

BigBand BMR1200[®]

Broadband Multimedia-Service Router

The BigBand BMR[®] (Broadband Multimedia-Service Router) is the recognized benchmark platform for network delivery of video services. It is a versatile platform for a broad range of solutions, built on the most powerful media processing and routing engines available in the industry.

Flexible and scalable, the BigBand BMR1200 is fully interoperable with sources of a broad range of content and services in headend and hub facilities, enabling a service provider to achieve significantly higher utilization of network capacity and assets. The BMR features programmable hardware for easy upgrading and reconfiguration, maximizing return on capital investments. The modular, high density design of the BMR facilitates a “grow as you go” capex model.

At the core of the BigBand BMR is a protocol-agnostic, content intelligent architecture that switches and processes MPEG, IP and Ethernet packets. The innovative BMR design supports applications such as digital simulcast, standards-based ad splicing, time-shifting and switched

digital video. BMR functionality includes RateShaping[®] dynamic bit rate adaptation for video, and other advanced capabilities such as network edge de-jittering and QAM modulation/RF upconversion.

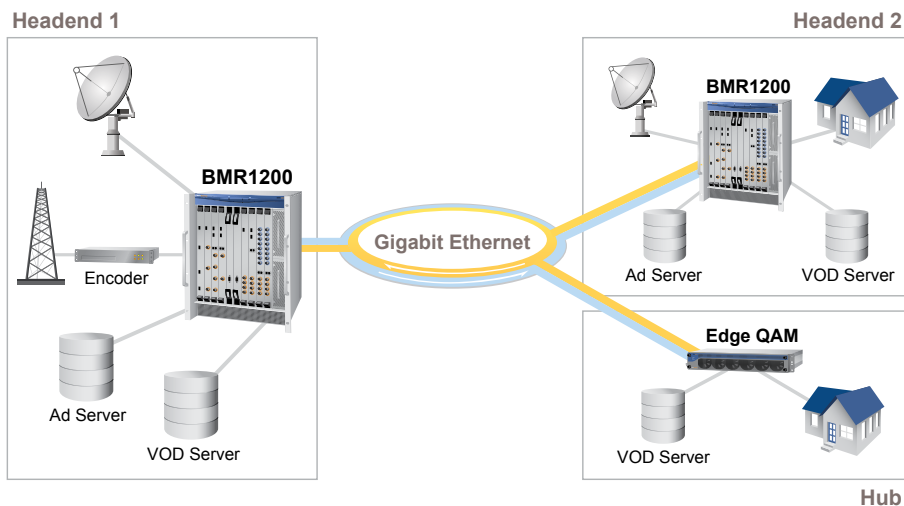
The BigBand Management and Server Suite make it easy to configure and manage the BigBand BMR1200, and dynamically provision content and services to be carried over a video network. Intuitive graphical user interfaces assist in provisioning services, and assessing network and element performance. Robust, open protocols including SNMP are used for communicating routing and performance data information. The extensive capabilities of the BigBand Management and Server Suite help minimize operational expenditures.

The BigBand BMR1200 is a robust platform designed from the ground up to be carrier-class. Hot-swappable input/output cards and power supplies, a passive backplane, and other features ensure that the BMR meets the highest availability requirements.



- Versatile platform that enables “grow as you go” scalability
- Supports wide range of services including digital TV management, deep digital transport, digital simulcast, digital ad insertion, HDTV and switched digital video
- Innovative routing and processing engine, fully non-blocking, with 32 Gb/s capacity
- High density chassis, capable of holding up to eight I/O cards, for a total of 96 ASI inputs, 72 ASI outputs, 32 GigE inputs/outputs, and 64 broadcast QAM outputs
- SFP-based Gigabit Ethernet interfaces, with optional DWDM and CWDM enables cost-effective digital transport
- Robust chassis design ensures the highest performance in even the most arduous conditions
- Carrier-grade platform, with hot-swappable cards, supports 99.999% availability
- NEBS Level 3 certified

The BigBand BMR1200 provides a broad range of video networking functionality



User-Friendly Management Suite

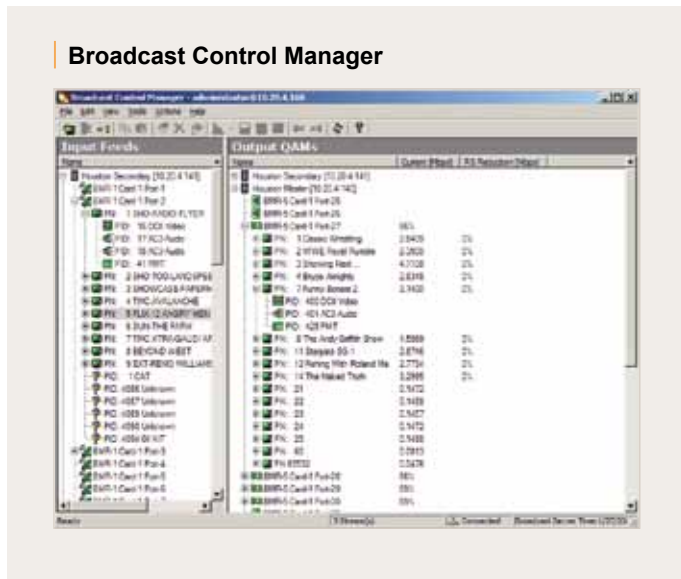
The BigBand Management Suite makes it easy to manage the BMR and co-located BigBand equipment, and provision content and services, by providing a large amount of mission critical information in easy-to-understand GUI formats.

Versatile and Scalable Server Suite

The BigBand Server Suite is a family of software applications that control communications between the BMR and external software managers and clients. This includes the BMR Management Suite, a Service Manager (talking to the Session Monitor), Broadcast Control Server (talking to the Broadcast Control Manager), Topology Server (talking to the Connection Manager), Alarm Server (talking to the Alarm Logger and Viewer) and SMU Manager Server (talking to the SMU). The Server Suite resides on the SMU1000, a robust server running Windows 2003.

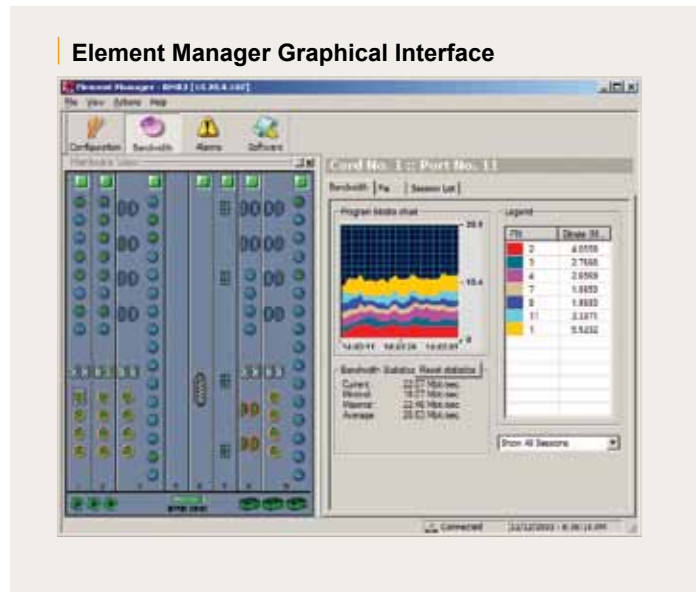
Broadcast Control Manager

The BCM (Broadcast Control Manager) is the main interface for configuring and managing broadcast sessions, and supports “drag and drop” creation of output multiplexes without service interruption. The BCM enables an operator to browse input programs, viewing program information and bandwidth allocations. Program line-ups can be saved and restored as needed.



The Element Manager

The primary function of the Element Manager is configuration, optimization and control of the hardware and software assets of a BigBand BMR. The Element Manager enables an operator to configure multiple parameters, including port bandwidth utilization and feed redundancy. Alarm monitoring is supported by the Element Manager with card status shown in color on the GUI. The Element Manager also supports remote I/O card software upgrades.



Configuration Manager

The Configuration Manager allows connections between a BigBand BMR and a third-party network element, such as a VOD server, to be created. The Configuration Manager controls and monitors sessions, and informs the Topology Server (see BigBand Server Suite) when a new network element is added.

Alarm Logger and Viewer

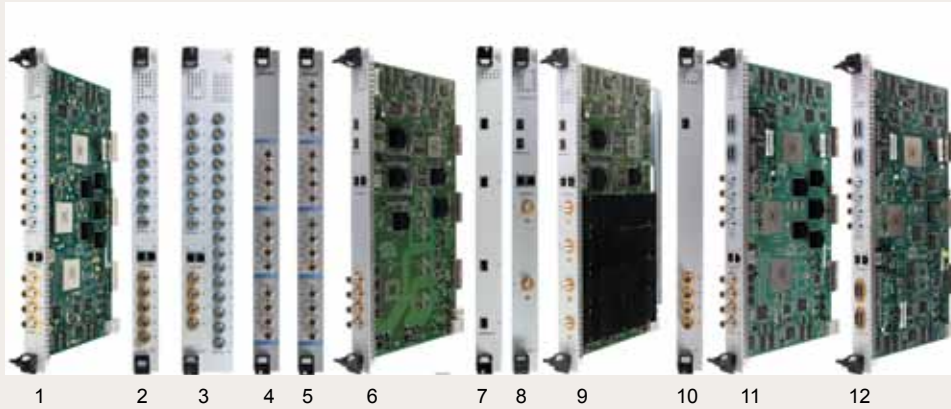
The Alarm Logger and Viewer stores alarm traps and provides an operator with a convenient way of displaying a multitude of information including alarm name, severity of alarm, time of occurrence and current status. Alarms can be sorted and filtered according to a variety of criteria. Alarms from any BMR in a network can be viewed from a single GUI. A command line interface is also available for basic control and diagnostic, and is part of the embedded operating system of the BMR.

Modular Hardware Configurations

The BMR chassis holds up to eight I/O cards for a total of up to 96 ASI inputs, 72 ASI outputs, 32 GigE inputs/outputs, and 64 broadcast QAM outputs

Many different types of I/O cards are currently available, giving a service provider a broad selection of functionality to choose from. All cards are software upgradeable.

Modular Hardware Configurations



- | | |
|----------------|--------------|
| 1. AFA824XA | 7. GFG404 |
| 2. AFA825XA | 8. GFR222 |
| 3. AFA24-2-4XA | 9. GFR224 |
| 4. ENS0012XA | 10. GNA114XA |
| 5. ENS0016XA | 11. MFA824XA |
| 6. GFA224 | 12. MFD824XA |

The XA family includes the AFA, ENS, GNA, MFA and MFD cards. These cards are used for all video processing functions including RateShaping, muxing, ASI and GigE ad splicing, ETV applications, clamping and transport. The XA cards are offered with ASI and DHEI interfaces as well as Fast Ethernet NICs. The GigE family includes the GFA, GFG, GFR and GNA cards. These cards are used for MPEG transport over IP, with or without video processing functionality.

The BMR chassis supports N+1 redundancy of RF ports, 1+1 redundant management cards, and redundant load sharing power supplies. Hot-swappable I/O cards, fans and power supplies, a passive backplane and other features ensure that the BMR meets the highest availability requirements.

I/O Board Hardware Configurations

I/O Board Hardware Configurations		AFA824XA	AFA825XA	AFA24-2-4XA	ENS0012XA	ENS0016XA	GFA224	GFG404A	GFR222	GFR224	GNA114XA	MFA824XA	MFD824XA
		INPUTS	DVB-ASI	8	8	24							
DHEI												4	4
Fast Ethernet (10/100 BaseT)	2		2	2					2	2		2	2
Gigabit Ethernet (SFP)						4	1	2	2	1			
OUTPUTS	DVB-ASI	4	4	4	12	16					4	4	
	DVB-ASI (up to 160 Mbps)		1										
	DHEI												4
	Fast Ethernet (10/100 BaseT)	2	2	2			2		2	2		2	2
	Gigabit Ethernet (SFP)						2	4	2	2			
	RF (1:1, 2:1 or 4:1 upconversion)								2	4			

BigBand BMR1200®

Broadband Multimedia-Service Router

Specifications

System

- MPEG and IP native switching and routing
- 32Gb/s non-blocking switching core
- Redundant Management cards
- Statistical multiplexing of different types of data and video sources
- RateShaping for MPEG compressed streams
- Multicast support for IP and MPEG packets
- Service-level input redundancy
- DVB Simulcrypt support
- DVB CSA scrambling

Interfaces

- DVB-ASI inputs (up to 213Mb/s data rate—270Mb/s link rate)
- DVB-ASI outputs (up to 160Mb/s data rate—270Mb/s link rate)
- DHEI inputs (up to 40Mb/s)
- DHEI outputs (up to 40Mb/s)
- Fast Ethernet inputs/outputs: 10/100BaseT
- Gigabit Ethernet inputs/outputs: 1000BaseSX, 1000BaseLX, WDM (using SFP modules)
- Layer 2 and Layer 3 Ethernet inputs/outputs
- QAM RF outputs (1:1, 2:1 or 4:1 upconversion)

Rate Shaping

- Bit-rate change from input to output for optimal utilization with minimal video quality degradation and low latency
- VBR and CBR outputs
- Supports MPEG SP@ML, MP@ML, MP@HL—SDTV and HDTV
- Supports 1920, 1280, 720, 704, 544, 528, 480
- Multiple QoS priority levels
- SDTV and HDTV splicing including Enhanced TV PIDs

Remultiplexing

- Real-time support for CBR and VBR video stream multiplexing and remultiplexing on every output port
- Support for MPTS and SPTS
- Support of in-the-clear or encrypted MPEG streams
- Ability to pass through all MPEG levels and profiles
- Supports 512 output PIDs for ITV and advanced music services

IP Protocols

- ARP (RFC 826)
- IGMPv3 (RFC 3376)
- SNMPv2 (RFC 3416)
- ICMP (RFC 792)

MPEG Stream Manipulation

- PCR re-stamping
- Support for common input PCR
- Support for common input PMT
- PID filtering, dynamic input tracking and remapping
- Support for PID remapping
- PAT and PMT generation
- Dynamic or static PMT generation
- CAT, NIT, SDT, SI table generation
- Converts off-air PSIP data for cable plant carriage

Physical

- Dimensions H x W x D 22.72" x 17.72" x 21.14"
(577mm x 450mm x 537mm)
- Weight (Fully Loaded) 88lbs (40Kg)

Environmental

- Input Voltage 110/220VAC, 50/60Hz
-48VDC, -36 to -75VDC
- Power Supplies Dual hot-swappable redundant
- Power Consumption 11A Max @ 110VAC
5.2A Max @ 220VAC
33A Max @ -48VDC
925W
- Operating Temp. 32 to 122°F (0 to 50°C)
- Storage Temp. -4 to + 185°F (-20 to + 85°C)
- Cooling Type 3 fans, hot-swappable
- Airflow Front to back
- Rel. Humidity (Max) 95% non-condensing

Compliance

- Safety UL/cUL 1950 EN 60950
- Electro-Magnetic FCC Part 15 Class A
ETSI 300-386 v1.2.1
- NEBS Level 3

Corporate Headquarters

475 Broadway Street
Redwood City, CA 94063
United States
phone +1.650.995.5000
fax +1.650.995.0060

bigbandnet.com

Asian Operations Center

Unit 3602, 36th Floor
The Center, No. 99 Queen's Road
Central, Hong Kong
People's Republic of China
phone +852.3151.7431
fax +852.3151.7385

BIGBAND®
networks