

# Cisco Media Origination System

## Product Overview

The Cisco Videoscape™ Media Origination System (MOS) is a cloud-based media origination platform that streamlines deployment of advanced services, such as cloud DVR and TV Everywhere, and provides critical functions such as media ingest, recording, packaging, storage, and publishing. Using the latest virtualization and cloud orchestration technology, Cisco MOS allows operators to elastically instantiate and scale critical media functions independently, which offers greater deployment flexibility than legacy systems. With Cisco MOS, operators can prepare and originate media for distribution to the latest HTTP adaptive bit rate (ABR) streaming clients, as well as to legacy MPEG2 streaming platforms for Internet Protocol Television (IPTV) and quadrature amplitude modulation (QAM) set-top box (STB) endpoints.

Cisco MOS incorporates high-performance media preparation functions for indexing and packaging media into final consumable formats, such as Apple HTTP Live Streaming (HLS), Microsoft HTTP Smooth Streaming (HSS), and Adobe HTTP Dynamic Streaming (HDS), while also providing digital rights management (DRM) encryption. By re- envisioning media origination in this way, Cisco allows operators to ingest and store media in a common format, rather than in a multitude of final consumption formats, thus providing tremendous storage savings. Cisco MOS offers open APIs for smooth integration with both Cisco and third-party control-plane elements, allowing operators full control over the infrastructure. Cisco MOS is the only media origination platform an operator needs to provide services at any scale, to any device, anywhere, over any content delivery network (CDN).

## Features and Benefits

### Service Delivery

Cisco MOS helps accelerate service delivery by providing, in a single commonly managed platform, the core media origination capabilities for the following services:

- **Video on demand:** Cisco MOS provides a video-on-demand (VoD) library function for originating content to both traditional QAM STBs and IP clients. It also simplifies deployment of the media origin by supporting the ingest of content in a common MPEG-TS-based format and serving both QAM STBs and IP devices. By using Cisco on-demand packaging technology for HTTP ABR formats, an operator can achieve significant storage savings.
- **Live linear:** Cisco MOS provides the ability to package a high volume of linear streams into multiple protected adaptive formats for secondary distribution, reducing operational expenses. The role of the Cisco MOS live packager is to rewrap ABR streams, preparing them for distribution by generating ABR manifests, fragments, and segments, and by reformatting subtitles, multi-audio tracks, and ad markers into target output formats. Cisco MOS supports packaging and origination for multiple ABR formats, as well as multiple DRM solutions for content protection.

- **Time-shifted TV and cloud DVR:** Cisco MOS provides ingest and recording functions at any scale in support of new revenue-generating, time-shifted viewing services such as catch up TV and personalized cloud DVR. Using open APIs, Cisco MOS can integrate with the Cisco Videoscape Multiscreen Cloud DVR control plane or the control plane of the operator's choice. Cisco MOS promotes storage efficiency by recording in a common Adaptive Transport Stream (ATS) MPEG2-based format, and it facilitates playback by using its on-demand packaging technology to produce DRM-protected media in any final ABR format. In support of external recorders, Cisco MOS also serves as a scalable, high-performance, on-demand packaging platform, sourcing content from the recording system or archive storage as necessary to serve media requests for fully encapsulated HLS, HSS, or HDS content, then applying appropriate DRM encryption as the operator requires.

### **Unified Content Origin**

Cisco MOS unifies media ingest and origination for both legacy IPTV and QAM-based delivery, as well as newer HTTP ABR models, allowing service providers to simplify their operations. Cisco MOS ingests and stores linear or VoD content from various sources, such as upstream transcoders and encoders. It can ingest existing MPEG transport stream-based content used for traditional linear delivery, as well as ATS content that is conditioned to facilitate ABR delivery to IP-only endpoints. During playout, Cisco MOS can dynamically generate formats which may include MPEG-TS format for legacy set-top boxes or various ABR formats for next-generation IP clients.

### **Massive Ingest and Storage Capabilities**

Cisco MOS is designed for highly optimized ingest and storage. It provides an integrated ingest-and-storage array using Cisco Content Delivery Engine 460 and Content Delivery Engine 470. The content delivery engines are grouped into arrays that operate as a single logical system. Service providers can easily expand capacity by simply attaching additional engines to the array, thereby achieving virtually unlimited video ingest and storage capacity. Cisco MOS uses a hierarchical storage design that allows service providers to maintain huge content libraries while simplifying content storage management. With a logically distributed architecture that can separate ingest and storage from streaming, each function can be scaled independently of the other by simply adding additional content delivery engines, which dynamically increases the pooled ingest and storage resources available throughout the network.

### **Cloud Scaling**

Cisco MOS has been designed to work with customer-provided commodity compute and storage infrastructure, and it uses cloud-platform-orchestration tools to horizontally scale deployment. This option provides independent scalability of media acquisition (indexing and encapsulation), recording, and playout functions. Most functions are delivered as virtual appliances that can be instantiated on virtual machines. The cloud-based deployment model offers multi-format recording capabilities along with high-performance media-object storage software that increases the efficiency of the storage infrastructure for high I/O workloads, such as those required for a cloud DVR application. The cloud solution abstracts the underlying storage system through a storage-abstraction layer.

The Cisco MOS system supports highly scalable, elastic service management. It provides an autoscaling capability by dynamically defining resources for acquisition (scaled by number of channels), recording engines (scaled by events and unique copies), and playout (scaled by number of concurrent requests for recorded content).

## HTTP Adaptive Streaming Optimization with Media Packaging on Demand

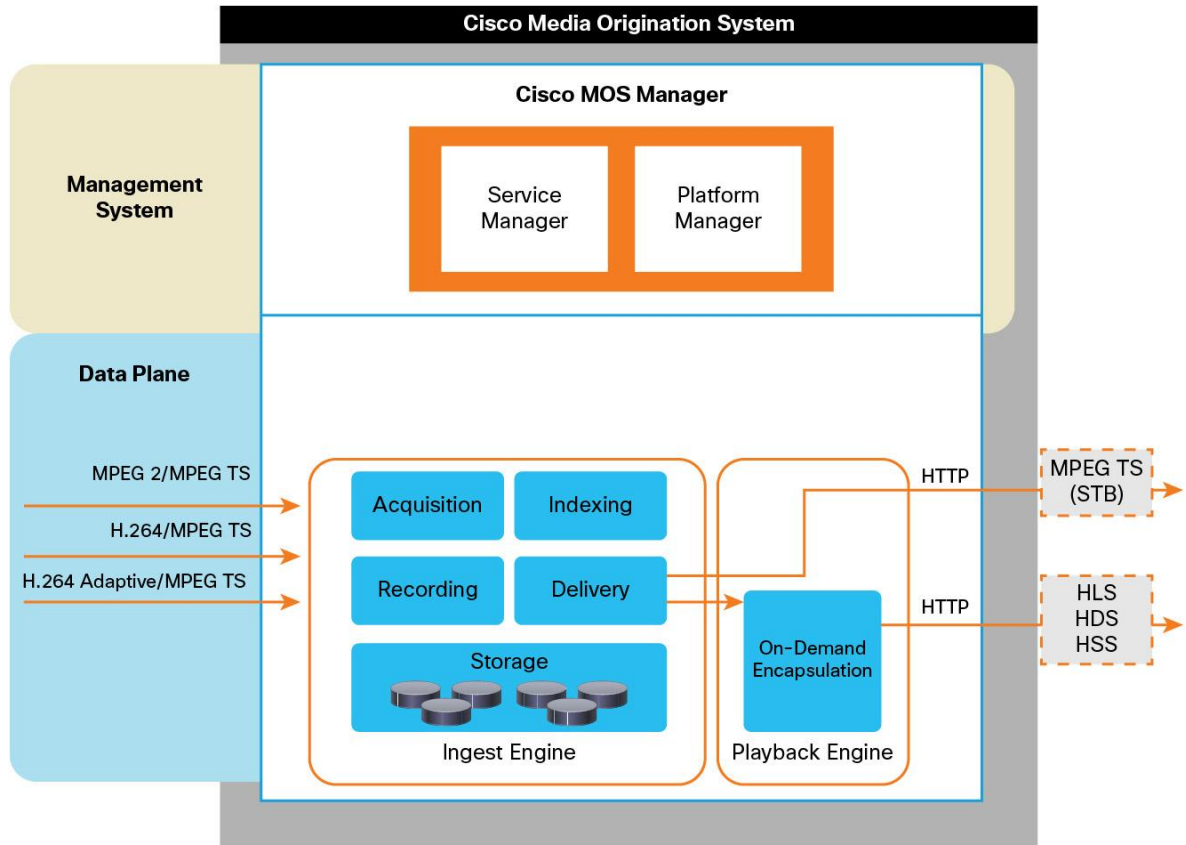
Cisco MOS supports a common ATS format, which is a standards-based H.264 MPEG-TS encapsulated format with MPEG DASH indexing. This allows the operator to store VoD and time-shifted TV content in a single format that can be transformed in real time by the Cisco MOS on-demand packaging function to satisfy client-specific fragment requests for Microsoft HSS, Apple HLS, or Adobe HDS media. As a result, there are significant reductions in storage requirements as well as storage write throughput.

## Unified, Automated Provisioning and Management

Cisco MOS provides the tools for video operators to provision, manage, and monitor media origination services that power critical revenue-generating consumer services. The Cisco Media Origination System Service Manager (MOS-SM) provides an easy-to-use, browser-based user interface, web services APIs for back-office integration, and secure user and group role-based access. Cisco MOS-SM facilitates flexible and scalable device management, making it simple to add and remove servers within the Cisco MOS cluster. It also provides centralized device configuration and software upgrade capabilities.

Additionally, Cisco MOS-SM monitors devices and services, providing a graphical alarm console and corresponding Simple Network Management Protocol (SNMP) traps to northbound network management systems (NMS). Cisco MOS-SM also provides reports covering critical service-specific and content-specific statistics using raw data received from individual Cisco MOS servers within the cluster.

Figure 1. Cisco MOS Functional Diagram



## Product Specifications

Cisco MOS product specifications are summarized in Table 1.

**Table 1.** Cisco MOS Product Specifications

Description	Specification
<b>Input formats</b>	<ul style="list-style-type: none"> <li>• MPEG-TS (MPEG-2 and H.264)</li> <li>• Multiprofile ATS</li> </ul>
<b>Content acquisition</b>	<ul style="list-style-type: none"> <li>• Recordings: IP multicast</li> <li>• VoD: FTP</li> </ul>
<b>Playback formats</b>	<ul style="list-style-type: none"> <li>• MPEG-TS (MPEG-2 and H.264)</li> <li>• Apple HLS</li> <li>• Microsoft HSS</li> <li>• Adobe HDS</li> </ul>
<b>Content protection</b>	<ul style="list-style-type: none"> <li>• AES 128 Encryption (Apple HLS)</li> <li>• Microsoft PlayReady</li> <li>• Adobe Access</li> <li>• Verimatrix</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Centralized user interface for system configuration and management</li> <li>• RESTful APIs allowing integration with third-party components</li> <li>• Automated virtual machine deployment and configuration</li> <li>• SNMP trap generation</li> <li>• Traffic statistics and system health monitoring</li> </ul>
<b>Platform support</b>	<ul style="list-style-type: none"> <li>• Cisco Unified Computing System™ (Cisco UCS®) servers</li> <li>• VMWare vSphere 5.x</li> </ul>

**Table 2.** Cisco MOS Components

Description	Specification
<b>Ingest engine</b>	<ul style="list-style-type: none"> <li>• Appliance-based system used for ingest, recording, and storage of content for VoD and cloud DVR services</li> <li>• Based on the VDS-TV Cisco Content Delivery Engine 460 and Content Delivery Engine 470 appliance servers</li> </ul>
<b>Playback engine</b>	<ul style="list-style-type: none"> <li>• Virtual machine-based application used for on-demand encapsulation (ODE) of common format content to native ABR formats (HLS, HSS, and HDS)</li> </ul>
<b>Cisco MOS Manager</b>	<ul style="list-style-type: none"> <li>• Virtual machine-based application used to manage Cisco MOS components</li> </ul>

## Platform Support and Compatibility

Cisco MOS contains both appliance-based components and software-based components. The software components can be deployed on either Cisco UCS hardware or comparable third-party hardware.

### Recommended Cisco UCS Hardware Configurations

Table 3 summarizes the recommended hardware for Cisco MOS installation on a Cisco UCS B Series Blade Server.

**Table 3.** Recommended Hardware Configuration on Cisco UCS B Series Blade Server

Product Part Number	Description	Recommended Quantity
UCSB-B200-M3-U	UCS B200 M3 Blade Server	1
UCS-CPU-E52680B	2.80 GHz E5-2680 v2/115W 10C/25MB Cache/DDR3 1866MHz	2
UCS-MR-1X082RY-A	8GB DDR3-1600-MHz RDIMM/PC3-12800/dual rank/1.35v	16
A03-D600GA2	600GB 6Gb SAS 10K RPM SFF HDD/hot plug/drive sled mounted	2
UCSB-MLOM-40G-01	VIC 1240 modular LOM for M3 blade servers	1

## Ordering Information

Table 4 lists the Cisco MOS product part numbers required to place an order, including application and feature licenses.

To place an order, visit the [Cisco Ordering Home Page](#) and refer to Table 4.

**Table 4.** Ordering Information

Type	Part Number	Part Name	Product Description
Cisco MOS bundle	MOS-BUNDLE	MOS Bundle license	Top level MOS bundle license
Software license	L-MOS-P-SUB-T1	MOS license	MOS perpetual license, per subscriber
Hardware	CDE460-K9	CDE460	Content Delivery Engine Base System
	CDE470-K9	CDE470	Content Delivery Engine Base System

## Service and Support

Cisco offers a wide range of service programs to accelerate customer success. These innovative service programs are delivered through a unique combination of people, processes, tools, and partners, helping to achieve high levels of customer satisfaction. Cisco Services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).



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