MediaCentral Platform Services 2.2 Hardware Guide

Important Information

For the latest information on MediaCentral Platform Services, see the documentation available from the MediaCentral Services page of the Avid Knowledge Base. Updates are occasionally issued after initial release.

http://avid.force.com/pkb/articles/en_US/readme/Avid-MediaCentral-Version-2-2-x-Documentation

***Important**: Search the Avid Knowledge Base MCS 2.2 web page for the most up-to-date* **MediaCentral Platform Services Hardware Guide**, *which contains the latest information that might have become available after this document was published.*

> ***Note**: For information on the supported RHEL version see the* **MediaCentral Platform 2.2 ReadMe**.

***Note**: This document provides HP and Dell part numbers for each item. Prices are no longer provided, and may differ, depending on your geography and the customer's relationship with HP.*

***Note**: For information on upgrading to MCS 2.2 from an earlier release, see the* **MCS 2.2 Upgrading Guide**, *available from the Avid Knowledge Base MCS 2.2 web page.*

Revision History

Date Revised	Changes Made
April 10, 2015	First Publication
April 22,2015	Added additional processor support for HP DL360 Gen9
April 27, 2015	Clarified 366FLR support (different part numbers for DL360 Gen8 vs. Gen9)
May 12, 2015	Updated "Optional Items for Connection to ISIS"

About MCS 2.2

Please see the ***MediaCentral Platform 2.2 ReadMe*** and any ReadMe documents pertaining to the solution(s) by which MCS is used.

Contents

1 Audience

This document is intended for people who either need to advise on or directly make purchase decisions for hardware on which MediaCentral Platform Services (MCS) will be installed and configured.

A basic understanding of server components (CPU, RAM, network cards) is required, but this document does not go into technical depth in this respect.

1.1 Additional Resources — HP

The Hewlett-Packard web site contains numerous resources for researching and configuring the HP ProLiant DL360p Gen8 server.

- HP web site (US):

  http://www8.hp.com/us/en/home.html

1.1.1 HP ProLiant DL360 Gen9

- HP ProLiant DL360 Gen9 product page:

  http://www8.hp.com/us/en/products/proliant-servers/product-detail.html?oid=7252836#!tab=features

- "QuickSpecs" for detailed specifications, including up-to-date options and part numbers (also available as a PDF):

  http://h20195.www2.hp.com/v2/gethtml.aspx?docname=c04375623

  http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c04375623

- HP Support Center for this model:

  http://h20566.www2.hp.com/portal/site/hpsc/public/psi/home/?sp4ts.oid=7252836

- HP RHEL support options:

  http://h30094.www3.hp.com/searchresults.aspx?store_id=17&search_id=180&dept_id=1128

1.1.2 HP ProLiant DL360 Gen8

- HP ProLiant DL360p Gen8 product page:

  http://www8.hp.com/us/en/products/proliant-servers/product-detail.html?oid=5177953#!tab=features

- "QuickSpecs" for detailed specifications, including up-to-date options and part numbers (also available as a PDF):

  http://h18000.www1.hp.com/products/quickspecs/14211_na/14211_na.html

  http://h18000.www1.hp.com/products/quickspecs/14211_na/14211_na.pdf

- HP Support Center for this model:

  http://h20565.www2.hp.com/portal/site/hpsc/public/psi/home/?sp4ts.oid=5177953

- HP RHEL support options:

  http://h30094.www3.hp.com/searchresults.aspx?store_id=17&search_id=180&dept_id=1128

1.2 Additional Resources — Dell

http://www.dell.com/ca/business/p/poweredge-r630/pd

1.3 Additional Resources — RHEL

- Red Hat RHEL support options:

  https://www.redhat.com/wapps/store/catalog.html

2 What's New

In this latest update of the ***MCS Hardware Guide***, here is what has changed since the previous version:

- *Newly qualified: HP Proliant DL360 Gen9 server*
- *Newly qualified: Dell PowerEdge R620/R630 server*
- *Price guidelines have been removed from the document. Please use the online configurators to estimate server costs*

***Note**: The Dell PowerEdge R620 server is supported but unavailable for purchase at time of publication. Only part numbers for the Dell R630 are provided.*

3 Overview

Before getting into the details of buying hardware for MCS, take a moment to understand what MCS is, and why it is important to make the right hardware purchase decisions.

3.1 What is MCS?

MCS is a set of software services that serve application layouts for applications, provide user authentication, manage system configuration settings, and deliver video playback over the network to web-based and mobile clients used with the following Avid solutions:

- MediaCentral | UX
- Media Composer | Cloud
- Interplay | MAM
- Media | Distribute

MCS consists of:

- MediaCentral Middleware Services
- MediaCentral User Management Services
- MediaCentral Playback Services
- MediaCentral Configuration Service
- MediaCentral Messaging Service
- MediaCentral AAF Generator Service

MCS installs all services on the same server, and multiple servers can be clustered together to obtain high-availability and horizontal scale.

3.2 Buying Hardware for MCS

For the most part, provisioning hardware is straightforward in that it is easy to configure a basic supported server. However, due to the different and optional video playback methods and features determining exactly what to provision can be complex. Take the time needed to determine the number of servers required, and the options with which the servers may need to be provisioned.

This document aims to facilitate the process of determining how many servers are needed, and which, if any, options are required.

- MCS supports MediaCentral and Media Composer | Cloud on HP and Dell hardware only.
- MCS supports Interplay | MAM on HP, Dell and other hardware.
- MCS supports deployments that do not require video playback on HP, Dell and other hardware. An iNEWS-only deployment with connections to iNEWS but no connection to Interplay | Production is a non-video deployment.

In all cases, it is recommended that you review hardware purchase assessments with a qualified Avid representative before purchasing any servers. Reviewing this document is an essential first step prior to consultation that will accelerate the process.

After reading this document you should be able to:

- ☐ Clearly identify the solution for which you are buying MCS hardware
- ☐ Determine the general hardware platform you need to buy
- ☐ Choose the Red Hat Enterprise Linux (RHEL) support subscription option that best meets your needs
- ☐ Determine which, if any, specific network interface cards (NICs) are required
- ☐ Determine whether or not you require additional hard drives for media caching
- ☐ Collect data that will allow you to determine how many MCS servers are required
- ☐ In the case of provisioning hardware from Avid, HP, or Dell, provide valid part numbers for everything you need to offer
- ☐ If applicable, explain all hardware purchases to your customer

3.3 Server Requirements at a Glance

The number of servers needed depends on a number of factors that can be determined in advance of hardware procurement:

1. **Deployment Type**: This type of deployment has a primary influence on server requirements. An iNEWS only deployment without video playback has the lowest processing needs. MediaCentral UX and Interplay MAM deployments require more CPU resources, due to the media transcoding requirements.
2. **Media Formats**: The next biggest consideration is the media storage format. For example, DNxHD is a resource-intensive media format. Avid JFIF is lightweight, in comparison. Thus for the same number of users, fewer servers are needed for a site where media is stored as Avid JFIF.
3. **Frame-based vs File-based Playback**: In frame-based playback, MCS decodes the stored proxies and streams images and audio to the remote client as individual frames. In file-based playback, MCS transcodes to FLV and caches the results. Both MediaCentral UX and Interplay MAM can be set (by the end-user) for either frame-based or file-based playback. Frame-based playback is the more CPU-intensive. As above, for the same number of users, fewer servers will be needed for a site favoring file-based playback.
4. **Number of Users**: The number of servers deployed must match peak usage requirements. For example, if a single server can simultaneously transcode 15 streams of the proxy storage format, but 25 users are expected, two servers will be needed.

The following table summarizes the basic cases for one, two and three or more servers. For a detailed discussion see “***Deploying Multiple Servers*** on page 21.

Number of Servers	Deployment Model	Description
1	Single Server	The minimum deployment model, suitable for environments with few users and/or undemanding transcoding requirements. For example, suitable for MediaCentral for iNEWS-only deployment; that is, to browse and edit iNEWS content with no connection to Interplay | Production (hence no video browse/edit/playback).
2	Master + Slave	Adds automatic failover safety to the basic single-server deployment, plus increased peak-usage and transcoding capacity. This is the minimum recommended deployment for most scenarios.
3+	Master + Slave + Load Balancing	Adds increased peak-usage and media transcoding capacity. Deploying multiple servers in a cluster is particularly important for sites with many users and/or resource-hungry media formats. For example, a single server can support the simultaneous playback of over 100 Avid JFIF media streams, but only 15 streams of AVC Intra 50 to MediaCentral UX.

4 Qualified Servers

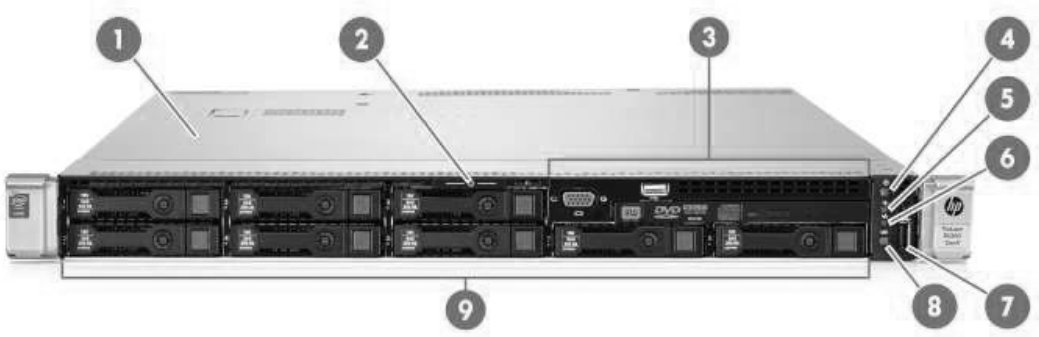
The following servers are qualified for use with MCS 2.2:

- ☐ Dell PowerEdge R630
- ☐ HP ProLiant DL360 Gen9
- ☐ HP ProLiant DL360p Gen8
- ☐ Dell PowerEdge R630

4.1 HP ProLiant DL360 Gen9

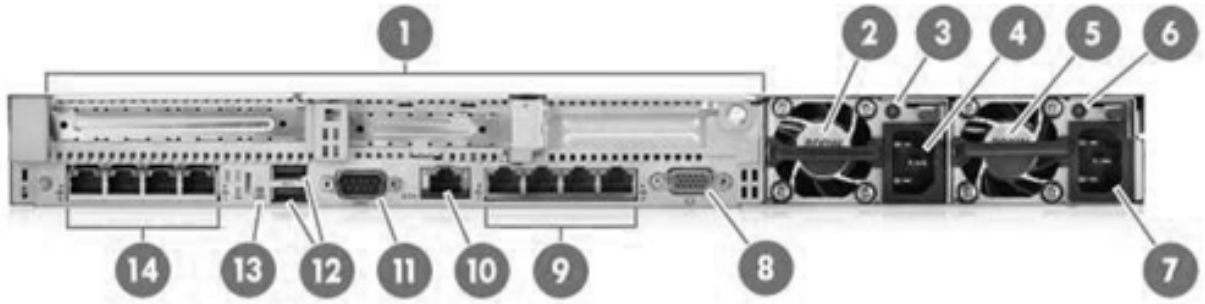
We currently qualify the HP DL360 Gen9 server. This 1U form factor server provides enough expansion for NICs and drives to suit all MCS deployments.

DL360 Gen9 - Front



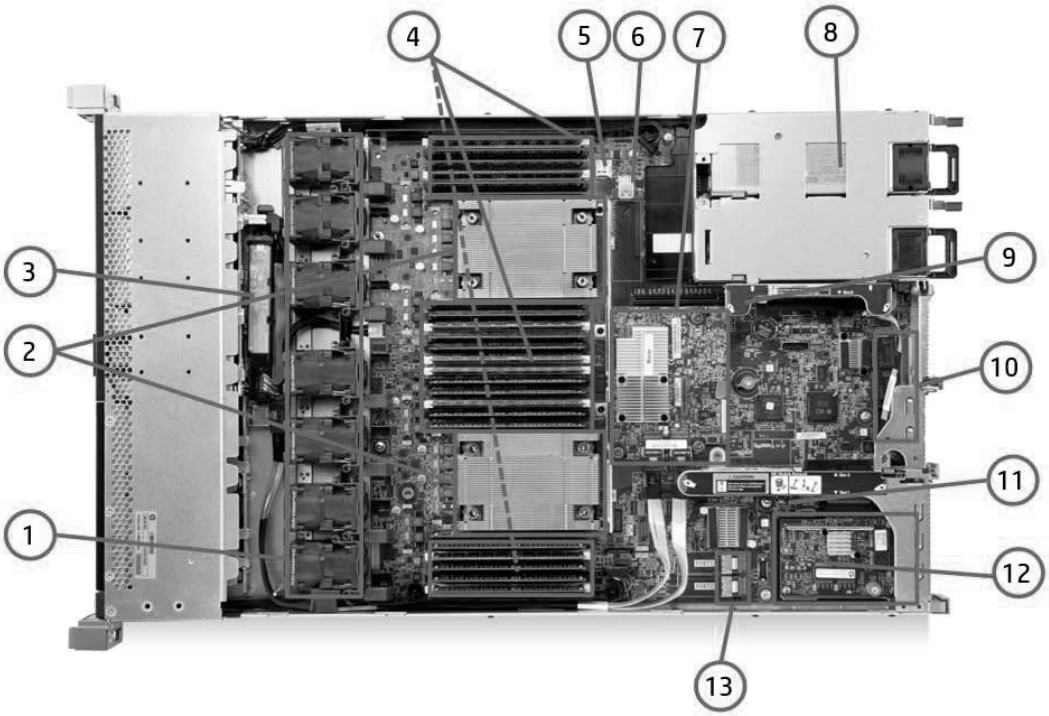
1. Access Panel
2. Serial Label Pull Tab
3. HP Universal Media Bay
4. Power On/Standby button and system power LED button
5. Health LED
6. NIC Status LED
7. USB 3.0 Connector
8. Unit Identification Button & LED
9. SAS/SATA/SSD Drive Bays

DL360 Gen9 - Back



1. PCIe 3.0 Slots 1-3
2. HP Flexible Slot Power Supply Bay 2
3. Power Supply 2 Status LED
4. Power Supply 2 C13 Connection
5. HP Flexible Slot Power Supply Bay 1
6. Power Supply 1 Status LED
7. Power Supply 1 C13 Connection
8. Video Connector
9. Embedded 4x1GbE Network Adapter
10. Dedicated iLO 4 connector
11. Serial Port Connector (Optional)
12. USB 3.0 Connectors (2)
13. Unit Identification LED
14. FlexibleLOM bay (Optional)
    NOTE: Shown: 4x1Gbe.

DL360 Gen9 - Top

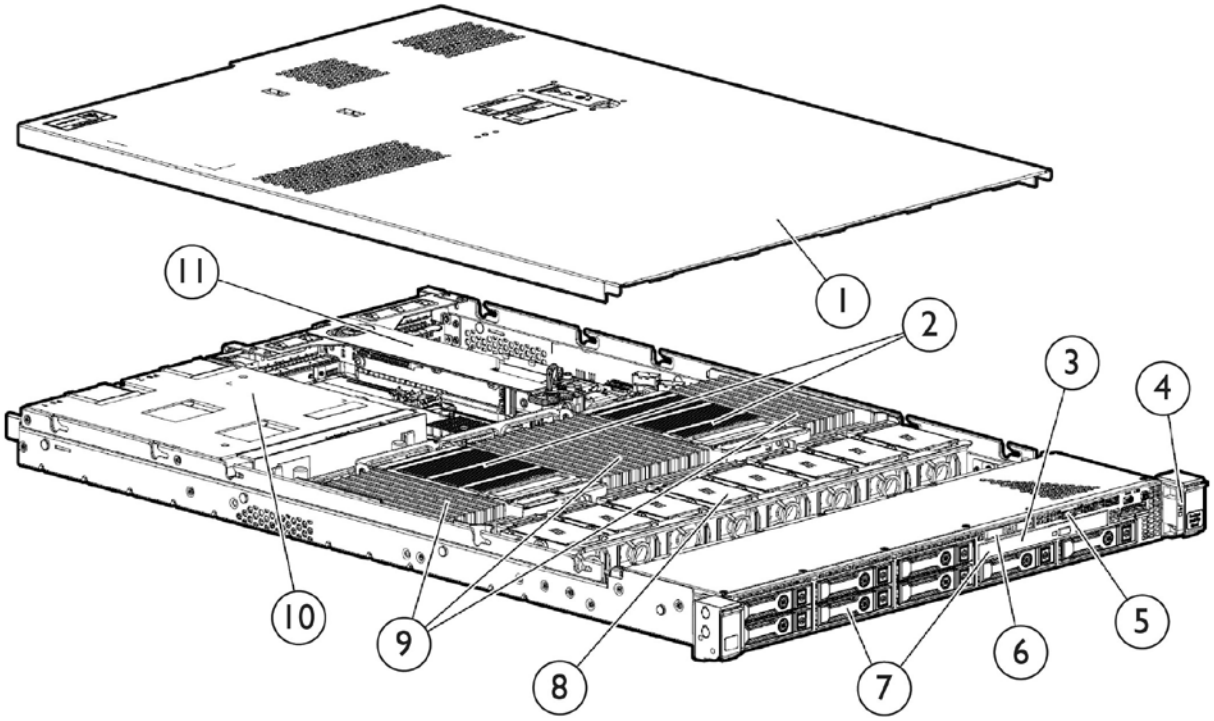


1. 5 Standard Fans Ship for 1P and 7 Standard Fans Ship for 2P
   NOTE: High Performance Fans also available as an option.
2. 2 Processors with HP Smart Socket Guide
3. HP Smart Storage Battery
4. 24 DDR4 DIMM slots (12 per processor)
5. MicroSD card slot
6. Dual Internal USB 3.0 connector
7. HP Flexible Smart Array or Smart HBA
8. 2 HP Flexible Slot Power supplies
9. Secondary PCIe 3.0 riser for PCIe slot 3 (requires CPU 2)
10. Embedded 4x1Gbe NIC
11. Primary PCIe 3.0 riser for PCIe slots 1 & 2
12. FlexibleLOM Bay
13. Embedded SATA Controller ports

4.2 HP ProLiant DL360p Gen8

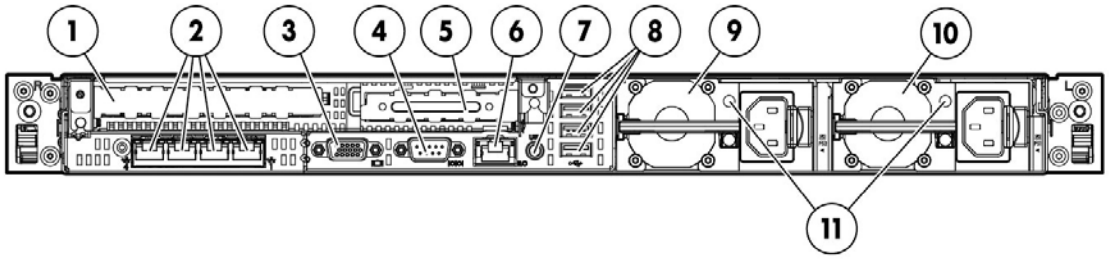
We currently qualify the HP DL360P Gen8 server; however, this server is no longer available for purchase in some regions. This 1U form factor server provides enough expansion for NICs and drives to suit all MCS deployments.

DL360p Gen8 - Overview



1. Hood cover
2. Up to two Intel® E5-2600 Series processors
3. Optical Disk Drive Bay
4. Active Health and Network Status LEDs
5. Video connector (requires Front Video Adapter Kit)
6. Slide-out System Insight Display (SID)
7. Hard Drive Bays
8. Removable hot-plug fan modules for easy serviceability
9. 24 DIMM slots
10. Redundant Hot Plug Power Supplies (upgradeable option)
11. Removable Riser Cage assembly for 2 x PCIe 3.0 Slots

DL360p Gen8 - Back



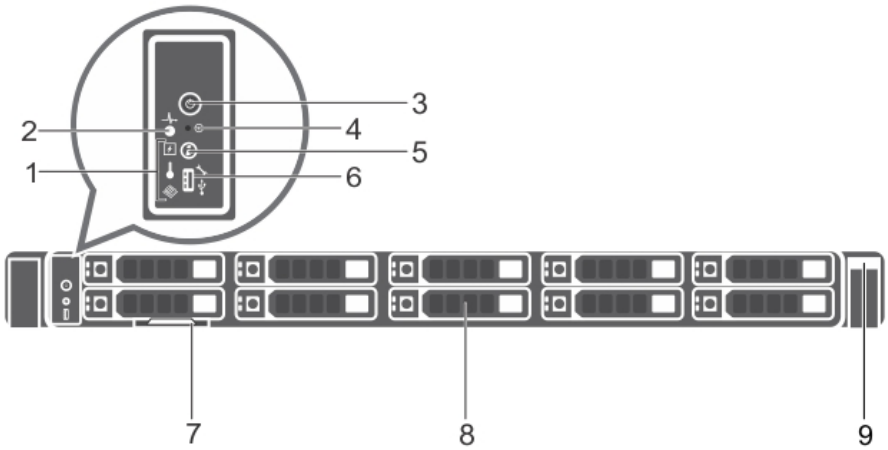
1. PCIe 3.0 Full-height/half length x16 expansion slot
   (Myricom 10GigE / HP NC365T GigE NIC card goes here)
2. FlexibleLOM ports (Shown: 4 ports 1Gb each)
3. Video connector
4. Serial connector
5. PCIe 3.0 Low Profile x8 expansion slot (*not used*)
6. iLO Management Engine NIC connector
7. Unit ID LED/button
8. 4 USB connectors
9. Power supply bay 2 (Shown populated: Optional Power Supply for Redundant Power)
10. Power supply bay 1 (Primary Power Supply)
11. Power Supplies Health/Activity Indicators

4.3 Dell PowerEdge R630

We currently qualify the Dell PowerEdge R630 server. This 1U form factor server provides enough expansion for NICs and drives to suit all MCS deployments.

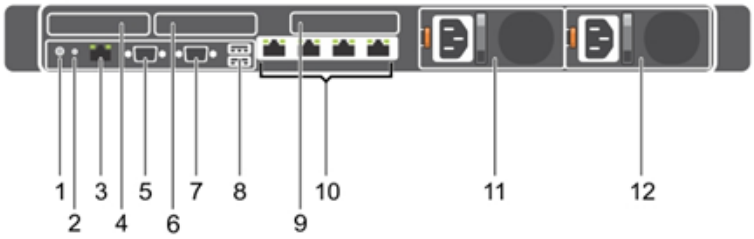
The Dell PowerEdge R620 is also supported, but is unavailable for purchase in some regions.

PowerEdge R630 - Front



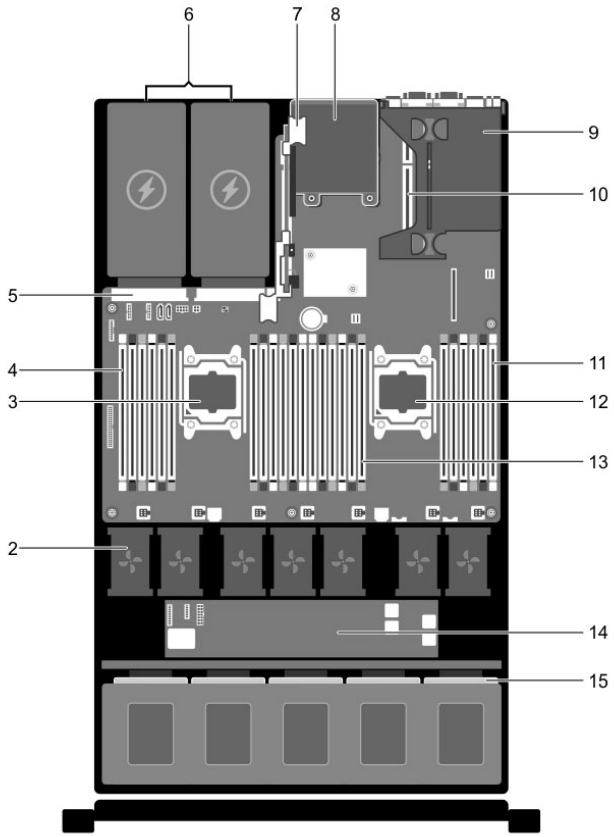
1. Diagnostic indicators
2. System health indicator
3. Power-on indicator, power button
4. NMI button
5. System identification button
6. Mini USB connector/iDRAC Direct
7. Information tag
8. Hard drives (10)
9. Quick Sync

PowerEdge R630 - Back



1. System identification button
2. System identification connector
3. iDRAC8 Enterprise port
4. LP PCIe expansion card slot (riser 1)
5. Serial connector
6. LP PCIe expansion card slot (riser 2)
7. Video connector
8. USB connectors (2)
9. LP PCIe expansion card slot (riser 3)
10. Ethernet connectors (4)
11. Power supply (PSU1)
12. Power supply (PSU2)

PowerEdge R630 - Top



1. Control panel assembly (not indicated)
2. Cooling fans (7)
3. Processor 1
4. DIMMs (6)
5. PSU connector
6. Power supply (2)
7. Riser card
8. Network daughter card
9. Riser card 1
10. Riser card 2
11. DIMMs (6)
12. Processor 2
13. DIMMs (12)
14. Expander board
15. Hard drive

5 Operating System Requirements

MCS requires Red Hat Enterprise Linux (RHEL), a commercially supported open source operating system. RHEL is not free, and Avid does not redistribute it or include it as part of the MCS solution.

***Note**: For information on the supported RHEL version see the* **MediaCentral Platform 2.2 ReadMe**.

In order to be legally compliant with the RHEL EULA, customers are required to procure a RHEL support subscription, a commercial offering that recurs annually. RHEL support offers two key components:

- Technical support for OS-related issues. The level of support depends on the support subscription purchased by the customer.
- Indemnification. Because RHEL is an open source project, there is a risk that it will be discovered to infringe on patents and the patent holders will take legal action. Red Hat protects its customers by taking legal responsibility for the distribution.

There are two different ways to provision RHEL support:

- HP offers RHEL 3-yr. renewable support subscriptions.
- Red Hat offers different tiers of annual support subscriptions directly.

5.1 HP RHEL Support

HP RHEL support covers indemnification and provides technical support staffed by people who specialize in Red Hat running on HP servers. This option is fairly expensive (compared to Red Hat direct offerings) but gives the customer 'one throat to choke' for OS and hardware related issues. It also is an easier purchase process—the customer simply adds it to the HP server order.

Item	Qty	Part Number	Component	Description
1	1	BC321AAE	RHEL 6 Support	Red Hat Enterprise Linux 2 Sockets 1 Guest 3 Year Subscription 24x7 Support No Media Lic E-LTU

HP provides other RHEL support options (shorter terms, support for more server sockets and/or virtual guests), but we see this option as the most appropriate for MCS deployments. For more information, visit:

http://h30094.www3.hp.com/searchresults.aspx?store_id=17&search_id=180&dept_id=1128

5.2 Dell RHEL Support

For information on Dell RHEL support:

http://www.dell.com/redhat

http://en.community.dell.com/techcenter/os-applications/w/wiki/red-hat

http://www.dell.com/learn/us/en/qto87/operating-systems/redhatalliance

5.3 Direct RHEL Support

Price-sensitive customers may prefer to provision RHEL support subscriptions directly from Red Hat. In this case, they order the server with no OS. In parallel they buy RHEL support from Red Hat—in which case they have different support tiers to choose from.

The least expensive option is RHEL Self-Support. It is roughly 25% of the cost of the HP RHEL support, but it covers indemnification only. For actual technical support issues, it simply provides access to Red Hat online resources and community support. It should be noted that OS-related issues for MCS are *extremely* rare (in fact, so far unprecedented). For more information on Red Hat's support offerings and pricing, visit:

https://www.redhat.com/wapps/store/catalog.html

5.4 Optional Support

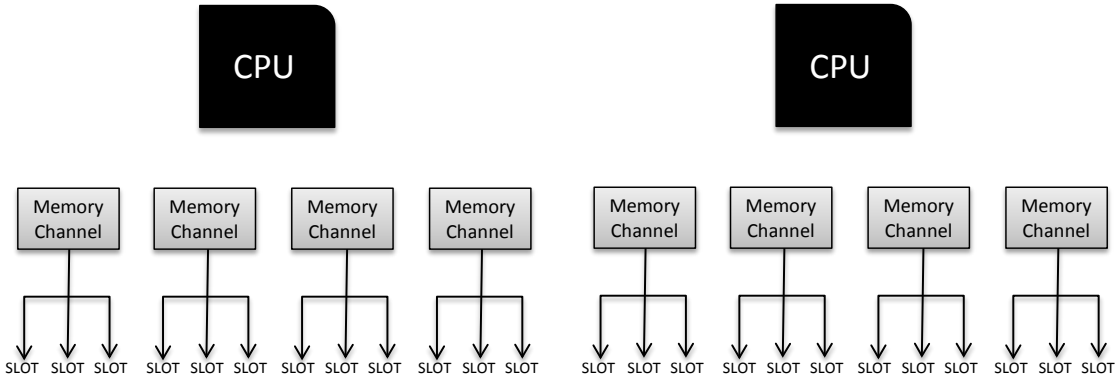
HP and Dell offer several support options varying in coverage and duration. Customers should purchase the support option they feel is appropriate for their operation.

6 Memory Requirements

The following table summarizes the memory requirements.

RAM	Description
96GB	Minimum RAM required for all deployments
128GB	Minimum RAM required for deployments with high-quality streaming and/or Media | Index

To optimize RAM configuration and slot usage, it is helpful to understand how the Intel Xeon 2650L V3 CPU handles its RAM. As shown in the following illustration, the CPU features 4 memory channels with 3 DIMM slots per channel. When populating the motherboard with RAM, ideally each channel receives at least one DIMM (not shown in illustration).

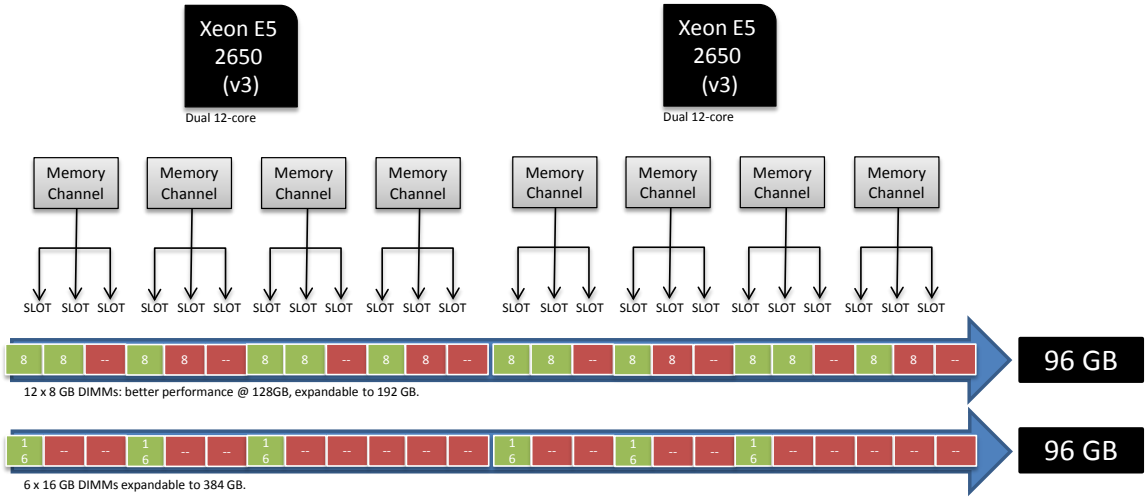


For optimal memory performance, select RAM in "kits" of matched DIMMS that correspond to the available memory channels (e.g. x4, x8). For example, you could deploy two x4 kits, or one x8 kit. A x4 kit would consist of 4 matched DIMMs. An x8 kit would consist of 8 matched DIMMs. Matched DIMMs are tested and guaranteed to perform well when installed, one per channel, in each of a CPUs memory channels. DIMM slots are usually color coded to indicate each memory channel.

Mixing DIMMs of different size and/or different kits is not recommended, and can result in performance degradation that can be hard to diagnose and remedy. Please consult your hardware vendor for assistance with RAM configuration.

6.1 96GB RAM Slot Usage

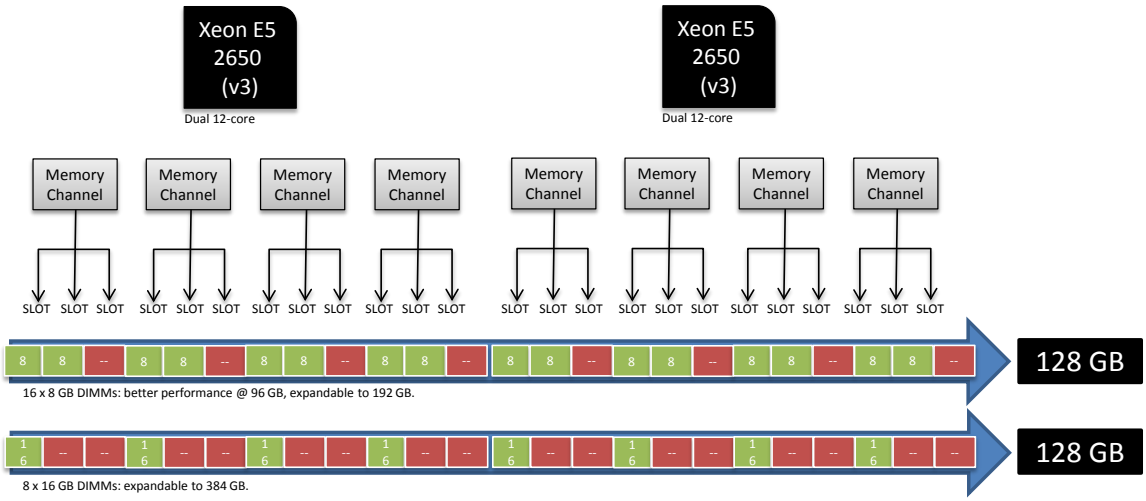
When configuring the server with 96GB RAM, the following illustration shows acceptable DIMM placement.



In the above illustration, note that the first configuration (12 x 8GB DIMMs) indicates best use of the CPU's capabilities, since it populates each memory channel. As noted, unused memory channels can result in suboptimal RAM performance.

6.2 128GB RAM Slot Usage

When configuring the server with 128GB RAM, the following illustration shows acceptable DIMM placement.



In the above illustration, both deployment styles are acceptable, since each channel receives at least one DIMM.

7 Caching and HDD Requirements

In several workflows, MCS generates and caches web and mobile format media assets. These workflows include:

- Multi-cam logging functionality is used in MediaCentral | UX, must be configured with media cache drives.
- iOS application Interplay and iNEWS video asset playback.
- Interplay | MAM browse proxy file-based playback for formats that cannot be natively loaded in the Flash player (MPEG-1, Sony XDCAM, WMV, Harmonic MXF).

These workflows all share the same requirement: video playback from a web or mobile application is requested of a source media asset that is not web or mobile compliant. In this case MCS must locally generate a web and mobile compliant copy of the source media asset. This asset is then served to the requesting web or mobile application. The asset is also cached in anticipation of a subsequent playback request.

As a result, additional drives are required on MCS servers for this cache:

- ☐ The HP ProLiant DL360 supports up to 8 internal drives. 2 drives are used for the operating system (in a RAID 1 configuration).
- ☐ The Dell PowerEdge R630 supports up to 10 internal drives. 2 drives are used for the operating system (in a RAID 1 configuration).

The following table summarizes caching requirements:

Deployment	Cache Requirements	Comments
MCS for MediaCentral	*Yes. A media cache is required.*	Populated with JPEG images when multi-cam logging is performed and MPEG-2 Transport Stream media files when the iOS application is used.
MCS for MediaCentral: iNEWS-only	*No. A media cache is not required.*	
MCS for Interplay | MAM: Other Browse Proxy Formats	*Yes. A media cache is required.*	Populated with FLV videos when a file-based playback request is made of any non-MP4 (h.264/aac) format proxy.
MCS for Interplay | MAM: MP4 (h.264/aac) browse proxies	*No. A media cache is not required.*	
For hard drive specifications and the number of drives required, see "*Media Cache Drive Configuration*", below.		

7.1 Media Cache Drive Configuration

When a media cache is required, the following options are supported:

Drives	Volume Configuration and Notes
1	A single hard drive configured as a separate volume. This configuration provides no redundancy in case of hard drive failure.
2	2 drives configured as a RAID1 volume. This configuration provides redundancy in case one of the hard drives fails.
6	6 drives configured as a RAID5 volume. This configuration provides redundancy in the event of hard drive failure. It also provides increase I/O for a higher volume of proxy generation and serving.
Important: In all cases, the media cache is distinct from, and in addition to, the 2 HDD RAID1 volume configured for the operating system.	

The cache drives can be sourced directly from HP/Dell as part of your server requisition. The following drives are recommended:

Supplier	Item	Qty	Part Number / Product Code	Description
HP	1	6	652572-B21	HP 450GB 6G SAS 10K SFF (2.5-inch) SC Enterprise 3 yr Warranty HDD
Dell	1	6	600S10	600GB 10K RPM SAS 6Gbps 2.5in Hot-plug Hard Drive

8 Optional Items for Connection to ISIS

MCS provides playback of video assets registered in Interplay | Production and residing on an ISIS over a Zone 1, Zone 2, or Zone 3 (recommended) connection, GigE or 10GigE. A 10GigE connection is required for any MediaCentral deployment that will use 100+ Mbps video formats (e.g., AVC-I 100, DVCPro 100, DNxHD 145).

- If you are connecting MCS server(s) to the ISIS via GigE, the following GigE NIC is required, *and can be sourced directly from HP/Dell as part of your server requisition*.

Item	Qty	HP/Dell Part Number	Component	Description
1	1	665240-B21 (Gen9 Part Number)	GigE NIC	HP Ethernet 1Gb 4-port 366FLR FIO adapter
		684217-B21 (Gen8 Part Number)	GigE NIC	HP Ethernet 1Gb 4-port 366FLR FIO adapter
1	1	540-BBHF (R620 & R630)	GigE NIC	Intel Ethernet i350 QP 1Gb Network Daughter Card

- The following GigE NIC is still supported for ISIS connections:

Item	Qty	HP Part Number	Component	Description
1	1	593722-B21	GigE NIC	HP NC365T 4-port Ethernet Server Adapter

- If you are connecting MCS server(s) to the ISIS via 10GigE, the following 10GigE NIC is required, *and can be sourced from Avid*. This is the only NIC that works with the ISIS client—if another 10GigE NIC is installed, it will have unknown performance characteristics and may simply not work.

Item	Qty	Avid Part Number	Component	Description
1	1	7010-30241-01	10 GigE NIC	Single Channel 10 GigE PCI-e network interface card with short range (SR) integrated optics

Note: If you are connecting the MCS servers to the ISIS via 10GigE, additional networking infrastructure may be required. Make sure you review solution design with an Avid representative.

9 Deploying Multiple Servers

Determining the number of MCS servers required for a given installation can be challenging. Some MCS deployments are straightforward, but other can be difficult because MCS provides several different playback methods that have very different CPU and I/O footprints. In cases where different playback methods are used, it can get complicated.

The two factors that determine the quantity of servers required for an MCS deployment are *redundancy* and *horizontal scale*.

9.1 About MCS Video Playback

MCS for MediaCentral provides playback of different format video assets registered by Interplay | Production and residing on ISIS. MCS decodes the source format and streams images and sound to the remote web-based MediaCentral client.

MediaCentral playback capacity per server is limited by one of two factors:

- *CPU bound*: after a certain number of playback streams, the server has no more CPU cycles left
- *I/O bound*: after a certain number of streams, the servers connection to the ISIS cannot draw any more

Different source formats have different CPU-decode profiles, and different I/O footprints. Typically: low bitrate source formats are CPU bound; high-bitrate source formats are I/O bound.

The other factor that determines whether a source format is CPU or I/O bound is the ISIS connection, which is either GigE or 10GigE.

9.2 Redundancy

The first factor that may require adding a server is if the customer requires redundancy for all services.

An MCS deployment is at minimum a single playback server. However, in most cases we recommend that customers deploy two servers to obtain high-availability. Depending on source formats and the expected number of concurrent users at peak usage—more servers may be required in a load-balanced playback server cluster.

No special hardware is required for redundancy with MCS. Failover and load balancing are provided by software services running directly on the MCS server(s).

So, the first question you have to answer when trying to determine how many servers are needed is:

Is high-availability required?

- If **no**, then one server is required, possibly more *only if* concurrent usage peaks are not satisfied by the playback capacity of a single server.
- If yes, then two servers are required, possibly more *only if* concurrent usage peaks are not satisfied by the playback capacity of two servers. See "***11.2.3 Media Format and Stream Count Assessment***" on page 32.

9.3 Horizontal Scale

Most MCS services run on a single server and at most failover to another server in the cluster. The MediaCentral Playback Services (MCPS), however, are the hungriest services (CPU and memory) and are designed to run on all servers in the cluster such that playback sessions are distributed, or load-balanced, across all servers. This allows for horizontal scale—adding servers in a cluster to accommodate increased capacity.

10 HP DL360 Gen9 Hardware Requirements

The following table presents the minimum server specification.

Item	Qty	Part Number	Component	Description
1	1	755258-B21	Product	HP ProLiant DL360 Gen9 8-SFF Configure-to-order (CTO) Server
2	1	764101-L21	Processors	HP DL360p Gen9 E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO (Factory Installation Option) Processor Kit
3	1	764101-B21		HP DL360p Gen9 E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit
4	12	726718-B21	Memory*	HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit
5		766205-B21	Storage controller**	HP DL360 Gen9 Smart Array P840 SAS Card with Cable Kit
6		--	Drive cage	HP 8-Bay Small Form Factor Drive Cage
		764630-B21	Additional drive cage	HP DL360 Gen9 2SFF SAS/SATA Universal Media Bay Kit
7	2	652745-B21	1st hard drive & 2nd hard drive	HP 500GB 6G SAS 7.2K rpm SFF (2.5in) SC Midline 1 yr Warranty Hard Drive
	6	652572-B21	3rd through 8th hard drives***	HP 450GB 6G SAS 10K SFF (2.5-inch) SC Enterprise 3 yr Warranty HDD
8		--	RAID setting	None. Do not specify a RAID setting when ordering. RAID is configured during software installation.
		784308-B21	BIOS Mode/ Controller State Setting	HP FIO Enable B140i Setting
10		665240-B21	FlexibleLOM options/ upgrades****	HP Ethernet 1GbE 4-port 366FLR (FlexibleLOM form factor) FIO (Factory Installed Option) adapter
11	2	720479-B21	Power Supply	HP 800W Flex Slot Platinum Hot Plug Power Supply Kit
12	2	AF556A	Power Cord	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord

Item	Qty	Part Number	Component	Description
13	1	663201-B21	Rail Kit	HP 1U Small Form Factor Ball Bearing Rail Kit

*Alternately, to configure 6x16GB RAM (for a total of 96GB RAM), HP online server configuration requires the following selection (select once for each of the two CPUs):

HP 48GB (3x16GB) Dual Rank x4 Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit

Before provisioning memory, see "***Additional Note on Item #4***", below.

**Includes the P840 Smart Array controller with 4GB integrated cache, HP Smart Storage Battery, and associated cabling to attach it to a 10SFF configuration.

The procurement of additional HDDs for caching depends on deployment and media formats. See "Caching and HDD Requirements***" on page 19.

****For non-ISIS connections, you can substitute the following adapter instead:

HP Ethernet 1GbE 4-port 331FLR (FlexibleLOM form factor) FIO (Factory Installation Option) Adapter (part # 684208-B21)

Note on Item #4*—The server must be configured with 12x8GB RAM DIMMs. Some clusters in the field have been found with nodes using different configurations of 8 and 4 GB DIMMs in different configurations, which can adversely affect system synchronization required for stable playback.*

Additional Note on Item #4*—If you plan to enable settings in MediaCentral UX permitting playback at higher image quality you must configure more memory than indicated in the body of the table. See "Adding Memory to Accommodate Higher-Quality Playback" on page 30.*

Note on Item #7*—The DL360 supports up to 8 internal drives. 2 drives are required for the operating system (in a RAID 1 configuration). In some cases, additional drives may be required for file caching. See "***Caching and HDD Requirements***" on page 19.*

Note on Item #10*—This HP Ethernet 1GbE 4-port 331FLR adapter (network interface card) cannot be used for an ISIS connection! If you are purchasing servers to configure MCS for use with MediaCentral connected to one or more ISIS storage systems, substitute the substitute the HP Ethernet 1Gb 4-port 366FLR FIO adapter instead. See also "Optional Items for Connection to ISIS " on page 21.*

Note on Item #12*—The power cord indicated is standard for North America, Central America, parts of South America, and other countries. Please ensure you specify the correct power cord for your particular geographical region.*

10.1 Complete List of Supported CPUs

The following is the complete list of E5-2600 V3 series processors supported for MCS.

Part Number	Description
755388-L21/B21	HP DL360 Gen9 Intel Xeon E5-2650v3 (2.3GHz/10-core/25MB/105 W)
755390-L21/B21	HP DL360 Gen9 Intel Xeon E5-2660v3 (2.6 GHz/10-core/25MB/105 W)
755392-L21/B21	HP DL360 Gen9 Intel Xeon E5-2670v3 (2.3 GHz/12-core/30MB/120 W)
755394-L21/B21	HP DL360 Gen9 Intel Xeon E5-2680v3 (2.5 GHz/12-core/30MB/120 W)
755396-L21/B21	HP DL360 Gen9 Intel Xeon E5-2690v3 (2.6 GHz/12-core/30MB/135 W)
755398-L21/B21	HP DL360 Gen9 Intel Xeon E5-2683v3 (2.0 GHz/14-core/35MB/120 W)
755400-L21/B21	HP DL360 Gen9 Intel Xeon E5-2695v3 (2.3 GHz/14-core/35MB/120 W)
755402-L21/B21	HP DL360 Gen9 Intel Xeon E5-2697v3 (2.6 GHz/14-core/35MB/145 W)
755408-L21/B21	HP DL360 Gen9 Intel Xeon E5-2667v3 (3.2 GHz/8-core/20MB/135 W)
764099-L21/B21	HP DL360 Gen9 Intel Xeon E5-2698v3 (2.3 GHz/16-core/40MB/135 W)
764101-L21/B21	HP DL360 Gen9 Intel Xeon E5-2650Lv3 (1.8GHz/12-core/30MB/65 W)
780003-L21/B21	HP DL360 Gen9 Intel Xeon E5-2699v3 (2.3 GHz/18-core/45MB/145 W)

11 Dell PowerEdge R630 Hardware Requirements

The following table presents the minimum server specification.

Item	Qty	Product Code	Component	Description
1	1	R630	Product	PowerEdge R630 Server, No TPM
2	--	103P	Chassis Configuration	Chassis with up to 10, 2.5" Hard Drives, 3 PCIe Slots
3	1	10523	Processors	Intel® Xeon® E5-2650 v3 2.3GHz,25M Cache,9.60GT/s QPI,Turbo,HT,10C/20T (105W)
4	1	A10523		Intel® Xeon® E5-2650 v3 2.3GHz,25M Cache,9.60GT/s QPI,Turbo,HT,10C/20T (105W)
5	1	HS1202	Processor Thermal Configuration	2 CPU up to 120W
6	--	--	PCIe Riser	None
7	--	R2133	Memory DIMM Type and Speed	2133MT/s RDIMMs
8	--	AECC	Memory Configuration Type	Advanced ECC
	12	8G2R	Memory Capacity*	8GB RDIMM, 2133MT/s, Dual Rank, x8 Data Width
8	--	URH	RAID Configuration	Unconfigured RAID for H330/H730/H730P (1-24 HDDs or SSDs)
9	1	H7301G	Storage Controller**	PERC H730 RAID Controller, 1GB NV Cache
10	8	600S10	Hard Drives	600GB 10K RPM SAS 6Gbps 2.5in Hot-plug Hard Drive
11	1	I350	Network Daughter Card	Intel Ethernet i350 QP 1Gb Network Daughter Card
12	--	--	Additional Network Cards	No additional NIC cards
13	--	--	Host Bus Adapter/Converged Network Adapter	No host bus adapter
14	--	--	Additional PCIe cards	No additional PCIe cards

Item	Qty	Product Code	Component	Description
15	1	I8EXP	Embedded Systems Management	iDRAC8 Express, integrated Dell Remote Access Controller, Express
16	--	--	Internal SD module	None
17	--	NODVD1	Internal Optical Drive	No internal optical drive
18	--	NOBEZL	Bezel	No bezel
19		RRCMA	Rack Rails	ReadyRails™ Sliding Rails With Cable Management Arm
20	--	HPBIOS	Performance BIOS Setting	Performance BIOS Setting
21	1	495R	Power Supply	Dual, Hot-plug, Redundant Power Supply (1+1), 495W
22	2	125V10	Power Cord	NEMA 5-15P to C13 Wall Plug, 125 Volt, 15 AMP, 10 Feet (3m), Power Cord, North America
23	--	--	Server Accessories	No server accessories
24	--	NODOCS	Systems Documentation	No systems documentation, no OpenManage DVD Kit
25	--	NOOS	Operating System	No operating system
26	--	--	Licenses	No licenses
27	--	NOMED	OS Media Kits	No Media Required
28	--	--	OS Partitions	None
29	--	--	Secondary OS	No secondary OS
30	--	--	Virtualization Software	None
31	--	--	Virtualization Licenses and Subscription	None
32	--	--	Enable Virtualization	None
33	--	--	Database Software	None
34	--	--	Client Access Licenses	No client access licenses
35	--	--	Additional Software Offerings	None

Item	Qty	Product Code	Component	Description
36	--	--	Advanced System Configurations	No advanced system configurations
37	--	--	System Management Upgrades	No system management upgrades
38	--	U3OS	Hardware Support Services	Avid does not have a specific recommendation. Select according to client needs.
39	--	--	Proactive Systems Management	None
40	--	NOINSTL	Installation Services	No installation
41	--	--	Proactive Maintenance	Proactive maintenance declined
42	--	NORCS	Remote Consulting Service	Declined Remote Consulting Service
43	--	--	Additional Installation Services	No additional installation services
45	--	--	Keep Your Hard Drive	None
*For a total of 128GB RAM select the following instead: 8x16GB RDIMM, 2133MT/s, Dual Rank, x4 Data Width - or - 16x8GB RDIMM, 2133MT/s, Dual Rank, x8 Data Width **PERC H730P RAID Controller, 2GB NV Cache (optional)				

Note on Item #22*—The power cord indicated is standard for North America, Central America, parts of South America, and other countries. Please ensure you specify the correct power cord for your particular geographical region.*

12 Over-Specifying and Under-Specifying the Hardware

In some cases a price-sensitive customer looking to set up a smaller deployment may want to provision more cost effective servers because they do not need the capacity of the server specified in this document. We can support that in some cases.

In other cases, a customer may be provisioning for a very large number of users, or looking to support high-density media formats (e.g. AVC-I 50/100). In this case, getting more powerful servers can be more cost effective. This is supported.

- **MediaCentral**: All deployments must provision *no less than* the server specified in this document:
  - 2x E5-2650 8-core 2.0 GHz (2.0GHz/8-core/20MB/95W) CPU
  - 8x HP 8GB 1Rx4 PC3-12800R (DDR3-1600) Registered CAS-11 RAM (total = 64GB)
- **Media Composer | Cloud and MAM**: In cases where not many connections are required, fewer, lower frequency CPU cores and less RAM can be provisioned. Consult Avid product management.
- **In all cases**: Customers can provision faster, more powerful CPUs to get additional capacity from their servers. It should be understood, however, that Avid has not measured server capacity in these cases. We can only say that more concurrent streams will be supported, but we cannot specify how many.

No matter which CPU is provisioned, there are hard and fast rules regarding CPU & memory allocation:

- **CPU**: Sandy Bridge (v1) and Ivy Bridge (v2) CPUs must be a non-energy saving model (e.g. a performance model), minimum 2.4GHz (e.g. an Intel Xeon E5-2600 series 2.0GHz with Turbo Boost Technology capability). Certain approved Haswell (v3) processors (e.g. E5-2650Lv3) are exempt from the non-energy saving restriction.
- **RAM**: For each core, 4GB RAM must be installed. For example:
  - 1 x 6-core CPU → 24GB RAM
  - 2 x 4-core CPU → 32GB RAM
  - 2 x 6-core CPU → 48GB RAM
  - 2 x 8-core CPU → 64GB RAM
  - 2 x 12 core CPU → 96GB RAM

12.1 iNEWS-Only MCS 2.2

Because video playback is not invoked by this configuration, the CPU and memory requirements are reduced. Hardware for this configuration need only meet the following minimum requirements:

- Minimum 2 x quad-core Intel Xeon CPU @ 1.8 GHz or higher
- 12 GB RAM

Any vendor can be supported, though as with all MCS deployments, the installation process is streamlined specifically for HP DL 360/380 G7/Gen8/Gen9 and Dell PowerEdge R630 servers.

12.2 MCS 2.2 & iNEWS on the Same Server

You can install and run MCS and iNEWS on the same server. You can also configure iNEWS on two servers with failover, but MCS only runs on one of them *without* failover. The server hardware requirements for these configurations are the same as for iNEWS-only MCS.

13 Adding Memory to Accommodate Higher-Quality Playback

In MediaCentral 2.0 a feature was introduced where you can add users to a group with the ability to set a maximum JPEG stream image size of up to 960px wide (as opposed to the default maximum width of 480px). If this option is used, MediaCentral servers must be provided with additional RAM, as indicated in the following table:

RAM	Description
96GB	Minimum RAM required for all deployments
128GB	Minimum RAM required for deployments with high-quality streaming and/or Media | Index

13.1 Intel Xeon 2650L V3 CPU

If you have not already provisioned the system with the minimum RAM requirements (12x8GB = 96GB DIMMs), use the following table to accommodate higher-quality playback (8x16GB = 128GB DIMMs):

Qty	Part Number	Component	Description
8	726719-B21	Memory	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit
8	16G2R	Memory	Dell 8x16GB RDIMM, 2133MT/s, Dual Rank, x4 Data Width

If the system has already been provisioned with 12x8GB DIMMs, purchase an *additional* 4x8GB of identical RAM, as illustrated in the following table:

Qty	Part Number	Component	Description
4	726718-B21	Memory	HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit
4	8G2R	Memory	Dell 8GB RDIMM, 2133MT/s, Dual Rank, x8 Data Width

14 How Many Servers: MediaCentral & Media Composer | Cloud

This section of the document explains how to calculate the number of servers needed for MediaCentral and Media Composer | Cloud deployments (including deployments where MediaCentral and Media Composer | Cloud share the same MCS cluster).

Note: The MediaCentral Price Book contains tools where you enter data and the number of servers is automatically calculated for you. Make sure you have the latest price book in case there are changes to server performance capacity numbers.

The following sections cover the things you need to do to determine how many servers a deployment will need.

14.1 iNEWS-only Deployments of MediaCentral?

If you are deploying MediaCentral for iNEWS only, there is no video playback. This means one server is needed, unless high-availability is required, in which case 2 servers are needed.

It also means that a full HP DL360 Gen9 or Dell PowerEdge R630 (as specified in this document) is not required. Instead, you can provision one (or two) server(s) that meet the following minimum requirements:

- Minimum 2 x quad-core Intel Xeon CPU @ 1.8 GHz or higher
- 12 GB RAM
- 2 x 500GB SAS 7.2K hard drives (RAID1 for system drive)

But in most cases MediaCentral is configured with Interplay | Production and playback of video assets is a key part of the solution. In this case, things get more complicated. You've got some data to collect.

14.2 Deployment and Workflow Assessment

To determine the number of servers you need to support your deployment of MediaCentral or Media Composer | Cloud, you need to know the following information:

- Which media formats are in use (e.g. DNxHD 145, XDCAM50, h.264 800Kbps proxy)?
- How many users (peak usage) are expected for each format?
- Is the iOS application being deployed?
- Is Media Composer | Cloud being deployed?
- By which interface is MCS connecting to the ISIS storage (GigE or 10GigE)?
- Is an additional server required for redundancy? (Allowing for peak expected capacity even if one server fails.)

14.3 Media Format and Stream Count Assessment

To determine the number of servers you need to support your deployment of MediaCentral or Media Composer | Cloud, you need to know which media formats are in use because a server can support a certain number of concurrent playback streams per format.

The following tables provide stream counts for the three connection types (MediaCentral, Media Composer | Cloud, and the iOS app) per server, per format, for both GigE and 10GigE connections to the ISIS.

Some notes about the numbers:

- Stream counts with purple shading indicate an I/O bound limit (the server could process more, but it can't pull any more streams over the GigE link).
- Stream counts with green shading indicate a CPU bound limit (the server is using its full compute capacity).
- 100+ Mbps formats not supported over a GigE connection to the ISIS—not enough streams can get through to be cost effective.
- iOS encoding always points to hi-res (this ensures good quality for the Wi-Fi-stream), so no numbers are provided for proxies.

14.3.1 Intel Xeon 2650L V3 CPU

For stream counts for MCS on supported servers equipped with Intel Xeon E5-2650L V3 CPUs, please see "***Ivy Bridge (V2) CPU***", below.

14.3.2 Ivy Bridge (V2) CPU

The following tables provide stream counts for MCS on HP DL360p Gen8 servers equipped with Intel Xeon E5-2650 V2 (Ivy Bridge) CPUs.

Note: For this version of the document, only the Central Users 10 GigE information has been updated.

Format	Central Users		Sphere Users		iOS Users	
	GigE	10 GigE	GigE	10 GigE	GigE	10 GigE
AVC Intra 100	--	14	--	10	--	10
AVC Intra 50	--	15	10	10	10	10
Avid JFIF 2:1/20:1	†	110	†		†	50
DNxHD 145	--	20	--	16	--	16
DNxHD 220x	--	16	--	16	--	16
DNxHD 100	--	22	--	16	--	16
DNX 45	12	24	12	24	12	24
DV 25	30	85	20	42	20	42
DV50	12	53	12	52	12	50
XDCAM EX 35	16	40	16	36	16	42
IMX 30/40	28	68	20	42	20	42
IMX 50	28	70	16	36	16	42
XDCAM HD 17.5/35	18	40	18	30	18	36
XDCAM HD 50	12	34	12	24	12	24
Proxy h.264	120	120	60	60	50	50
Proxy h.263	80	95	30	30	50	50

†Information unavailable at time of publication.

14.3.3 Sandy Bridge (non V2) CPU

The following tables provide stream counts for HP DL360p Gen8 servers equipped with Intel Xeon E5-2650 (Sandy Bridge) CPUs.

Format	GigE	10 GigE	GigE	10 GigE	GigE	10 GigE
	Central Users		Sphere Users		iOS Users	
DNxHD 80-145; DVCPRO-HD	--	16	--	16	--	16
AVC Intra 100	--	10	--	10	--	10
AVC Intra 50	10	10	10	10	10	10
Avid JFIF 1:1	†	27	†		†	27
Avid JFIF 2:1/3:1	†	90	†		†	50
Avid JFIF 4:1/8:1/15:1	†	190	†		†	50
Avid JFIF 10:1/20:1	†	124	†		†	50
DNX 36-45, XDCAM HD 50	12	24	12	24	12	24
XDCAM EX 35, IMX50	16	42	16	36	16	42
XDCAM HD 17.5/35	18	36	18	30	18	36
DV50	12	56	12	52	12	50
DV 25; IMX 30/40	20	42	20	42	20	42
Proxy /h.264	120	120	60	60	50	50
Proxy h.263	80	80	30	30	50	50
†Information unavailable at time of publication.						

14.4 Peak Usage Assessment

To determine the number of servers you need to support your deployment of MediaCentral or Media Composer | Cloud, you need to know how many users (at peak) are expected to be working with each media format in use.

For example:

- 30 Media Composer | Cloud users of h.264 800 Kbps proxy
- 30 iOS users of XDCAM 50
- 20 users of DNxHD 145 (no proxy)
- 40 users of XDCAM 50 (no proxy)
- 75 users of h.264 800 Kbps proxy

Determining the number of servers needed is more of an art than a science. The customer has to understand their workflow and load well. It is advisable to be conservative when assessing these numbers.

14.5 Overhead Assessment

To determine the number of servers you need, some overhead must be accounted for:

- There is a constant overhead of 0.25 servers to run non-playback services, followed by the servers needed to run the total number of users for each format.
- If high-availability is required, add one (1) more server.

14.6 Final Assessment

You make the final assessment by bringing in all previous assessments together. For example, given the following data:

- Constant 25% server overhead (.25)
- 10GigE connection to ISIS
- 30 Media Composer | Cloud users of h.264 800 Kbps proxy @ 60 streams/server (30/60)
- 30 iOS users of XDCAM 50 @ 24 streams/server (30/24)
- 20 users of DNxHD 145 (no proxy) @ 16 streams/server (20/16)
- 40 users of XDCAM 50 (no proxy) @ 24 streams/server (40/24)
- 75 users of h.264 800 Kbps proxy @ 100 streams/server (75/100)
- Plus 1 server for redundancy

You make the following calculation:

$$x = .25 + \frac{30}{60} + \frac{30}{24} + \frac{20}{16} + \frac{40}{24} + \frac{75}{100} + 1$$

which means…

$$x = .25 + .5 + 1.25 + 1.25 + 1.67 + .75 + 1$$

which means…

$$x = 6.67 \text{ servers}$$

We recommend rounding up to ensure capacity—it also gives some additional overhead in case of oversubscription or if you want to add users.

15 How Many Servers: Interplay | MAM

MCS for Interplay | MAM provides playback of different format video assets registered as a browse proxy by Interplay | MAM and residing on standard filesystem storage or proprietary storage that provides a standard system gateway. For each playback request, MCS does one of the following:

- Frame-based playback. MCS decodes the proxy and streams images and audio to the remote web-based client. This playback mode is the same one used by MediaCentral, and is required in MAM for growing file workflows and variable speed playback. This is the most CPU intensive playback mode.
- File-based playback (native). MCS serves the proxy file *as is* to the remote web-based client. This playback mode requires that the proxies be a format that Flash can play natively, i.e., MP4-wrapped h.264/aac or FLV. This is the least CPU intensive playback mode.
- File-based playback (alternate) MCS decodes the proxy and transcodes it to a cached FLV, which is subsequently served to the remote web-based client. This playback method occurs when file-based playback requests are made of proxy formats that cannot be played natively by Flash. This playback method has a one-time CPU hit on initial playback request for each asset, but it subsequently very light because the same cached file is served.

Unlike MediaCentral, MCS playback in Interplay | MAM is very rarely I/O bound. Most Interplay | MAM deployments are on a network that can sustain many, many playback requests.

Armed with this information, it is still difficult to assess how many MCS servers are needed for Interplay | MAM. The foregoing playback methods each have their own CPU footprint, and can be provisioned by MAM to different user groups.

For example, Interplay | MAM can be configured to provision 20 users the rights to use frame-based playback and 1000 users to use only file-based playback. Even then, their proxy repository may be a mix of formats, only some of which can be played natively by Flash.

For this reason, IME product management recommends that you consult with them directly.

The assessment will be based on the HP DL360p Gen8 specification in this document. In some cases (very small deployments), a smaller, less expensive server specification will be recommended (fewer, lower frequency cores, less RAM).

Additionally, if the customer wants to provision servers from another vendor, IME product management will assess the request. You should attach the specifications for the server they want to provision to the completed questionnaire.

Typically the servers specified in this document can:

- Support ~120 frame-based playback streams (growing files) of most Interplay | MAM proxy formats. (Variable speed playback reduces the number of streams per server by ~50%)
- Concurrently transcode ~50 alternate proxy formats to FLV. Because the transcode process is a one-time hit per asset, this usually translates to ~120 concurrent users per server.
- Serve ~4000 h.264 proxy files (provided there is enough outbound network connectivity and proxy storage disk I/O).

If you are requesting a consultation with IME product management for determining how many servers are required for an Interplay | MAM deployment, please request the questionnaire (an *.xls* file) directly. The questions in the questionnaire cover two categories:

- General Project Information
- Formats, Workflows, and Expected Peak Load

15.1 General Project Information

Identify the customer and briefly describe the project.

1. Does the customer require redundancy for the playback service?
   This is separate from adding servers to accommodate capacity.
2. Does the customer want to procure a server from a specific vendor?
   If so, please attach a detailed specification of the target server with this questionnaire.
3. On which storage solution and/or filesystem are the proxies stored?
   If the storage system is proprietary, please indicate the standard filesystem gateway through which MCS will mount it (e.g., Omneon MediaGrid via CIFS).

15.2 Formats, Workflows, & Expected Peak Load

For each registered browse proxy format, answer the following questions:

1. What is the proxy format?
   Please indicate the file container and the codecs used for video and audio essences.
2. What is the expected peak of concurrent streams for this format?
   For example, there may be 100 users, but only 25 users at any given time will be working with assets using this proxy format.
3. Do users of this format require playback of growing files?
   Only MPEG-1 and Sony XDCAM Proxy formats are supported for this workflow.
4. How many streams of variable speed playback are required?
   Interplay | MAM can provision permission to use variable speed playback. As it is a CPU intensive playback method, it should only be provisioned to users who really need it.
5. What is the maximum video image resolution?
   For example, 720x406 pixels.
6. What is the maximum proxy bit rate?
   For example, 3.0 Mbps.

16 Appendix A: HP DL360p Gen8 Hardware Requirements

First of all, you must provision *at least* the following server specification.

Item	Qty	Part Number	Component	Description
1	1	666532-B21	Product	HP ProLiant DL360p Gen8 10-SFF Configure-to-order (CTO) Server
2	1	712726-L21	Processors	HP DL360p Gen8 Intel Xeon E5-2650 V2 (2.6GHz/8-core/20MB/95W) FIO (Factory Installation Option) Processor Kit (Ivy Bridge)
3	1	712726-B21		HP DL360 Gen8 E5-2650 V2 (2.6GHz/8-core/20MB/95W) Processor Kit (Ivy Bridge)
4	8	731761-B21	Memory*	HP 8GB (1x8GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit
5		--	Storage controller**	HP Embedded P420i Smart Array controller
6		--	Drive cage	HP 10-Bay Small Form Factor Drive Cage
7	2	652745-B21	1st hard drive & 2nd hard drive	HP 500GB 6G SAS 7.2K rpm SFF (2.5in) SC Midline 1 yr Warranty Hard Drive
8		--	RAID setting	None. Do not specify a RAID setting when ordering. RAID is configured during software installation.
9		631679-B21	Storage Controller Upgrade	HP 1GB P-series Smart Array Flash Backed Write Cache (FBWC)
10		684217-B21	FlexibleLOM options/upgrades***	HP Ethernet 1GbE 4-port 366FLR (FlexibleLOM form factor) FIO (Factory Installed Option) adapter
11	2	512327-B21	Power Supply	HP 750W Common Slot Gold Hot Power Supply Kit
12	2	AF556A	Power Cord	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord
13	1	663201-B21	Rail Kit	HP 1U Small Form Factor Ball Bearing Gen8 Rail Kit

Item	Qty	Part Number	Component	Description
*To configure 8x8GB RAM (for a total of 64GB RAM), HP online server configuration requires the following selection (select once for each of the two CPUs): HP 32GB (4x8GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit Before provisioning memory, see "***Additional Note on Item #4***", below. **Factory integrated models ship with a P420i Smart Array controller. HP 1GB P-series Smart Array Flash Backed Write Cache (FWBC) upgrade option must be added. ***For non-ISIS connections, you can substitute the following adapter instead: HP Ethernet 1GbE 4-port 331FLR (FlexibleLOM form factor) FIO (Factory Installation Option) Adapter (part # 684208-B21)				

Note on Items #2 & #3— *As of August 2013 the HP ProLiant DL360P Gen8 server also ships with the Intel® Xeon® E5-2650 v2 (Ivy Bridge) processor. Previously it shipped with the E5-2650 Sandy Bridge based processor. The part numbers for the previous generation of processor and related memory are provided the table below. Both processors are supported.*

Item	Qty	Part Number	Component	Description
2	1	654772-L21	Processors	HP DL360p Intel Xeon Gen8 E5-2650 (2.0GHz/8-core/20MB/95W) FIO (Factory Installation Option) Processor Kit (Sandy Bridge)
3	1	654772-B21		HP DL360p Gen8 E5-2650 (2.0GHz/8-core/20MB/95W) Processor Kit (Sandy Bridge)
4	8	647899-B21	Memory	HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Reg CAS-11 Memory Kit

Note on Item #4—*The server must be configured with 8x8GB RAM DIMMs. Some clusters in the field have been found with nodes using different configurations of 8 and 4 GB DIMMs in different configurations, which can adversely affect system synchronization required for stable playback.*

Additional Note on Item #4—*If you plan to enable settings in MediaCentral UX permitting playback at higher image quality you must configure more memory than indicated in the body of the table. See "Adding Memory to Accommodate Higher-Quality Playback" on page 30.*

Note on Item #7—*The DL360p supports up to 8 internal drives. 2 drives are required for the operating system (in a RAID 1 configuration). In some cases, additional drives may be required for file caching. See "Caching and HDD Requirements" on page 19.*

Note on Item #10—*This HP Ethernet 1GbE 4-port 331FLR adapter (network interface card) cannot be used for an ISIS connection! If you are purchasing servers to configure MCS for use with MediaCentral connected to one or more ISIS storage systems, substitute the substitute the HP Ethernet 1Gb 4-port 366FLR FIO adapter instead. See also "Optional Items for Connection to ISIS" on page 21.*

Note on Item #12—*The power cord indicated is standard for North America, Central America, parts of South America, and other countries. Please ensure you specify the correct power cord for your particular geographical region.*

16.1 Complete List of Supported CPUs

The following is the complete list of E5-2600 V2 series processors supported for MCS.

Part Number	Description
712745-B21	HP DL360p Gen8 Intel Xeon E5-2697v2 (2.7 GHz/12-core/30MB/130 W)
712771-B21	HP DL360p Gen8 Intel Xeon E5-2695v2 (2.4 GHz/12-core/30MB/115 W)
712504-B21	HP DL360p Gen8 Intel Xeon E5-2690v2 (3.0 GHz/10-core/25MB/130 W)
712506-B21	HP DL360p Gen8 Intel Xeon E5-2680v2 (2.8 GHz/10-core/25MB/115 W)
712508-B21	HP DL360p Gen8 Intel Xeon E5-2670v2 (2.5 GHz/10-core/25MB/115 W)
712773-B21	HP DL360p Gen8 Intel Xeon E5-2667v2 (3.3 GHz/8-core/25MB/130 W)
712724-B21	HP DL360p Gen8 Intel Xeon E5-2660v2 (2.2 GHz/10-core/25MB/95 W)
712726-B21	HP DL360p Gen8 Intel Xeon E5-2650v2 (2.6 GHz/8-core/20MB/95 W)

The following is the complete list of E5-2600 series processors supported for MCS.

Part Number	Description
664011-B21	HP DL360p Gen8 Intel® Xeon® E5-2690 (2.9GHz/8-core/20MB/135W)
654789-B21	HP DL360p Gen8 Intel® Xeon® E5-2680 (2.7GHz/8-core/20MB/130W)
654786-B21	HP DL360p Gen8 Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/115W)
654791-B21	HP DL360p Gen8 Intel® Xeon® E5-2667 (2.9GHz/6-core/15MB/130W)
666029-B21	HP DL360p Gen8 Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/115W)
654784-B21	HP DL360p Gen8 Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/95W)
654772-B21	HP DL360p Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W)

17 Copyright and Disclaimer

Product specifications are subject to change without notice and do not represent a commitment on the part of Avid Technology, Inc.

The software described in this document is furnished under a license agreement. You can obtain a copy of that license by visiting Avid's Web site at www.avid.com. The terms of that license are also available in the product in the same directory as the software. The software may not be reverse assembled and may be used or copied only in accordance with the terms of the license agreement. It is against the law to copy the software on any medium except as specifically allowed in the license agreement.

Attn. Government User(s). Restricted Rights Legend

U.S. GOVERNMENT RESTRICTED RIGHTS. This Software and its documentation are “commercial computer software” or “commercial computer software documentation.” In the event that such Software or documentation is acquired by or on behalf of a unit or agency of the U.S. Government, all rights with respect to this Software and documentation are subject to the terms of the License Agreement, pursuant to FAR §12.212(a) and/or DFARS §227.7202-1(a), as applicable.

Trademarks

Adrenaline, AirSpeed, ALEX, Alienbrain, Archive, Archive II, Assistant Avid, Avid Unity, Avid Unity ISIS, Avid VideoRAID, CaptureManager, CountDown, Deko, DekoCast, FastBreak, Flexevent, FXDeko, iNEWS, iNEWS Assign, iNEWSControlAir, Instinct, IntelliRender, Intelli-Sat, Intelli-sat Broadcasting Recording Manager, Interplay, ISIS, IsoSync, LaunchPad, LeaderPlus, ListSync, MachineControl, make manage move | media, Media Composer, NewsCutter, NewsView, OMF, OMF Interchange, Open Media Framework, Open Media Management, SIDON, SimulPlay, SimulRecord, SPACE, SPACEShift, Sundance Digital, Sundance, Symphony, Thunder, Titansync, Titan, UnityRAID, Video the Web Way, VideoRAID, VideoSPACE, VideoSpin, and Xdeck are either registered trademarks or trademarks of Avid Technology, Inc. in the United States and/or other countries.

All other trademarks contained herein are the property of their respective owners.

MediaCentral Services 2.2 Hardware Guide• 12 May 2015

• This document is distributed by Avid in online (electronic) form only, and is not available for purchase in printed form.