

The Broadband Services Router 1000 (BSR 1000) from Motorola is a compact, high-performance Cable Modem Termination System (CMTS) and full-featured router which enables broadband service providers to cost-effectively deliver voice, data and multimedia content and services. The BSR 1000 is a 1U, rack-mountable platform with an integrated up-converter, and it is a perfect solution for small- or medium-sized distribution hubs, or for larger sites in the earlier stages of broadband service market penetration. Broadband providers can also deploy space-saving BSR 1000s in hospitality locations or Multiple Dwelling Unit (MDU) facilities to extend broadband access services. The compact BSR 1000 can be deployed as a stand-alone unit or in small clusters to cost-effectively extend broadband access infrastructure to additional subscribers. This easy-to-use platform helps carriers develop a competitive edge in defining, deploying and managing broadband services.

The BSR 1000 implements SmartFlow™ features to cost-effectively extend the rich Quality of Service (QoS) support required to deliver multiple

services. It can be installed by non-technical personnel, and can operate as a Layer 2 bridge or as an edge router with enhanced security features. Traffic flows from

multiple BSR 1000s can be aggregated by the carrier-class Broadband Services Router 64000 (BSR 64000) to bring robust traffic management to a distributed environment. The BSR 1000 changes the value proposition for small broadband access network locations by offering the most compact CMTS solution in the industry that can be installed in minutes to enable the cost-effective delivery of voice, data and multimedia content and services.



## ► Features

- Compact, space-saving 1U platform that can be installed in minutes by non-technical personnel
- Fully compatible with the carrier-class BSR 64000
- Based on open systems standards, the BSR 1000 is DOCSIS 1.0-qualified, EuroDOCSIS 1.0-qualified and is compatible with DOCSIS 1.1, EuroDOCSIS 1.1 and PacketCable 1.0 specifications
- Advanced Spectrum Management to ensure reliable and high-quality service delivery
- Supports 16,000 service flows to enable individual voice, data and multimedia streams to be handled effectively
- SmartFlow QoS classification for thousands of flows at wire-speed with guaranteed Service Level Agreements (SLAs)
- Full-featured routing with support for intradomain, interdomain and multicast routing including OSPF v2, RIP v1 and v2, BGP4, IS-IS, VRRP, IGMP, DVMRP and PIM-SM/DM
- Flexible management and streamlined service provisioning
- The Advanced Provisioning Manager allows operators to automatically create value-added services and manage BSR platforms

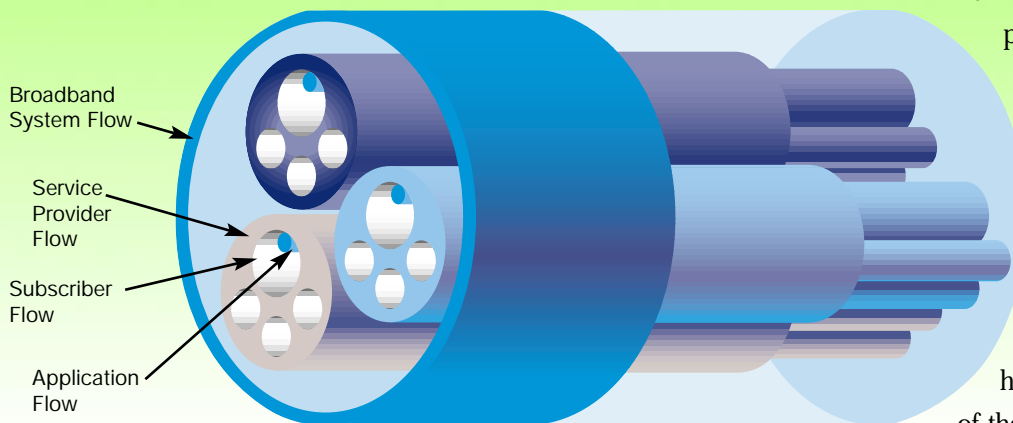


# SUPPORT

## Distributed QoS and Multi-Service Support

Broadband access networks deliver the capacity required for converged data, voice and multimedia services, and the BSR 1000 is a flexible platform that enables the convergence of these services at the Internet Protocol (IP) level. The BSR 1000 allows broadband operators to support multiple services from one or more providers. Operators can deliver measurable QoS from the subscriber to the backbone networks of multiple service providers.

SmartFlow allows operators to classify packets into flows based on packet content and to provide the appropriate QoS treatment for each traffic flow, according to DOCSIS 1.1 standards, for the access network. The BSR 1000 provides the customized statistics collection and per-provider provisioning needed to ensure and document the flexible delivery of services over a common broadband access network.



**SmartFlow Granular QoS**

## Full-Featured Routing

Operators can deploy the BSR 1000 to serve as a self-configuring CMTS/router or as a Layer 2 CMTS. Each routing protocol implemented on the BSR 1000 offers maximum expansion to support new services, subscribers and providers. A full suite of unicast routing protocols are supported, including carrier-class implementations of advanced routing protocols such as Routing Information Protocol (RIP) v1, RIP v2, Open Shortest Path First (OSPF) v2, Border Gateway Protocol (BGP) 4, and Intermediate System-Intermediate System (IS-IS). The BSR 1000 also offers carrier-grade implementations of IP multicast protocols, including the Distance Vector Multicast Routing Protocol (DVMRP) and Protocol-Independent Multicast/Sparse Mode and Dense Mode (PIM-SM/DM), and it allows the end-to-end delivery of IP services using MultiProtocol Label Switching (MPLS) and Diff-Serv.

Policy-Based Routing with MPLS allows providers to easily support Open Access applications. The BSR 1000 inspects multiple fields within packets to determine the appropriate routing and QoS. The routing is partially determined by looking at the source IP address, understanding which service provider partner is responsible for the IP address and then routing the traffic to that partner for handling. The per-flow queuing ability of the BSR 1000 implements QoS on the access network by mapping IP flows to DOCSIS 1.1 service flows and then mapping these flows to either MPLS label switched paths, independent physical networks or IP Diff-Serv-enabled networks.

## CONTROL

### ➤ Network Management and Control

The BSR 1000 offers several options for efficient administration, management and control to streamline deployment and operations costs. In distribution hubs with limited availability of trained staff, troubleshooting on the BSR 1000 is simple – with easy-to-read diagnostic LEDs as well as remote management capability to support provisioning, configuration and problem identification. Partitioned management allows users with different administrative access needs customized views according to their access privileges. It also allows multiple providers to each view its own network management environment or control services to its customers over the broadband access network.

The BSR 1000 supports Simple Network Management Protocol (SNMP) v1 and v3. Motorola supports all appropriate standard MIBs and offers custom MIBs to monitor and control the BSR 1000's value-added features. The system supports the File Transfer Protocol (FTP) for bulk data transfer, and it can be seamlessly integrated into the existing network management infrastructure. The BSR 1000 also offers a Cisco-compatible Command Line Interface (CLI) for ease-of-use and interoperability with legacy infrastructure. The CLI supports full scripting capability, and ASCII-formatted command files can be uploaded, downloaded and executed.

### ➤ Automated Service Creation

The Advanced Provisioning Manager from Motorola abstracts the creation of QoS-enabled services so that they can be defined according to the business policy needs of the operator rather than the CLI of the edge router. The Advanced Provisioning Manager allows broadband operators to offer Web-based customer self-provisioning and to integrate service creation with the existing Operations Support Systems (OSS) infrastructure.

The Advanced Provisioning Manager is based on industry standards. Motorola provides compatibility with leading OSS applications to enable providers to deploy the Advanced Provisioning Manager as part of a complete subscriber management system. Motorola complements the Advanced Provisioning Manager with partnerships with best-of-breed OSS vendors so operators can ensure compatibility as they deploy end-to-end services. They can therefore provision end-to-end services from the subscriber to the core network of multiple providers.

The Advanced Provisioning Manager enables integration with provisioning, subscriber management and other OSS applications and databases using the Lightweight Directory Access Protocol (LDAP).

Compact, easy-to-use BSR 1000s allow broadband service providers to cost-effectively address new service areas to expand market share and offer diverse services.

## The BSR 1000 allows broadband operators to support multiple services from one or more providers.

In addition, it also offers Java™ and eXtensible Markup Language (XML) interfaces. With the Advanced Provisioning Manager, operators benefit from per-flow metering, and can retrieve and export information in XML. Operators can create and manage service profiles and they can instantiate the service profiles into both BSR 1000s and carrier-class BSR 64000 intelligent edge routers. The service profile can then optionally be sent to a third-party service mediation system to populate customer care systems and to enable customer self-selection at self-service portals. These service mediation systems are offered by partners of Motorola, and they can also provide flow-through connectivity to back-end OSS applications. The Advanced Provisioning Manager also serves as an Element Management System (EMS) for the BSR 64000 and the BSR 1000 platforms to enable efficient management and control.

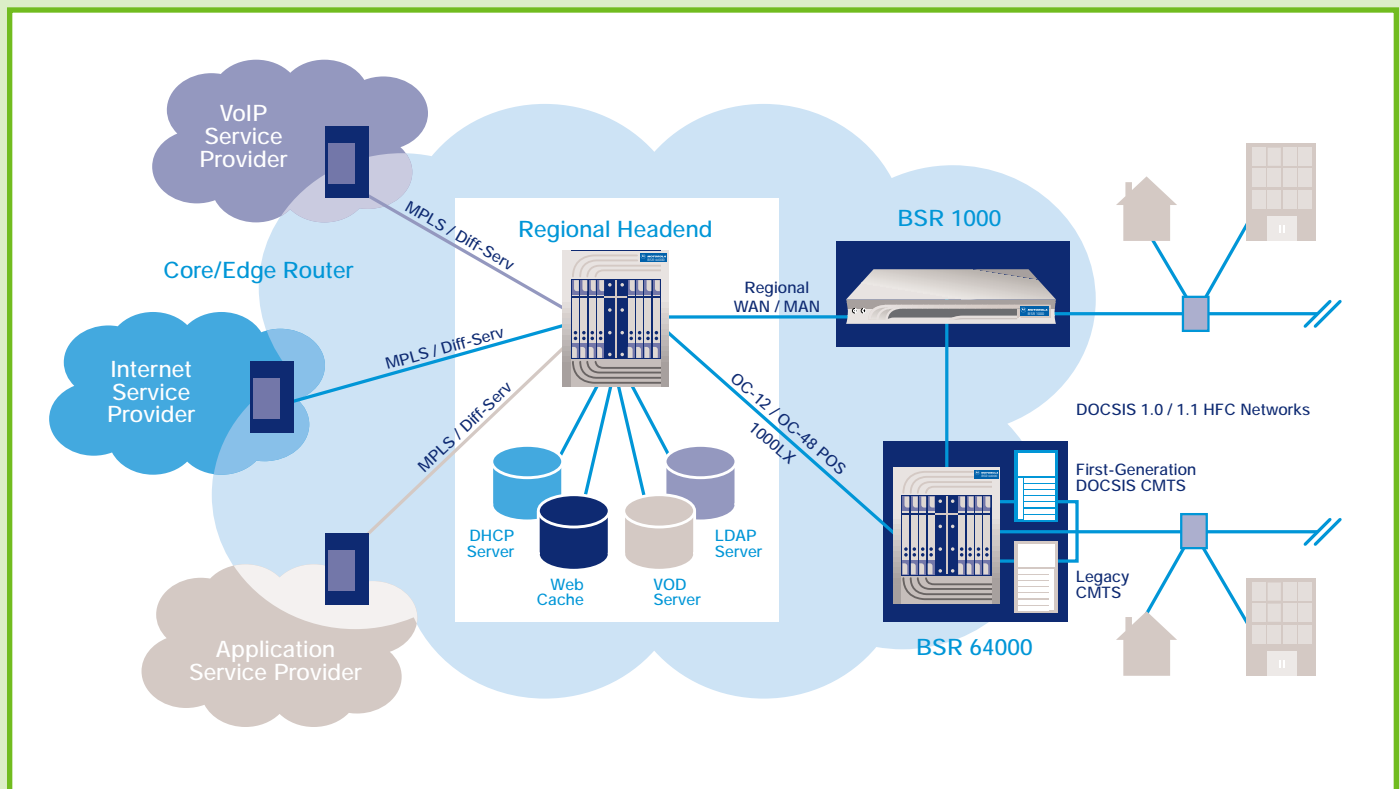
### ► **Space-Saving Hospitality/MDU Solutions**

Deploying broadband services to hospitality locations or MDUs creates new opportunities for providers. Compact, easy-to-use BSR 1000s allow broadband service providers to cost-effectively address new service areas to expand market share and offer diverse services. Hotels, convention centers and other hospitality locations can quickly deploy scalable broadband services, and MDUs can quickly “turn on” broadband access to offer high-speed services to all

residents of an apartment house or condominium complex. Both MDU owners and hospitality companies are looking at broadband services as a means of creating new revenue streams from fixed assets, and as a means of differentiating their offerings. Whether a traveler is staying in a hotel for an evening and needs basic Internet access or a condominium owner wants tiered-data services, the hospitality company or MDU operator can swiftly and easily add new services and create new revenue streams. Services can be easily delivered without adding any client software or making any configuration changes to the customer’s PC.

Modems can be deployed in hotel rooms or in dwelling units while connected to a BSR 1000 located in a utility closet. A locally-attached DHCP/TFTP/NTP server can dynamically distribute IP addresses and provide time-stamping services. The BSR 1000 can be managed locally or remotely using standard management interfaces. Automatic billing can be established and operators can provide a dynamic, easy-to-use subscriber experience that requires minimal setup and maintenance. The BSR 1000 allows hospitality and MDU operators to efficiently connect to broadband access networks so they can create recurring revenue streams that increase the value of the hospitality center or MDU facility.

The BSR 1000 inspects multiple fields within packets to determine the appropriate routing and QoS.



## PLATFORM

A Next-Generation Distributed Platform

The BSR 1000 is Data Over Cable Service Interface Specification (DOCSIS) 1.0-qualified, EuroDOCSIS 1.0-qualified and compatible with DOCSIS 1.1, EuroDOCSIS 1.1 and PacketCable 1.0 specifications. This compact CMTS is configured with an auto-sensing 10/100 Ethernet uplink to connect to a local data network. It is available in bridge and router configurations, and offers a space-saving 1U

“pizza box” chassis that allows broadband operators to deploy high-speed services in the smallest locations where real estate is at a premium. The system delivers the isolation, policing and address management needed to implement measurable SLAs. This solution allows cost-effective expansion of the service area and it delivers the traffic shaping needed to enable end-to-end SLAs across broadband access networks.

# BSR 1000 SPECIFICATIONS

## COMPACT, DISTRIBUTED CMTS

Form Factor . . . . . 1U "Pizza Box"  
Height . . . . . 1.75" (43.5 mm)  
Width . . . . . 19" (48.3 cm)  
Depth . . . . . 16.75" (42.5 cm)  
Fully-configured  
Weight . . . . . 9.8 lbs (5.4 kg)  
VxWorks Real-time Operating System  
Power . . . . . 90 – 260 Volts,  
47 – 63 Hz  
  
Operating  
Temperature . . . . . -5° C to 50° C  
Non-operating  
Temperature . . . . . -25° C to 70° C  
Operating Humidity . . . . . 10 – 90%,  
(Non-condensing)  
Non-operating  
Humidity . . . . . 5 – 95%,  
(Non-condensing)

## STANDARDS-BASED INTEROPERABILITY

DOCSIS 1.0-qualified  
EuroDOCSIS 1.0-qualified  
DOCSIS 1.1-compatible  
EuroDOCSIS 1.1-compatible  
PacketCable 1.0-compatible

## NETWORK INTERFACES

Single-port Autosensing 10/100 Ethernet

## NETWORK MANAGEMENT AND PROVISIONING

Cisco-compatible CLI  
SNMP v1 and v3  
Standard DOCSIS and IETF MIBs  
Motorola MIBs  
LDAP v3  
Open Interfaces to Provisioning, Accounting  
and Billing Applications  
HTTP/Java/XML Integration  
DHCP Relay  
Multiple Levels of Account/Password  
Authentication  
Telnet with Security Extensions  
Multiple Community Strings

## FULL RF SPECTRUM SUPPORT

DOCSIS and EuroDOCSIS  
4 Upstream DOCSIS Receivers  
Advanced Spectrum Management Functionality  
Downstream DOCSIS Transmitter  
Integrated Up-converter for RF Output  
Upstream  
Modulation . . . . . QPSK and 16 QAM  
Upstream Per-channel  
Bit Rate . . . . . 0.320 – 10.24 Mbps  
Upstream Input  
Frequency Range . . . . . 5 – 42 MHz  
DOCSIS  
5 – 65 MHz  
EuroDOCSIS  
Downstream  
Modulation . . . . . 64 QAM and  
256 QAM  
Downstream Output  
Frequency Range . . . . . 88 – 857 MHz  
(Channel Center)  
Output Frequency  
Step Size . . . . . 32.0 kHz  
Downstream  
Per-channel  
Bit Rate . . . . . 27 Mbps  
(64 QAM DOCSIS)  
36 Mbps  
(64 QAM  
EuroDOCSIS)  
38 Mbps  
(256 QAM DOCSIS)  
56 Mbps  
(256 QAM  
EuroDOCSIS)

## INTRADOMAIN/ INTERDOMAIN ROUTING

RIP v1 . . . . . OSPF v2  
RIP v2 . . . . . BGP4  
IS-IS . . . . . VRRP

## MULTICAST ROUTING SUPPORT

DVMRP . . . . . IGMP v2  
PIM-SM/DM . . . . . MBGP

## BRIDGING AND ROUTING

Layer 2 Bridging . . . . . Layer 3 Routing  
SmartFlow Wire-speed . . . . . Wire-speed QoS  
Forwarding and  
Flow Classification



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