



CHAPTER 1

Introduction to Cisco CDS Video Navigator

This chapter provides an introduction to Cisco CDS Video Navigator (CDS-VN) Application, Release 2.1, and contains the following major topics:

- [CDS Video Navigator Overview, page 1-1](#)
- [CDS Video Navigator Logical Interfaces, page 1-3](#)
- [CDS Video Navigator Client on Cisco Set-Top Box, page 1-4](#)
- [Content Delivery Engine 110 for CDS Video Navigator, page 1-5](#)

CDS Video Navigator Overview

Cisco CDS Video Navigator is a navigation application server that provides information about available video on demand (VOD) content to the on-demand client application running on a set-top box. CDS Video Navigator, a web services application, is required for VOD navigation with the Service Delivery Platform (SDP). Because of resource constraints in the set-top box, such as memory sufficient for a VOD catalog of arbitrary size, the catalog metadata (title, genre, rating, length, description, price, and so forth) must reside on an application server—CDS Video Navigator.

CDS Video Navigator retrieves the metadata describing VOD services and offerings, along with subscriber rental history, from the video back office. Because the video back office is not designed to support real-time queries from thousands of set-top boxes simultaneously, CDS Video Navigator caches the metadata and presents the information to the on-demand client on the set-top box. The client on the set-top box uses the metadata and subscriber data to determine which VOD content to display for the subscriber.

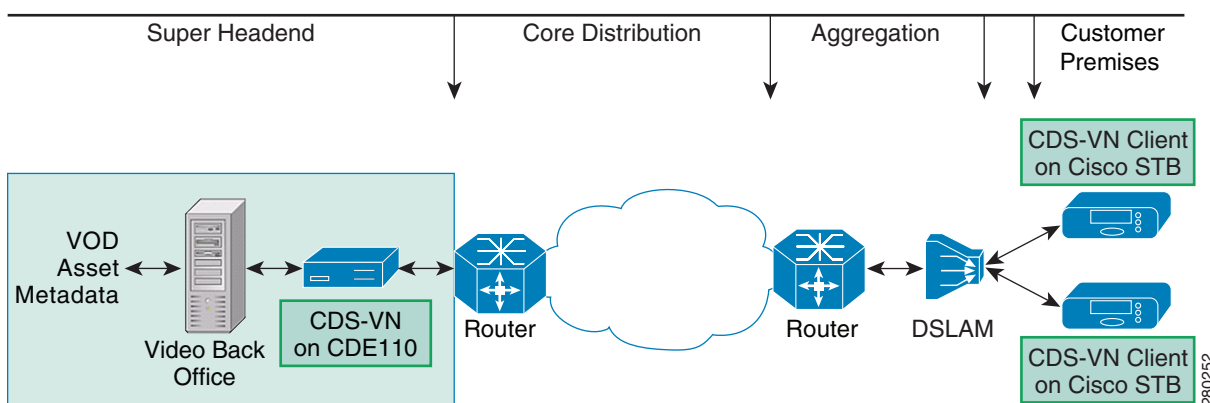
CDS Video Navigator is located between the video back office and the set-top box client. The two major software components related to CDS Video Navigator are shown in [Figure 1-1](#). The figure is a partial diagram of the reference VOD network architecture and shows only the elements needed to illustrate the role of Video Navigator.

- **CDS Video Navigator (CDS-VN) on the CDE110**—The CDS Video Navigator application on the Cisco Content Delivery Engine 110 (CDE110) responds to client requests that are made as the subscriber navigates the VOD menu.
- **CDS Video Navigator Client (CDS-VN Client)**—The on-demand application on the Cisco set-top box requests metadata information from CDS Video Navigator and displays the VOD catalog to the subscriber.

Cisco CDS Video Navigator, Release 2.1, supports the SDP environment with the following components:

- Video back office (VBO)—Tandberg OpenStream on-demand application server with web services extensions
- Set-top box (STB)—Cisco IP set-top box using middleware for manipulating digital media and a browser running on top of the Cisco IPTV Layer (SAIL) 2.0 environment

Figure 1-1 CDS Video Navigator Network Diagram



CDS Video Navigator retrieves the catalog data from the video back office. It creates and stores an XML data structure representing the VOD content menu hierarchy in a format optimized for fast access by the set-top box client. To minimize the need to dynamically process catalog data requested by the set-top box client, CDS Video Navigator pre-generates and caches various lists of sorted and filtered offerings. The pre-generated lists may include such items as Titles (A-M), Titles (N-Z), Titles by Genre, Titles by Studio/Network, and so forth.

As the subscriber navigates the set-top box's VOD guide menu by browsing and selecting shows and movies to view, CDS Video Navigator presents the set-top box client with XML data describing each currently displayed node of the VOD guide. When a subscriber session initiates a request for non-catalog data such as poster art or trailers, CDS Video Navigator redirects the request to the URL/URI specified in the metadata.

A subscriber may purchase new services or cancel existing services either by calling the service operator, who manually provisions them, or by ordering the services directly by interacting with the CDS-VN client on the set-top box. The CDS-VN client transacts all purchases directly through the video back office server, which interfaces to the operator's subscriber management and traffic and billing systems. CDS Video Navigator has no direct role in the purchase of any VOD service or offering.

The video back office stores subscriber purchases for billing purposes. CDS Video Navigator also caches history about subscriber purchases and bookmarks that occur during each VOD navigation session so that the state can be reflected in the VOD guide on the set-top box. Service listings are correlated with individual account status and flagged in the XML data structure, allowing the set-top client to differentiate those services to which the user has subscribed from those to which the user has not subscribed. This differentiation enables promotion and upselling of additional services.

A single CDS Video Navigator server is expected to support a population of 75,000 set top boxes with an assumed concurrency rate of 2 percent (that is, 1500 simultaneous sessions with CDS-VN clients where users are engaged in any arbitrary combination of actions such as catalog browsing, checking of rental history, and so forth). The actual capacity of a CDS Video Navigator server may vary based on the VOD usage patterns of the subscriber base. As an example, how frequently the VOD guide is accessed and how long the average subscriber stays within the guide are affected by how compelling an operator's VOD service is and how aggressively it is marketed.

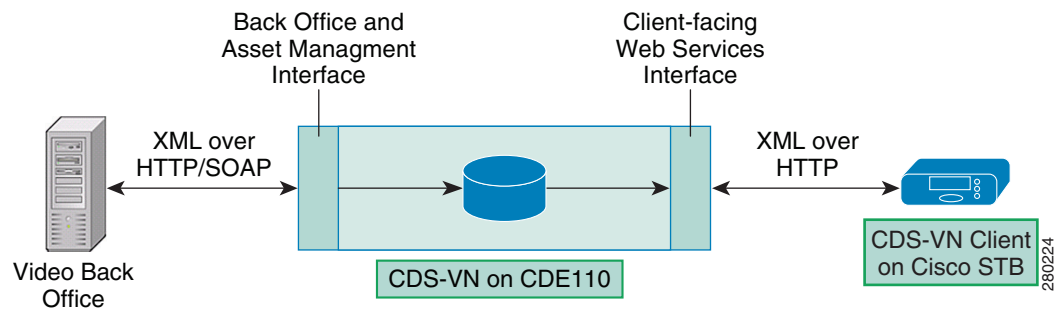
CDS Video Navigator Logical Interfaces

CDS Video Navigator is a web services application that acts similar to a web proxy between metadata sources for VOD services (the video back office) and the metadata consumers (the CDS-VN clients on the set-top boxes). Cisco CDS Video Navigator, Release 2.1, supports two major logical interfaces:

- Back Office and Asset Management Interface
- Client-facing Web Services Interface

Figure 1-2 shows these two interfaces and associated data flows.

Figure 1-2 CDS Video Navigator Logical Interfaces and Data Flows



Back Office and Asset Management Interface

The Back Office and Asset Management Interface is responsible for extracting asset metadata and subscriber data from the video back office. The CDS Video Navigator local cache of VOD catalog offerings, subscriber services, and rental history is automatically synchronized with the video back office database through the use of the Tandberg OpenStream Web Services interface.

In the Service Delivery Platform environment supported by Cisco CDS Video Navigator, Release 2.1, the Back Office and Asset Management Interface conforms to the Tandberg OpenStream VOD Web Services API 1.4. This API provides VOD functionality using XML over HTTP and Simple Object Access Protocol (SOAP).

Client-facing Web Services Interface

The Client-facing Web Services Interface is the interface to the CDS-VN client application running on the set-top box. In CDS Video Navigator, Release 2.1, the Client-facing Web Services Interface provides the CDS-VN client application with a set of APIs so that the client can do the following:

- Browse the VOD catalog navigation tree
- Query for rental history and purchased services
- Search for electronic program guide (EPG) and VOD assets
- Post purchase and bookmark information

For browsing the VOD catalog, the Client-facing Web Services Interface provides a paging mechanism for efficient navigation.

The Client-facing Web Services Interface uses detailed metadata on the VOD catalog that conforms to the *CableLabs Video-On-Demand Content Specification* Version 1.1. The Client-facing Web Services Interface API provides its VOD functionality using XML over HTTP.

CDS Video Navigator Client on Cisco Set-Top Box

In the SDP environment supported by Cisco CDS Video Navigator, Release 2.1, the CDS-VN client on the Cisco set-top box is the on-demand menu application. The CDS-VN client on the set-top box is the end node that consumes and uses the metadata.

Cisco's IPTV Service Delivery Server (ISDS) application provides the CDS-VN client with the address of CDS Video Navigator. When the subscriber signs on and selects the VOD service, the CDS-VN client queries CDS Video Navigator by Terminal ID for the list of VOD services to which it is entitled. CDS Video Navigator then synchronizes its subscriber database for that set-top box with the video back office to make sure CDS Video Navigator's cache is up-to-date.

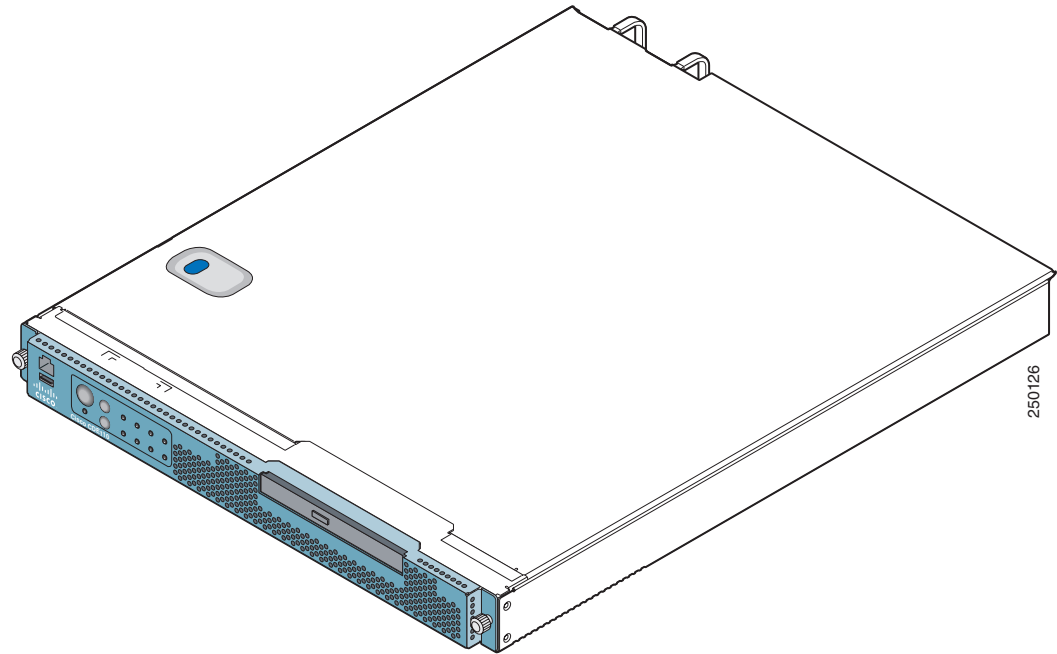
Each page of the VOD menu is a STB-resident HTML template. In response to queries from the CDS-VN client, CDS Video Navigator returns XML data used to fill out the template (title, genre, rating, and so forth) and sends information to create the link for each actionable button that appears on the VOD menu.

The Cisco set-top box software includes middleware for manipulating digital media and a web browser engine optimized for user interfaces, such as the VOD customer interface presented by the CDS-VN client.

Content Delivery Engine 110 for CDS Video Navigator

Each CDS Video Navigator runs on one Cisco Content Delivery Engine 110 (CDE110). The Cisco CDE110 (Figure 1-3) models used for CDS Video Navigator come with the Red Hat Enterprise Linux operating system, required third-party software, and the CDS Video Navigator software pre-installed.

Figure 1-3 **Content Delivery Engine 110**



The Cisco CDE110 appliance is a NEBS-3 and ETSI-compliant carrier-grade rack server. It is powered by two 64-bit Dual-Core Intel Xeon processor LV 5148 processors. For optimal performance, it contains 8 GB of dual-channel Fully Buffered DIMM (FB-DIMM) memory at 667 MHz.

For storage, the Cisco CDE110 has three 146-GB simple-swap, serial attached SCSI (SAS) hard disk drives. The three hard disk drives are configured, by default, to use RAID 1 disk duplexing. RAID 1 is an easy and highly efficient way to provide data redundancy and system availability.

On the CDE110, the 4-GB flash drive provides a more reliable boot mechanism in the event of hard-drive failure. The flash drive stores the software image used to boot the server and serves as a file system for failsafe booting as well as non-volatile storage for system configuration data.

The Cisco CDE110 front panel has controls panels, a CD/DVD RW combination optical drive, a Serial B port (RJ45), and a USB port. The Cisco CDE110 rear panel includes the following:

- Four integrated 10/100/1000 Mb Ethernet ports
- Serial B port (RJ45) for the system console
- Two USB ports
- Monitor port
- Dual PS/2 ports for keyboard and mouse
- Telco alarms port

The Cisco CDE110 has a 1-RU form factor and is available with redundant AC or DC hot-swappable power supplies. The Cisco CDE110 Telco Alarm Management features provide visual and audible (optional) indications of faults.

For complete information on the Cisco CDE110, see the *Cisco Content Delivery Engine 110 Hardware Installation Guide*.