Cisco CDS Video Navigator Application User Guide, Release 2.1

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CONTENTS

Preface

This preface describes the objectives and organization of this document and explains how to find additional information on related products and services. This preface contains the following sections:

Objectives

This document describes Cisco Content Delivery System (CDS) Video Navigator Application, Release 2.1, and explains how to configure CDS Video Navigator and other related software.

Document Revision History

Table 1 records technical changes to this document. The table shows the document revision number for the change, the date of the change, and a brief summary of the change.

Table 1 Document Revision History

Revision	Date	Change Summary
OL-15898-02	April, 2009	Initial release (CDS Video Navigator, Release 2.1)

Document Organization

This publication is organized as follows:

Chapter	Title	Description
Chapter 1	Introduction to Cisco CDS Video Navigator	Provides an introduction to Cisco CDS Video Navigator.
Chapter 2	Getting Started with CDS Video Navigator	Explains how to perform the initial configuration tasks needed to get CDS Video Navigator running.
Chapter 3	Troubleshooting CDS Video Navigator Software Components	Describes how to identify and remedy problems related to CDS Video Navigator.

Related Documentation

The following is a list of related documents and URLs for the Cisco CDS Video Navigator Application, Release 2.1, and the Cisco Content Delivery Engine 110:

- *Release Notes for Cisco CDS Video Navigator Application, Release 2.1*
  http://www.cisco.com/en/US/docs/video/cds/cda/vn/2_1/release/notes/vn_notes2_1.html
- *Cisco Content Delivery Engine 110 Hardware Installation Guide*
  http://www.cisco.com/en/US/docs/video/cds/cde/cde110/installation/guide/cde110_install.html
- *Regulatory Compliance and Safety Information for the Cisco Content Delivery Engine 110*
  http://www.cisco.com/en/US/docs/video/cds/cde/regulatory/compliance/cde110_rcsi.pdf

Conventions

This guide uses the following conventions for command syntax descriptions and textual emphasis:

Table 2 Command Syntax and Emphasis Conventions

Convention	Description
boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{*x* | *y* | *z*}	Alternative, mutually exclusive, keywords are grouped in braces and separated by vertical bars.
[*x* | *y* | *z*]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`screen` font	Terminal sessions and information the system displays are in `screen` font.
`boldface screen` font	Information you must enter is in **`boldface screen`** font.

Table 2 Command Syntax and Emphasis Conventions (continued)

Convention	Description
italic screen font	Arguments for which you supply values are in *italic screen* font.
^	The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords, are in angle brackets in contexts where italics are not available.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this publication.

Tip Means the following information might help you solve a problem.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

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

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.

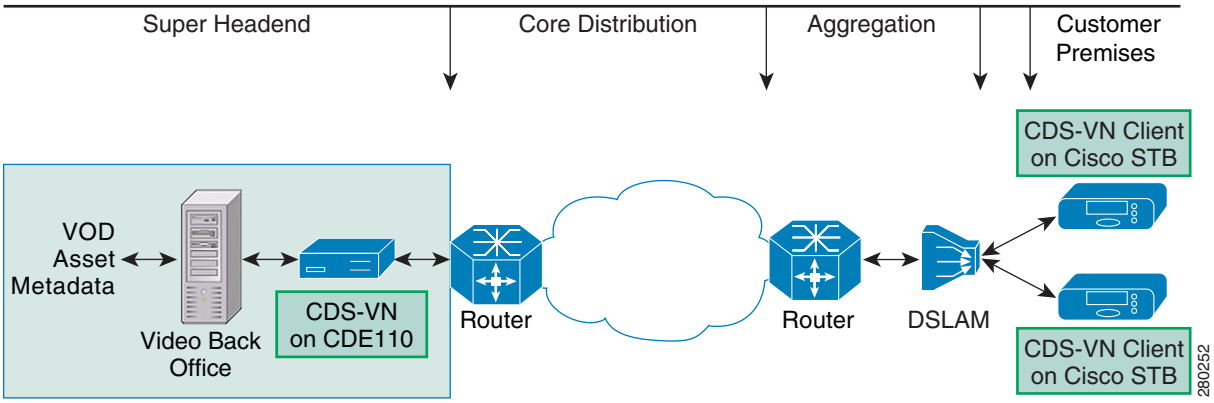
CDS Video Navigator is located between the video back office and the set-top box client. The two major software components related to CDS Video Navigator are shown in Figure 1-1. The figure is a partial diagram of the reference VOD network architecture and shows only the elements needed to illustrate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

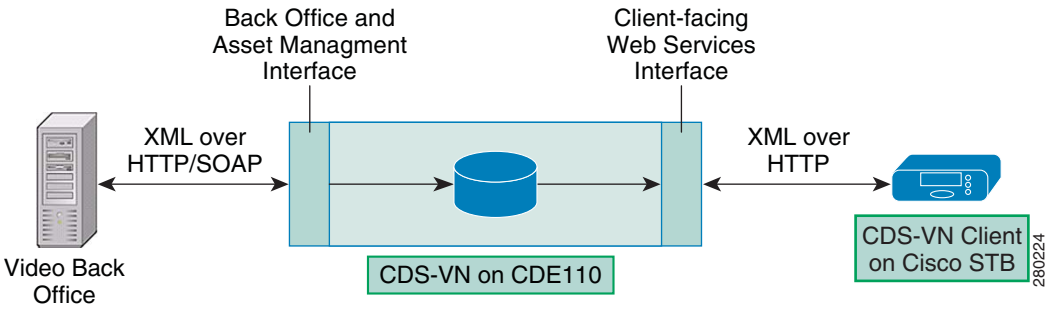
CDS Video Navigator Logical Interfaces

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.

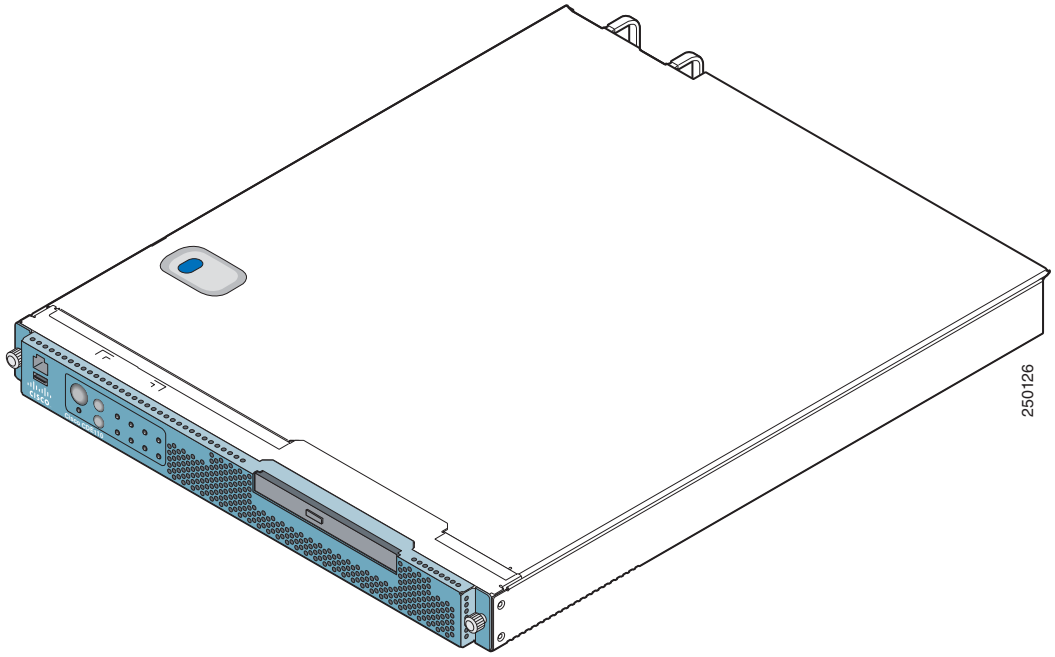
Each page of the VOD menu is a STB-resident HTML template. In response to queries from the CDS-VN client, CDS Video Navigator returns XML data used to fill out the template (title, genre, rating, and so forth) and sends information to create the link for each actionable button that appears on the VOD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

CHAPTER 2

Getting Started with CDS Video Navigator

This chapter explains how to perform the initial configuration tasks needed to get CDS Video Navigator running. Read the following sections and perform the initial configuration tasks in this order:

1. Configuring Terminal Emulation Software, page 2-1
2. Connecting Cables to the CDE110, page 2-1
3. Configuring the CDE110 Ethernet Interfaces, page 2-3
4. Configuring CDS Video Navigator, page 2-5
5. Configuring the Apache Web Server, page 2-5
6. Starting CDS Video Navigator and Verifying Status, page 2-6

In addition, the "Information on CDE110 Hardware" section on page 2-10 contains some notes on the hardware components and configuration used with CDS Video Navigator.

This chapter assumes that the Cisco CDE110 hardware has been installed as described in the *Cisco Content Delivery Engine 110 Hardware Installation Guide*, including connecting cables and connecting power.

Configuring Terminal Emulation Software

The RJ-45 serial ports on the Cisco CDE110 front and back panels can be used for administrative access to the CDE110 through a terminal server. Terminal emulation software must be configured as follows:

- Bits per second: 9600
- Data bits: 8
- Parity: none
- Stop bits: 1
- Hardware flow control: ON

Connecting Cables to the CDE110

The following cable connections are used on the Cisco CDE110:

- For the four Ethernet interfaces on the back of the Cisco CDE110, use Category 5 UTP cables to connect the following:

  - One CDE110 Ethernet interface to the network that includes the set-top boxes that CDS Video Navigator will service
  - One CDE110 Ethernet interface to connect to the network used for management and back-office communication
- If a terminal server is used, the RJ-45 cable from the terminal server is connected to an RJ-45 serial port on the front or back of the Cisco CDE110. Only one serial port can be used because it is one shared serial port.
- If a PC is directly connected to the CDE110 serial port, the cable from the PC is connected to an RJ-45 serial port on the front or back of the Cisco CDE110. Only one serial port (front or back) can be used because it is one shared serial port. The PC end of the cable connected to the CDE110 serial port varies depending on the type of ports supported by the PC.

Note The serial port is used for the system console. A system console is typically used rather than a monitor, keyboard, and mouse directly attached to the Cisco CDE110.

- If a monitor, keyboard, and mouse are used, the cables for the devices are connected to the appropriate connectors on the Cisco CDE110.

For the location of connectors on the Cisco CDE110 front and back panels, see the *Cisco Content Delivery Engine 110 Hardware Installation Guide*.

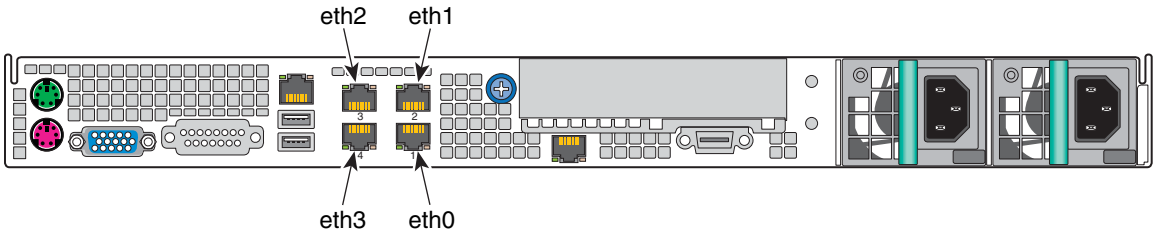
Configuring the CDE110 Ethernet Interfaces

This section explains the initial Ethernet interface configuration tasks needed for a Cisco CDE110 that will run CDS Video Navigator software. The explanation assumes that the needed software for Red Hat Linux and CDS Video Navigator has been pre-installed on the Cisco CDE110. For Red Hat Enterprise Linux 3.0 AS/ES Update 9 documentation, go to the following web site:

http://www.redhat.com/docs/manuals/enterprise/

For software configuration, the RJ-45 NIC (Ethernet) ports on the Cisco CDE110 back panel are specified as eth0, eth1, eth2, and eth3 as shown in Figure 2-1.

Figure 2-1 NIC Port Numbering for Software Configuration

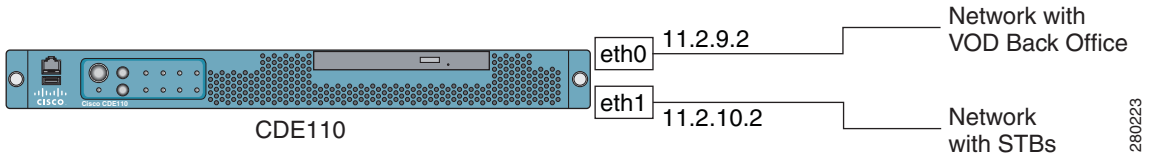


Note On the back panel, the NIC ports labeled 1, 2, 3, and 4 are, respectively, for interfaces eth0, eth1, eth2, and eth3.

For the configuration examples in this section, Figure 2-2 shows the IP addresses for the following interfaces:

- Interface eth0 connects to the network used for management and back-office communication
- Interface eth1 connects to the network containing the set-top boxes (STBs)

Figure 2-2 IP Addresses for CDS Video Navigator Configuration Examples



To configure the CDE110 Ethernet interfaces for CDS Video Navigator, follow these steps:

Step 1 Press the front panel power switch to power on the Cisco CDE110.

The operating system boots.

Step 2 Log in as root with the password rootroot.

Step 3 So that your system password for root is not the default password, use the **passwd** command to change the password used for root.

Step 4 For the Ethernet interfaces that will be used for CDS Video Navigator (eth0 and eth1), use a text editor to modify the two appropriate /etc/sysconfig/network-scripts/ifcfg-eth# files (where # is the number of the Ethernet interface, such as ifcfg-eth1) and do the following:

- Change ONBOOT to yes
- Add IPADDR=*ip_address_of this_system_eth#*
- Add NETMASK=*netmask_for_eth#_network*

As an example, for the eth1 interface, the /etc/sysconfig/network-scripts/ifcfg-eth1 file would include the following after the modifications:

```
ONBOOT=yes
IPADDR=11.2.10.2
NETMASK=255.255.255.0
```

Step 5 To bring the Ethernet interfaces up, issue the **ifup** command for eth0 and eth1. For example:

```
[root@system]# ifup eth1
```

Step 6 Verify that the eth0 and eth1 interfaces are configured correctly and up and running.

- Use the **ifconfig** *interface* command to verify that each Ethernet interface is up and running and the IP address and netmask for each are set correctly. The following example is for eth1:

```
[root@system]# ifconfig eth1

eth1      Link encap:Ethernet  HWaddr 00:0E:0C:C6:F3:0F
          inet addr:11.2.10.2  Bcast:11.2.10.255  Mask:255.255.255.0
          inet6 addr: fe80::20e:cff:fec6:f30f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3 errors:0 dropped:0 overruns:0 frame:0
          TX packets:36 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:192 (192.0 b)  TX bytes:2700 (2.6 KiB)
          Base address:0x3000 Memory:b8800000-b8820000
```

- Use the **ip link show eth#** command (where # is the Ethernet interface number) to check that the link is up. The following example is for eth1:

```
[root@system]# ip link show eth1

eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
link/ether 00:0e:0c:c6:e4:fe brd ff:ff:ff:ff:ff:ff
```

- Use the **ping** command to check that the Cisco CDE110 can reach the devices directly connected to the Ethernet interfaces (for example, a directly connected router):

```
[root@system]# ping device_IP_address
```

Step 7 Use a text editor to modify the /etc/hosts file and add a line with the IP address for eth0 and the associated hostname. For example:

```
11.2.9.2 starfire-iptv
```

Step 8 Save and close the /etc/hosts file.

Note For the host system IP address, using the IP address of the Ethernet interface that points to the management network and video back office is recommended.

Step 9 Use a text editor to modify the /etc/sysconfig/network file and change HOSTNAME to the hostname of this system. For example:

```
HOSTNAME=starfire-iptv
```

Step 10 Save and close the /etc/sysconfig/network file.

Note The changes to the files /etc/hosts and /etc/sysconfig/network do not take effect until the system is rebooted in the Step 11.

Step 11 To restart the system, issue the following command:

```
[root@system]# init 6
```

The operating system restarts.

Configuring CDS Video Navigator

CDS Video Navigator is a web application and requires minimal configuration.

To configure CDS Video Navigator, follow these steps:

Step 1 Log in with the user name isa and password calypso.

Step 2 Change the working directory as follows:

```
$ cd /home/isa/MIDAS/config
```

Step 3 Use a text editor to modify the backoffice.properties file.

a. Search for the TandbergWSAddress and CatalogFetchUrl parameters in backoffice.properties.

b. Enter the IP address of the Tandberg OpenStream platform in these two parameters as follows:

TandbergWSAddress=http://*Tandberg_IP_address*:6070/OSVod

CatalogFetchUrl=http://*Tandberg_IP_address*:6070/Catalog

For example:

```
TandbergWSAddress=http://192.168.100.200:6070/OSVod
CatalogFetchUrl=http://192.168.100.200:6070/Catalog
```

Step 4 Save and close the backoffice.properties file.

Configuring the Apache Web Server

You must configure the Apache web server to work with multiple IP addresses. Typically, two CDE110 Ethernet interfaces are configured with IP addresses. One Ethernet interface is for the set-top box client-facing VLAN, and the other Ethernet interface is for the management- and back-office-facing VLAN.

To configure the Apache web server, follow these steps:

Step 1 Log in as root or use the **su** command to get root privileges.

Step 2 Change the working directory as follows:

```
# cd /usr/local/apache2/bin
```

Step 3 Stop the Apache httpd daemon:

```
# ./apachectl stop
```

Step 4 Change the working directory as follows:

```
# cd /usr/local/apache2/conf
```

Step 5 Use a text editor to modify the httpd.conf file.

a. Search for the following section:

```
# Listen: Allows you to bind Apache to specific IP addresses and/or
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
Listen 80
```

b. Replace `Listen 80` with the following:

```
Listen  xxx.xx.xx.xxx:80
Listen  yyy.yy.yy.yyy:80
```

In the preceding, *xxx.xx.xx.xxx* and *yyy.yy.yy.yyy* are the IP addresses that you configured for the two CDE110 Ethernet interfaces.

c. Save and close the httpd.conf file.

Step 6 Change the working directory as follows:

```
# cd /usr/local/apache2/bin
```

Step 7 Start the Apache httpd daemon:

```
# ./apachectl start
```

Starting CDS Video Navigator and Verifying Status

The following system services are started automatically each time the CDE110 is powered on:

- sshd— Secure Shell daemon
- httpd—HyperText Transfer Protocol daemon (the Apache web server)
- tomcat5—Apache Tomcat application server

This section shows you how to do the following:

1. Manually start CDS Video Navigator when you start it for the first time
2. Verify that CDS Video Navigator is running correctly
3. Configure CDS Video Navigator to start automatically when the CDE110 is powered on or is restarted in the case of a software failure

Note The name “midas” appears in the CDS Video Navigator commands and directory names. The midas name was used for CDS Video Navigator when the commands were created.

To start CDS Video Navigator and verify that the needed processes are running, follow these steps:

Step 1 Log in with the user name isa and password calypso.

Step 2 To start CDS Video Navigator, issue the following command:

```
$ start_midas

MIDAS not running ....... starting MIDAS
```

Step 3 To verify that the CDS Video Navigator process is running, issue the following command:

```
$ check_midas

MIDAS (2.1.X.X) is running
```

If CDS Video Navigator is not running, the output will be `MIDAS is not running`.

Step 4 To test the set-top box Client-facing Web Services Interface, issue the following commands:

```
$ cd /home/isa/MIDAS_IntegrationTest
$ clientinterfacetest
```

The **clientinterfacetest** script does not verify the connection from CDS Video Navigator to the set-top box. It does verify that the Client-facing Web Services Interface of CDS Video Navigator is working correctly.

If the test is successful, the output is as follows:

```
************************************************
Start testing liveness of MIDAS client interface.
************************************************
output = <html><body><h1>Welcome to MIDAS Server</h1></body></html>

Test successful
```

If the test is not successful, the output is as follows:

```
************************************************
Start testing liveness of MIDAS client interface.
************************************************
Method failed: HTTP/1.1 503 Service Temporarily Unavailable
Test unsuccessful
```

Step 5 To test the connection to and the Web Services interface on the Tandberg OpenStream, issue the following commands:

```
$ cd /home/isa/MIDAS_IntegrationTest
$ tandbergtest
```

The **tandbergtest** script tests fetching a web catalog from the Tandberg OpenStream. It also tests the Tandberg Web Services interface by querying the number of services and their corresponding offerings.

Some abbreviated example output from a successful test is as follows:

```
*****************************************************
* Start testing fetching catalog from Tandberg. *
*****************************************************
Success: Fetched catalog information from Tandberg

*************************************************************************
* Start testing Tandberg WS - Fetching available services and offerings. *
*************************************************************************

Success: Number of services in Tandberg system = 8

Service id = 0
name = N2BB
description =
displayPrice = null
pricename = 0
type = mod

Offering count of 4 for N2BB
Offering id = 1
Offering id = 3
Offering id = 51
Offering id = 103

Service id = 255
name = SOD
description =
displayPrice = null
pricename = 599
type = svod

Offering count of 0 for SOD

Service id = 203
name = MAX
description =
displayPrice = null
pricename = 299
type = svod

Offering count of 0 for MAX

Service id = 0
name = TVN
description =
displayPrice = null
pricename = 0
type = mod

Offering count of 0 for TVN

... <Output omitted> ...

Offering count of 1 for HOD
Offering id = 301
```

Step 6 Log in as root or use the **su** command to get root privileges.

Step 7 To verify the sshd process is running, issue the following command and look for output similar to that shown below.

```
# ps -ef | grep sshd
```

```
root      2835     1  0 Jul18 ?        00:00:00 /usr/sbin/sshd
```

Step 8 To verify the httpd process is running, issue the following command and look for output similar to that shown below.

```
# ps -ef | grep httpd

root      2880     1  0 Jul18 ?        00:00:00 /usr/sbin/httpd
apache    4881  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4882  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4883  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4884  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4885  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4886  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4887  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4888  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
```

Step 9 To verify the tomcat5 process is running, issue the following command and look for output similar to that shown below.

```
# ps -ef | grep tomcat5

root      2915     1  0 Jul18 ?        00:00:11 /usr/java/default/bin/java
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
-Djava.util.logging.config.file=/usr/share/tomcat5/conf/logging.properties
-Djava.endorsed.dirs=/usr/share/tomcat5/common/endorsed -classpath
:/usr/share/tomcat5/bin/bootstrap.jar:/usr/share/tomcat5/bin/commons-logging-api.jar
-Dcatalina.base=/usr/share/tomcat5 -Dcatalina.home=/usr/share/tomcat5
-Djava.io.tmpdir=/usr/share/tomcat5/temp org.apache.catalina.startup.Bootstrap start
```

Step 10 Do one of the following after checking that the sshd, httpd, and tomcat5 processes are running:

- If these checks indicate that all processes are running, proceed to Step 11.
- If any of these checks fail, restart the processes that are not running. As an example, to restart the tomcat5 process, use **service tomcat5 restart**. Then verify the processes are running and proceed to Step 11.

Step 11 Change the working directory as follows:

```
# cd /etc
```

Step 12 To configure CDS Video Navigator to start automatically when the CDE110 is powered on or restarts in the case of a software failure, use a text editor to modify the rc.local file.

a. Uncomment the following line by deleting the # character:

```
#su - isa -c "cd /home/isa/MIDAS; ./run_midas >& /home/isa/MIDAS/midas_log&"
```

b. Save and close the rc.local file.

Information on CDE110 Hardware

This section has some brief notes on some of the hardware components and RAID configuration that are used for CDS Video Navigator models of the Cisco Content Delivery Engine 110 (CDE110).

Flash Disk

The Cisco CDS Video Navigator models of the CDE110 include a 4-GB flash drive. 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.

Hardware RAID and Disk Duplexing

The Cisco CDS Video Navigator models of the CDE110 provide hardware RAID (redundant arrays of independent disks) on the motherboard. Hardware RAID includes the following three components:

- Intelligent Battery Backup Unit (IBBU)
- RAID Activation Key
- RAID MiniDIMM

On the Cisco CDS Video Navigator models of the CDE110, 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.

By default, the two drives are configured for RAID 1, and the third drive is configured as a hot spare. If one hard disk in the disk-duplexed pair fails, all data is immediately available on the other without an impact on performance. With a hot spare drive, any disk failure will start an automatic rebuild of the data onto the hot spare drive. The hot spare automatically replaces the failed drive in the disk-duplexed pair.

With RAID 1, because all data is duplicated, only half of the total drive space can be counted as available space. Therefore, data capacity for the disk-duplexed pair of drives (two 146-GB drives) is approximately 146 GB total.

CHAPTER 3

Troubleshooting CDS Video Navigator Software Components

This chapter contains information that is useful for identifying and remedying problems related to Cisco CDS Video Navigator. This chapter contains the following major topics:

CDS Video Navigator Logging and Log Files

CDS Video Navigator log file entries can provide useful information for troubleshooting. CDS Video Navigator is a web application that makes use of the Apache Tomcat application server. Apache Tomcat uses the log4j logging system.

The CDS Video Navigator log file is named midas.log and resides in the /home/isa/MIDAS/logs directory. The log file is automatically rotated when its size reaches 20 MB. Up to ten archived log files are stored in the /home/isa/MIDAS/logs directory. For example:

```
-rw-rw-r-- 1 isa isa 342473 Jan 23 20:40 midas.log
-rw-rw-r-- 1 isa isa 20965936 Jan 19 17:45 midas.log.1
-rw-rw-r-- 1 isa isa 20960394 Jan 18 14:00 midas.log.2
-rw-rw-r-- 1 isa isa 20966090 Jan 17 20:52 midas.log.3
-rw-rw-r-- 1 isa isa 20968401 Jan 16 20:52 midas.log.4
-rw-rw-r-- 1 isa isa 20969543 Jan 15 20:51 midas.log.5
-rw-rw-r-- 1 isa isa 20969613 Jan 14 20:51 midas.log.6
-rw-rw-r-- 1 isa isa 20968092 Jan 13 20:51 midas.log.7
-rw-rw-r-- 1 isa isa 20966422 Jan 12 20:51 midas.log.8
-rw-rw-r-- 1 isa isa 20969681 Jan 11 20:51 midas.log.9
```

Logging Levels

The CDS Video Navigator logging levels are FATAL, ERROR, WARN, INFO, and DEBUG. Logging levels go from least verbose to most verbose. The FATAL level generates the smallest number of messages, and the DEBUG level generates the greatest number of messages. The default value is WARN.

In a lab environment, you might want to keep the logging level at DEBUG. However, using the DEBUG level affects performance. For load testing or a production environment, the logging level should be set to INFO or, for better performance, WARN.

The CDS Video Navigator logging configuration file is named midasLog.properties and resides in the /home/isa/MIDAS/config directory.

To change the logging level, follow these steps:

Step 1 If needed, log in as root on the CDE110 that hosts CDS Video Navigator.

Step 2 Change the working directory as follows:

```
[root@system]# cd /home/isa/MIDAS/config
```

Step 3 Use a text editor to modify the midasLog.properties file.

a. Change the log level in the property log4j.logger.Midas Logger to the value needed. Allowed values are FATAL, ERROR, WARN, INFO, and DEBUG. For example, the following line changes the log level to DEBUG:

```
log4j.logger.MidasLogger=DEBUG, MidasLogFile
```

b. Save and close the midasLog.properties file.

Note Changes to the midasLog.properties file do not take effect until CDS Video Navigator is restarted in Step 4.

Step 4 To stop and restart CDS Video Navigator, issue the following commands:

```
[root@system]# stop_midas

MIDAS Running ......shutting down
Using CATALINA_BASE: /usr/local/tomcat
Using CATALINA_HOME: /usr/local/tomcat
Using CATALINA_TMPDIR: /usr/local/tomcat/temp
Using JRE_HOME: /usr/local/java
Killing: 17895
MIDAS stopped

[root@system]# start_midas

MIDAS not running ....... starting MIDAS
```

Log Entry Format

Each CDS Video Navigator log entry has the following format:

[*Date Time*] [*Logging level*] [*Logging class*] - [*Log message*]

Some sample log entries are as follows:

```
[2008-02-04 18:49:49,626][ERROR] [CatalogHttpServer] - Error fetching catalog from
Tandberg java.io.IOException: Method failed: HTTP/1.1 503 Service Temporarily Unavailable
```

```
[2008-02-04 18:45:29,322][WARN] [BrowseCatalogAction] - device: 132 - Invalid page size -1
[2008-02-04 18:45:58,290][WARN] [BrowseCatalogAction] - device: 132 - Invalid page size -1
[2008-02-04 18:46:04,971][WARN] [BrowseCatalogAction] - device: 132 - Catalog 100 doesn't
exist

[2008-02-04 18:49:49,627][INFO] [CatalogHttpServer] - Fetch local catalog
[2008-02-04 18:49:49,825][INFO] [CatalogHttpServer] - Last local catalog
[2008-02-04 18:49:49,826][INFO] [CatalogHttpServer] - CR catalogId = 1
[2008-02-04 18:49:49,827][INFO] [CatalogHttpServer] - CR downloadTime = 1201219710722
[2008-02-04 18:49:49,828][INFO] [CatalogHttpServer] - CR fileName = catalog.113.xml
[2008-02-04 18:49:49,828][INFO] [CatalogHttpServer] - Going to load local catalog file
/home/isa/MIDAS/catalog/catalog.113.xml

[2008-02-04 18:49:50,133][DEBUG] [AssetIndexer] - Built index for asset 327
[2008-02-04 18:49:50,133][DEBUG] [AssetIndexer] - Add title = Wedding Crashers
[2008-02-04 18:49:50,134][DEBUG] [AssetIndexer] - Add summary = Two divorce mediators who
crash weddings to pick up women engage in comical misadventures at the nuptials of a
politician's daughter. Ends 09/02
[2008-02-04 18:49:50,134][DEBUG] [AssetIndexer] - Add content = Wedding Crashers Two
divorce mediators who crash weddings to pick up women engage in comical misadventures at
the nuptials of a politician's daughter. Ends 09/02 Owen Wilson Vince Vaughn Christopher
Walken Rachel McAdams
[2008-02-04 18:49:50,142][DEBUG] [AssetIndexer] - Built index for asset 328
[2008-02-04 18:49:50,142][DEBUG] [AssetIndexer] - Add title = The Rock
[2008-02-04 18:49:50,143][DEBUG] [AssetIndexer] - Add summary = Sean Connery and Nicolas
Cage team up to stop a devious U.S. general's threat to chemically attack San Francisco
from Alcatraz Island. Ends 09/09
[2008-02-04 18:49:50,160][DEBUG] [AssetIndexer] - Add content = The Rock Sean Connery and
Nicolas Cage team up to stop a devious U.S. general's threat to chemically attack San
Francisco from Alcatraz Island. Ends 09/09 Sean Connery Nicolas Cage Ed Harris Michael
Biehn William Forsythe
```

CDS Video Navigator Directory Structure

CDS Video Navigator uses the directory structure shown in Table 3-1.

Table 3-1 CDS Video Navigator Directory Structure

Directory	Contents
/home/isa/MIDAS/catalog	Contains the latest catalog files fetched from the Tandberg OpenStream. A maximum of five latest catalog files are kept in this directory. *Do not modify the contents of this directory.*
/home/isa/MIDAS/config	Contains files for configuring CDS Video Navigator.
/home/isa/MIDAS/docs	Contains the release notes or some user help files. The release notes contain the release number of the installed CDS Video Navigator software.
/home/isa/MIDAS/epg/data	Contains EPG data and a mapping file.
/home/isa/MIDAS/epg/index	Contains EPG search indexes.
/home/isa/MIDAS_IntegrationTest	Contains scripts for checking whether the client-facing and back-office interfaces are working correctly.
/home/isa/MIDAS/logs	Contains the CDS Video Navigator log files. For more information, see the "CDS Video Navigator Logging and Log Files" section on page 3-1.

Table 3-1 CDS Video Navigator Directory Structure (continued)

Directory	Contents
/home/isa/MIDAS/scripts	Contains scripts for starting, stopping, and checking whether CDS Video Navigator is running.
/home/isa/MIDAS/test	Contains sample test files.
/home/isa/MIDAS/webapps	Contains the CDS Video Navigator web applications.
/usr/local/apache2	Contains the Apache web server binary executable.
/usr/local/tomcat	Contains files related to the Tomcat application server.

CDS Video Navigator Scripts

The CDS Video Navigator software includes the scripts shown in Table 3-2. These scripts may be needed to troubleshoot and resolve some CDS Video Navigator problems.

Table 3-2 CDS Video Navigator Scripts

Directory and Script	Contents
/home/isa/MIDAS/scripts/start_midas	Starts CDS Video Navigator and the Apache Tomcat application server (tomcat5).
/home/isa/MIDAS/scripts/stop_midas	Stops CDS Video Navigator.
/home/isa/MIDAS/scripts/check_midas	Checks whether CDS Video Navigator is running and displays the release number of the installed CDS Video Navigator software.
/home/isa/MIDAS_IntegrationTest/clientinterfacetest	Checks whether the Client-facing Web Services Interface is working correctly. The **clientinterfacetest** command does not verify the connection from CDS Video Navigator to the set-top box.
/home/isa/MIDAS_IntegrationTest/searchTest	Checks whether EPG and VOD search is working.
/home/isa/MIDAS_IntegrationTest/tandbergtest	Checks whether the connection to and the Web Services interface on the Tandberg OpenStream are working correctly.

Note The CDS Video Navigator software installation script adds /home/isa/MIDAS/scripts to the PATH variable but does not add /home/isa/MIDAS_IntegrationTest to the PATH. Therefore, your current working directory must be /home/isa/MIDAS_IntegrationTest when either the **clientinterfacetest** or **tandbergtest** scripts are executed.

CDS Video Navigator Troubleshooting

This section provides information on troubleshooting the following specific problems that can occur with CDS Video Navigator:

- VOD Catalog Not Displayed on Set-Top Boxes, page 3-5

VOD Catalog Not Displayed on Set-Top Boxes

Symptom: The VOD catalog is not displayed on one or more set-top boxes.

Explanation: If the VOD catalog is not available on a set-top box, set the CDS Video Navigator logging level to DEBUG. For information on how to set the logging level, see the "Logging Levels" section on page 3-1.

Observe the entries in the log file for SignOn and BrowseCatalog requests as described in the following explanation.

When the set-top box user selects the VOD service, the CDS-VN client on the set-top box makes a SignOn request to CDS Video Navigator. The CDS-VN client queries CDS Video Navigator by device ID (MAC address of the set-top box) for the list of VOD services to which it is entitled. With the logging level set to DEBUG, you should be able to see the SignOn request in the CDS Video Navigator log file. For example:

```
[2008-01-31 11:10:38,125][DEBUG] [SignOnAction] - SignOn request
[2008-01-31 11:10:38,125][DEBUG] [SignOnAction] - deviceId = null
[2008-01-31 11:10:38,128][DEBUG] [SignOnAction] - deviceId 00:14:F8:E3:0A:DF- SignOn:
processServices
[2008-01-31 11:10:38,152][DEBUG] [SignOnAction] - Process service done
[2008-01-31 11:10:38,152][DEBUG] [SignOnAction] - deviceId 00:14:F8:E3:0A:DF- SignOn:
processRentals
[2008-01-31 11:10:38,221][DEBUG] [SignOnAction] - deviceId 00:14:F8:E3:0A:DF has 0 rental
records on Tandberg system
[2008-01-31 11:10:38,221][DEBUG] [SignOnAction] - No of rental records in MIDAS database =
0
[2008-01-31 11:10:38,222][DEBUG] [SignOnAction] - Process rental done
[2008-01-31 11:10:38,222][DEBUG] [ActionSkeleton] - HTTP Response
[2008-01-31 11:10:38,222][DEBUG] [ActionSkeleton] - <?xml version="1.0" encoding="UTF-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"><env:Body
xmlns="com.cisco.midas.client"><SignOnResponse /></env:Body></env:Envelope>^
```

When the set-top box user starts browsing the VOD catalog, the CDS-VN client on the set-top box makes a BrowseCatalog request to CDS Video Navigator. For example, the following log entries show a BrowseCatalog request and response:

```
[2008-01-31 11:10:38,334][DEBUG] [BrowseCatalogAction] - BrowseCatalog request
[2008-01-31 11:10:38,335][DEBUG] [BrowseCatalogAction] - deviceId = 00:14:F8:E3:0A:DF
[2008-01-31 11:10:38,335][DEBUG] [BrowseCatalogAction] - catalogId = 1
[2008-01-31 11:10:38,335][DEBUG] [BrowseCatalogAction] - categoryId = 0
[2008-01-31 11:10:38,338][DEBUG] [BrowseCatalogAction] - pageNo = 1
[2008-01-31 11:10:38,338][DEBUG] [BrowseCatalogAction] - pageSize = 7
[2008-01-31 11:10:38,338][DEBUG] [BrowseCatalogAction] - Construct JDOM response
[2008-01-31 11:10:38,339][DEBUG] [BrowseCatalogAction] - deviceId 00:14:F8:E3:0A:DF - From
= 0 to = 5
[2008-01-31 11:10:38,339][DEBUG] [BrowseCatalogAction] - deviceId 00:14:F8:E3:0A:DF -
Output list size = 5
[2008-01-31 11:10:38,339][DEBUG] [BrowseCatalogAction] - hasCategory
[2008-01-31 11:10:38,339][DEBUG] [BrowseCatalogAction] - hasServiceCategory
[2008-01-31 11:10:38,339][DEBUG] [ActionSkeleton] - HTTP Response
[2008-01-31 11:10:38,340][DEBUG] [ActionSkeleton] - <?xml version="1.0"
encoding="UTF-8"?>^M
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"><env:Body
xmlns="com.cisco.midas.client"><BrowseCatalogResponse><category id="2" name="All Movies"
parentId="0" desc="" /><category id="4" name="Cat1" parentId="0" desc="" /><category
id="12" name="HBO" parentId="0" desc="" /><serviceCategory id="15" name="MAX" parentId="0"
desc=""><service id="203" name="MAX" desc="Cinemax On Demand" price="$2.99"
purchased="false"><backoffice name="vendorName" value="Tandberg" /><backoffice
name="vendorVersion" value="3.3" /><backoffice name="serviceOfferingId" value="203"
/><backoffice name="serviceName" value="MAX"
```

```
/></service></serviceCategory><serviceCategory id="20" name="Showtime" parentId="0"
desc=""><service id="255" name="SOD" desc="Showtime On Demand" price="$5.99"
purchased="false"><backoffice name="vendorName" value="Tandberg" /><backoffice
name="vendorVersion" value="3.3" /><backoffice name="serviceOfferingId" value="255"
/><backoffice name="serviceName" value="SOD"
/></service></serviceCategory><pageNo>1</pageNo><pageSize>7</pageSize><totalItems>5</total
Items><hasMore>false</hasMore><catalogVersion>1</catalogVersion></BrowseCatalogResponse></
env:Body></env:Envelope>
```

It is possible that the SignOn and BrowseCatalog requests and responses appear in the CDS Video Navigator log entries, but no VOD catalog is displayed on the set-top box. This set of symptoms may indicate that there is a network problem or (less likely) that the set-top box cannot process the returned data.

Remedy: If there is no log-file entry for the SignOn request or other activity in the CDS Video Navigator log file, follow these steps:

Note Because CDS Video Navigator is a web application, there is no Video Navigator process that you can check to see if it is running. Instead, use the **check_midas** command.

Step 1 Log in as root.

Step 2 If you know the set-top box IP address, use the **ping** command and the IP address to verify that the CDS Video Navigator server (CDE110) can reach the set-top box.

Step 3 To check that CDS Video Navigator is running, issue the following command:

```
[root@system]# check_midas
```

If CDS Video Navigator is running, the output has “MIDAS is running”. If CDS Video Navigator is not running, output has “MIDAS is not running”.

Do one of the following:

- If CDS Video Navigator is not running, go to Step 5.
- If CDS Video Navigator is running, go to Step 4.

Step 4 If CDS Video Navigator is running, verify that the Apache HTTP server service (httpd) is running by issuing the following command:

```
[root@system]# ps -ef | grep httpd
```

Do one of the following depending on whether httpd is running.

- If httpd is running, the output is similar to the following. Go to Step 6.

```
root      2880     1  0 Jul18 ?        00:00:00 /usr/sbin/httpd
apache    4881  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4882  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4883  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4884  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4885  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4886  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4887  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
apache    4888  2880  0 04:03 ?        00:00:00 /usr/sbin/httpd
```

- If httpd is not running, the preceding output will not be present. Restart the httpd daemon by issuing the following command:

```
[root@system]# service httpd restart
```

Go to Step 6.

Step 5 If CDS Video Navigator is not running, restart it and verify that it is running by issuing the following commands:

```
[root@system]# start_midas

MIDAS not running ....... starting MIDAS

[root@system]# check_midas

MIDAS (2.1.X.X) is running
```

Step 6 On the set-top box, select or have the user select the VOD service.

Step 7 Check the log entries to verify that a SignOn request from the set-top box is sent to CDS Video Navigator.

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