4Motion®

Product Release 3.0M1
GA Release Note

April 2011

Version 0.17

Contents

1. General

This document details the main hardware elements, software features, and limitations of 4Motion release 3.0M1 software. The 4Motion release's main benefits are:

- Flexibility and Scalability:
    - Pay-as-you-grow design from single sector to multi sector
    - Various Diversity techniques from 2x2, 2x4 to 4x4
    - High throughput and coverage Macro BS, High MS count
    - Efficient network deployment configuration (N=1, 3, 1/3)
    - Scalable distributed ASN-GW as well as Centralized Network Architecture
    - Flexible deployments with various BTS types: Macro Indoor/Outdoor & Micro Outdoor
    - Future adjacent multi-carrier deployments, software upgrade using newly available IF combiner
    - BreezeMAX ASN-GW Load Balancing and redundancy for increased availability and capacity
- Efficiency and Performance:
    - MIMO B and Adaptive MIMO A/B switching for enhanced sector throughput
    - 4 Tx Beamforming for increased Reuse 1 capacity at 3.5/2.5GHz/2.3GHz (10MHz)
    - Optimized high performance scheduling, dynamic rate adaptation and diversity
    - Proportional Fair Scheduler Phase 1 for enhanced throughput for uncommitted downlink & uplink traffic
    - Coverage cost optimized radio heads with 4th order diversity (2x4 ODUs) - reducing the number of BS sites with extended range of up to ~30 km.
    - Idle mode increasing sector users count, saving device power, and reducing overheads on the network
    - RET antenna for optimized installation and maintenance
- Variety of RF bands and channel bandwidths enabling worldwide opportunities
    - 5/7/10MHz Channel Bandwidth (7MHz supported on 3.5 GHz)
    - 2.3 (+WCS), 2.5, 3.3a/b, 3.5, 3.6-3.8 GHz

2. Released Products and Overview

4Motion release 3.0M1 is an e-certified release enabling advanced mobility technologies with enhanced capacity optimized performance such as MIMO B & Idle mode. The system operates in bands 2.3/2.5/3.3/3.5/3.6 GHz (5 MHz, 7 MHz, and 10 MHz) and is intended for worldwide use. The product introduced in this release is designed with open architecture and interfaces complying with IEEE 802.16e and WiMAX Forum Technical Working Group (TWG) PHY/MAC Profiles and Networking Working Group (NWG) Profile C. It is designed to support both distributed and centralized topology approaches, thus providing operators with the flexibility to select the mobile WiMAX network topology that best suits their needs and existing network architecture.

The product is Alvarion's market-leading mobile WiMAX solution. Designed with open IP architecture and interfaces, 4Motion release 3.0M1 integrates the most advanced and adaptive radio management and control technologies to optimize operator spectrum and network resource usage introducing in the first time ever 4Tx Beamforming over wireless network world-wide.

Maintaining a host of radio and air interface, security, networking and management features, 4Motion release 3.0M1 also introduces seamless handover control and management as well as stringent QoS requirements for next-generation applications.

The product is an end-to-end solution comprising Base Transceiver Station (BTS) equipment, Access Service Network Gateway (ASN-GW), AAA servers, an Element Management System (EMS), and End User Devices.

Leveraging its leadership position in WiMAX and driven by BreezeMAX® and now 4Motion, Alvarion's release 3.0M1 is taking the market to the next level – mobile WiMAX.

3. About this Release

The following features are newly supported in this release compared to former R2.5M and former R3.0 (in bold) (for a full list of supported features, please refer to Detailed Supported Features).

3.1. BTS and Radio

- 4 Tx Beamforming for 2.3/2.5**/3,5** GHz at 10MHz with BMAX4000 devices for increased capacity mainly in reuse 1 networks (cost option)
- Radio Heads: 1x1 3.3b, 3.65GHz, **2x2 3.475-3.675GHz**
- Micro Outdoor with 2x2 diversity 2.5/3.5 GHz
- Power Control improvement for increased uplink capacity
- Ease of operation be removing lookup table internal AU-NPU connectivity

- R8 Handover messaging information (NDD)
- Additional KPIs
- **Power saving ability to shutdown Tx of a specific channel (Rx mode for 2Tx4Rx with 2x2 ODU pair)**
- **Increased device peak throughput**[1]
- 512 registered MS in a sector (10MHz)
- BreezeMAX Macro Outdoor 2x2 Configuration*: NAU, DAU, SAU
- 2x2 Radio Heads 2.3/2.5/3.5 GHz*
- Reuse N=1 at 7MHz with FFR on Maps (not for 1000e MS types)

3.2. Antenna, GPS and Accessories

- IF Combiner hardware for future adjacent multi carrier software upgrades
- DDP Antenna 2.3-2.7 33º
- DP EDT Antenna 2.3-2.7
- **DDP Antenna -90 º -3.3-3.8Ghz**
- **DDP Antenna -65 º -3.3-3.8Ghz**
- New GPS
- Managing of outdoor cabinets

3.3. Networking (BreezeMAX ASN-GW)

- ASN-GW Redundancy & Load Balancing allowing implementation of stackable ASN-GW architecture within same site or Geo Redundancy for separate sites
- Hotlining for sub to be directed to operators subscription or self care portal (prepaid or first power CPE) (Beta Required)
- BS ID reporting – subscriber's location is reported in interim accounting messages and can be retrieved from AAA
- DHCP Options in DHCP Proxy allowing populating the DHCP options (e.g. opt 60), similarly to DHCP Relay mode (integrated with Bridgewater AAA only)
- AAA Redundancy (with Bridgewater Redundant AAA set up) (Beta required)
- Network Time Protocol (NTP) for clock sync for Mini-centralized ASN-GW
- Additional KPI for StarQuality
- Real Time Counters for AlvariSTAR
- EAP-TLS support for BMAX2000\4000 (limited)
- **Gratuitous update for core router ARP support upon INE**
- Mini Centralized ASN-GW

[1] EUD implementation dependant

3.4. End User Devices (some apply to former R2.5M2)

- BreezeMAX USB 250 in 2.3/2.5/3.5GHz
    - CD less installation
    - OMA-DM (Ready)
    - Downlink MIMO A&B and uplink Tx diversity
    - Mac OS support
- BreezeMAX 3000:
    - BreezeMAX 3000 – Self Install 1D unit in 2.5GHz
    - BreezeMAX 3000 – Outdoor units in 3.6-3.8 / 3.3-3.4 / 2.3-2.4 / 3.3-3.6 /3.475-3.675GHz
    - 3.6GHz hardware upgraded to 22dBm for US model
    - Application level
    - ETH CS Bridge Mode (VLAN CS)
    - IP CS Bridge Mode (with NGVG)
    - Extended ND&S
- BreezeMAX 4000:
    - Self install Indoor for 2.5/3.5/3.3 GHz
    - 1 data, 1 voice, WiFi (in 3.5G)
    - 2.5 GHz 2D,2V,WiFi – ALV Model
    - 2 directional antennas (~6dBi gain in 3.5GHz)
    - 26 dBm Tx power
    - MIMO A/B
    - TR-69, OMA-DM (ready)
    - ETH-CS (VLAN-CS)
    - IP-CS Bridge Mode
- Network Gateway Voice Gateway NG-VG
    - The NG_VG integrated wireless gateway for small offices and home offices (SOHO) is a standalone wireless broadband access device and a VoIP gateway. The NG_VG provides users with broadband internet via the WAN connection and also voice over IP, fax, and IEEE 802.11b/g Wi-Fi access. Power Sourcing Equipment (PSE) over the WAN interface provides power to a WiMAX outdoor unit in a PoE setup. The NG_VG has an external dipole Wi-Fi antenna, and supports TR-069 for remote management. IP-telephony services are supported for standard analog phones or fax machines (2POTS).
- AlvariSTAR (Since 4.7)
    - Platform: capacity scaling to manage 2,000 BSTs
    - Platform: Geo Redundancy support (DRP)
    - Interface: SNMP Fault NBI to become Bi-directional enabling OSS to request resending traps in case of link failure
    - Interface: exposing information to Google Earth including BTS location based GPS coordinates as well as some BTS properties

    - Configuration: Added Predefined radio configuration templates based on Engineering guidelines
    - Security: Ability to define User Access per domain (Geographical area)
    - GUI: Updating Network elements icons
    - Connectivity screens redesign to ease usage
    - Enhancements of existing mass deployment features
  - Duplicate BTS (Site) for quick initial configuration with intuitive wizard-based process.
  - Template Manager for quick network maintenance - expanded to support Alvarion MC ASN-GW and Micro outdoor.
  - Copy BS with a single click of a button.
    - AlvariCRAFT: Introducing in memory DB for rapid and light installation
- AlvariSTAR (v4.8)
    - Fault: Alarms de-duplication improvement to prevent active alarm screen flood due to toggling alarms
    - SW upgrade: an ability to re-run a SW upgrade task for a BTS for which the task failed the first time
    - GUI: Improved BS neighboring filter at the on line configuration module
    - Configuration: New optional Mass configuration module enabling simple process, based wizard and templates, generating full BTS XML configuration files for multi BTSs (currently supports 4Motion Macro v3.0m and v2.5m2 in transparent mode).
- StarACS
    - Improved Mass Operations grouping capabilities
    - Higher flexibility on search results
    - High Availability and Geo redundancy support
    - New diagnostic features: Ping and Trace Route per individual CPE (from StarACS 3.1)
    - Events – A new module allowing configuration that triggers the generation of events on information received from the device (e.g. specific parameters value or counts of different information types). Triggers can be sent as SOAP messages to external OSS systems (from StarACS 3.1).
    - Platform performance improvements (from StarACS 3.1).
- StarDM (powered by Motive):
    - Scalable up to Millions of devices
    - OMA-DM & TR69 support
    - Web Services APIs
    - Pre integrated interface with BWS AAA
- StarQuality:
    - Supporting dozens of New 16e counter and KPIs of 4M 3.0
    - Added BTS □ BS Sector □ CPE relation Table
    - High Availability and Geo redundancy support
    - New Star Quality Graphs (RSSI/CINR Min/Max)

- Web service interface to AlvariSTAR for automatic BTS discovery
- Supporting Multi BTS KPI versions

- StarReport:
  - Powerful Business Objects based tool providing Ad Hoc and pre-defined network level configuration and inventory reports for improved decision support (customized product provided ARO+3month).

This release is designed as an end-to-end solution based on the following system components:

- BTS equipment with localized integrated and distributed ASN-GW
- Centralized ASN-GW, which may be offered as part of an end-to-end solution
- AAA servers provided by Bridgewater Systems (with Alvarion ASN and with Cisco ASN specific customer setup) and Cisco (with Cisco ASN)
- Element Management System AlvariSTAR providing interfaces towards NMS/OSS systems
- End User Devices: Si Indoor and Outdoor CPEs and Dongles

4. End to End Configurations

The following table summarizes the supported configurations from an end to end ecosystem perspective including, MS types, BS, ASN-GW and AAA Server with applicable channel bandwidths and RF Bands. For other ASN-GW and AAA configurations, please contact the PLM team.

#	MS Vendor - SoC Type	BS	ASN-GW	AAA	Channel BW and RF Bands	Notes
1	AWB- 2000 ALVR-4000 (Beceem)	BMAX	Alvarion NPU/MC	Bridgewater	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.5GHz	2.3GHz BMAX 2000 only
2	ALV-RD2 (1000)	BMAX	Alvarion NPU/MC	Bridgewater	5/10MHz @ 2.3/WCS/2.5GHz 5/7/10MHz @ 3.3/3.5/3.6GHz	
12	ALV-RD2 (1000)	BMAX	Cisco-7600	Cisco	5/10MHz @ 2.3/WCS/2.5GHz 5/7/10MHz @ 3.3/3.5/3.6GHz	
11	AWB- 2000 ALVR-4000 (Beceem)	BMAX	Cisco-7600	Cisco	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.3/3.5GHz	2.3GHz BMAX 2000 only
13	Montevino - Kilmer Peak	BMAX	Cisco-7600	Cisco	5/10MHz @ 2.5GHz 5/7/10MHz @ 3.5GHz	Laptop by 3rd party
6	AWB- 2000 ALVR-4000 (Beceem)	BMAX	Cisco-7600	Bridgewater	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.3/3.5GHz	2.3GHz BMAX 2000 only
7	ALV-RD2 (1000)	BMAX	Cisco-7600	Bridgewater	5/10MHz @ 2.3/WCS/2.5GHz 5/7/10MHz @ 3.3/3.5/3.6GHz	
8	Montevino - Kilmer Peak	BMAX	Cisco-7600	Bridgewater	5/10MHz @ 2.5GHz 5/7/10MHz @ 3.5GHz	Laptop by 3rd party

#	MS Vendor - SoC Type	BS	ASN-GW	AAA	Channel BW and RF Bands	Notes
4	ALV-3000 (Sequans)	BMAX	Alvarion NPU/MC	Bridgewater	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.5/3.6GHz	
14	ALV-3000 (Sequans)	BMAX	Cisco-7600	Cisco	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.5/3.6GHz	
9	ALV-3000 (Sequans)	BMAX	Cisco-7600	Bridgewater	5/10MHz @ 2.3/2.5GHz 5/7/10MHz @ 3.3/3.5/3.6GHz	

Note:

- Micro Outdoor available for 2.5/3.5 GHz bands only

- MC mini-centralized ASN-GW

5. Supported Hardware Elements

The release supports the following main hardware elements:

(A detailed description is available on relevant products release notes)

- BreezeMAX Macro Indoor - Indoor Unit Chassis - IDU:
    - Baseband Card AU IDU
      4-channels card (up to 6 per chassis)
    - Network & Management Card – NPU:
      1 GB data interface (1 per chassis)
- BreezeMAX Macro Outdoor (2 or 4 channels)
    - NAU – Network Access Unit
    - DAU – Dual AU
    - SAU – Single AU

- ODU – Radio Heads:
    - 2x2 ODU in 2.3/2.3WCS/2.5GHz (38dBm) & 3.5/3.475-3.675GHz (37dBm)
    - 2x4 ODU in 2.5GHz and 3.5/3.6 GHz bands
      (38/37/36 dBm respectively)
    - 1x1 ODU in 2.5 GHz and 3.3/3.5/3.65 GHz Bands
      (36/33/34/22dBm respectively)
    - 1x1 ODU in 2.3GHz/2.3WCS (36 dBm)
    - ODU 137 support

- BreezeMAX Micro Outdoor:
    - 2x2 2.5GHz - 37dBm 10MHz (FCC, ETSI B),
      36dBm 10MHz (ETSI A)
    - 2x2 3.5 GHz - 36dBm (FCC, ETSI)

- Mini Centralized ASN-GW

    - Alvarion Mini Centralized ASN-GW
- Antennas:
    - Mechanical Tilt 65/90º Dual Slant in 2.3-2.7/3.3-3.8GHz by PCTEL/Telsa
    - Omni antenna in 2.3-2.7 GHz by MTI
    - Electrical Down Tilt (EDT), Remote Electrical Tilt (RET) 65º Dual Slant in 2.3-2.7/3.3-3.8GHz by Argus
    - Electrical Down Tilt (EDT), Remote Electrical Tilt (RET) 65º Dual Slant in 2.3-2.7/3.3-3.8GHz by Argus
    - DDP Antenna 2.3-2.7 33º by Argus
    - DP EDT Antenna 2.3-2.7 65º by Argus
    - DDP Antenna -90 º -3.3-3.8GHz by Alpha
    - DDP Antenna -65 º -3.3-3.8GHz by Alpha
    - For best performance it's recommended using (Electrical Down Tilt) EDT antennas
- Accessories
    - IF Combiner hardware for future adjacent multi carrier software upgrades
    - Managing of outdoor cabinets
- Applicable GPS products and modules
    - Base Station clocks synchronization by GPS; GPS cable adaptor
    - Trimble - Acutime Gold, & Acutime 2000 for Macro BS
    - New GPS by Alvarion for Macro BS
    - GPS for Micro BS
- MS Types:
    - USB Dongle
        - BreezeMAX USB 200 in 2.3/2.5/3.5 GHz
        - BreezeMAX USB 250 in 2.3/2.5/3.5 GHz
            - Self Install Indoor unit (Residential Gateway)
        - BreezeMAX 1000e – Self Install unit in 2.3/WCS/2.5/3.3/3.5/3.6 GHz
        - BreezeMAX 2000 – Self Install unit in 2.3/2.5/3.5 GHz
        - BreezeMAX 3000 – Self Install unit in 2.5GHz
        - BreezeMAX 4000 – Self Install unit in 2.5/3.3/3.5 GHz
- Outdoor Unit
    - BreezeMAX 1000e – Outdoor and Indoor units in 2.3/WCS/2.5/3.5/3.6 GHz
    - BreezeMAX 2000 – Outdoor and Indoor units in 2.3/2.5/3.5 GHz
    - BreezeMAX 3000 – Outdoor units in 2.3/2.5/3.3-3.4/3.3-3.6/3.5/3.6-3.8/3.475-3.675GHz
- Network Gateway Voice Gateway NG-VG

- The NG_VG integrated wireless gateway for small offices and home offices (SOHO) is a standalone wireless broadband access device and a VoIP gateway. The NG_VG provides users with broadband internet via the WAN connection and also voice over IP, fax, and IEEE 802.11b/g Wi-Fi access. Power Sourcing Equipment (PSE) over the WAN interface provides power to a WiMAX outdoor unit in a PoE setup. The NG_VG has an external dipole Wi-Fi antenna and supports TR-069 for remote management. IP-telephony services are supported for standard analog phones or fax machines (2POTS).

- Star Management Suite – EMS
  - AlvariSTAR
    - AlvariSTAR carrier-class management system manages and controls the 4Motion Macro, Micro BTSs as well as MC-ASN-GW.
  - StarACS
    - StarACS carrier-class ACS (Auto Configuration System) manages TR-069 based CPEs
  - StarDM
    - Device management system for managing OMA-DM and TR-069 devices for large scale networks
- Cisco ASN-GW, AAA and DHCP Servers
  - CISCO ASNGW Router 7600
  - AAA Server (CAR) - x1 Sun T1000
  - DHCP Server (CNR) – x1 Processor Dual Pentium 4 2.4 GHz and above with Hyper Threading RAM & Hard Disk 2 GB, SATA or SCSI hard disk 40 GB
- BWS AAA
  - AAA - x1 Sun T2000/T5220

6. Software Used per Product Type

The following are targeted software versions introduced in this release (for latest CPE version, please refer to CPE RN).

Product Type	Product Vendor	Product P/N	Release	Comments
DHCP Server	Cisco	CNR	6.2.3.2	
AAA Server	Bridgewater	AAASC	8.2.c.4	
	Cisco	CAR	5.0	Controlled availability
ASN-GW	Alvarion	NPU	3.0.10.9	
	Cisco	7600 IOS	2.3	Controlled availability. Previous versions are subject to specific IOT
	WiChorus-Tellabs	IOT By 3rd party	2.1.3	Subject to customer specific IOT
BS	Alvarion	Macro AU, Micro	3.0.10.126	
MS	Alvarion	Indoor RGW Si 1000e	2.5.1.1060	WCS, 2.3/2.5/3.3/3.5/3.6
	Alvarion	Outdoor Pro 1000e	2.5.1.1060	WCS, (No 2.34-2.4) 2.3/2.5/3.3/3.5/3.6
	Alvarion (AWB)	Indoor RGW Si 2000e	1.0.0.37 2.3/2.5G 1.0.0.38 3.5G to be updated	Beceem 5.2.6.8 2.3/2.5/3.5G
	Alvarion (AWB)	Outdoor Pro 2000e	1.0.0.37 2.3/2.5G 1.0.0.38 3.5G to be updated	Beceem 5.2.6.8 2.3/2.5/3.5G
	Alvarion (AWB)	PC Card	1.0.11.4 / 1.0.13.0 to be updated	Idle disabled\enabled
	Alvarion	CPE Modem 3000	R4.6.2.3-27251-v6.6.1ALV	2.3/2.5/3.5GHz SEQ 4.6.2.3-27251
	Alvarion	CPE Outdoor Modem 3000	R4.6.2.3-27251-v6.6.1ALV	2.3/2.5GHz SEQ 4.6.2.3-27251
	Alvarion	Indoor RGW Si 4000	01.02.68.999	Beceem 2.4.4
	Alvarion	USB Dongle 250	2.0.3.0/2.0.2.0	2.3/2.5/3.5GHz (v5.2.7.4)
	Quanta	USB Dongle 200	ALV-R2.68.05.0d-061110	2.3/2.5/3.5GHz
	ASUS with Intel Kilmer-Peak laptops	IOT By 3rd party	5.3/6.1	2.5/3.5GHz

Product Type	Product Vendor	Product P/N	Release	Comments
	Alvarion	NG-VG	1.0.8	With Outdoor BMAX3000
EMS	Alvarion	AlvariSTAR EMS 4M DD	3.1.2.92	
	Alvarion	AlvariSTAR infra	4.8.1.211	Alvari CRAFT
	Alvarion	Star Quality	3.1.15	
	Alvarion	StarACS	3.1.8	+ BMAX4000 add-on
	Alvarion	StarReport	Customized	ARO+3 to 5 months
Home Agent	Cisco		5.x	To be validated upon request

7. Detailed Supported Features

4Motion release 3.0M1 supports the following main features:

- BreezeMAX Macro Configurations:
    - BMAX Macro Indoor up to 6 sectors configuration
    - BMAX Macro Outdoor up to 6 sectors configuration
    - BTS antenna – 2nd and 4th order diversity
    - RF Bands:
    - 2.3 WCS, 2.30-2.36/2.34-2.4/2.3-2.4 GHz
    - 2.485-2.690 / 2.496-2.602 / 2.590-2.690 GHz
    - 3.300-3.350 / 3.350 – 3.400 / 3.4-3.6 / 3.6-3.8 / 3.475-3.675 / 3.65 GHz
    - Channel Bandwidths: 5MHz, 7MHz (in 3.x GHz) and 10MHz
- Radio Features
    - Enhanced Power Control for interference avoidance and increased capacity
    - UL and DL Rate Adaptation
    - UL and DL HARQ
    - MIMO (Matrix A, B) – STC and MIMO B
    - 4 Tx Beamforming for 2.3/2.5/3.5GHz @ 10MHz with BMAX4000 devices for increased capacity mainly in reuse 1 networks (cost option)
    - 2 and 4 way UL diversity (MRRC)
    - MS scanning and pre-defined best AU selection (MS configured)
    - 64QAM Uplink support

- Extended Range of 30 km.[2]
- Single Sector Idle Mode (not supported in MS type 1000)
- Proportional Fair Scheduler Phase 1 for enhanced throughput for uncommitted Best Effort downlink and uplink throughput traffic
- Reuse N=3 as well as enhanced data reuse N=1 with FFR 1/3 on Maps at 7 and 10 MHz (not for 1000e MS types)
- R8 Handover messaging information (NDD)
- Enhanced KPIs

- ASN Features
  - Intra-BTS optimized Hard HO
  - Inter-BTS optimized Hard HO
  - R6 Profile C
  - Fast R8 for mobility control
  - ASN Diffserv, 802.1p marking policy
  - Distributed and Centralized ASN architectures
  - IPv4 CS
  - Multiple Hosts - with up to 3 autonomous users per MS/CPE
  - VLAN service interface
  - R3 IP over VLAN Tunnel
  - DHCP Options 43, 60, 82 & DHCP server name
  - QoS Types: UGS, BE, eRT, RT, nRT
- Network Features
  - Mobile services
  - Authentication: EAP-TTLS, EAP-TLS available in BMAX 3000 and BMAX 4000 series as well as Kilmer-peak Intel based laptops with BWS AAA only
  - Unmanaged VoIP
  - Centralized ALVR ASN-GW with multiple BSs
  - Secondary DNS
  - IP anti-spoofing
  - Load Balancing
  - Session-Redundancy with Cisco ASN-GW
  - Volume and Time based Accounting
  - Interim Accounting Messages supported
  - Hotlining and CoA for sub to be directed to operators subscription or self care portal (prepaid or first power CPE)

[2] EUD model and channel bandwidth dependant

- BS ID reporting – subscriber's location is reported in interim accounting messages and can be retrieved from AAA
- AAA Redundancy - BWS AAA only
- Gratuitous update for core router ARP support upon INE

- BreezeMAX ASN-GW Features
  - VLAN-CS for VLAN services (incl 802.1 q-q)
  - Three DHCP modes:
  - DHCP Relay
  - DHCP Server
  - DHCP proxy
  - Simple IP
  - R3 Radius: Authentication, Authorization, Accounting
  - Post Paid Accounting
  - IPoIP tunneling on R3 northbound
  - Disconnect Message
  - ASN-GW Redundancy & Load Balancing allowing implementation of stackable ASN-GW architecture within same site or Geo Redundancy for separate sites
  - DHCP Options in DHCP Proxy allowing populating the DHCP options (e.g. opt 60), similarly to DHCP Relay mode (integrated with Bridgewater AAA only)
  - Network Time Protocol (NTP) for clock sync for Mini-centralized ASN-GW
  - Additional KPI for Star quality
  - Real Time Counters for AlvariSTAR

- AlvariSTAR EMS Features
  - Unified Management System for managing both 16e-ready, 16d and 16e WiMAX devices
  - Fault Management: Active Event Monitor and Event History
  - Configuration Management: Equipment Manager, Network Discovery and Device Synchronization
  - Security: User and permission management
  - Task Manager: Software Upgrade task and Configuration Backup task
  - SNMP Northbound Interface for forwarding Alarms to Higher level OSS systems
  - Various configuration screens have been updated
  - Platform: capacity scaling to manage 2,000 BSTs
  - Platform: Geo Redundancy support (DRP)
  - Interface: SNMP Fault NBI to become Bi-directional enabling OSS to request resending traps in case of link failure
  - Interface: exposing information to Google Earth including BTS location based GPS coordinates as well as some BTS properties
  - Configuration: Added Predefined radio configuration templates based on Engineering guidelines
  - Security: Ability to define User Access per domain (Geographical area)

- GUI: Updating Network elements icons
- Mass deployment features:
  - Copy BS – enabling creation of a new BS based on the configuration of an existing BS with Enhancements of existing mass deployment features.
  - Duplicate Site for initial configuration with intuitive wizard-based process.
  - Template Manager for quick network maintenance.
- Release Enhancements:
  - Duplicate BTS (Site) for quick initial configuration with intuitive wizard-based process.
  - Template Manager for quick network maintenance - expanded to support Alvarion MC ASN-GW and Micro outdoor.
  - Copy BS with a single click of a button.

- AlvariCRAFT Configuration Tool
  - AlvariCRAFT is designed for field technician, enabling Graphical LCT with FCPS functionality managing a single base transceiver station with in memory DB for rapid and light installation.
- StarACS EMS Features
  - Remote management of TR-69 based CPE devices
  - Quick Search and drill-down to device level
  - Device Configuration
  - Software/Firmware Management
  - Device Inventory Management
  - Real time performance monitoring
  - Improved Mass Operations grouping capabilities
  - Higher flexibility on search results
  - High Availability and Geo redundancy support
- StarDM (powered by Motive):
  - Scalable up to Millions of devices
  - OMA-DM & TR69 support
  - Web Services APIs
  - Pre integrated interface with BWS AAA
- StarReport:
  - Powerful Business Objects based tool providing Ad Hoc and pre-defined network level configuration & inventory reports for improved decision support (customized ARO+3-5 months)
- WiMAX Devices:
  - USB Dongle
    - BreezeMAX USB 200 in 2.3/2.5/3.5 GHz
    - BreezeMAX USB 250 in 2.3/2.5/3.5 GHz

- Self Install Indoor unit (Residential Gateway)
  - BreezeMAX 1000e – Self Install unit in 2.3/WCS/2.5/3.3/3.5/3.6 GHz
  - BreezeMAX 2000 – Self Install unit in 2.3/2.5/3.5 GHz
  - BreezeMAX 3000 – Self Install unit in 2.5GHz
  - BreezeMAX 4000 – Self Install unit in 2.5/3.3/3.5 GHz
- Outdoor Unit
  - BreezeMAX 1000e – Outdoor and Indoor units in 2.3/WCS/2.5/3.5/3.6 GHz
  - BreezeMAX 2000 – Outdoor and Indoor units in 2.3/2.5/3.5 GHz
  - BreezeMAX 3000 – Outdoor in 2.3/2.5/3.3-3.4/3.3-3.6/3.5/3.6-3.8/3.475-3.675GHz
- NG-VG
  - RGW with Wi-Fi, VOIP,POE and 4xLAN ports

- Network Ecosystem
  - ASN-GW:
    - Distributed ASN – BreezeMAX ASN-GW
    - Centralized ASN – Cisco ASN-GW 7600
  - AAA:
    - Bridgewater Systems for BreezeMAX ASN-GW and for Cisco ASN-GW
    - Cisco CAR for Cisco ASN-GW

8. Documentation

- System Manual, comprising the following main chapters:
  - System Description
  - Commissioning
  - Operation and Administration
- 4Motion Installation Manual (detailed step by step installation instructions for Alvarion equipment)
- 4Motion Installation Procedure (detailed step by step installation and inspection instructions for a basic site)
- AlvariSTAR 4Motion Device Manager User Manual
- 4Motion End User Devices documentation:
  - Product Manual

    Quick Start Guide