Cisco Video Distribution Suite for Internet Streaming (VDS-IS)

With the ever-increasing demand for online video content propelled by changes in consumer behavior, service providers realize that delivery of multiscreen content is strategically important and core to their business. The 2013 Cisco® Visual Networking Index (VNI) forecasts that Internet video will be 69 percent of all consumer Internet traffic in 2017. The sum of all forms of video - linear TV, Video on Demand (VoD), Internet video, and peer-to-peer video - will be in the range of 80 to 90 percent of global consumer traffic by 2017. This demand raises a challenge to service providers that leads them to deploy and own Content Delivery Network (CDN).

Factors that need to be considered when building CDNs include:

- Growth of IP video traffic and the ability of the video distribution architecture to scale accordingly
- Demand for multiscreen video experiences: managed video content to customer's IP-enabled devices such as PCs, tablets, game consoles, and Wi-Fi-connected mobile phones
- Demand from content providers, broadcasters, and movie studios for a secured distribution of video content to protect copyrights
- Need for advanced service routing and delivery service management
- Low OpEx and TCO

Cisco Videoscape™ Distribution Suite for Internet Streaming (VDS-IS) meets all of these requirements, and augments core CDN capabilities with advanced service routing and content streaming intelligence. Cisco can help service providers take full advantage of CDN technology to reduce costs, deliver amazing multiscreen experiences, and capitalize on the cloud revolution.

Product Overview

Cisco Videoscape™ Distribution Suite for Internet Streaming (VDS-IS) is an integrated system with a network-based architecture that transcends existing streaming solutions. It allows service providers to extend their video-managed content to their customers' IP-enabled devices such as PCs, tablets, game consoles, and Wi-Fi-connected mobile phones by using sophisticated service routing and content distribution intelligence.

Cisco VDS-IS software is installed on Cisco Content Delivery Engine (CDE) appliances as well as Cisco high-performance Unified Computing System™ (Cisco UCS®) servers and blades, providing a flexible and cost-effective solution to service providers who plan to build content delivery networks.

The Cisco Videoscape™ Distribution Suite for Internet Streaming (VDS-IS) software applications are optimized to meet the cloud environment needs. The VDS-IS software applications can be fully virtualized and can operate on a cloud platform built of COTS server. Virtualizing the VDS-IS software applications, can provide a scaled solution to meet the increasing demand for online video content. It provides an efficient solution to reduce the operational costs in addition an effective model to increase streaming capacity as demand grows (Flash Crowds for Live and VOD Events).

The Cisco Videoscape™ Distribution Suite for Internet Streaming (VDS-IS) software applications can virtualize on top of VMware hypervisor and soon planned to be supported with KVM and open stack.

Cisco VDS-IS technology incorporates three main functions: content ingest and distribution, content delivery, and service routing. It includes Cisco Content Delivery Applications (CDAs), software that performs ingest, storage, caching, streaming, and other real-time, scalable and resilient capabilities (Table 1). Figure 1 illustrates the Internet streaming solution.

Table 1.   Cisco Content Delivery Applications

Content Delivery Application	Description
VDS Content Acquirer	The VDS Content Acquirer provides content ingest and storage functionality. It supports both a pull- and push-based model to ingest content from origin servers and encoders.
VDS Internet Streamer	The VDS Internet Streamer provides edge caching, content streaming, and download to subscriber IP devices such as PCs, tablets, game consoles, and Wi-Fi-connected mobile phones.
VDS Service Router	The VDS Service Router mediates requests from subscriber IP devices. It is responsible for choosing the most appropriate Internet streamer based on location and load conditions of individual Internet streamers.
VDS Manager	The VDS Manager is a graphical, browser-based application designed to manage the elements of a Cisco VDS network. It offers a workflow-based approach, automating and centralizing the major system management functions, including configuration, monitoring, troubleshooting, reporting, and maintenance.

Figure 1.   Cisco VDS Internet Streaming Solution
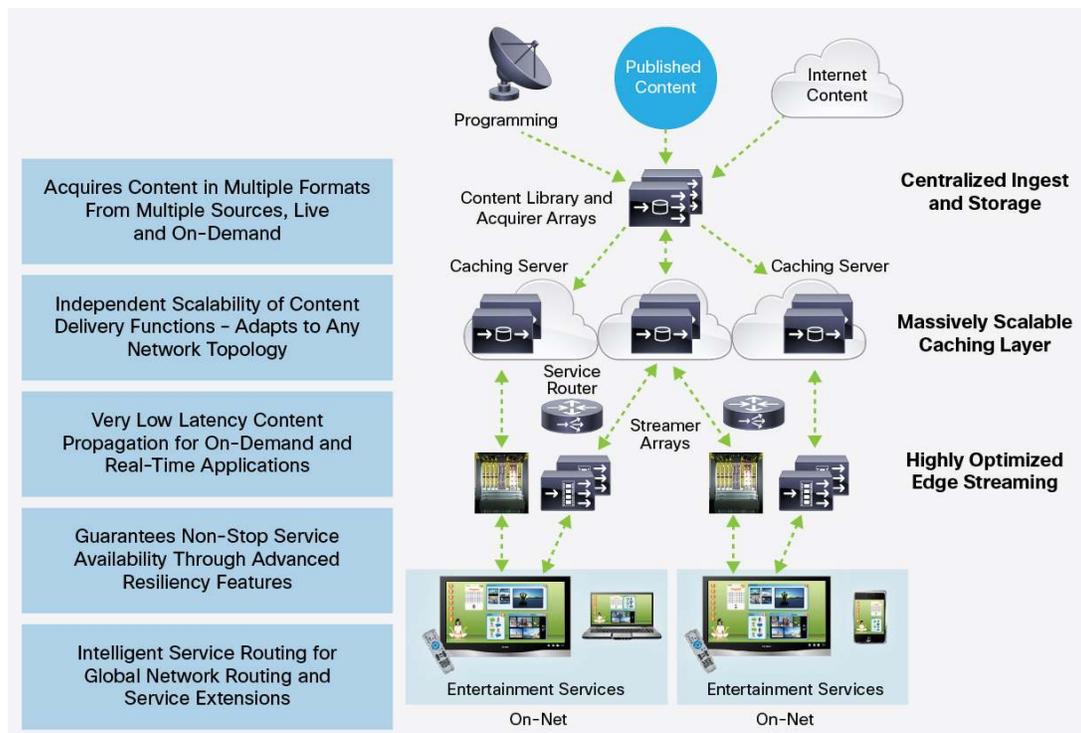
Services

Using Cisco's VDS Internet Streaming solution, service providers can deploy a variety of next-generation, value-added video entertainment services, including the following.

Retail CDN: Live and VoD Streaming Services Across Multiple Screens, Applications, and Networks

With Cisco's VDS Internet Streaming solution, service providers can stream Live and Video-on-Demand (VoD) managed content to any IP-enabled device, allowing end users to enjoy their video services anywhere at any time.

Wholesale Content Delivery Network (CDN)

Cisco's VDS Internet Streaming solution has native support for advanced multitenant Content Delivery Network (CDN) services that give service providers ample flexibility to acquire new business models and revenue streams. Cisco VDS-IS includes advanced tools to manage multiple CDN customers (such as content providers and broadcasters) with "virtual CDN" capabilities. This state-of-the-art architecture allows service providers to create and enforce CDN Service Level Agreements (SLA) that promise high quality of experience (QoE) to the content provider's and broadcaster's end users.

Cisco VDS-IS also provides multitenant reporting, logging, and billing capabilities through the Cisco VDS Manager.

CDN Federation

Using Cisco's VDS Internet Streaming solution, service providers can participate in a multi-operator, multi-footprint CDN by employing the VDS-IS-supported interconnect model to complement IP transit and peering. This model helps service providers to:

- Lower transport costs by pooling CDN federation resources
- Extend their own video service offerings
- Provide to their consumers a better quality of experience

Cisco VDS-IS Advantage

Major benefits of the Cisco VDS Internet Streaming solution include:

- Delivers a variety of next-generation, multiscreen, value-added video entertainment services
- Supports a hierarchical deployment model that allows service providers to scale their offerings to millions of subscribers
- Supports multiple streaming protocols and file transfer protocols, allowing service providers to converge on a single multipurpose infrastructure for distribution and delivery of rich media
- Simplifies operations and reduces OpEx through the use of sophisticated management software
- Provides a flexible platform with application-layer intelligence that can serve as the basis for both existing and future service offerings
- Offers an attractive economic scaling model for capacity that allows service providers to scale their offerings to meet the rapidly growing demand for video content

Features and benefits of the Cisco VDS Internet Streaming solution are summarized in Table 2.

Table 2.　　Cisco VDS-IS Features and Benefits

Feature	Benefit
Content Ingest	
Pre-Defined content ingest	Digital assets such as long- and short-form video can be acquired from a variety of sources using different protocols, and placed in resilient storage. This capability allows operators to honor content agreements and provide a wide variety of content to subscribers
On-demand content ingest	Reduces operational complexity of ingest and delivery. Operators can offer long-tailed content, which is ingested based on content demand without knowing its popularity in advance
Live stream splitting	A single stream entering the Cisco VDS network can be efficiently split to serve multiple subscribers, allowing operators to offer live streaming in a manner that scales
Content Distribution and Delivery	
HTTP adaptive bit rate streaming support	Adaptive bit rate streaming support for a variety of formats (Microsoft, Apple, Adobe®, and Widevine)
HTTP download and progressive download	Supports serving of long- and short-form content and offering services such as download-to-own
HTTPS download and progressive download	HTTP/SSL for secure VOD download with certificate management
Adobe Flash Media: Real-Time Messaging Protocol (RTMP), RTMPE, RTMPT, and RTMPTE	Supports content streaming to a variety of PCs and mobile devices with Flash, AIR, and Flash Lite clients. RTMPE enables 128-bit encryption without use of certificates to help secure streamed media and communication
Real Time Streaming Protocol (RTSP), Real-time Transport Protocol (RTP), and Multimedia Message Service (MMS) over HTTP	Allows streaming of video to commonly deployed PC clients such as Microsoft Windows Media and Apple QuickTime
Request Routing and Load Balancing	
Load balancing	The Cisco VDS Service Router supports several routing methods to best determine which Cisco Internet Streamer should be used to serve content based on dynamic loading conditions
Location independence	Allows serving any content to any place by factoring in the location of the requesting client to determine the choice of Cisco Internet Streamer
System resiliency	Provides system resiliency against network and device failures by dynamically detecting and routing requests to alternative Cisco Internet Streamers
Proximity-based routing	Cisco VDS Service Router introduces a network-proximity-based service routing mechanism to determine the closest streamer that can serve the content most efficiently to the client
Management	
Management as a single system	Management is simple, with a single, easy-to-use GUI to configure, monitor, and troubleshoot the Cisco Internet Streamer applications throughout the entire system. Management simplicity contributes to reduction in OpEx
Real-time analytics and reporting	Integrated with Cisco VDS-SM application that provides analytics and reporting (daily, monthly, etc.) by using the VDS-IS transaction log data

Product Specifications

Cisco VDS Internet Streaming product specifications are summarized in Table 3.

Table 3.　　Cisco VDS-IS Product Specifications

Description	Specification
Content types and formats	• Windows Media WMA, WMV, ASF, VC-1 • QuickTime (MOV), hinted (3GP) • HTTP image files (for example, HTML and JPEG) • MPEG1, MPEG2, MPEG4 • Adobe Flash (SWF, FLV, MP3) • H.264 • SHOUTcast

Description	Specification
Delivery protocols	• Web content through HTTP and HTTPS • Adobe Flash Media Streaming RTMP (T/E) • Windows Media RTP and RTSP, MMS-over-HTTP • Streaming MP3, MP4 (H.264), MOV, M4V, and 3GP (3GPP) content through RTP and RTSP
Ingest protocols	• HTTP • HTTPS • FTP • CIFS • RTSP and RTP • Acquisition from local disk
HTTP adaptive bit rate streaming support	• Apple HTTP Live Streaming (HLS) • Microsoft HTTP Smooth Streaming (HSS) • Adobe HTTP Dynamic Streaming • Widevine HTTP Adaptive Bit Rate Streaming • MPEG DASH
MIBs	• SNMP v1, v2, v3 supported • ENTITY-MIB (RFC 2037) • MIB-II (RFC 1213) • HOST-RESOURCES-MIB • BGP-4-MIB (RFC-4274) • UCD-SNMP-MIB • CISCO-ENTITY-ASSET-MIB • CISCO-CONFIG-MAN-MIB • CISCO-SERVICE-ENGINE-MIB SR CISCO_CDS_SERVICE_ROUTING
Cisco VDS-IS Manager	• Secure, browser-based GUI over HTTPS • Configuration of Cisco CDEs • Provisioning of VoD and Live delivery services • Traffic statistics and system health monitoring • Administrative authentication, authorization, and accounting (AAA) and role-based management • Active-standby management redundancy • Device group configuration for bulk provisioning changes • Centralized system upgrade manager for easy upgrading of thousands of CDEs • Web services API • XML flexible rules template for cache policies and rules

Service routing	Cisco Service Router supports the following routing methods:
	• Multiple client redirection methods based on the protocol and the user-agent of the client:
	  ◦ HTTP ASX redirection
	  ◦ HTTP 302 redirection
	  ◦ RTSP 302 redirection
	  ◦ RTSP REDIRECT redirection
	  ◦ RTMP redirection
	• Dynamic network proximity routing
	• Static network proximity routing with XML configuration file
	• Load-based routing
	• Delivery-service-aware routing
	• Content-aware routing
	• Last-resort URL rewrite to secondary CDN (when all eligible streamers are overloaded)
	• Streamer health and load: application, storage, CPU, and memory
	• Quota management based on concurrent sessions and bandwidth used

Internet video back-office integration interfaces	• Supports Internet back-office integration using XML-based "Manifest" files that describe content ingest tasks • Supports integration with entitlement services, digital rights management, and Internet publishing tools • Web service APIs

Description	Specification
Security and access management	ACLs for content-engine interfaces: standard and extended IP access lists for inbound and outbound traffic
Hardware support	• Cisco Content Delivery Engines: CDE 250, CDE 220 and CDE 205 • Cisco Unified Computing System: UCS C220 & UCS C240 (specified configurations)
Virtualization	• All VDS-IS Software applications: VDS Content Acquirer, VDS Internet Streamer, VDS Service Router, VDS Manager • Supported hypervisor - VMware, KVM/Open stack (soon) • Support of VMware: ESXI, VSphere, VCenter

Ordering Information

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

Cisco VDS-IS software is integrated with Cisco Content Delivery Engine (CDE) appliances as well with Cisco high-performance UCS servers. In addition it can be integrate on top of virtualize environment.

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
Applications	VDSMU-K9	Multi-Protocol Streamer	Multi-Protocol (HTTP, RTSP, RTMP) Streamer + 1 Gbps + Acquirer License
	VDSHU-K9	HTTP Streamer	HTTP Streamer + 1 Gbps Capacity + Acquirer License
	VDSSR-K9	Service Router	Request Resolution and Server Selection + 100 TPS
	VDSMGR-K9	CDS Manager	Centralized Element and Service Management
Features	VDSURL	URL Signing	URL Signing Enforcement (per Streamer)
	VDSSBE	Session Based Encryption	HTTP ABR Session Based Encryption for Apple & Microsoft (per Streamer)
	VDSHSL	HTTPS Download	HTTP/SSL Secure Progressive Download (per Streamer)
	VDSMCS	Multicast Sender Server	Multicast Pre-Positioning Sender
	VDSMCR	Multicast Receiver	Multicast Receiver Function (per Streamer)
Capacity Licenses	L-VDSHT1	HTTP 1-50Gbps	Tier 1, First 50 Gbps HTTP (ABR, PDL, Live, VOD)
	L-VDSHT2	HTTP 51-250Gbps	Tier 2, Next 200 Gbps HTTP (ABR, PDL, Live, VOD)
	L-VDSHT3	HTTP Upgrade 251+	Tier 3, 251+ Gbps HTTP (ABR, PDL, Live, VOD)
	L-VDSMT1	Multi-Protocol 1-50Gbps	Tier 1, First 50 Gbps (HTTP, RTSP, RTMP, VOD, Live)
	L-VDSMT2	Multi-Protocol 51-250Gbps	Tier 2, Next 200 Gbps (HTTP, RTSP, RTMP, VOD, Live)
	L-VDSMT3	Multi-Protocol 251+ CDN	Tier 3, 251+ Gbps (HTTP, RTSP, RTMP, VOD, Live)
	L-VDSSR500	Service Router TPS Upgrade	500 TPS Server Router Upgrade

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, resulting in 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.

For More Information

For more information about the Cisco Videoscape Distribution Suite, visit http://www.cisco.com/go/Videoscape.

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