



# MediaCentral Platform Services v2.7

## Hardware Guide

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### Important Information

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

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, etc.) is required.



*This document provides HP and Dell part numbers as a reference. Prices are not provided, and may differ, depending on your geography and the customer's relationship with HP or Dell. Part numbers may change without notification. Consult the manufacturer directly for updated information.*

### Revision History

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Date Revised	Changes Made
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September 29, 2016	Minor fixes and updated links.
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June 30, 2016	First Publication
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- Clarification for installing [“MCS & iNEWS on the Same Server”](#) on page 15.
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# Overview

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

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 the type of network interface card (NIC) required for your environment
- 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

## What is MediaCentral Platform Services?

MediaCentral Platform Services (MCS) is a set of software services that provide a foundation for applications such as MediaCentral | UX, Interplay | MAM, Media Composer | Cloud, and more. Some of the primary services hosted on the platform are:

- Layouts for various applications and workflows
- Local or global MCS user management and authentication
- A graphical user interface (GUI) for system configuration and management
- Network-based video playback services for web and mobile clients

For more information, see the *MediaCentral Platform Services Concepts and Clustering Guide* at:

[http://avid.force.com/pkb/articles/en\\_US/user\\_guide/Avid-MediaCentral-Documentation](http://avid.force.com/pkb/articles/en_US/user_guide/Avid-MediaCentral-Documentation)

## Buying Hardware for MCS

For the most part, provisioning hardware is straightforward in that it is easy to configure a basic supported server. However, varying workflows and optional video playback methods can add complexity to the hardware provisioning process. Take the time to determine the number of servers required, and the hardware options with which the servers may need to be equipped. Review the following deployment options and associated supported server types:

- MCS supports MediaCentral UX 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 your hardware assessment with a qualified Avid representative before making a final purchase. Reviewing this document is an essential first step prior to consultation that will accelerate the process.

## Server Requirements at a Glance

Determining the number of required servers depends on a number of factors:

1. **Deployment Type:** The type of deployment is the 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 source media format. For example, DNxHD is a resource-intensive media format while Avid JFIF is lightweight in comparison. Thus for the same number of users, fewer servers are needed for a site where the source media is Avid JFIF.
3. **Frame-based vs File-based Playback:**
  - The default playback method for MediaCentral UX is frame-based. In this mode, media is encoded as a series of JPEG files that are streamed directly from the server for playback. This technique provides frame-accuracy and a smooth transition between cuts. Frame-based playback is high quality, but requires a higher network bandwidth than file-based playback.
  - The default playback method for Interplay | MAM is file-based. In this mode, media is encoded as a series of FLV files that are downloaded to the client workstation for playback. File-based playback provides good quality in low-bandwidth situations.
  - Both MediaCentral UX and Interplay MAM allow the end-user to configure the session for either playback method. Frame-based playback is more CPU-intensive in MAM configurations that use an MP4 format with an H.264/AAC essence. In file-based playback in Interplay Production configurations, assets are converted to FLV/MP3 files on the MCS server. The first playback transcodes the file and initially consumes more resources than frame-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 and if 25 concurrent user connections are expected, two servers will be needed to serve media to all users.

The following table summarizes the basic cases for one, two and three or more servers. For more information, see [“Deploying Multiple Servers” on page 15](#).

Number of Servers	Deployment Model	Description
1	Single Server	<p>The minimum deployment model, suitable for MediaCentral for iNEWS-only (browse and edit iNEWS content with no media playback requirement) or environments with few users and / or undemanding transcoding requirements.</p> <p>This solution offers some hardware redundancy (dual power supplies, dual internal drives), but little redundancy for system services.</p>
2	Master and Slave	<p>This is the minimum recommended deployment for most scenarios.</p> <p>Adds automatic failover safety to the basic single-server deployment, plus increased peak-usage and transcoding capacity.</p> <p>This solution offers redundancy for both hardware and system services.</p>

Number of Servers	Deployment Model	Description
3 +	Master, Slave and Load Balancing	<p>Adds increased peak-usage and media transcoding capacity.</p> <p>Deploying multiple servers in a cluster is particularly important for sites with many users and/or resource-hungry media formats.</p> <p>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.</p> <p>This solution offers redundancy for both hardware and system services.</p>

## Adding Servers to an Existing Installation

Over time, a site may wish to expand a single server to a cluster configuration or potentially add nodes to an existing cluster. When purchasing, sites might not be able to obtain server hardware that matches the specifications of the original hardware. Avid supports mixing server hardware for a cluster configuration as long as the following criteria are met:

- Mixed processor speeds and RAM are supported between the servers. However, all servers should meet the minimum RAM requirements outlined in this document.
- RAID1 (OS) and RAID5 (cache) drive sizes do not need to be identical between the old and new servers. However, the DRBD volume size and the Gluster bricks need to be the same sizes. If the new servers include larger drives, some space will be left unused. In other words, if the RAID5 cache volume is 2TB on the original hardware and is 3TB on the new hardware, 1TB will be left unused.
- The network interface card does not need to be of the same type, but the name of the interface must be the same. For example, the naming convention for the network adapters in an HP is “ethx”, while Dell servers use “emx” and “pxp1”. When creating or expanding a cluster, special care and additional steps are required to ensure that all NICs have the same interface name.
- While mixing 1 GB and 10 GB network adapters between the servers is possible, it is not recommended. Avid has not specifically tested clusters containing a mix of 1 GB and 10 GB adapters
- Mixed server generations are supported. For example, an HP Gen 8 server and an HP Gen 9 server are supported together in the same cluster.

## Additional Resources

The following sections provide useful links for vendors discussed in this guide.

### Red Hat Enterprise Linux (RHEL)

Red Hat Enterprise Linux main page:

<https://www.redhat.com/en/technologies/linux-platforms/enterprise-linux>

## Hewlett-Packard (HP) and Dell

Consult the manufacturer's web site for the most up-to-date for resources for researching and configuring the servers supported for MediaCentral Platform Services.

- HP (Enterprise) website (US):  
<https://www.hpe.com/us/en/home.html>
- Dell (Enterprise) website (US):  
<http://www.dell.com/us/business/p/enterprise-products>

## Operating System Requirements and Support

MediaCentral Platform Services requires Red Hat Enterprise Linux (RHEL), a commercially supported open source operating system. Although it is open source, RHEL is not free. Avid does not include or redistribute it as part of the MCS software set.



*For information on the supported RHEL version, see the [Interplay Production and MediaCentral Compatibility Matrix](#) on the Avid Knowledge Base.*

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.

It should be noted that OS-related issues for MCS are extremely rare.

There are two different ways to provision RHEL support:

- HP offers RHEL one and five year renewable support subscriptions.
- Red Hat offers different tiers of annual support subscriptions directly.

## 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 single point of contact for both OS and hardware related issues. It also is an easier purchase process—the customer simply adds it to the HP server order.

Part Number	Component	Description
G3J28AAE	Red Hat Enterprise Linux Server	2 Sockets or 2 Guests 1 Year Subscription 24x7 Support E-LTU
G3J32AAE	Red Hat Enterprise Linux Server	2 Sockets or 2 Guests 5 Year Subscription 24x7 Support E-LTU

HP provides other RHEL support options (subscription periods, support for more server sockets and/or virtual guests), but the two options listed above are the most appropriate selections for MCS deployments. For more information, visit:

<https://h41380.www4.hp.com/red-hat-product-selector/>

## 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” which covers indemnification only. For technical support issues, users have access to Red Hat online resources and community support. For more information on Red Hat’s support offerings and pricing, visit:

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

## Dell RHEL Support

For information on Dell RHEL support, visit:

<http://www.dell.com/redhat>

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

## Optional Support

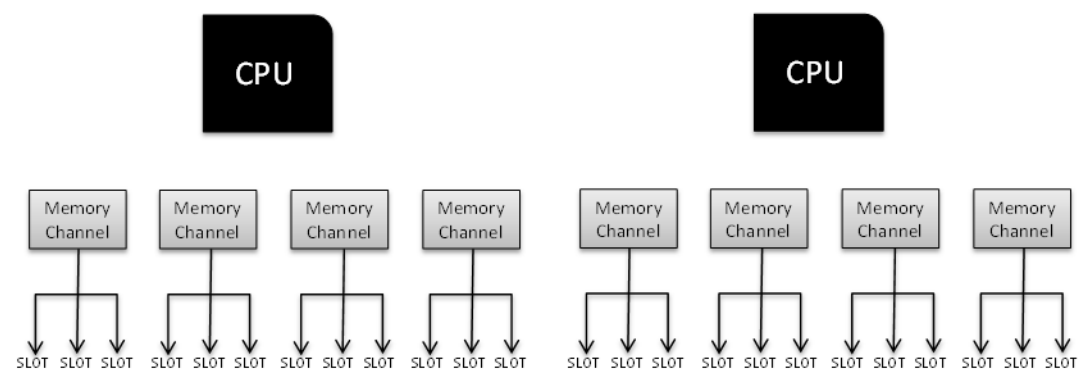
HP and Dell offer several other support options varying in coverage and duration. Customers should purchase the support option they feel is appropriate for their operation.

# Memory Requirements

The following table summarizes the MCS memory requirements:

RAM	Description
64 GB	Minimum RAM required for MCS v2.1 and earlier deployments
96 GB	Minimum RAM required for all current deployments (MCS 2.2 and later)
128 GB	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 processor addresses memory. As shown in the following example, the 2650L V3 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).

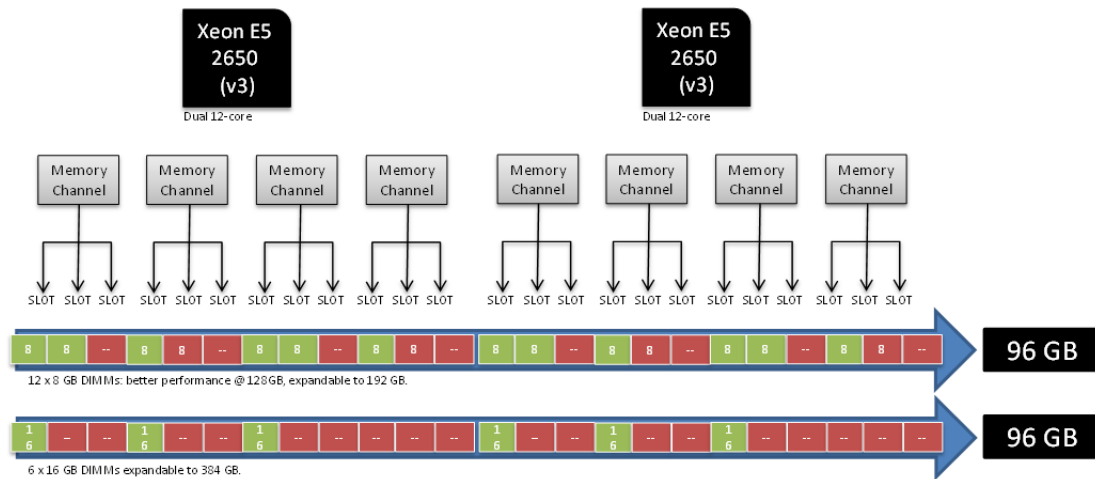


For optimal memory performance, select RAM in “kits” of matched DIMMs that correspond to the available memory channels (e.g. x4, x8). For example, you could deploy two x4 kits, or one x8 kit. A x4 kit would consist of 4 matched DIMMs. An x8 kit would consist of 8 matched DIMMs. Matched DIMMs are tested 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 difficult to diagnose and remedy. Consult your hardware vendor for assistance with RAM configurations.

## 96 GB Memory Configuration

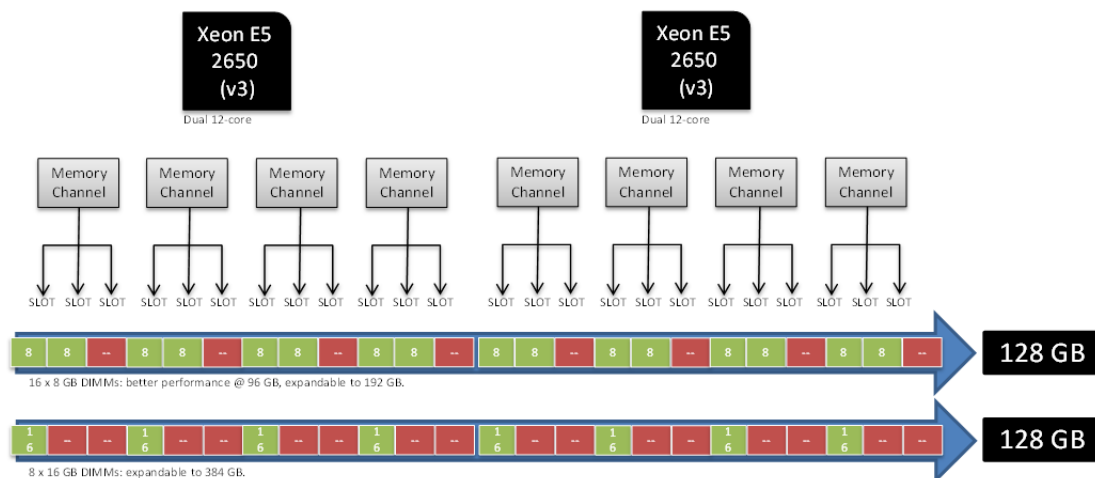
When configuring the server with 96 GB RAM, the following illustration shows acceptable DIMM placement:



In the above illustration, note that the first configuration (12 x 8 GB DIMMs) indicates best use of the CPU's capabilities, since it populates each memory channel. Although the second configuration achieves the desired amount of RAM (96 GB), it is a suboptimal configuration as two memory channels remain unused.

## 128 GB Memory Configuration

When configuring the server with 128 GB 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.

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

## Intel Xeon 2650L V3 CPU

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

Alternatively, if you already provisioned the system with the minimum RAM requirements (12x8 GB = 96 GB DIMMs), all 8 GB DIMMs can be replaced with 16 GB DIMMs (8x16 GB = 128 GB DIMMs):

Qty	Part Number	Component	Description
8	(HP) 726719-B21	Memory	HP 16 GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit
8	(Dell) 16G2R	Memory	Dell 8x16 GB RDIMM, 2133MT/s, Dual Rank, x4 Data Width



*For DIMM placement information, see “128 GB Memory Configuration” on page 9.*


# Caching and HDD Requirements

In several workflows, MCS generates and locally caches transcoded media assets. These workflows include:

- Multi-cam logging in MediaCentral | UX
- Media playback for iOS and Android mobile apps
- 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: asset 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 or 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. In the case of multi-server deployments (cluster), the cached assets are replicated across the servers to reduce future transcoding of the same asset on a different playback server.

As a result, additional drives are required on MCS servers for this cache. The following table summarizes caching requirements:

Deployment	Comments
MediaCentral UX for Interplay Production	<p>Required for:</p> <ul style="list-style-type: none"> <li>• Multicam media - The cache is populated with JPEG images when multi-cam logging is performed.</li> <li>• Media Composer Cloud workflows using multicam media.</li> <li>• Mobile Apps - The cache stores MPEG-2 Transport Stream media files.</li> <li>• File-based playback</li> </ul> <p> <i>Media is not created on the cache while in frame-based playback mode.</i></p>
MediaCentral UX for iNEWS-only	The cache volume is not used with iNEWS-only workflows.
MCS for Interplay   MAM	<ul style="list-style-type: none"> <li>• The cache is populated with FLV files when a file-based playback request is made of any non-MP4 (H.264/aac) format proxy.</li> <li>• The Remote Playback workflow introduced with MCS v2.5 caches JPEGs and audio media for frame-based playback.</li> <li>• The cache is not used when playing back MP4 (H.264/aac) browse proxies.</li> </ul>

For hard drive specifications and the number of drives required, see [Media Cache Drive Configuration](#) below.

## 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 or 8	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 (or equivalent) drives are recommended:

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

# Supported Network Adapters for Avid Shared Storage

MCS provides playback of video assets registered in Interplay | Production and residing on Avid shared storage over a Zone 1, Zone 2, or Zone 3 (recommended) through a 1 Gb or 10 Gb connection.

The following tables list the network adapters that are supported with Avid MediaCentral Platform Services for an Avid shared storage connection. Selecting an adapter that is not represented here will have unknown performance characteristics and may simply not work.

## 1 Gigabit Adapters

If you are connecting MCS server(s) to Avid shared storage via a 1 Gb connection, the following network adapters are supported, and can be sourced directly from HP or Dell (availability may vary).

HP/Dell Part Number	Description
665240-B21 (Gen 9 Part Number)	HP Ethernet 1 Gb 4-port 366FLR FIO adapter
684217-B21 (Gen 8 Part Number)	HP Ethernet 1 Gb 4-port 366FLR FIO adapter
593722-B21 (Gen 8 Part Number)	HP NC365T 4-port Ethernet Server Adapter (HP Gen 8 servers only)
540-BBHF (R620 & R630)	Intel Ethernet i350 QP 1 Gb Network Daughter Card

## 10 Gigabit Adapters

If you are connecting MCS server(s) to Avid shared storage via a 10 Gb connection, the following network adapters are supported, and can be sourced directly from Avid.

A 10 Gb connection is required for any MediaCentral deployment that will use 100+ Mbps video formats (e.g., AVC-I 100, DVCPro 100, DNxHD 145).

Avid Part Number	Description
7010-30241-01	Single Channel 10 Gb PCI-e network interface card with short range (SR) integrated optics
7030-30041-02	Dual-port 10 Gb PCI-e Myricom 10G-PCIE2-8B2-2S card with short range (SR) integrated optics



*If you are connecting the MCS servers with a 10 Gb network adapter, additional networking infrastructure may be required. Make sure you review solution design with an Avid representative.*

## 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. This is supported 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 (iNEWS only):** For more information, see [iNEWS-Only Configurations](#) below.
- **MediaCentral (with playback):** All deployments must provision no less than the following specifications:
  - 2x Intel Xeon E5-2650 8-core 2.0 GHz (2.0GHz/8-core/20MB/95W) CPU
  - 96 GB of RAM
- **MediaCentral (for MAM):** In cases where not many connections are required, a single processor (minimum 6-core) and 24GB of RAM can be provisioned. Consult Avid product management.
- **In all cases:** Customers can provision additional RAM and faster, more powerful CPUs to get increased 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.

If your configuration allows for under-specified hardware, adhere to the following 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). Certain approved Haswell (v3) processors (e.g. E5-2650Lv3) are exempt from the non-energy saving restriction.
- **RAM:** For each core, 4 GB RAM must be installed. For example:
  - 1 x 6-core CPU x 4 GB RAM = 24 GB RAM
  - 2 x 4-core CPU x 4 GB RAM = 32 GB RAM
  - 2 x 6-core CPU x 4 GB RAM = 48 GB RAM
  - 2 x 8-core CPU x 4 GB RAM = 64 GB RAM
  - 2 x 12 core CPU x 4 GB RAM = 96 GB RAM

### iNEWS-Only Configurations

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 ProLiant and Dell PowerEdge servers.

## MCS & iNEWS on the Same Server

MediaCentral Platform Services and Avid iNEWS can be installed on the same physical hardware in a virtualized environment. In other words, a single VM server can host separate MCS and iNEWS virtual machines. Co-installing MCS and iNEWS under a single instance of Red Hat Enterprise Linux (physical or virtual) is not supported.

For more information on installing MediaCentral Platform Services in a virtual environment, see the *MediaCentral Platform Services Virtual Environment with VMware® Best Practices Guide*.

## Deploying Multiple Servers

MCS provides several different playback methods that have very different CPU and I/O footprints. Therefore, determining the number of MCS servers required for a given installation can be challenging.

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

### Redundancy

An MCS deployment is at minimum a single server. However, in most cases Avid recommends deploying at least two servers to obtain high-availability and service redundancy. Depending on source formats and the expected number of concurrent users at peak usage—three or 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 services are provided by software components running directly on the MCS servers.

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 might be sufficient. Additional servers are required if concurrent usage peaks are not satisfied by the playback capacity of a single server.
- If yes, then two servers are required. Additional servers are required if concurrent usage peaks are not satisfied by the playback capacity of the two servers.

For more information, see [“Media Format and Stream Count Assessment”](#) on page 17.

### Horizontal Scale

Most MCS services run on a single server and at most failover to a second server in the cluster. The Playback Services are the most CPU and memory intensive component of the system. They 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.

## Determining Scale: MediaCentral UX for iNEWS

iNEWS-only workflows do not include a video playback component. In this situation, a single MediaCentral server is sufficient. A single server includes power and operating system HDD redundancy, but minimal redundancy for service failures. For additional redundancy, a second server can be added to create a two-node cluster configuration.

The lack of a video playback component also means that under-specified hardware can be utilized in this configuration. For more information, see [“iNEWS-Only Configurations” on page 14](#).

## Determining Scale: MediaCentral UX & Media Composer Cloud Deployments

This section of the document explains how to calculate the number of servers needed for MediaCentral UX and / or Media Composer | Cloud. iNEWS workflows or additional components such as Media | Distribute might also be integrated in this configuration.

To determine the number of servers you need to support your deployment of MediaCentral UX and / 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 MCUX mobile application being deployed?
- Is Media Composer | Cloud being deployed?
- Interface through which MCS is connecting to Avid shared storage (1 Gb or 10 Gb)?
- Preferred level of redundancy?
  - Two servers provide cluster capability for service or hardware failures
  - $(n + 1)$  An additional server that allows for peak expected capacity even if one server fails.

### About Video Playback

MediaCentral Platform Services for MediaCentral UX supports playback of a variety of video formats registered by Interplay | Production and residing on Avid shared storage. MCS decodes the source format and streams images and sound to the MediaCentral UX 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 server's network bandwidth becomes saturated

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

The other factor that determines whether a source format is CPU or I/O bound is the network connection, which is either 1 Gb or 10 Gb.

## 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, as each server can support a certain number of concurrent playback streams per format.

Some notes about the following tables:

- The HP DL360p Gen8 server is used as an example in both tables. For comparison, the first table provides values for this server when populated with the Intel Xeon E5-2650 v1 (**Sandy Bridge**) CPUs. The second table provides information on many of the same formats with the server populated with Intel Xeon E5-2650 v2 (**Ivy Bridge**) CPUs.
- Stream counts with green shading indicate a CPU bound limit (the server is using its full compute capacity).
- Stream counts with orange shading indicate an I/O bound limit (the server can process more streams, but is limited by the 1 Gb network connection).
- 100+ Mbps formats are not supported (NS) over a 1 Gb connection to Avid shared storage, as not enough streams can be processed to be cost effective.
- Information on some formats was not available (NA) at time of publication.
- Mobile encoding always points to hi-res media to ensure good quality for the WiFi-stream. Information on low-res proxy formats is provided in case hi-res media is unavailable.

### Intel Xeon Sandy Bridge (v1) CPU

Format	MCUX Users		Cloud Users		Mobile Users	
	1 Gb	10 Gb	1 Gb	10 Gb	1 Gb	10 Gb
DNxHD 80-145; DVCPRO-HD	NS	16	NS	16	NS	16
AVC Intra 100	NS	10	NS	10	NS	10
AVC Intra 50	10	10	10	10	10	10
Avid JFIF 1:1	NA	27	NA		NA	27
Avid JFIF 2:1/3:1	NA	90	NA		NA	50
Avid JFIF 4:1/8:1/15:1	NA	190	NA		NA	50
Avid JFIF 10:1/20:1	NA	124	NA		NA	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

**Intel Xeon Ivy Bridge (v2) CPU**

Format	MCUX Users		Cloud Users		Mobile Users	
	1 Gb	10 Gb	1 Gb	10 Gb	1 Gb	10 Gb
AVC Intra 50	NS	15	10	10	10	10
AVC Intra 100	NS	14	NS	10	NS	10
Avid JFIF 2:1/20:1	NA	110	NA		NA	50
DNxHD 145	NS	20	NS	16	NS	16
DNxHD 220x	NS	16	NS	16	NS	16
DNxHD 100	NS	22	NS	16	NS	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

**Intel Xeon Haswell (v3) CPU**

For stream counts on supported MCS servers equipped with Intel Xeon E5-2650L v3 (Haswell) CPUs and beyond, reference the “[Intel Xeon Ivy Bridge \(v2\) CPU](#)” table.

**Peak Usage Assessment**

To determine the number of servers you need to support your deployment of MediaCentral | UX 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 Mobile users of XDCAM 50
- 20 MediaCentral UX users of DNxHD 145 (no proxy)
- 40 MediaCentral UX users of XDCAM 50 (no proxy)
- 75 MediaCentral UX users of H.264 800 Kbps proxy

## 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) additional server.

## Final Assessment

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

- 10 Gb network connection to Avid shared storage
- Constant 25% server overhead (.25)
- 30 Media Composer | Cloud users of H.264 800 Kbps proxy @ 60 streams/server (30/60)
- 30 Mobile users of XDCAM 50 @ 24 streams/server (30/24)
- 20 MediaCentral UX users of DNxHD 145 (no proxy) @ 16 streams/server (20/16)
- 40 MediaCentral UX users of XDCAM 50 (no proxy) @ 24 streams/server (40/24)
- 75 MediaCentral UX 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...

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

Avid recommends rounding up to ensure capacity. This method also provides some additional overhead in case of over-subscription or if a minimal number of additional users are added.

## Determining Scale: Interplay | MAM Deployments

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

- 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.
- 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 UX, and is required in MAM for growing file workflows and variable speed playback. This is the most 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 UX, 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, Avid Sales and Product Management are generally consulted for each Interplay | MAM deployment. In some cases (very small deployments), a smaller, less expensive server specification will be recommended (fewer, lower frequency cores, less RAM).

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).
- Process ~30 video analysis requests.

## General Project Information

Having answers to the following questions will help Avid Product Management assess the project:

1. Provide a brief description of the project with specific goals.
2. Does the project require redundancy for the playback service (cluster failover)?

*This is separate from adding servers to accommodate capacity.*

3. Will known servers (HP or Dell) be utilized or are custom servers from a specific vendor be procured?

*If so, attach a detailed specification of the target server with the questionnaire.*

4. On which storage solution and/or file system are the proxies stored?

*If the storage system is proprietary, please indicate the standard file system gateway through which MCS will mount it (e.g., Omneon MediaGrid via CIFS).*

## 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.*

## Qualified Servers

The following sections cover the Avid qualified servers for use with MediaCentral Platform Services. Product descriptions and part numbers have been added (where available).



*This document provides HP and Dell part numbers for each item as a reference. Prices are not provided, and may differ, depending on your geography and the customer's relationship with HP or Dell. Part numbers may change without notification. Consult the manufacturer directly for updated information.*

Refer to the following sections for details on specific servers:

- [HP ProLiant DL360 Gen9](#)
- [HP ProLiant DL360p Gen8](#)
- [HP ProLiant DL380 Gen7](#)
- [Dell PowerEdge R630](#)
- [Dell PowerEdge R620](#)

### HP ProLiant DL360 Gen9

Avid has qualified the HP DL360 Gen9 server for use with MCS. This 1U form factor server provides enough expansion for NICs and drives to suit all MCS deployments.

- HP ProLiant DL360 Gen9 product page:  
<http://www8.hp.com/us/en/products/proliant-servers/product-detail.html?oid=7252836>
- “QuickSpecs” for detailed specifications, including up-to-date options and part numbers:
  - HTML: <http://h20195.www2.hp.com/v2/gethtml.aspx?docname=c04375623>
  - PDF: <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c04375623>
- HP Support Center for this model:  
<http://h20565.www2.hp.com/portal/site/hpsc/public/psi/home/?sp4ts.oid=254886>
- HP RHEL support options:  
<http://h41380.www4.hp.com/red-hat-product-selector/>

### DL360 Gen9 Hardware Requirements

The following table presents the minimum server specifications:

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

Item	Qty	Part Number	Component	Description
4	12	726718-B21	Memory <sup>a</sup>	HP 8 GB (1x8 GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit
5		766205-B21	Storage controller <sup>b</sup>	HP DL360 Gen9 Smart Array P840 SAS Card with Cable Kit
6	-- --		Drive cage	HP 8-Bay Small Form Factor Drive Cage
7		764630-B21	Additional drive cage (optional, but recommended)	HP DL360 Gen9 2SFF SAS/SATA Universal Media Bay Kit
8	2	652745-B21	1st and 2nd hard drive	HP 500 GB 6G SAS 7.2K rpm SFF (2.5in) SC Midline 1 yr Warranty Hard Drive
9	6 or 8	652572-B21	Drives (cache) <sup>c</sup>	HP 450 GB 6G SAS 10K SFF (2.5-inch) SC Enterprise 3 yr Warranty HDD
10	-- --		RAID setting	None. Do not specify a RAID setting when ordering. RAID is configured during software installation.
11		665240-B21	Flexible LOM options / upgrades <sup>d</sup>	HP Ethernet 1 Gb 4-port 366FLR (Flexible LOM form factor) FIO (Factory Installed Option) adapter
12	2	720479-B21	Power Supply	HP 800W Flex Slot Platinum Hot Plug Power Supply Kit
13	2	AF556A	Power Cord	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord
14	1	663201-B21	Rail Kit	HP 1U Small Form Factor Ball Bearing Rail Kit

- a. Alternately, to configure 6x16 GB RAM (for a total of 96 GB RAM), HP online server configuration requires the following selection (select once for each of the two CPUs): HP 48 GB (3x16 GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit. Before provisioning memory, see “Additional Note: Item #4”, below.
- b. Includes the P840 Smart Array controller with 4 GB integrated cache, HP Smart Storage Battery, and associated cabling to attach it to a 10 SFF configuration
- c. The procurement of additional HDDs for caching depends on deployment and media formats. See “[Caching and HDD Requirements](#)” on page 11.
- d. For non-Avid shared storage connections, you can substitute the following adapter instead: HP Ethernet 1 Gb 4-port 331FLR (Flexible LOM form factor) FIO (Factory Installation Option) Adapter (part # 684208-B21)

#### Additional Notes:

- **Item 4:** The server must be configured with 12x8 GB 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.
- **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 10.
- **Items 6 and 7:** The DL360 supports up to 10 internal drives. The included drive cage provides space for up to eight internal HDDs. The additional drive cage (764630-B21) replaces the optical drive bay to accommodate two more HDDs.



*Avid highly recommends ordering the additional drive cage and two additional HDDs for increased storage capacity.*

- **Items 9 and 10:** The first two drives are configured in RAID 1 and host the operating system and MCS software installation. All remaining drives are configured in a RAID 5 as a media file cache. For more information, see [“Caching and HDD Requirements” on page 11](#).
- **Item 11:** This HP Ethernet 1 Gb 4-port 331FLR adapter (network interface card) cannot be used with Avid shared storage! If you are purchasing servers to configure MCS for use with MediaCentral connected to one or more Avid shared storage systems, substitute the HP Ethernet 1 Gb 4-port 366FLR FIO adapter instead. See also [“Supported Network Adapters for Avid Shared Storage” on page 13](#).
- **Item 13:** 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.

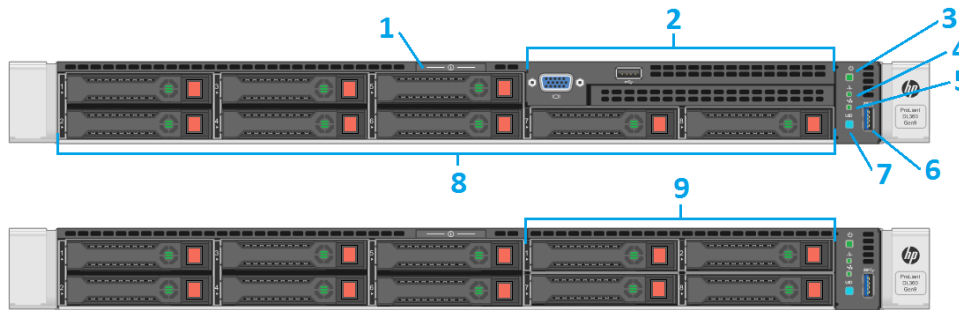
## DL360 Gen9 Supported CPUs

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)

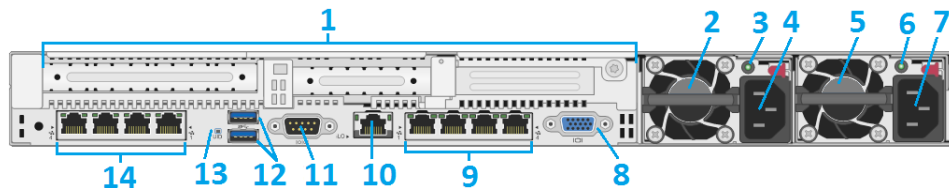
## HP ProLiant DL360 Gen9 Overview

### Front View (8 bay and 10 bay)

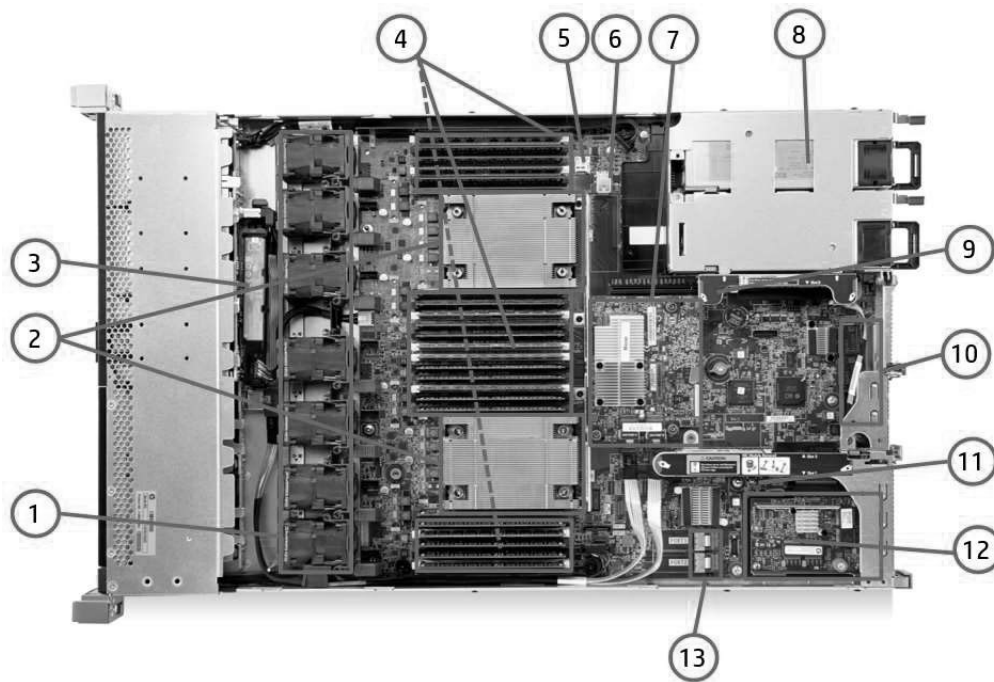


1. Serial Label Pull Tab
2. HP Universal Media Bay
3. Power On/Standby button and system power LED button
4. Health LED
5. NIC Status LED
6. USB 3.0 Connector
7. Unit Identification Button & LED
8. SAS/SATA/SSD Drive Bays
9. Recommended configuration with 2 SFF Drive Cage (764630-B21)

### Rear View



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 4x1 Gb 331i Network Adapter (not supported for Avid shared storage)
10. Dedicated iLO 4 connector
11. Serial Port Connector (Optional)
12. USB 3.0 Connectors (2)
13. Unit Identification LED
14. Flexible LOM bay (Optional, 4x1 Gb shown)

**Top View**

1. Five standard fans ship for 1P and 7 standard fans ship for 2P. High performance fans are also available as an option.
2. Two 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. Two HP Flexible Slot power supplies
9. Secondary PCIe 3.0 riser for PCIe slot 3 (requires CPU 2)
10. Embedded 4x1 Gb 331i Network Adapter (not supported for Avid shared storage)
11. Primary PCIe 3.0 riser for PCIe slots 1 & 2
12. Flexible LOM bay
13. Embedded SATA controller ports

## HP ProLiant DL360p Gen8

Avid has qualified the HP DL360P Gen8 server for use with MCS. This 1U form factor server provides enough expansion for NICs and drives to suit all MCS deployments.

Although no longer available for purchase, this server continues to be supported.

- “QuickSpecs” for detailed specifications, including up-to-date options and part number:

<http://www8.hp.com/h20195/v2/GetPDF.aspx%2Fc04123167.pdf>

- HP Support Center for this model:

<http://h20565.www2.hp.com/portal/site/hpsc/public/psi/home/?sp4ts.oid=254886>

- HP RHEL support options:

<https://h41380.www4.hp.com/red-hat-product-selector/>

### HP DL360p Gen8 Hardware Requirements

The following table presents the minimum server specifications:

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		Memory <sup>a</sup>	HP 8 GB (1x8 GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit
5			Storage controller <sup>b</sup>	HP Embedded P420i Smart Array controller
6			Drive cage	HP 10-Bay Small Form Factor Drive Cage
7	2	652745-B21	1st and 2nd hard drive	HP 500 GB 6G SAS 7.2K rpm SFF (2.5in) SC Midline 1 yr Warranty Hard Drive
8	6	652572-B21	Drives (cache)	HP 450 GB 6G SAS 10K SFF (2.5-inch) SC Enterprise 3 yr Warranty HDD
9			RAID setting	None. Do not specify a RAID setting when ordering. RAID is configured during software installation.
10		631679-B21	Storage Controller Upgrade	HP 1 GB P-series Smart Array Flash Backed Write Cache (FBWC)
11		684217-B21	Flexible LOM options/upgrades <sup>c</sup>	HP Ethernet 1 Gb 4-port 366FLR (Flexible LOM form factor) FIO (Factory Installed Option) adapter
12	2	512327-B21	Power Supply	HP 750W Common Slot Gold Hot Power Supply Kit
13	2	AF556A	Power Cord	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord

Item	Qty	Part Number	Component	Description
14	1	663201-B21	Rail Kit	HP 1U Small Form Factor Ball Bearing Gen8 Rail Kit

a. To configure 8x8 GB RAM (for a total of 64 GB RAM), HP online server configuration requires the following selection (select once for each of the two CPUs): HP 32 GB (4x8 GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit. Before provisioning memory, see “Additional Note: Item #4”, below.  
 b. Factory integrated models ship with a P420i Smart Array controller. HP 1 GB P-series Smart Array Flash Backed Write Cache (FWBC) upgrade option must be added.  
 c. For non-Avid shared storage connections, you can substitute the following adapter instead: HP Ethernet 1 Gb 4-port 331FLR (Flexible LOM form factor) FIO (Factory Installation Option) Adapter (part # 684208-B21)

#### Additional Notes:

- **Items 2 and 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 8 GB (1x8 GB) Single Rank x4 PC3-12800 (DDR3-1600) Reg CAS-11 Memory Kit

- **Item 4:** The server must be configured with 8x8 GB 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.
- **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 10.
- **Item 7 and 8:** 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 11.
- **Item 11:** This HP Ethernet 1 Gb 4-port 331FLR adapter (network interface card) cannot be used with Avid shared storage! If you are purchasing servers to configure MCS for use with MediaCentral connected to one or more Avid shared storage systems, substitute the HP Ethernet 1 Gb 4-port 366FLR FIO adapter instead. See also [“Supported Network Adapters for Avid Shared Storage”](#) on page 13.
- **Item 13:** 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.

## Complete List of Supported CPUs

The following is the complete list of E5-2600 v2 series processors supported for MCS:

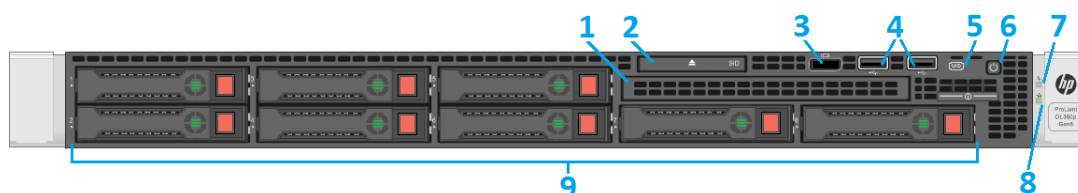
Part Number	Description
712745-B21	HP DL360p Gen8 Intel Xeon E5-2697v2 (2.7 GHz/12-core/30MB/130 W)
712771-B21	HP DL360p Gen8 Intel Xeon E5-2695v2 (2.4 GHz/12-core/30MB/115 W)
712504-B21	HP DL360p Gen8 Intel Xeon E5-2690v2 (3.0 GHz/10-core/25MB/130 W)
712506-B21	HP DL360p Gen8 Intel Xeon E5-2680v2 (2.8 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)

## HP ProLiant DL360p Gen8 Overview

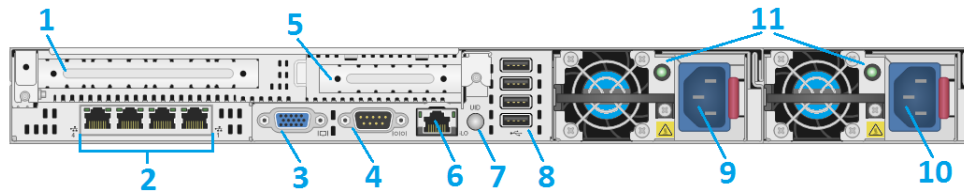
### Front View



1. Optional optical drive
2. Slide-out System Insight Display (SID)
3. Video connector (requires Front Video Adapter Kit)
4. USB ports (2)
5. Unit Identification Button & LED

6. Power On/Standby button and system power LED button
7. Health LED
8. NIC Status LED
9. Hard Drive Bays

### Back View



1. PCIe 3.0 Full-height / half-length x16 expansion slot (Myricom 10 Gb / HP NC365T 1 Gb NIC card goes here)
2. Flexible LOM ports (Shown: 4 ports 1 Gb 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. Four 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

## HP ProLiant DL380 Gen7

Although no longer available for purchase, this server continues to be supported.

- HP Support Center for this model:

<http://h20565.www2.hp.com/portal/site/hpsc/public/psi/home/?sp4ts.oid=4091412>

## Dell PowerEdge R630

Avid has qualified the Dell PowerEdge R630 server for use with MCS. 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 no longer available for purchase.

- Dell PowerEdge R630 product page:  
<http://www.dell.com/ca/business/p/poweredge-r630/pd>
- Dell Support Center:  
<http://www.dell.com/support/home/us/en/04/Products/>

### Dell PowerEdge R630 Hardware Requirements

The following table presents the minimum server specifications:

Item	Qty	Part Number	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 DIMMs
8	--	AECC	Memory Configuration Type	Advanced ECC
	12	8G2R	Memory Capacity <sup>a</sup>	8 GB RDIMM, 2133MT/s, Dual Rank, x8 Data Width
9	--	URH	RAID Configuration	Unconfigured RAID for H330/H730/H730P (1-24 HDDs or SSDs)
10	1	H7301G	Storage Controller <sup>b</sup>	PERC H730 RAID Controller, 1 GB NV Cache
11	8	600S10	Hard Drives	600 GB 10K RPM SAS 6 Gbps 2.5in Hot-plug Hard Drive
12	1	I350	Network Daughter Card	Intel Ethernet i350 QP 1 Gb Network Daughter Card
13	--	--	Additional Network Cards	No additional NIC cards
14	--	--	Host Bus Adapter/ Converged Network Adapter	No host bus adapter

Item	Qty	Part Number	Component	Description
15	--	--	Additional PCIe cards	No additional PCIe cards
16	1	I8EXP	Embedded Systems Management	iDRAC8 Express, integrated Dell Remote Access Controller, Express
17	--	--	Internal SD module	None
18	--	NODVD1	Internal Optical Drive	No internal optical drive
19	--	NOBEZL	Bezel	No bezel
20		RRCMA	Rack Rails	ReadyRails™ Sliding Rails With Cable Management Arm
21	--	HPBIOS	Performance BIOS Setting	Performance BIOS Setting
22	1	495R	Power Supply	Dual, Hot-plug, Redundant Power Supply (1+1), 495W
23	2	125V10	Power Cord	NEMA 5-15P to C13 Wall Plug, 125 Volt, 15 AMP, 10 Feet (3m), Power Cord, North America
24	--	--	Server Accessories	No server accessories
25	--	NODOCS	Systems Documentation	No systems documentation, no OpenManage DVD Kit
26	--	NOOS	Operating System	Operating System
27	--	--	Licenses	No licenses
28	--	NOMED	OS Media Kits	No Media Required
29	--	--	OS Partitions	None
30	--	--	Secondary OS	No secondary OS
31	--	--	Virtualization Software	None
32	--	--	Virtualization Licenses and Subscription	None
33	--	--	Enable Virtualization	None
34	--	--	Database Software	None
35	--	--	Client Access Licenses	No client access licenses
36	--	--	Additional Software Offerings	None
37	--	--	Advanced System Configurations	No advanced system configurations
38	--	--	System Management Upgrades	No system management upgrades
39	--	U3OS	Hardware Support Services	Avid does not have a specific recommendation. Select according to client needs.

Item	Qty	Part Number	Component	Description
40	--	--	Proactive Systems Management	None
41	--	NOINSTL	Installation Services	No installation
42	--	--	Proactive Maintenance	Proactive maintenance declined
43	--	NORCS	Remote Consulting Service	Declined Remote Consulting Service
44	--	--	Additional Installation Services	No additional installation services
45	--	--	Keep Your Hard Drive	None

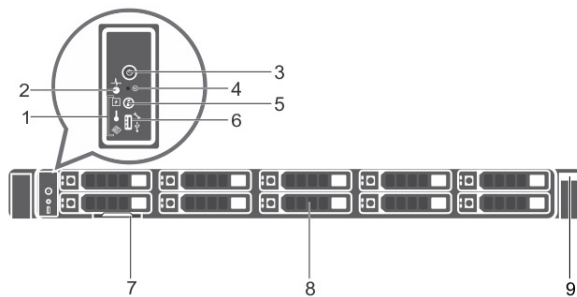
- a. For a total of 128 GB RAM select the following instead:  
 8x16 GB RDIMM, 2133MT/s, Dual Rank, x4 Data Width  
 - or -  
 16x8 GB RDIMM, 2133MT/s, Dual Rank, x8 Data Width  
 b. PERC H730P RAID Controller, 2 GB NV Cache (optional)

#### Additional Notes:

- **Item 23:** 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.

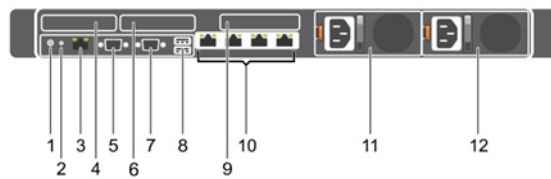
## Dell PowerEdge R630 Overview

### Front View



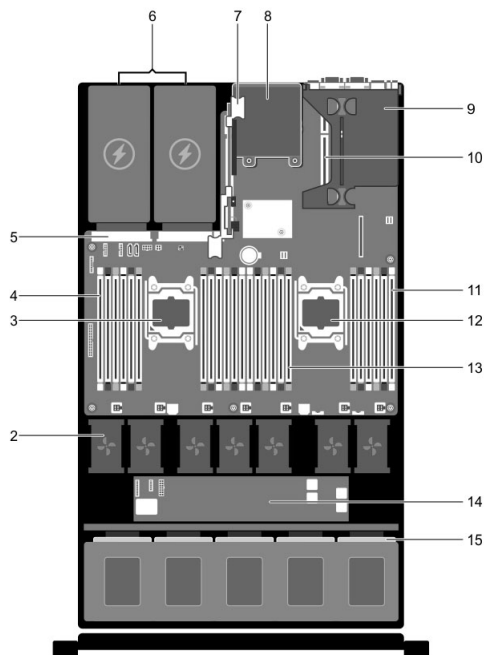
1. Diagnostic indicators
2. System health indicator
3. Power-on indicator, power button
4. NMI button
5. System identification button
6. Mini USB connector/iDRAC Direct
7. Information tag
8. Hard drives (10)
9. Quick Sync

## Rear View



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)

## Top View



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

## **Dell PowerEdge R620**

Although no longer available for purchase, this server continues to be supported.

- Dell PowerEdge R620 product page:  
<http://www.dell.com/ca/business/p/poweredge-r620/pd>
- Dell Support Center:  
<http://www.dell.com/support/home/us/en/04/Products/>

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