridge profile you just configured. | <p>Figures 7, 8</p> <p>Figures 9, 10</p> |
| 8. | Netspan - Edit BS TRx Provisioning | Configure traffic Port. | Set Traffic port = Traffic and management Ethernet. | |
| 9. | Netspan - Edit BS TRx Provisioning | Set ASN-GW Data Interface | <ul style="list-style-type: none"> ▪ Set IP address and Subnet mask according BS configuration as configured on the BS management web page. ▪ Router IP Address : <ol style="list-style-type: none"> 1. Uncheck option If ASN-GW and BS is in same sub-network. 2. Else, if there is a router between then, check in router IP address and enter the IP address of the router. | |
| 10. | Netspan - Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> ▪ Standalone RADIUS Client is automatically Uncheck – Not editable (ASN-GW access RADIUS) | |
| 11. | Netspan- Edit BS TRx Provisioning | Set paging group | <ul style="list-style-type: none"> ▪ Set paging Groups required only if using idle mode. | |
| 12. | Netspan- Edit BS TRx Provisioning | Set Channel Properties | <ul style="list-style-type: none"> ▪ Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. ▪ Be Aware to set a Suitable MAC Profile <u>with Authentication</u>. | |
| 13. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 14. | Netspan: BS TRx State | Re-provision | <ul style="list-style-type: none"> ▪ Re-provision BS TRx | |

| # | From | Action | Description | Comment |
|-----|---------------------------|--------------|--|---------|
| | and Control | | | |
| 15. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> ▪ Resetting BS | |

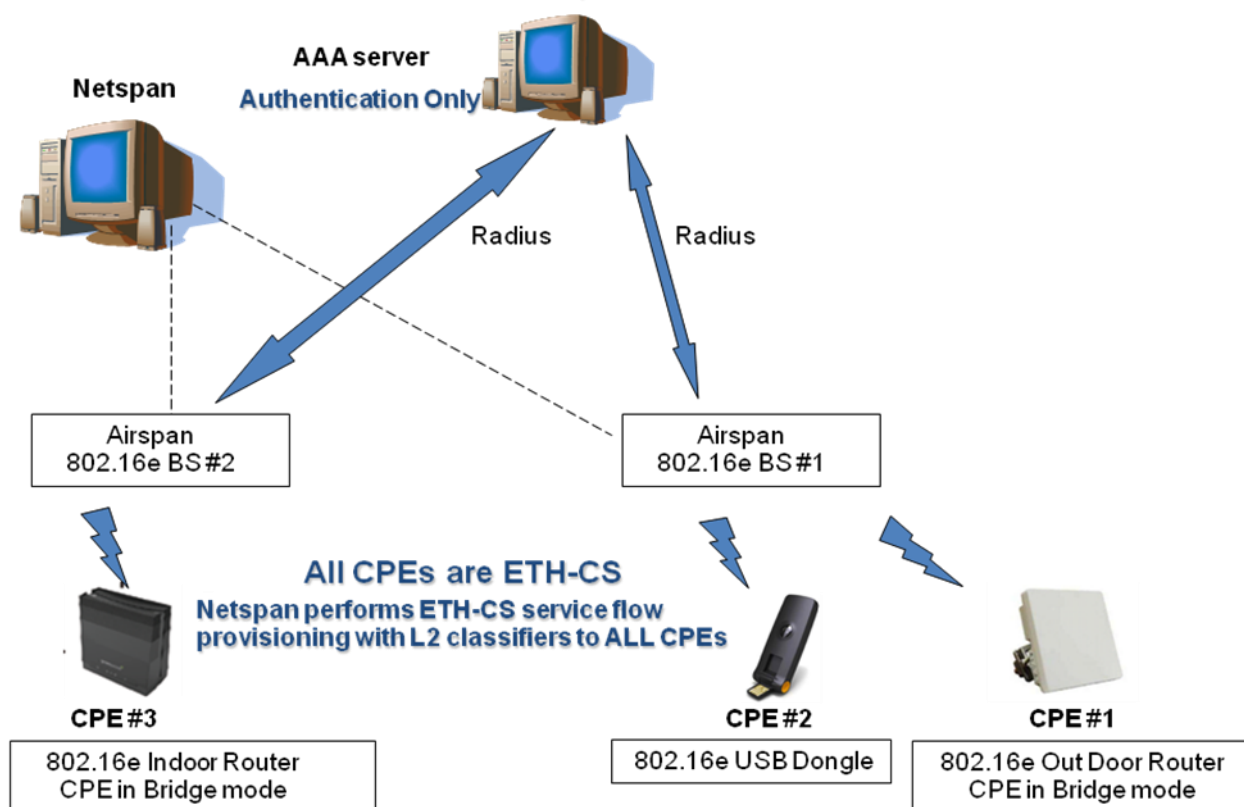
2.2 Stand Alone with Authentication No ASN-GW with AAA

In this architecture the Air4G-W24 (MacroMAXe) BS is connected directly to the CSN. This architecture does not include an ASN Gateway. This architecture is suited for fixed location CPE subscribers.

The following applies in the stand alone network architecture:


- Data service flows between the BS and CPEs are Ethernet CS only.
- All traffic between the CPEs and the CSN network is passing through the BS directly. Traffic is L2 (including Ethernet header and Vlans) since all data service flows are Ethernet CS only.
- Network entry process of the CPEs includes only the BS and the AAA server.
- The CPEs are managed by Netspan. Data service flows to the CPEs are provisioned by Netspan using service products.
- Mobile features of handover and idle mode are not applicable.

Stand Alone with Authentication Network Architecture No ASN-GW, with AAA server



2.2.1 Untagged Mode

In this Mode the Data Traffic and Management Traffic From / To BS are Untagged.

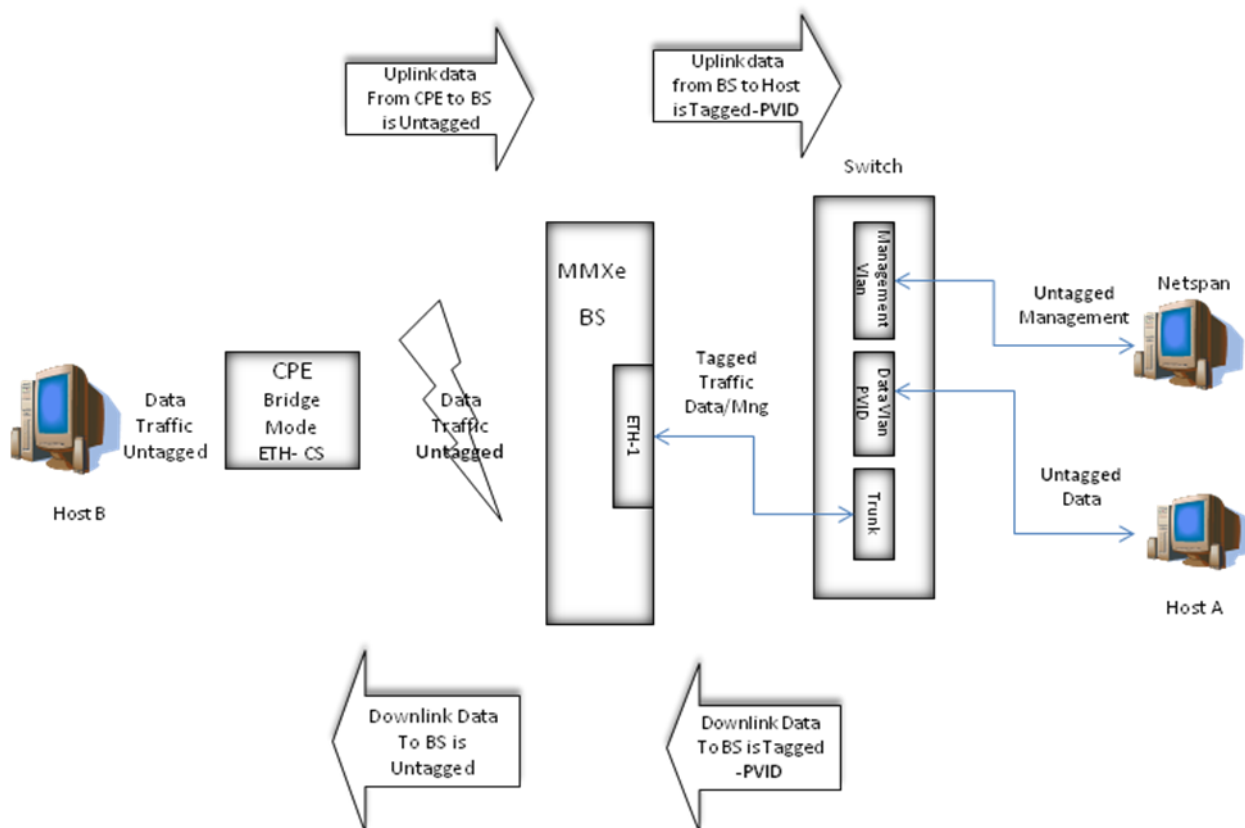
| # | From | Action | Description | Comment |
|----|------------------------------------|---|---|-----------|
| 1. | Base Station Web Page | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Browse default IP http://192.168.0.100 ▪ login: user= macromaxe ,password =macromaxe ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan =Untagged ▪ Set Read community = public, write community=private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot Bs via “General BS configuration”: Set BS action to “All Reset “. | |
| 2. | Netspan | Discovery BS. | <ul style="list-style-type: none"> ▪ Go to Server → Select Discovery parameters, Add Discovery Task. ▪ Insert Discovery parameters and Target IP of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> ▪ Go To Configuration Management → Select BS→ BS TRx. ▪ Select the configured BS and Press Edit Button down page to enter Edit Mode. | Figure 1 |
| 4. | Netspan- Edit BS TRx Provisioning | Set Bs TRx Properties | <ul style="list-style-type: none"> ▪ Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (Not editable). ▪ Mobility Mode = Fixed(No ASN-GW) ▪ Check In Managed. ▪ Set Ready For Service = Ready For Service. ▪ Set System Profile with a Default Netspan Profile for MMXe. ▪ Set Management Profile with a default Netspan Management Profile for MMXe. ▪ Set VoIP Profile = not set. | Figure 11 |
| 5. | Netspan - Edit BS TRx Provisioning | Configure Network profile. | Press List Button  to open BS TRx Network Profiles (16e) List, Press Add button | |

| # | From | Action | Description | Comment |
|----|---|--|---|--------------|
| | | | Located down the list. | |
| 6. | Netspan- Edit BS Network Profile | Add new BS Network Profile | <ul style="list-style-type: none"> ▪ Specify a Name for Network profile. ▪ Choose Target Hardware Category any or other if you want this profile to be associated also with other BS. <p><u>Network Servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck Use ASN-GW. ▪ Check In Use RADIUS Server (Beta). ▪ Set Standalone RADIUS Server parameters : <ol style="list-style-type: none"> 1. RADIUS Server IP Address 2. RADIUS Authentication Port (1812, or 1645) 3. RADIUS Accounting Port (1813, or 1646) <p><u>MS Control and Provisioning :</u></p> <ol style="list-style-type: none"> 1. Default MS Control Mode is automatically fulfilled with _Standalone (RADIUS) (not editable). 2. Allow MS MIB Provisioning =YES. 3. Set Default Service Product = Not set. 4. Default Convergence Sub layer =Ipv4 (Automatically configured not editable). 5. Allow IP Convergence Sub layer=Yes (Automatically configured not editable). 6. Set Allow Ethernet Convergence Sub layer = Yes. <p><u>NTP Servers :</u></p> <ul style="list-style-type: none"> ▪ Uncheck NTP Server 1 IP Address. ▪ Press Ok to save settings. ▪ Back to Edit BS TRx Provisioning. | Figure 12 |
| 7. | Netspan - Edit BS TRx Provisioning | Configure Bridge Profile Bottom Up: <ol style="list-style-type: none"> i. Create a Vlan configuration. ii. Create a Bridge Profile with the Vlan created. iii. Provision Created Bridge Profile to BS | <ul style="list-style-type: none"> ▪ Create a Vlan Configuration : <ol style="list-style-type: none"> 1. Go to services Profiles →Select Vlan Configuration. 2. Set Vlan Id 4087. 3. Uncheck single User. 4. Uncheck MAC Forced Forwarding 5. Flood Unknown Traffic set to Enable 6. Set Broadcast Mode to Multicast Group. | Figures 7, 8 |

| # | From | Action | Description | Comment |
|-----|------------------------------------|--------------------------------|--|---------------|
| | | | <p>7. Set Broadcast Service Class with Customer defined Class which does not work in HARQ!).</p> <p>Press Ok to save.</p> <ul style="list-style-type: none"> ▪ Go To BS Profile→ Vlan Bridge Profile and Create a <u>Vlan bridge profile</u>. Associate it with the Vlan you just created. <p>With :</p> <ul style="list-style-type: none"> ▪ Mode= Basic. ▪ Data traffic=Untagged. ▪ Data Traffic User Priority=1(default) <ul style="list-style-type: none"> ▪ Return back to BS provisioning and Select from list the bridge profile you just configured. | Figures 9, 10 |
| 8. | Netspan - Edit BS TRx Provisioning | Configure Traffic Port. | Set traffic port = Traffic and management Ethernet | |
| 9. | Netspan - Edit BS TRx Provisioning | Set Standalone Data Interface. | <ul style="list-style-type: none"> ▪ Set IP address and Subnet mask according BS configuration as configured on the BS management web page. | |
| 10. | Netspan - Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> ▪ Standalone RADIUS Client is automatically checked in (Not editable). ▪ Set BS IP address ▪ Set RADIUS shared secret. ▪ Set Router IP address (if RADIUS server is accessed via router, this has to be checked in and insert the Router IP). | Figure 11 |
| 11. | Netspan- Edit BS TRx Provisioning | Set channel Properties | <ul style="list-style-type: none"> ▪ Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. ▪ Be Aware to set a Suitable MAC Profile <u>with Authentication</u>. | |
| 12. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 13. | Netspan: BS TRx State and Control | Re-provision | <ul style="list-style-type: none"> ▪ Re-provision BS TRx | |
| 14. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> ▪ Resetting BS | |


| # | From | Action | Description | Comment |
|-----|------------------------------|-------------------------------------|--|-----------|
| 15. | Netspan: Service Profiles | Configuring MS Custom Configuration | <ul style="list-style-type: none"> ▪ Allow Service: Yes ▪ Control Mode: Standalone Authentication and MIB Provisioning ▪ Modulation: Dynamic ▪ Downlink Zone: Zone 2 MIMO (index 1) ▪ Uplink Zone: Dynamic ▪ MIMO Matrix: Dynamic Assignment | Figure 14 |
| 16. | Netspan: Service Profiles | Creating Service Product | <ul style="list-style-type: none"> ▪ Creating Service Product depend on customer requirements | Figure 15 |
| 17. | Netspan: Registered SS | Edit MS | <ul style="list-style-type: none"> ▪ Service Product ▪ Custom Configuration Profile | Figure 16 |
| 18. | Netspan: Registered SS | State -> Re-provision | <ul style="list-style-type: none"> ▪ Re-provision the MS | |

2.2.2 Tagged Mode



In this Mode the Data Traffic and Management Traffic From / To BS have a different VLAN ID.

| # | From | Action | Description | Comment |
|----|-----------------------|---|--|---------|
| 1. | Base station Web page | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Browse default IP http://192.168.0.100 ▪ login: user= macromaxe ,password =macromaxe ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan =Tagged ▪ Enter required Vlan Id. ▪ Set Read community = public, write community=private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot Bs via "General BS configuration": Set BS action to "All Reset ". | |
| 2. | Netspan | Discovery BS. | | |

| # | From | Action | Description | Comment |
|----|---|----------------------------|--|-----------|
| | | | <ul style="list-style-type: none"> Go to Server → Select Discovery parameters, Add Discovery Task. Insert Discovery parameters and Target IP of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> Go To Configuration Management → Select BS → BS TRx. Select the configured BS and Press Edit Button down page to enter Edit Mode. | Figure 1 |
| 4. | Netspan- Edit BS TRx Provisioning | Set Bs TRx Properties | <ul style="list-style-type: none"> Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (Not editable). Mobility Mode = Fixed (No ASN-GW) Check In Managed. Set Ready For Service = Ready For Service. Set System Profile with a Default Nest span Profile for MMXe. Set Management Profile with a default Netspan Management Profile for MMXe. Set VoIP Profile = not set. | Figure 11 |
| 5. | Netspan- Edit BS TRx Provisioning | Configure Network profile. | Press List Button  to open BS TRx Network Profiles (16e) List, Press Add button Located down the list. | Figure 3 |
| 6. | Netspan- Edit BS Network Profile | Add new BS Network Profile | <ul style="list-style-type: none"> Specify a Name for Network profile. Choose Target Hardware Category any or other if you want this profile to be associated also with other BS. <p><u>Network Servers:</u></p> <ul style="list-style-type: none"> Uncheck Use ASN-GW. Check In Use RADIUS Server (Beta). Set Standalone RADIUS Server parameters : <ol style="list-style-type: none"> RADIUS Server IP Address RADIUS Authentication Port (1812, or 1645) RADIUS Accounting Port (1813, or 1646) <p><u>MS Control and Provisioning :</u></p> <ol style="list-style-type: none"> Default MS Control Mode is automatically fulfilled with Standalone | Figure 12 |

| # | From | Action | Description | Comment |
|----|------------------------------------|--|---|--|
| | | | <p>(RADIUS) (not editable).</p> <p>2. Allow MS MIB Provisioning =YES</p> <p>3. Default Convergence Sub layer =Ipv4 (Automatically configured not editable).</p> <p>4. Allow IP Convergence Sub layer=YES (Automatically configured not editable).</p> <p>5. Set Allow Ethernet Convergence Sub layer = Yes.</p> <p><u>NTP servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck NTP Server 1 IP Address. ▪ Press Ok to save settings. ▪ Back to Edit BS TRx Provisioning. | |
| 7. | Netspan - Edit BS TRx Provisioning | <p>Configure Bridge Profile.</p> <p>i. Create a <u>Vlan Configuration</u>.</p> <p>ii. Create a <u>bridge profile</u> and associate it with the Vlan we just created.</p> <p>iii. Return back to BS provisioning and <u>select the bridge profile</u> you just configured with Tagged mode.</p> | <ul style="list-style-type: none"> ▪ Create a Vlan Configuration : <ol style="list-style-type: none"> 1. Go to services Profiles →Select Vlan Configuration. 2. Set Vlan Id for the Data traffic - This Vlan must be different than the management vlan that was entered via BS web page. 3. Uncheck single User. 4. Uncheck MAC Forced Forwarding 5. Flood Unknown Traffic set to enable 6. Set Broadcast Mode to Multicast Group. 8. Set Broadcast Service Class with Customer defined Class which does not work in HARQ!). <p>Press Ok to save.</p> <ul style="list-style-type: none"> ▪ Go To BS Profile → Vlan Bridge Profile and Create a <u>Vlan bridge profile</u>. Associate it with the VLAN Configuration you just created ,Setting: <ul style="list-style-type: none"> ▪ Mode= Basic. ▪ Data traffic=Tagged. ▪ Data Traffic User Priority=1(default) ▪ Return back to BS provisioning and Select from list the bridge profile you just configured. | <p>Figures 7, 8</p> <p>Figures 9, 10</p> |
| 8. | Netspan- Edit BS TRx Provisioning | Configure Traffic Port. | <ul style="list-style-type: none"> ▪ Set traffic port = Traffic and management Ethernet | |
| 9. | Netspan - Edit BS TRx Provisioning | Set Standalone Data Interface | <ul style="list-style-type: none"> ▪ Set IP address and Subnet mask according BS configuration as configured on the BS management web | |

| # | From | Action | Description | Comment |
|-----|--|--|--|-----------|
| | | | page. | |
| 10. | Netspan - Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> ▪ Standalone RADIUS Client is automatically checked in (Not editable). ▪ Set BS IP address ▪ Set RADIUS shared secret. ▪ Set Router IP address (if RADIUS server is accessed via router, this has to be checked in and insert the Router IP). | |
| 11. | Netspan- Edit BS TRx Provisioning | Set Channel Properties | <ul style="list-style-type: none"> ▪ Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. ▪ Be Aware to set a Suitable MAC Profile <u>with Authentication.</u> | |
| 12. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 13. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 14. | Netspan: BS TRx State and Control | Re-provision | <ul style="list-style-type: none"> ▪ Re-provision BS TRx | |
| 15. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> ▪ Resetting BS | |
| 16. | Netspan: Service Profiles | Configuring MS Custom Configuration | <ul style="list-style-type: none"> ▪ Allow Service: Yes ▪ Control Mode: Standalone Authentication and MIB Provisioning ▪ Modulation: Dynamic ▪ Downlink Zone: Zone 2 MIMO (index 1) ▪ Uplink Zone: Dynamic ▪ MIMO Matrix: Dynamic Assignment | Figure 14 |
| 17. | Netspan: Service Profiles | Creating Service Product | <ul style="list-style-type: none"> ▪ Creating Service Product depend on customer requirements | Figure 15 |
| 18. | Netspan: Registered SS | Edit MS | <ul style="list-style-type: none"> ▪ Service Product ▪ Custom Configuration Profile | Figure 16 |
| 19. | Netspan: Registered SS | State -> Re-provision | <ul style="list-style-type: none"> ▪ Re-provision the MS | |

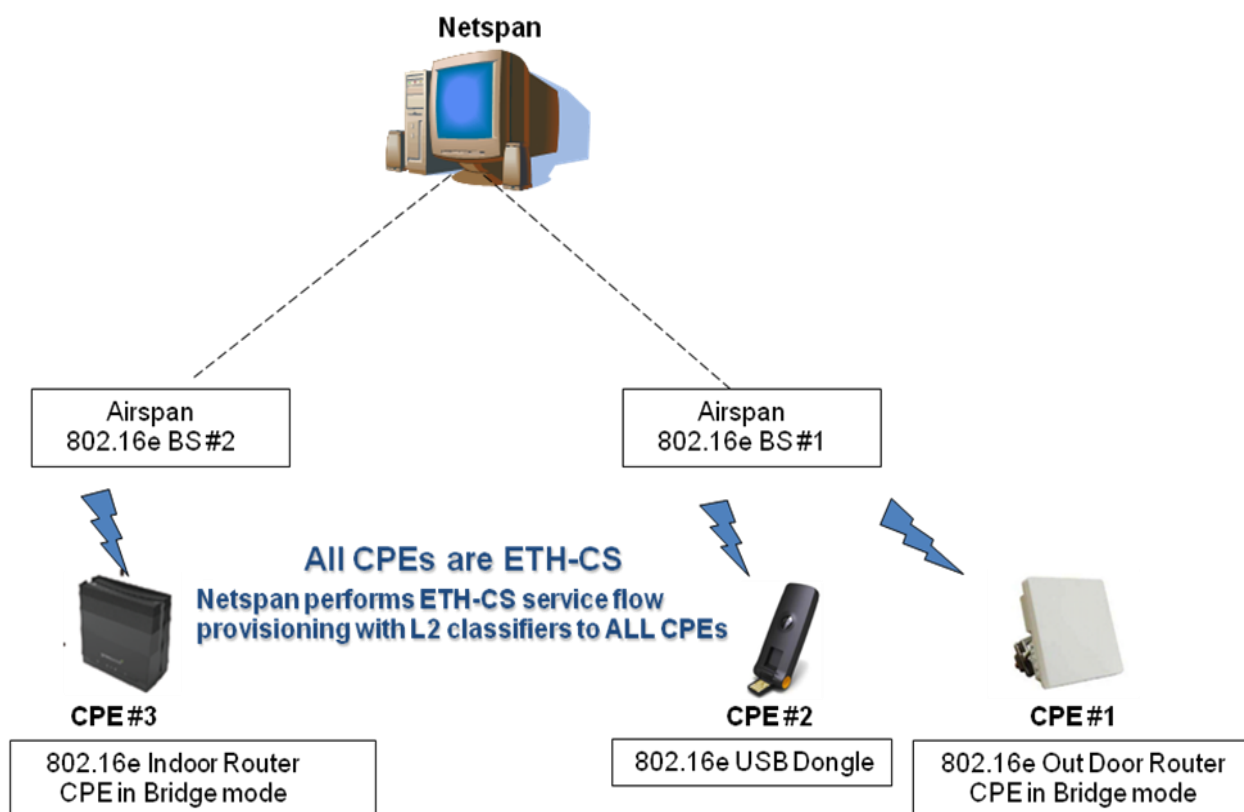
2.3 Stand Alone without Authentication No ASN-GW

In this architecture the MacroMAXe BS is connected directly to the CSN . This architecture does not include an ASN Gateway and AAA server.

The following applies in the stand alone network architecture:


- Data service flows between the BS and CPEs are Ethernet CS only.
- All traffic between the CPEs and the CSN network is passing through the BS directly. Traffic is L2 (including Ethernet header and Vlans) since all data service flows are Ethernet CS only.
- Network entry process of the CPEs includes only the BS.
- No CPE authentication is available. AES Encryption of the data service flows in the WiMAX air interface between the BS and the CPE using PKMv2 is not applicable.
- The CPEs are managed by Netspan. Data service flows to the CPEs are provisioned by Netspan using service products.
- Mobile features of handover and idle mode are not applicable.

Stand Alone without Authentication Network Architecture , No ASN-GW



2.3.1 Untagged mode

In this Mode the Data Traffic and Management Traffic From / To BS are Untagged.

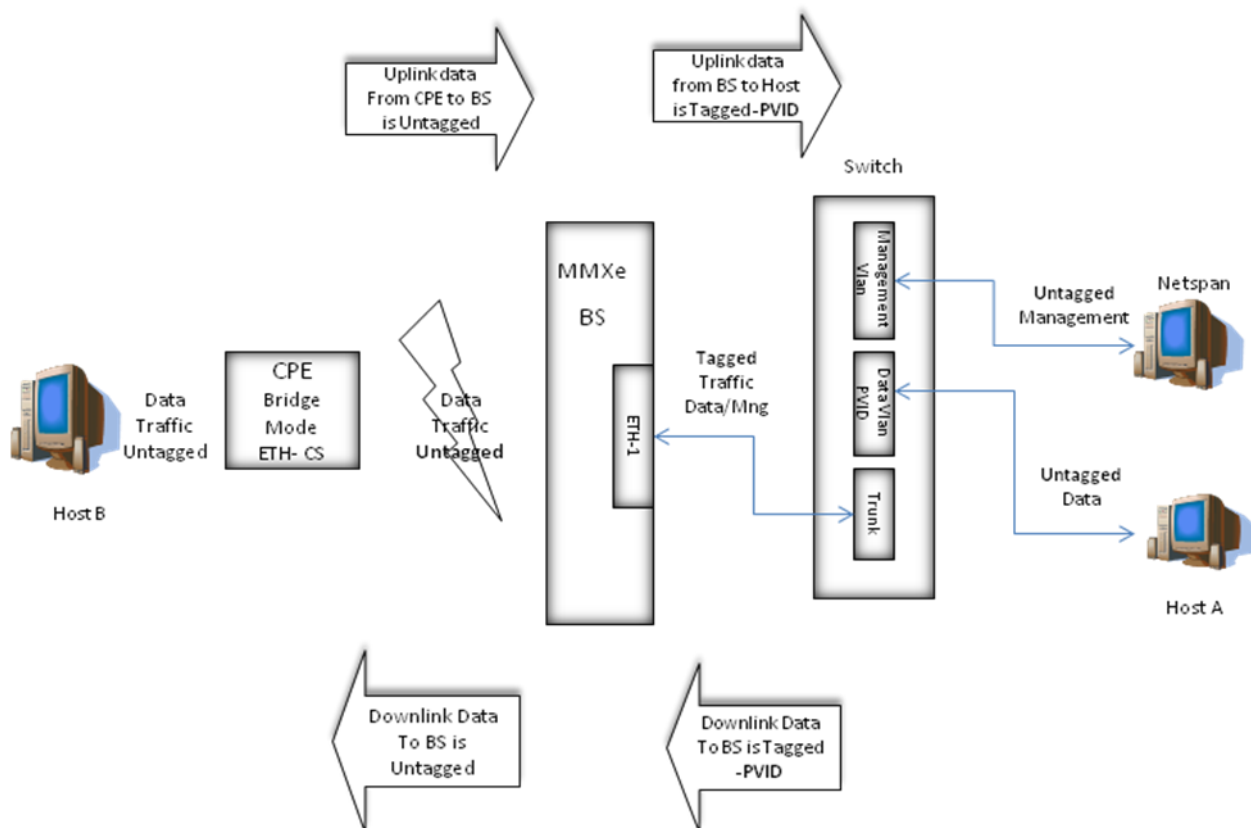
| # | From | Action | Description | Comment |
|----|---|---|--|-----------|
| 1. | Base station Web page | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Browse default IP http://192.168.0.100 ▪ login: user= macromaxe ,password =macromaxe ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan = Untagged ▪ Set Read community = public, write community=private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot Bs via “General BS configuration”: Set BS action to “All Reset “. | |
| 2. | Netspan | Discovery BS. | <ul style="list-style-type: none"> ▪ Go to Server → Select Discovery parameters, Add Discovery Task. ▪ Fulfil Discovery parameters and Target IP of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> ▪ Go To Configuration Management → Select BS → BS TRx. ▪ Select the configured BS and Press Edit Button down page to enter Edit Mode. | Figure 1 |
| 4. | Netspan- Edit BS TRx Provisioning | Set Bs TRx Properties | <ul style="list-style-type: none"> ▪ Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (Not editable). ▪ Mobility Mode = Fixed(No ASN-GW) ▪ Check In Managed. ▪ Set Ready For Service = Ready For Service. ▪ Set System Profile with a Default Netspan Profile for MMXe. ▪ Set Management Profile with a default Netspan Management Profile for MMXe. ▪ Set VoIP Profile = not set. | Figure 11 |
| 5. | Netspan - Edit BS TRx | Configure Network profile. | Press List Button  to open BS TRx Network Profiles (16e) List, Press Add button | |

| # | From | Action | Description | Comment |
|----|---|--|---|--|
| | Provisioning | | Located down the list. | |
| 6. | Netspan- Edit BS Network Profile | Add new BS Network Profile | <ul style="list-style-type: none"> ▪ Specify a Name for Network profile. ▪ Choose Target Hardware Category any or other if you want this profile to be associated also with other BS. <p><u>Network Servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck Use ASN-GW. ▪ Uncheck Use RADIUS Server (Beta). <p><u>MS Control and Provisioning :</u></p> <ol style="list-style-type: none"> 1. Default MS Control Mode is automatically fulfilled with Standalone (MIB) (not editable). 2. Allow MS MIB Provisioning =YES 3. Set Default Service Product = Not set. 4. Default Convergence Sub layer =Ipv4 (Automatically configured not editable). 5. Allow IP Convergence Sub layer = Yes (Automatically configured not editable). 6. Set Allow Ethernet Convergence Sub layer = Yes. <p><u>NTP servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck NTP Server 1 IP Address. ▪ Press Ok to save settings. ▪ Back to Edit BS TRx Provisioning. | Figure 13 |
| 7. | Netspan - Edit BS TRx Provisioning | <ul style="list-style-type: none"> ▪ Configure Bridge Profile Bottom Up: <ol style="list-style-type: none"> i. Create a Vlan configuration ii. Create a Bridge Profile with the Vlan created. iii. Provision Created Bridge Profile to BS | <ul style="list-style-type: none"> ▪ Create a Vlan Configuration : <ol style="list-style-type: none"> 1. Go to services Profiles → Select Vlan Configuration. 2. Set Vlan Id 4087. 3. Uncheck Single User. 4. Uncheck MAC Forced Forwarding 5. Flood Unknown Traffic set to enable 6. Set Broadcast Mode to Multicast Group. 7. Set Broadcast Service Class with 8. Customer defined Class which doesn't work in HARQ!). ▪ Go To BS Profile → Vlan Bridge Profile and Create a <u>Vlan bridge profile</u>. Associate it with the VLAN Configuration | <p>Figures 7, 8</p> <p>Figures 9, 10</p> |

| # | From | Action | Description | Comment |
|-----|------------------------------------|-------------------------------------|--|-----------|
| | | | <p>you just created ,Setting:</p> <ul style="list-style-type: none"> ▪ Mode= Basic. ▪ Data traffic=Untagged. ▪ Data Traffic User Priority=1(default) <p>▪ Return back to BS provisioning and Select from list the bridge profile you just configured.</p> | |
| 8. | Netspan - Edit BS TRx Provisioning | Configure Traffic Port. | Set traffic port = Traffic and management Ethernet | |
| 9. | Netspan- Edit BS TRx Provisioning | Set Standalone Data Interface. | <ul style="list-style-type: none"> ▪ Set IP address and Subnet mask according BS configuration as configured on the BS management web page. | |
| 10. | Netspan - Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> ▪ Standalone RADIUS Client is automatically Uncheck – Not editable (ASN- GW access RADIUS) | |
| 11. | Netspan- Edit BS TRx Provisioning | Set channel Properties | <ul style="list-style-type: none"> ▪ Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. ▪ Be Aware to set a Suitable MAC Profile <u>without Authentication.</u> | |
| 12. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 13. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> ▪ Verify SNMP properties are correct. | |
| 14. | Netspan: BS TRx State and Control | Re-provision | <ul style="list-style-type: none"> ▪ Re-provision BS TRx | |
| 15. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> ▪ Resetting BS | |
| 16. | Netspan: Service Profiles | Configuring MS Custom Configuration | <ul style="list-style-type: none"> ▪ Allow Service: Yes ▪ Control Mode: Standalone Authentication and MIB Provisioning ▪ Modulation: Dynamic ▪ Downlink Zone: Zone 2 MIMO (index 1) ▪ Uplink Zone: Dynamic ▪ MIMO Matrix: Dynamic Assignment | Figure 14 |
| 17. | Netspan: Service | Creating Service Product | <ul style="list-style-type: none"> ▪ Creating Service Product depend on customer requirements | Figure 15 |

| # | From | Action | Description | Comment |
|-----|------------------------------|----------------------|---|-----------|
| | Profiles | | | |
| 18. | Netspan: Registered SS | Edit MS | <ul style="list-style-type: none"> ▪ Service Product ▪ Custom Configuration Profile | Figure 16 |
| 19. | Netspan: Registered SS | State → Re-provision | <ul style="list-style-type: none"> ▪ Re-provision the MS | |

2.3.2 Tagged Mode



In this Mode the Data Traffic and Management Traffic From / To BS have different VLAN ID.

| # | From | Action | Description | Comment |
|----|-----------------------|---|--|---------|
| 1. | Base station Web page | Configure laptops and BS to same Sub-Network and connect laptop to BS using Ethernet cable. Set general IP configuration and SNMP. | <ul style="list-style-type: none"> ▪ Browse default IP http://192.168.0.100 ▪ login: user= macomere ,password =macomere ▪ Set General IP configuration. ▪ Set BS Id. ▪ Set management Vlan =Tagged ▪ Enter required Vlan Id. ▪ Set Read community = public, write community=private(default SNMP values); ▪ Set SNMP port=161 ▪ Set SNMP Trap IP with the Host IP of Netspan IP. ▪ Reboot Bs via “General BS configuration”: Set BS action to “All Reset “. | |
| 2. | Netspan | Discovery BS. | <ul style="list-style-type: none"> ▪ Go to Server → Select Discovery parameters, Add Discovery Task. ▪ Insert Discovery parameters and Target IP | |

| # | From | Action | Description | Comment |
|----|----------------------------------|----------------------------|---|-----------|
| | | | of the configured BS. | |
| 3. | Netspan | Edit BS Provisioning | <ul style="list-style-type: none"> ▪ Go To Configuration Management → Select BS→ BS TRx. ▪ Select the configured BS and Press Edit Button down page to enter Edit Mode. | Figure 1 |
| 4. | Netspan-Edit BS TRx Provisioning | Set Bs TRx Properties | <ul style="list-style-type: none"> ▪ Air Interface Type and Hardware is set automatically with 16e, Air4G-W24 (Not editable). ▪ Mobility Mode = Fixed (No ASN-GW) ▪ Check In Managed. ▪ Set Ready For Service = Ready For Service. ▪ Set System Profile with a Default Nest span Profile for MMXe. ▪ Set Management Profile with a default Netspan Management Profile for MMXe. ▪ Set VoIP Profile = not set. | Figure 11 |
| 5. | Netspan-Edit BS TRx Provisioning | Configure Network profile. | Press List Button to open BS TRx Network Profiles (16e) List, Press Add button Located down the list. | Figure 3 |
| 6. | Netspan-Edit BS Network Profile | Add new BS Network Profile | <ul style="list-style-type: none"> ▪ Specify a Name for Network profile. ▪ Choose Target Hardware Category any or other if you want this profile to be associated also with other BS. <p><u>Network Servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck Use ASN-GW. ▪ Uncheck Use RADIUS Server (Beta). <p><u>MS Control and Provisioning :</u></p> <ol style="list-style-type: none"> 1. Default MS Control Mode is automatically fulfilled with Standalone (MIB) (not editable). 2. Allow MS MIB Provisioning =YES 3. Set Default Service Product = Not set. 4. Default Convergence Sub layer =Ipv4 (Automatically configured not editable). 5. Allow IP Convergence Sub layer=YES (Automatically configured not editable). 6. Set Allow Ethernet Convergence Sub layer = Yes. | Figure 13 |

| # | From | Action | Description | Comment |
|-----|------------------------------------|---|---|--|
| | | | <p><u>Ntp servers:</u></p> <ul style="list-style-type: none"> ▪ Uncheck NTP Server 1 IP Address. ▪ Press Ok to save settings. ▪ Back to Edit BS TRx Provisioning. | |
| 7. | Netspan - Edit BS TRx Provisioning | <p>Configure Bridge Profile.</p> <p>i. Create a <u>Vlan Configuration</u>.</p> <p>ii. Create a <u>bridge profile</u> and associate it with the Vlan you just created.</p> <p>iii. Return back to BS provisioning and <u>select the bridge profile</u> you just configured with tagged mode.</p> | <p>▪ Create a Vlan Configuration :</p> <p>7. Go to services Profiles →Select Vlan Configuration.</p> <p>8. Set Vlan Id for the Data traffic</p> <p>- This Vlan must be different than the management Vlan that was entered via BS web page.</p> <ol style="list-style-type: none"> 1. Uncheck single User. 2. Uncheck MAC Forced Forwarding 3. Flood Unknown Traffic set to enable 4. Set Broadcast Mode to Multicast Group. 5. Set Broadcast Service Class with Customer defined Class which doesn't work in HARQ!). <p>Press Ok to save.</p> <ul style="list-style-type: none"> ▪ Go To BS Profile → Vlan Bridge Profile and Create a <u>Vlan bridge profile</u>. Associate it with the VLAN Configuration you just created ,Setting: <ul style="list-style-type: none"> ▪ Mode= Basic. ▪ Data traffic=Tagged. ▪ Data Traffic User Priority=1(default) ▪ Return back to BS provisioning and Select from list the bridge profile you just configured. | <p>Figures 7,8</p> <p>Figures 9,10</p> |
| 8. | Netspan : Edit BS TRx Provisioning | Configure Traffic Port. | <ul style="list-style-type: none"> ▪ Set traffic port = Traffic and management Ethernet | |
| 9. | Netspan - Edit BS TRx Provisioning | Set Standalone Data Interface | <ul style="list-style-type: none"> ▪ Set IP address and Subnet mask according BS configuration as configured on the BS management web page. | |
| 10. | Netspan - Edit BS TRx Provisioning | Standalone RADIUS Client | <ul style="list-style-type: none"> ▪ Standalone RADIUS Client is automatically Uncheck – Not editable (ASN-GW access RADIUS) | |
| 11. | Netspan- Edit BS TRx Provisioning | Set channel Properties | <ul style="list-style-type: none"> ▪ Check In Enable channel and set RF Properties and characterises according BS HW and RF requirement. ▪ Be Aware to set a Suitable MAC Profile <u>without Authentication</u>. | |

| # | From | Action | Description | Comment |
|-----|---|--|--|-----------|
| 12. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> Verify SNMP properties are correct. | |
| 13. | Netspan- Edit BS TRx Provisioning | Verify SNMP Properties | <ul style="list-style-type: none"> Verify SNMP properties are correct. | |
| 14. | Netspan: BS TRx State and Control | Re-provision | <ul style="list-style-type: none"> Re-provision BS TRx | |
| 15. | Netspan: BS TRx Action | Reset BS TRx | <ul style="list-style-type: none"> Resetting BS | |
| 16. | Netspan: Service Profiles | Configuring MS Custom Configuration | <ul style="list-style-type: none"> Allow Service: Yes Control Mode: Standalone Authentication and MIB Provisioning Modulation: Dynamic Downlink Zone: Zone 2 MIMO (index 1) Uplink Zone: Dynamic MIMO Matrix: Dynamic Assignment | Figure 14 |
| 17. | Netspan: Service Profiles | Creating Service Product | <ul style="list-style-type: none"> Creating Service Product depend on customer requirements | Figure 15 |
| 18. | Netspan: Registered SS | Edit MS | <ul style="list-style-type: none"> Service Product Custom Configuration Profile | Figure 16 |
| 19. | Netspan: Registered SS | State → Re-provision | <ul style="list-style-type: none"> Re-provision the MS | |

2.4 List of Figures

Figure 1 - BS TRx list

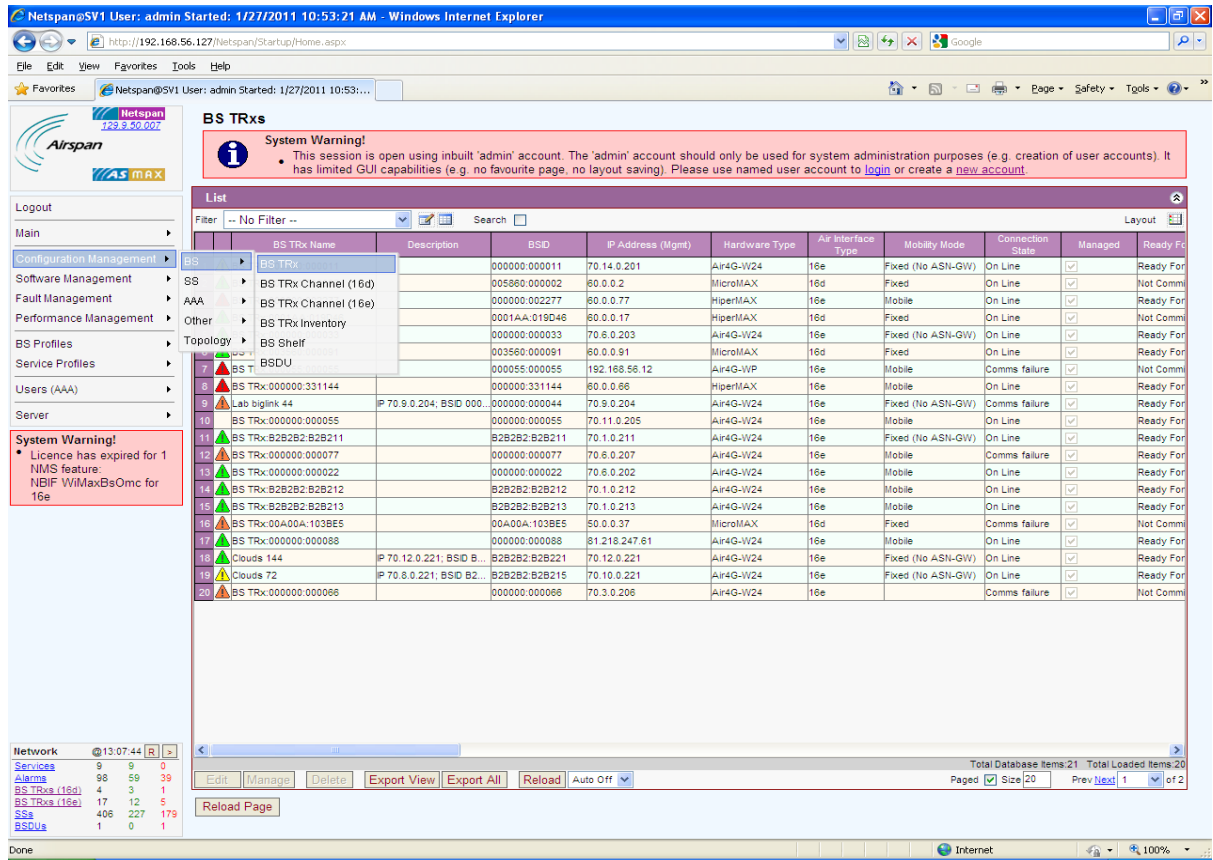


Figure 2 - BS TRx Provisioning

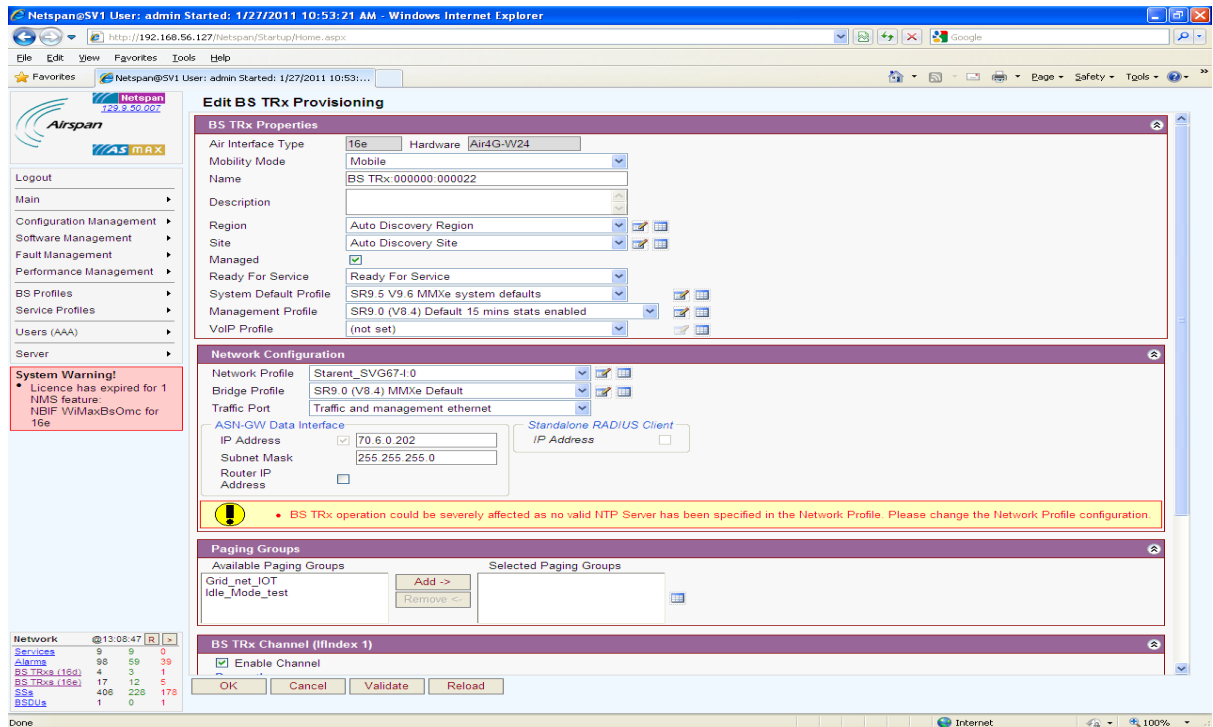


Figure 3 - BS TRx Network profiles (16e) List

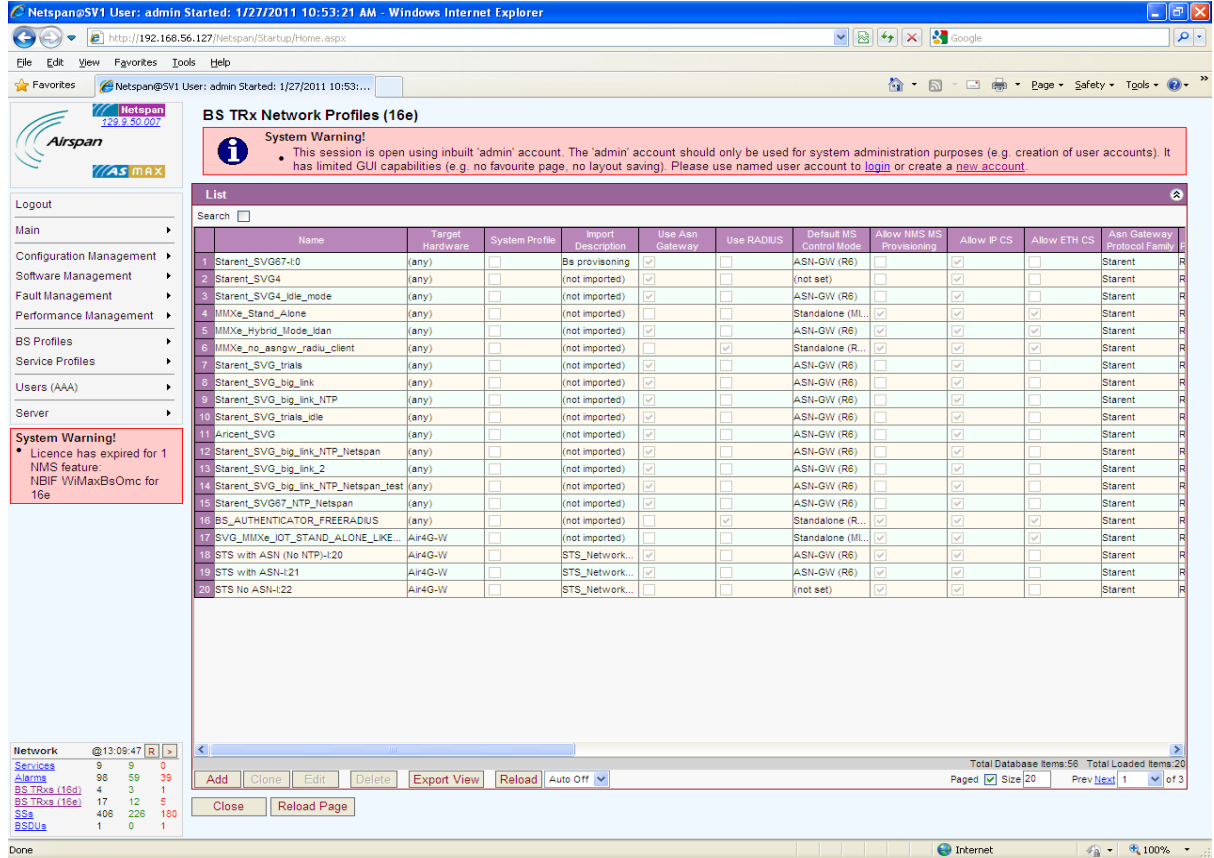


Figure 4 - Add BS TRx Network profile (16e) (ASN_GW settings)

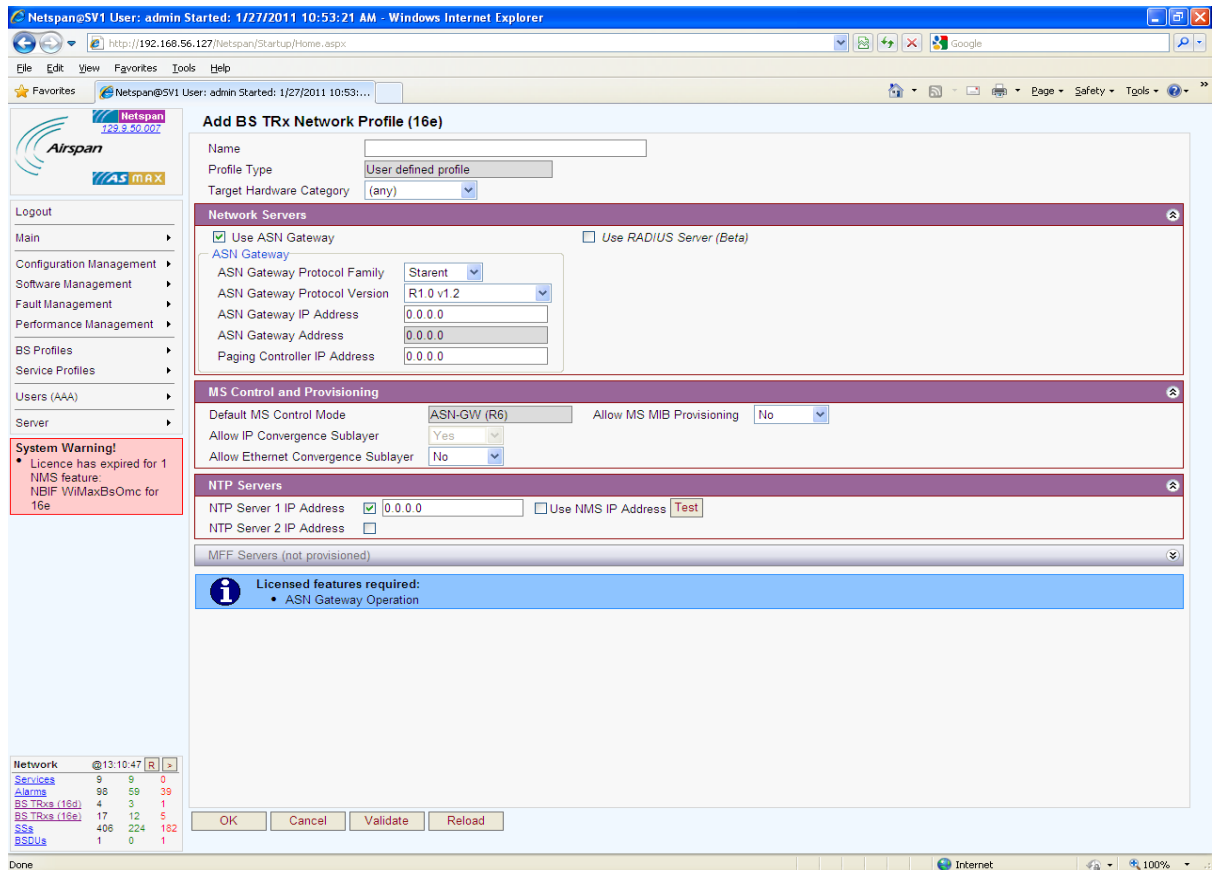


Figure 5 - Edit Vlan Bridge Profile (16e) (Default for Mobile)

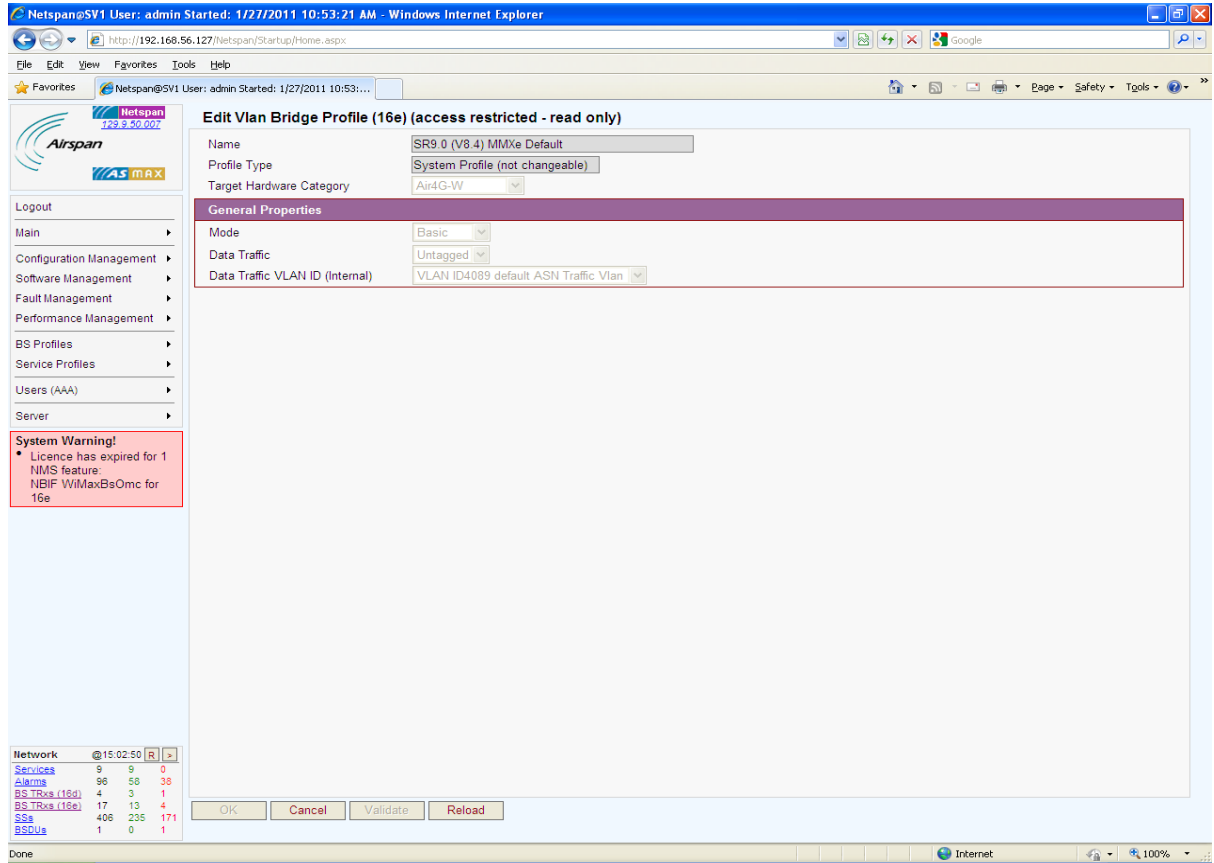


Figure 6 - Edit Vlan Configuration (Default Vlan Configuration – Not editable)

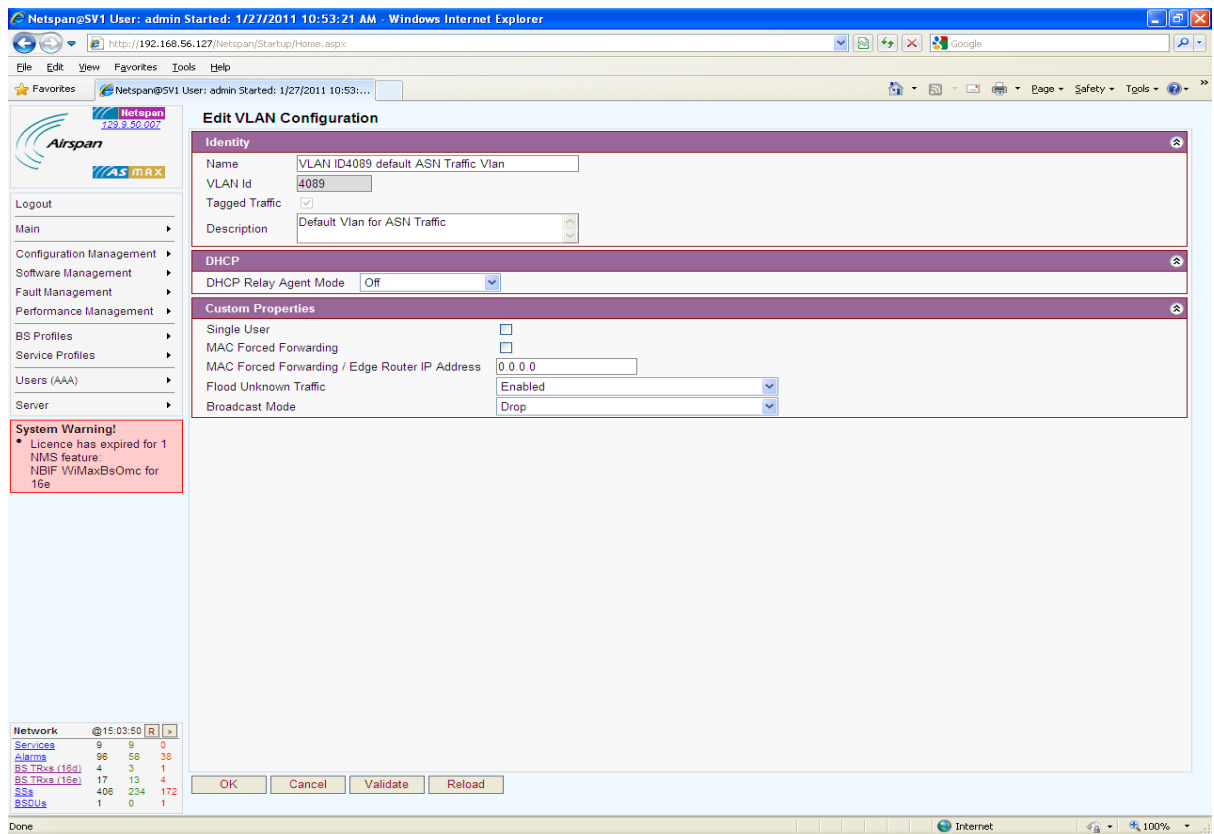


Figure 7 - Vlan Configurations

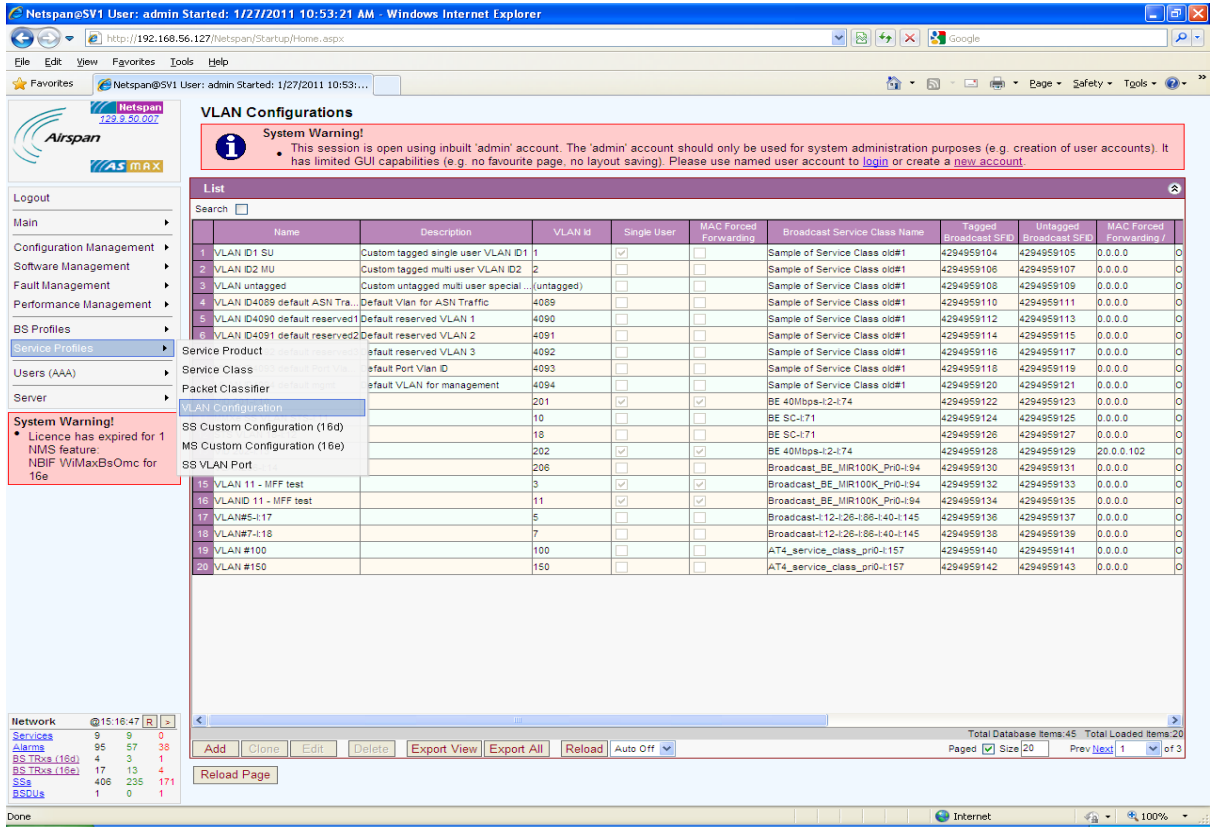


Figure 8 - add Vlan

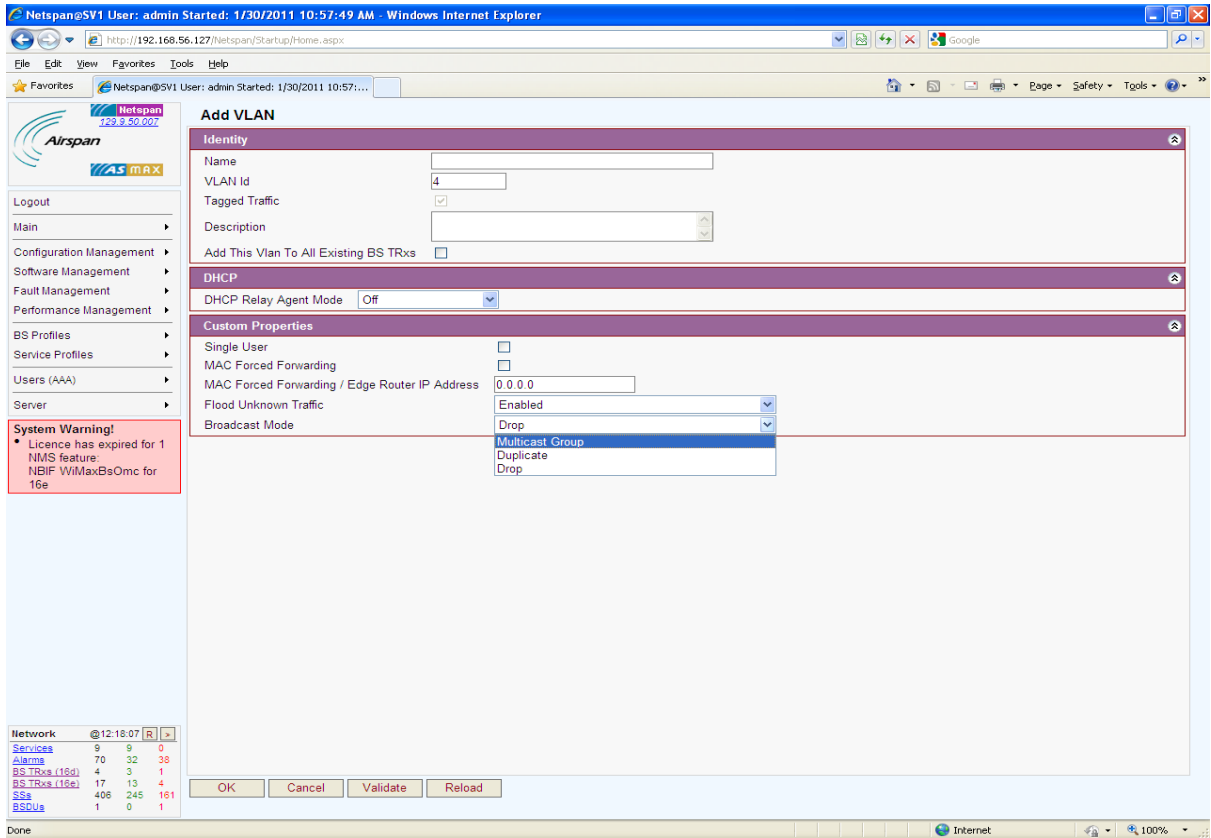


Figure 9 - Vlan Bridge Profile List

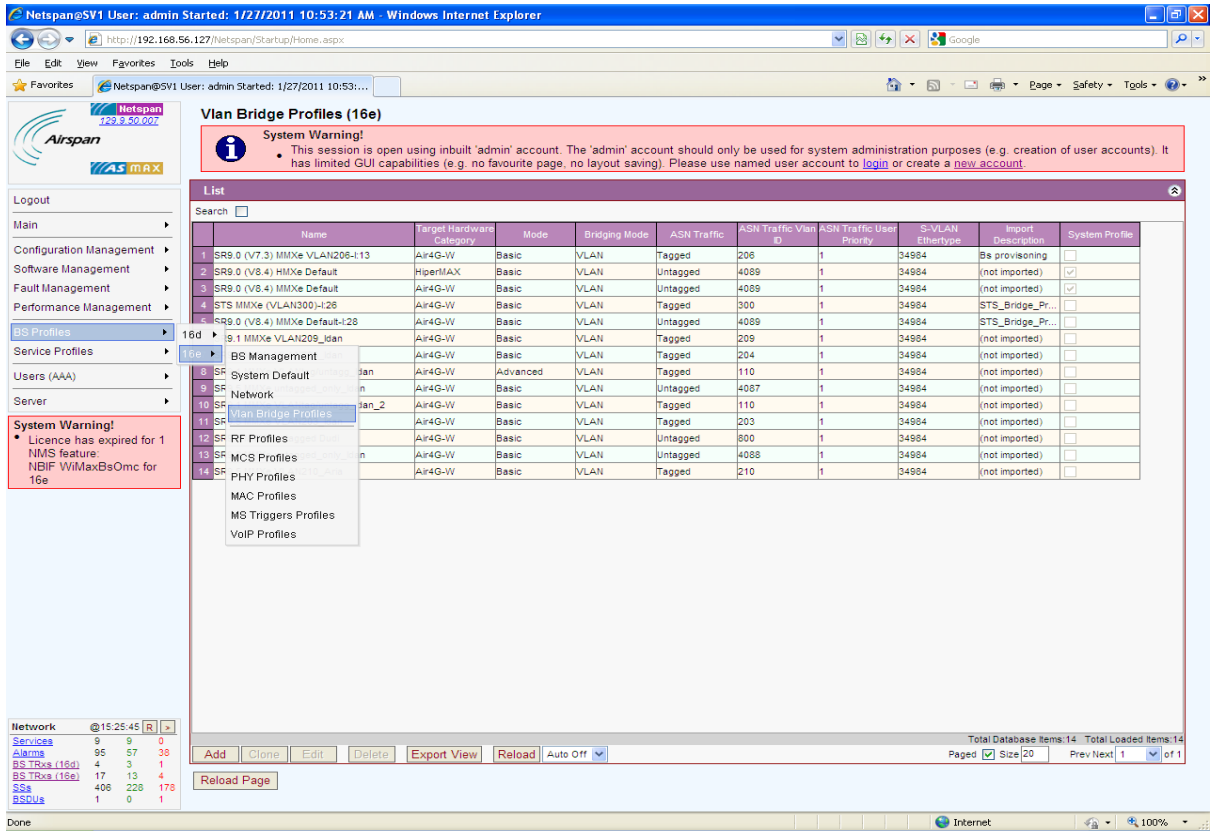


Figure 10 - Add Vlan Bridge Profile (16e)

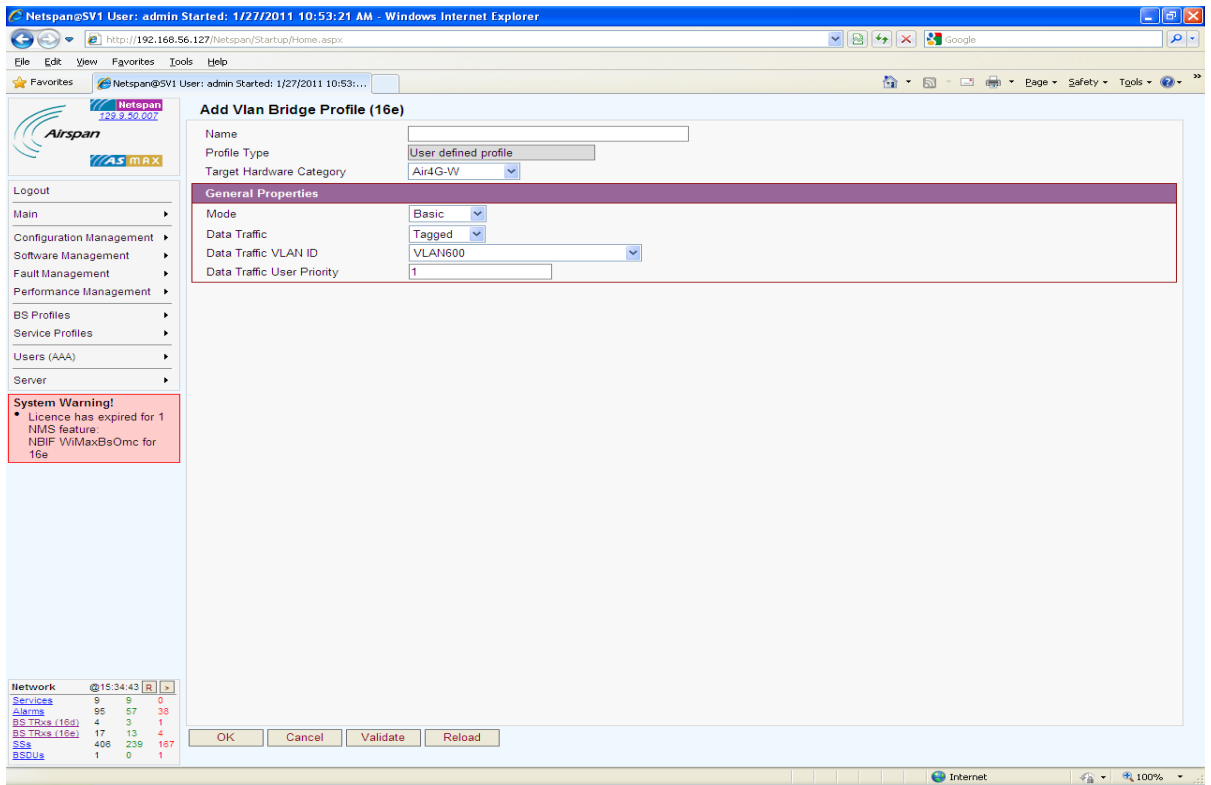


Figure 11 - Edit Bs TRx Provisioning (Standalone (No ASN GW) configuration)

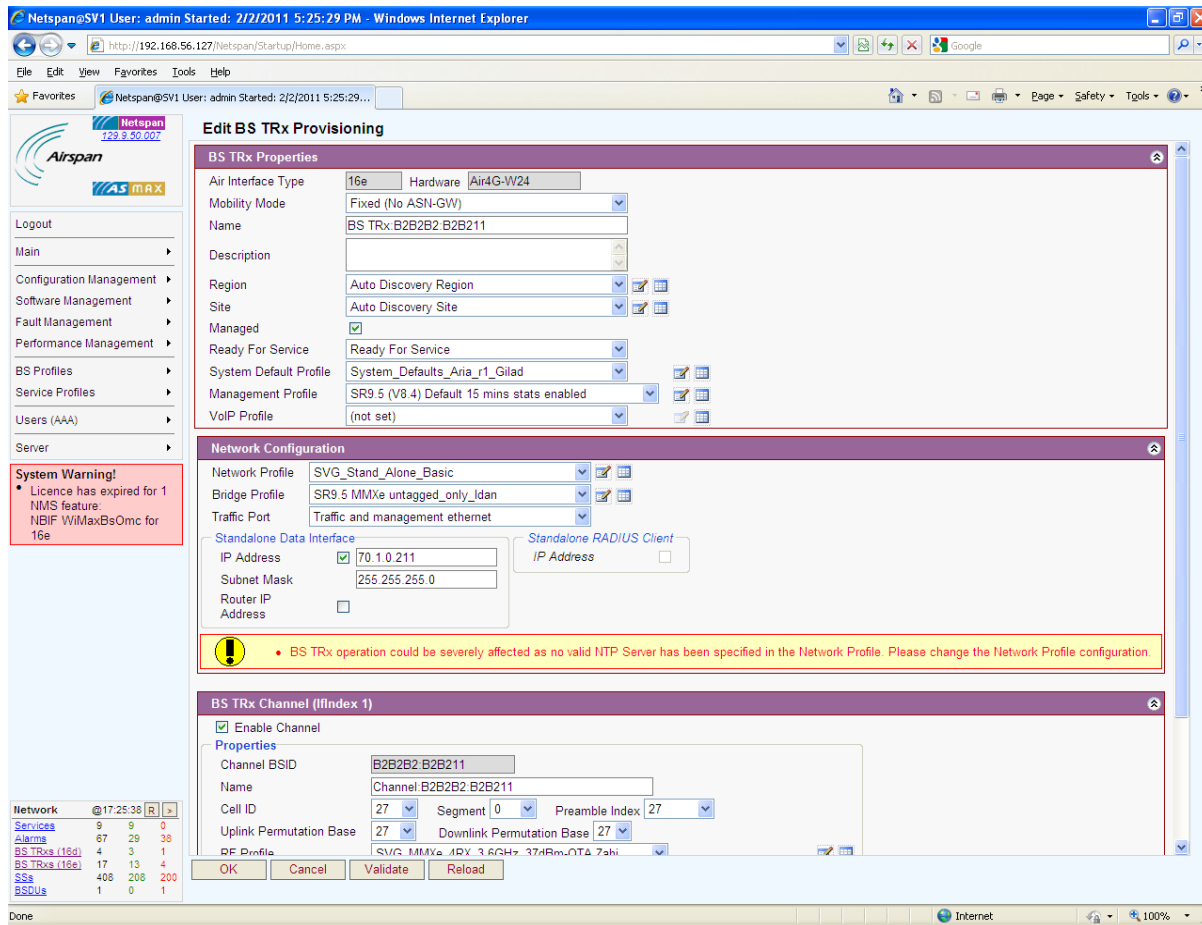


Figure 12 - Add BS Network Profile (16e) (Standalone (no ASN GW) settings)

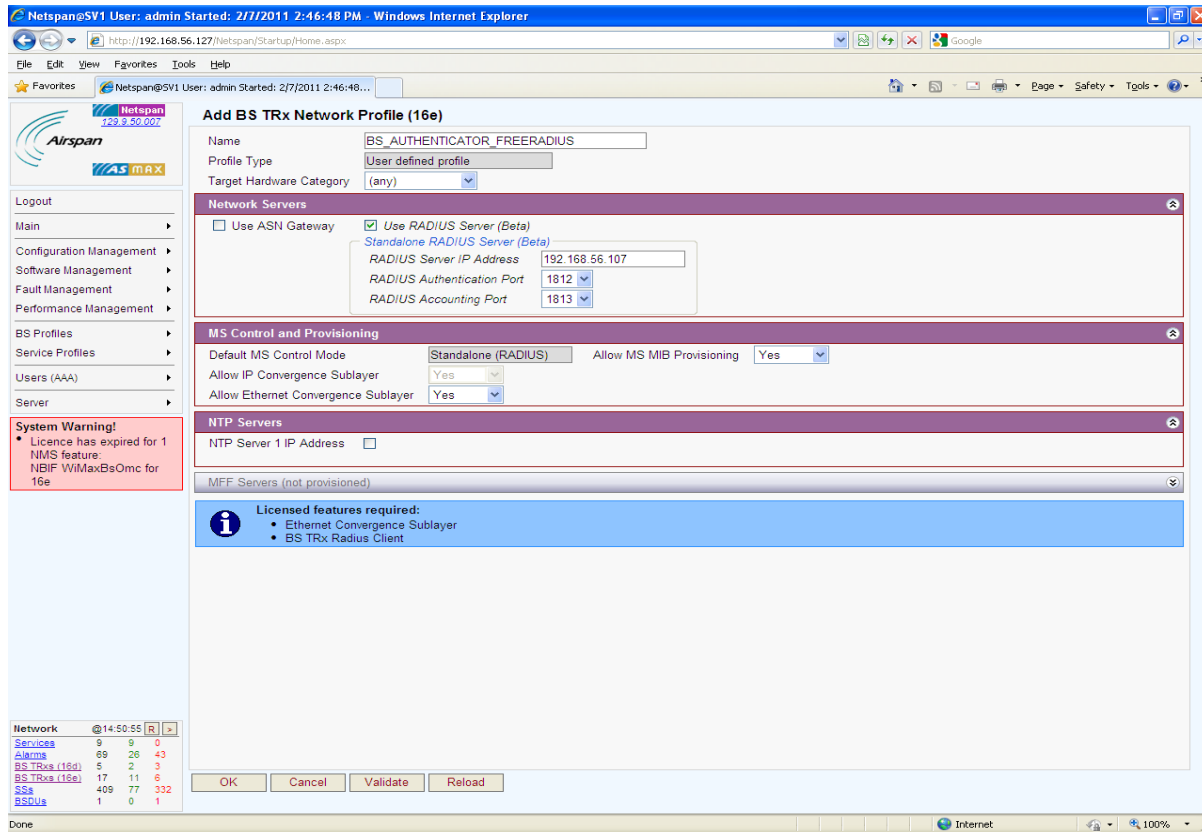


Figure 13 - Add BS Network Profile (16e) (Standalone without authentication)

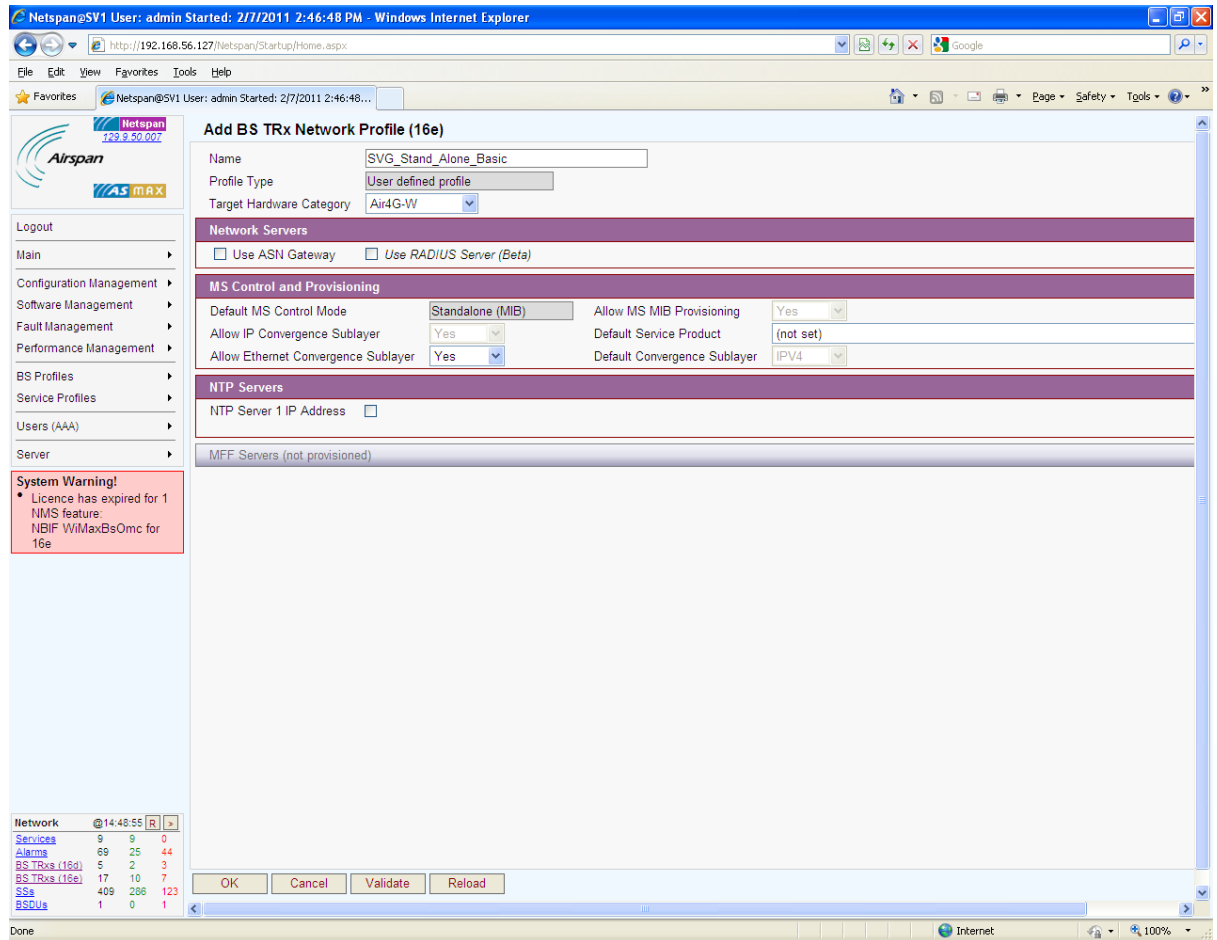


Figure 14 - MS Custom Configuration Profile

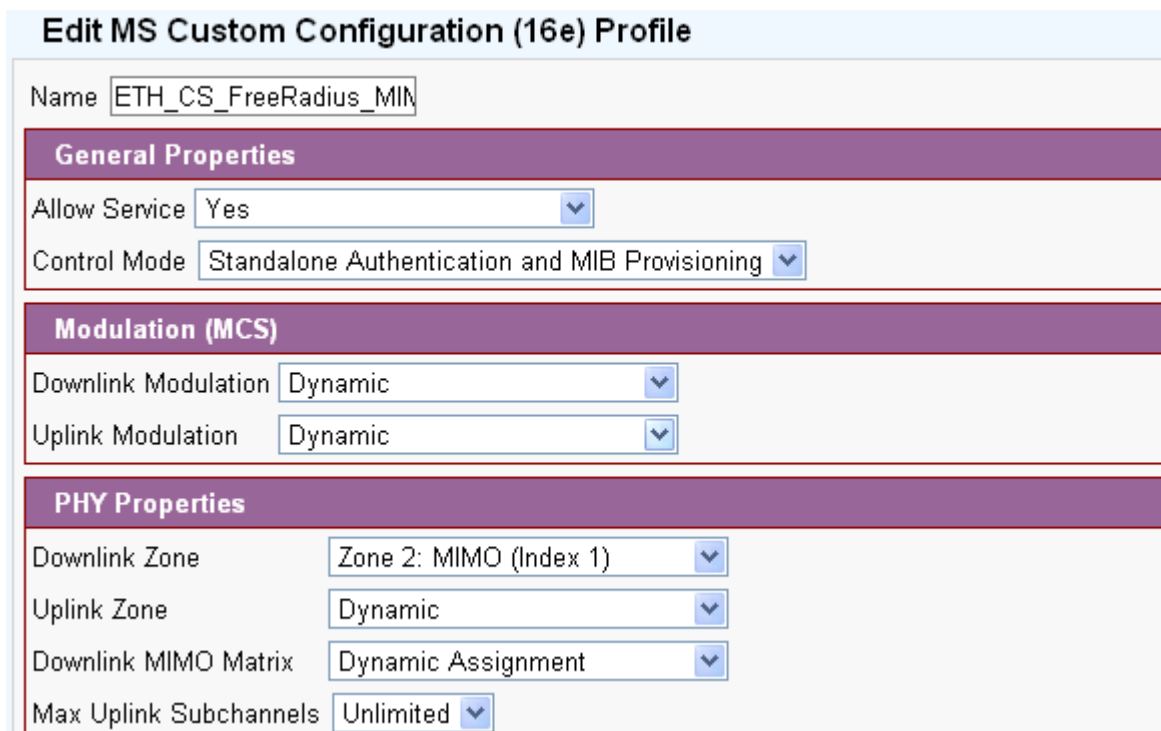


Figure 15 - Service Product

Edit Service Product (access restricted - read only)

Identity

Name

Description

CS Type

Service Flow Template List

| | | Description | Service Class | Scheduling Type | Traffic Priority | Direction | Initial State |
|--------------------------|---|-------------|------------------|-----------------|------------------|-----------|---------------|
| <input type="checkbox"/> | 1 | DL BE | data 30M Harq BE | (N/A) | 2 | Downlink | Active |
| <input type="checkbox"/> | 2 | UL BE | data 30M Harq BE | Best Effort | 2 | Uplink | Active |