

# SeaChange® BMC 60000

The SeaChange® Broadcast MediaCluster® 60000 Series is a family of highly scalable broadcast video servers designed for MPEG video applications such as post-production and HD playout. BMC 60000 systems provide industry-leading bandwidth and storage in an efficient package that supports up to eight 60Mb/s I/O channels per chassis. The BMC 60000 video server encodes, stores and decodes MPEG video at rates as high as 50Mb/s for broadcast television. Utilizing patented SeaChange RAID2® technology, the BMC 60000 provides high fault resilience and performance yet requires the storage of only a single copy of each video file. Customers using BMC 60000 solutions in single- and multi-channel broadcast facilities will benefit from their inherent reliability and fault tolerance, the scalability storage capacity, bandwidth and I/O channel count and the high storage efficiency of the RAID2 architecture.

The BMC 60000 supports a wide range of Broadcast MPEG video formats: program streams, transport streams, Long GOP, IMX, HDTV and DVB-ASI and can be equipped with SD encoders, SD decoders, HD decoders and an ASI I/O card for use with external encoders and decoders. With up to 3TB of storage per I/O chassis, the BMC 60000 not only provides plenty of storage for high-quality video but also maximum bandwidth to support the highest concentration of broadcast channels and redundant storage available in a broadcast video server.

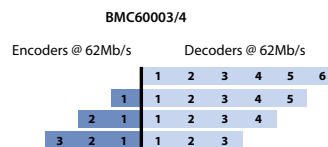
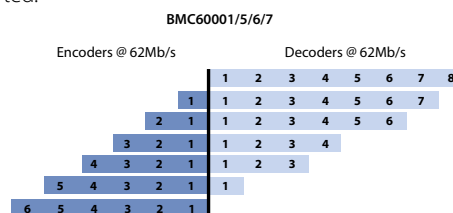
## BASE SYSTEM CONFIGURATIONS

BMC 60000 solutions can be configured and scaled to satisfy a variety of requirements. For example, in on-air applications requiring high fault tolerance, a clustered configuration (3 to 7 nodes) guarantees sustained performance, even in the unlikely event of a node failure. Typically, the number of nodes in a cluster is influenced by the storage capacity and bandwidth needed as well as the number of input and output channels. Where reliability is secondary to size and cost, a standalone, single node might be the optimum choice.

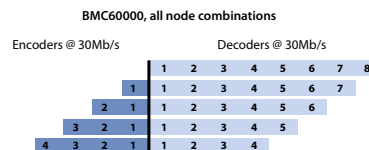
- 1-node, 3-node, 4-node, 5-node, 6-node and 7-node BMC clusters (BMC 6000n)
- SeaChange Codecs and I/O cards up to 62 Mb/s per channel
- 24 SCSI drives per node, RAID5 protected: 36GB, 73GB, 146GB or 300GB
- 8-port RS-422 Serial Controller Interface Kit for Broadcast Automation
- MediaCluster interconnect cables, 3 per node
- Two A/V patch panels per node
- Redundant power supplies

## INPUT/OUTPUT PROVISIONING

I/O provisioning rules are dependent upon the configuration of the BMC 60000 as well as the bit rate of the channels. In the following section, the first figure illustrates the I/O configurations available for the single node BMC 60001 and BMC 60005/6/7 when 62Mb/s codecs are used. As illustrated in the second figure, in the case of the BMC 60003/4, which has fewer cluster nodes, fewer I/O cards are supported.



In applications where the aggregate bit rate (video + audio + data) of the I/O channels is limited to 30Mb/s or less, all single and multi-node configurations of the BMC 60000 series can support the following I/O channel combinations as a minimum.



- Additional I/O Provisioning rules
  - The MTS 734 card is equivalent to an encoder + decoder
  - A chassis may have up to three Genesis HD Decoders, with the first Genesis HD Decoder occupying 3 standard decoder slots, the second occupying two more decoder slots, and the third occupying three more decoder slots.
- BMC 60000 Cluster Kit includes:
  - Patented RAID2 n+1 file protection across BMC 6000n
  - SeaChange BOSS diagnostic and system management station
  - 9RU rackmount keyboard/monitor/mouse with KVM switch for monitoring multiple nodes
  - 8-port 10/100/1000BASE-T Ethernet unmanaged switch
  - MediaCluster interconnect patch panels (three)
- Supports SeaChange-installed hardware and software only

## BMC 60001 OPTIONS

- SeaChange BOSS diagnostic and system management station (required for Time Delay application)
- 40RU Rack, 36" deep, with side panels and castors
- Fault-tolerant UPS
- 9RU rackmount keyboard/monitor/mouse
- Space-saving 1RU keyboard/monitor/mouse with KVM switch for operating BMC 60001 and optional BOSS

## BMC 6000n CLUSTER OPTIONS

- 40RU Racks, 36" deep, with side panels and castors, quantity dependent on configuration
- Fault-tolerant UPS, one per node
- Space-saving 1RU keyboard/monitor/mouse with KVM switch for operating multiple nodes

## PERFORMANCE PARAMETERS

- 62Mb/s maximum channel throughput (video plus audio/data)
- TCP/IP import/export rate up to 100 Mb/s for archive, file import, cluster-to-cluster transfer
- Maximum storage: 65,536 video files
- 5-second minimum video clip size for back-to-back play with no black frames; 2-second minimum video clip size with automation software support
- Fault resilience
  - A multi-node BMC 60000 system will maintain continuous operational performance in the event of any single component loss, including power supply, drive, node, or link failure, as well as input/output devices with the exception of the failed device. System performance in the event of a second component failure is not guaranteed, but can often be tolerated.
  - A BMC 60001 with RAID-5 storage supports on-air operations in the event of a hard drive failure; redundant power supplies and fans provide additional fault resilience.
- System scalability
  - The BMC 60001 is upgradeable in terms of drive size and I/O card quantity. The BMC 60001 can also be upgraded to a BMC 60003. All of these upgrades are off-line procedures.
  - The BMC 60003/4/5/6/7 supports drive size and codec upgrades during on-air operation.
  - A node may be added to the BMC 60003/4/5/6 to increase the system size during on-air operation.

## CHASSIS SPECIFICATIONS

- 24-drive LVDS chassis
- 64-bit, 33MHz, 14 PCI/4 ISA backplane
- Connections: VGA, PS/2 keyboard, bus mouse ports
- 6RU rack-mount chassis, 10.5"H x 19"W x 24"D
- Maximum weight: approximately 125lbs, or 57kg
- Operating temperature: 10° to 30° C
- Humidity: 20% to 80% RH, non-condensing, 2000 meters maximum altitude
- Power:
  - 18.0A @ 120VAC or 9.0A @ 240VAC, 50Hz or 60Hz
  - 3 x 500W power supplies, with one power supply redundant
- Certification: UL, FCC Class A, CE

## SYSTEM COMPONENTS

- 2.4GHz or faster Xeon CPU card with dual 10/100/1000 Base-T Ethernet ports
- 512MB or more system memory per node
- 8-port RS-422 Serial Controller Interface Kit (remove for 16-port upgrade)
- MediaCluster controller (IOP990) with 256MB memory, three per node
- Two-channel RAID controller, two per node
- 24 hard drives per node: 36GB, 72GB, 146GB or 300GB LVDS SCSI
- IDE Service Disk, one per node
- 56k external modem for each system
- Microsoft Windows 2003 license
- SeaChange operating software Vstrm 4.3 or higher
- SeaChange Service Disk software for system snapshots, rebuild and status
- SeaChange application software Broadcast 1.9 or higher

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