Configuring the Cisco Vision Dynamic Signage Director Server System Settings

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This document is intended for Cisco Vision Dynamic Signage Director administrators and describes how to configure the initial setup of the Cisco Vision Dynamic Signage Director server.

Contents

Prerequisites for Configuring Cisco Vision Dynamic Signage Director Server System Settings

Before you configure Cisco Vision Dynamic Signage Director servers, meet the following requirements:

- The Cisco Vision Dynamic Signage Director server hardware and software is installed. For more information, see Cisco Vision Software Installation and Upgrade Guide: Dynamic Signage Director Release 6.0.

- The Cisco Vision Dynamic Signage Director server is installed and you know the IP address.

- You have a supported browser version for Cisco Vision Dynamic Signage Director. For more information about the latest supported browsers, see Cisco Vision Software Installation and Upgrade Guide: Dynamic Signage Director Release 6.0.

- You have either physical console access or an SSH client such as PuTTY to log into the Cisco Vision Dynamic Signage Director server.

- You know the installer account credentials on the Cisco Vision Dynamic Signage Director server.

- You understand how to use the Text Utility Interface (TUI). For more information, see Cisco Vision Dynamic Signage Director Server Text Utility Interface, page 89. For simplicity in these tasks, the instruction to "select" a particular menu item implies that you type the character that corresponds to the menu option and press **Enter**.

- For NTP configuration requirements, see Prerequisites for Configuring NTP on Cisco Vision Dynamic Signage Director Servers and DMPs, page 17.

- For multicast configuration requirements, see Prerequisites for Configuring Multicast Ports in Cisco Vision Dynamic Signage Director, page 31.

How to Configure Cisco Vision Dynamic Signage Director Server System Settings

This section includes the following tasks:

Completing Initial Configuration of System Settings After a Full ISO Installation

When you install a full ISO, you configure certain network settings in the Linux interface as part of the ISO installation such as the server IP address and DNS configuration.

If the network configuration is successfully completed as part of the installation, then generate the SSL certificate, set the date and time options on the server (NTP and PTP), and restart the Cisco Vision Dynamic Signage Director software.

For detailed information about how to configure the date and time options, see Configuring NTP on Cisco Vision Dynamic Signage Director Servers and DMPs, page 16.

Note: If you were unable to complete the Linux network configuration as part of the ISO installation, complete all of the tasks in this module.

Configuring the Cisco Vision Dynamic Signage Director Server Network Interface

Note: If you were unable to complete the Linux network configuration as part of the full ISO installation, then complete this task.

This task describes how to access the Linux menus from the TUI to configure the Cisco Vision Dynamic Signage Director server network interface.

To configure the Cisco Vision Dynamic Signage Director server network interface:

1. Log into the TUI as installer using a directly-connected console or SSH client.

   The TUI Main Menu is displayed.

2. From the Main Menu, go to **System Settings** > **Network Settings** > **Setup Network Information**.

   Tip: To navigate through the TUI menus you must type the character that corresponds to the menu area where you want to go (a, b, c, and so on) and press Enter. To return to other menus, you must back out of the hierarchy of menus using one of the indicated keys to return you to prior menus.

3. At the Configure Network confirmation screen, press any key to continue to enter the Linux network configuration interface.

   The Select Action Linux screen is displayed with the **Edit Devices** option selected.

   Tip: If you notice what appears to be stray characters in the Linux interface, verify that your SSH client is using the UTF-8 character set translation.

4. In the Select Action screen, select **Edit Devices** and press **Enter** (Figure 1 on page 13).

Figure 1   Select Action Screen
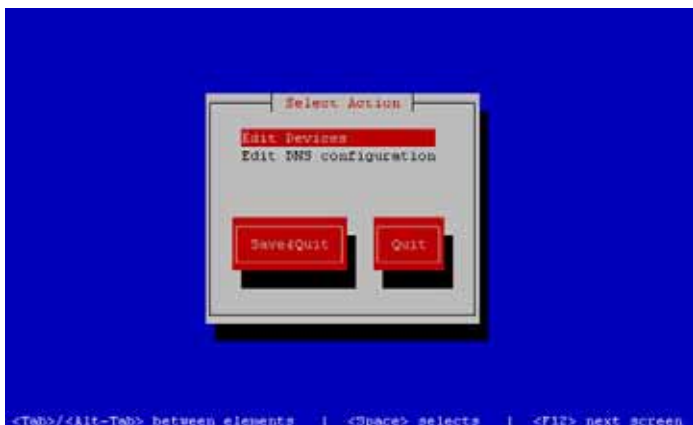
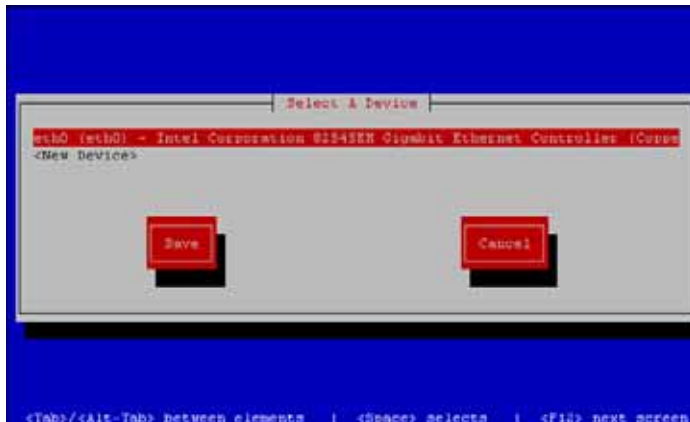5. In the Select a Device screen, select **eth0** and press **Enter** (Figure 2 on page 14).
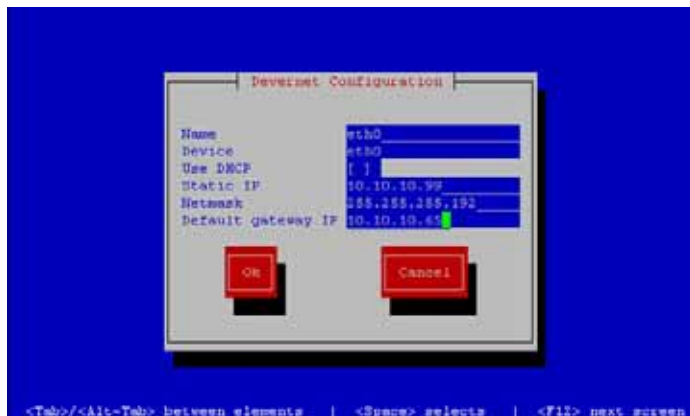
Figure 2   Select a Device Screen

The Ethernet Configuration screen is displayed (Figure 3 on page 14).

6. In the Ethernet Configuration screen, do the following:

Note: The Linux screen is mislabeled "Devernet Configuration."

Figure 3   Devernet Configuration Screen

a. Press the Tab key until the cursor is positioned on the Static IP address line.

b. Press the backspace key to go to the beginning of the line and type in the IPv4 address of the Cisco Vision Dynamic Signage Director server.

Note: If installing on a Platform 3 server, this should be a different IP address than what you configured for the CIMC interface.

c. Press the tab key to go to the Netmask line. Type the network mask for the IPv4 address.

d. (Optional) In the Default gateway IP line, type the address of the default gateway of your network.

7. When configuration of all options is complete, press the Tab key until the **Ok** button is selected and press **Enter**.

You return to the Select a Device screen.

8. Press the Tab key until the **Save** button is highlighted and press **Enter**.

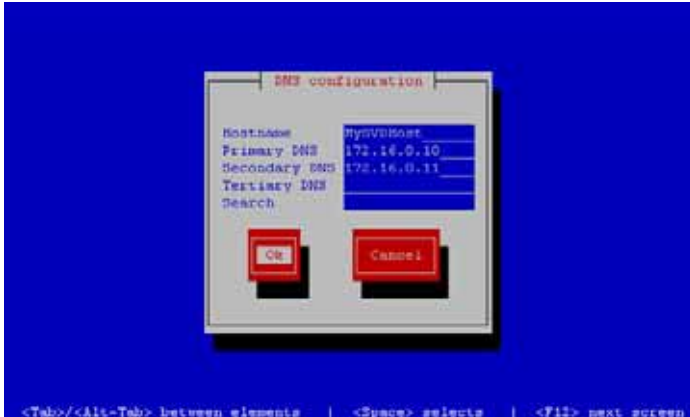You return to the Select Action screen.

9. Press the down arrow key to select the **Edit DNS configuration** option and press **Enter**.

   The DNS configuration screen is displayed.

10. In the DNS configuration screen (Figure 4 on page 15), select and configure the Hostname and one or more DNS Server IP addresses.

Note: Do not use hostnames that contain periods "." within the name.

Figure 4   DNS Configuration Screen

11. Press the Tab key until the **Ok** button is selected and press **Enter**.

    You return to the Select Action screen.

12. In the Select Action screen, press the Tab key until the **Save&Quit** button is selected and press **Enter**.

    You return to the TUI Configure Network menu.

Editing the Hosts File

Note: If for some reason you were unable to complete the Linux network configuration as part of the full ISO installation, then complete this task.

Before you begin, be sure that you know how to use the vi editor. For more information, see Cisco Vision Dynamic Signage Director Server Text Utility Interface, page 89.

To edit the hosts file, complete the following steps:

1. From the TUI Network Settings menu, select the **Edit hosts file** option.

2. At the confirmation prompt, press any key to open the /etc/hosts file for editing.

3. Change the line with IP address "10.10.10.10" to a comment (insert a # character at the beginning of the line) as shown in the following example:

   #10.10.10.10

4. Change the line for the IPv6 localhost entry "::1" to a comment as shown in the following example:

   #::1

5. Add a line for the server IP address and hostname as shown in the following example, where *x.x.x.x* is the IPv4 address of the Cisco Vision Dynamic Signage Director server, and *hostname* is the name to identify the server:

```
x.x.x.x hostname
```

Note: Do not use hostnames that contain periods "." within the name.

6. Press **Esc** to enter vi command mode.

7. Save the changes to the file by typing the following command:

   :wq

8. Press any key to return to the Network Settings menu.

Restarting the Network Service on the Server

Note: If for some reason you were unable to complete the Linux network configuration as part of the full ISO installation, then complete this task.

After you complete the network configuration on the Cisco Vision Dynamic Signage Director server, restart the network service to apply the network configuration.

1. Log into the TUI as installer on the server using a directly-connected console or SSH client.

   The TUI Main Menu is displayed.

2. From the Main Menu, go to **Services Control** > **Networking** > **Restart networking**.

   The network interface eth0 is restarted.

3. Confirm that the command completed successfully.

4. Press any key to return to the Networking menu.

5. Return to the Main Menu.

Generating the SSL Certificate

Note: Generation of a new SSL certificate also is required after initial upgrade to Release 6.0.

To generate the SSL certificate, complete the following steps:
1. From the Main Menu, go to **System Settings** > **Network Settings**.

2. Select the **Generate certificate file** option.

3. When the confirmation warning prompt appears, type **Y** to continue and generate a new SSL certificate.

   To cancel without generating a new certificate, type **N**.

4. Press any key to return to the Network Settings menu.

Configuring NTP on Cisco Vision Dynamic Signage Director Servers and DMPs

Network Time Protocol (NTP) service is required in Cisco Vision Dynamic Signage Director on the following devices:

◼ Cisco Vision Dynamic Signage Director servers

◼ Series 2 and Series 3 Precision Time Protocol (PTP) master device

NTP provides reliable clocking for your Cisco Vision network and helps ensure synchronicity between redundant servers.

Note: For optimized synchronization on the Series 2 and Series 3 media players, PTP is used. Only the PTP masters derive a clock using NTP.

You should verify the NTP configuration for your Cisco Vision Dynamic Signage Director servers, since the default NTP source is a Red Hat Linux public pool and might not be the NTP server source that you want to use for your venue.

Configuration of the DMP NTP source is done within the Cisco Vision Dynamic Signage Director Management Dashboard. As a best practice, the Cisco Vision Dynamic Signage Director server is already set as the NTP host by default for all media players. This does not need to be changed unless the venue requires a different NTP source.

Caution: The Cisco Vision Dynamic Signage Director server is itself enabled as an NTP host to provide timing to the media players only. Do not use Cisco Vision Dynamic Signage Director as an NTP host for other devices in your network.

This section includes the following tasks:

- Prerequisites for Configuring NTP on Cisco Vision Dynamic Signage Director Servers and DMPs, page 17 (required)

- Configuring the System Date and Time Using NTP on Cisco Vision Dynamic Signage Director Servers, page 18 (required)

- Configuring NTP and PTP on the Series 2 and Series 3 Media Players, page 22 (required)

Prerequisites for Configuring NTP on Cisco Vision Dynamic Signage Director Servers and DMPs

Caution: If you are running Cisco Vision Dynamic Signage Director on a virtual server, then you should reference a reliable NTP server running on a bare metal server, rather than relying on a clock from a VM environment that can drift and is not accurate.

Before configuring NTP on Cisco Vision Dynamic Signage Director servers and DMPs, be sure that the following requirements are met:

- You understand how to use vi editor commands.

- You understand the NTP host requirements for your Cisco Vision Dynamic Signage Director servers:

   – If you do not want to use the default public pool of NTP servers for the Cisco Vision Dynamic Signage Director servers, you have the IP address or DNS name of the NTP host for your network.

   – If you plan to use a public pool of NTP servers, be sure that the servers are reachable from the Cisco Vision Dynamic Signage Director network. By default, the ntp.conf file on Cisco Vision Dynamic Signage Director servers has configured the following Red Hat Linux public pool of servers:

      server 0.rhel.pool.ntp.org
      server 1.rhel.pool.ntp.org
      server 2.rhel.pool.ntp.org

      Tip: For more information about using NTP pool servers see the Network Time Protocol website.

- If you plan to change the default best practice of using the Cisco Vision Dynamic Signage Director server as the NTP source for DMPs, be sure that the following requirements are met:

   – You have configured the NTP host for the Cisco Vision Dynamic Signage Director server first.

   – You have upgraded the DMP firmware.

      For more information about how to upgrade the DMP firmware, see the Cisco Vision Software Installation and Upgrade Guide: Dynamic Signage Director for your release.

- For optimal synchronization, use the same NTP server that is configured for the Cisco Vision Dynamic Signage Director server. However, it is not required.

- The DMP must not reference an NTP server pool. If the Cisco Vision Dynamic Signage Director server references an NTP server pool (the default), then select a specific server from that same pool as the NTP server for the DMPs.

- Only IPv4 is supported for the NTP server address on the DMPs.

- The NTP server for the DMPs must not be a load-balanced server.

■ The Cisco Vision Dynamic Signage Director network is configured to allow bidirectional transmission of UDP messages on port 123 for NTP messages.

UDP port 123 is used for communication between the Cisco Vision Dynamic Signage Director servers and NTP hosts, and the DMPs and NTP host (by default, this is the Cisco Vision Dynamic Signage Director server).

For a complete port reference for Cisco Vision Dynamic Signage Director servers, see the "Port Reference" module of the Cisco Vision Software Installation and Upgrade Guide: Dynamic Signage Director for your release.

Configuring the System Date and Time Using NTP on Cisco Vision Dynamic Signage Director Servers

When you install or upgrade the Cisco Vision Dynamic Signage Director, you need to configure the system date and time in the TUI. You also need to configure the time zone.

Note: Although you can manually configure the system date and time on your servers when necessary, this should be avoided for your production network.

■ Setting Up the NTP Source on Cisco Vision Dynamic Signage Director Servers, page 18 (required)

■ Configuring the Time Zone, page 19 (required)

■ Restarting the Cisco Vision Dynamic Signage Director Software, page 21 (required)

■ Configuring the Date and Time Manually, page 22 (if necessary)

Setting Up the NTP Source on Cisco Vision Dynamic Signage Director Servers

Note: Complete this task only if you do not want to use the default public pool of servers.

Standard NTP server configuration uses the word "server" followed by the Domain Name System (DNS) name or IP address of an NTP server. By default, the ntp.conf file on Cisco Vision Dynamic Signage Director servers has configured the following Red Hat Linux public pool of servers:

```
server 0.rhel.pool.ntp.org
server 1.rhel.pool.ntp.org
server 2.rhel.pool.ntp.org
```

For these servers to be used as a reference clock, they must be reachable from the Cisco Vision Dynamic Signage Director network.

If you want to use your own server, be sure to add it and comment out these default pool servers in the ntp.conf file. Otherwise, you do not need to do any further editing of the ntp.conf file in this task.

To set up the NTP host on Cisco Vision Dynamic Signage Director servers, complete the following steps:

1. From the TUI Main Menu, go to **System Settings** > **Date and Time Settings** > **Setup NTP Source**.

   A confirmation screen to Configure NTP and edit the ntp.conf file is displayed.

2. To open the ntp.conf file for edit, press any key.

The ntp.conf file opens in the vi editor and the cursor is positioned at the end of the last configured NTP server line. If this is not the case, navigate to the server configuration section.

3. To enter INSERT line editing mode, type **i**.

The vi editor changes to INSERT mode.

4. If you have a server that you want to use as the reference clock source at your site, do the following:

  – Add a line and type "**server** *ip-address*" or "**server** *dns-name*," where *ip-address* or *dns-name* is replaced by the IP address or name of the NTP server that you want to configure.

  – Go to the lines where the pool servers are configured and add a "#" sign in front to comment them out of the configuration as shown below:

```
#server 0.rhel.pool.ntp.org
#server 1.rhel.pool.ntp.org
#server 2.rhel.pool.ntp.org
```

5. To exit INSERT mode and return to vi command mode, press **Esc**.

6. To save your changes, type **:wq**.

The configuration is saved and the ntpd service is restarted. Verify that you see the "OK" confirmation that the ntpd has started.

7. To return to the Date and Time Settings menu, press any key.

Configuring the Time Zone

Configuring the time zone is required for the Cisco Vision Dynamic Signage Director server.

Note: Although there is an option to set the time zone in the Venues interface of the Control Panel on the Cisco Vision Dynamic Signage Director server, this option is informational only and is also used for proof-of-play reporting.

This section includes the following tasks:

■ Finding the Time Zone Code for System Configuration, page 19 (optional)

■ Configuring the System Time Zone, page 20 (required)

Finding the Time Zone Code for System Configuration

Use this task if you need to find out the time zone code to configure the server's time zone information.

Note: This task provides information only and does not actually configure the time zone.

To find the time zone code for system configuration, complete the following steps:

  a. From the Date and Time Settings menu, do the following:

  b. Select **Change Timezone**.

  c. Type the number that corresponds to the applicable continent or ocean for the location of the server.

  d. Type the number that corresponds to the country.

  e. Type the number for the time zone (as applicable).

  f. When the confirmation of the time zone information that you configured is displayed, type **1 (**for Yes) to accept your settings, or 2 (for No) to cancel (Figure 5 on page 20).

Figure 5   Time Zone Confirmation Prompt

g. After confirming Yes at the prompt, note the time zone string that is provided.

Figure 6 on page 20 shows a sample time zone code for America/Los_Angeles.

Figure 6   Sample Time Zone Code

8. Press any key to return to the Date and Time Settings menu.

9. Configure the system time zone using the appropriate code for the server location. See Configuring the System Time Zone, page 20.

Configuring the System Time Zone

Prerequisites

Before you configure the system time zone, you should know the following information:

■ How to use vi editor commands.

■ The time zone code for the server location. If you need to look up the time zone code, see Finding the Time Zone Code for System Configuration, page 19.

Procedure

To configure the system time zone so that it persists after restart of the server, complete the following steps:

1. From the TUI Main Menu on the server, go to **System Settings** > **Date and Time Settings** > **Change System Timezone**.

2. At the prompt to edit the system clock file, press any key to continue.

   The /etc/sysconfig/clock file is opened for editing.

3. Use the vi editor to specify your time zone. Figure 7 on page 21 shows an entry for the **"America/Los_Angeles"** time zone code.

   Tip: The quotation marks and underscore symbols are required.

Figure 7   Editing the Clock File

4. To exit INSERT mode and return to vi command mode, press **Esc**.

5. To save your changes, type **:wq!**.

6. At the prompt, press any key to return to the Date and Time Settings menu.

7. Restart the server to put the time zone changes into effect.

Restarting the Cisco Vision Dynamic Signage Director Software

After you configure an NTP server and time zone in the TUI on the server, you must restart the Cisco Vision Dynamic Signage Director software.

To restart the Cisco Vision Dynamic Signage Director software, complete the following steps:

1. From the TUI Main Menu on the server, go to:

   Cisco Vision Server Administration > **Restart Cisco Vision Dynamic Signage Director software**.

2. When the prompt appears, press any key to return to the Server Administration menu.

3. Return to the Main Menu and exit the TUI.

Configuring the Date and Time Manually

Note: This task is provided as a precaution if you should find it necessary to manually set the system date and time. Manual date and time configuration should be avoided on a production system and NTP service used instead.

To configure the date and time manually, complete the following steps:

1. From the TUI Main Menu on the server, go to **System Settings** > **Date and Time Settings** > **Change Date and Time**.

2. At the confirmation prompt, type **Y** to continue.

3. Type the new date and time in the format: MMDDhhmm[[CC] YY] [.ss], where:

    – MMDDhhmm is required (MM is month, DD is day, hh is hour, and mm is minutes).

    – CC is the century (first 2 digits of the year) and is optional for use with YY. For example "20" in the year 2013.

    – YY is the last 2 digits of the year and is optional. For example "13" in the year 2013.

    – .ss is seconds and is optional.

4. Press any key to return to the Date and Time Settings menu.

Configuring NTP and PTP on the Series 2 and Series 3 Media Players

By default, both NTP and PTP services are automatically enabled for Series 2 and Series 3 media players. The Series 2 and Series 3 media players use PTP to achieve optimal synchronization. However, an NTP source also must be used to provide initial clocking to the devices that are elected PTP masters in the network.

This section provides information about the default settings and how to modify them. It includes the following tasks:

- Restrictions for NTP and PTP on the Series 2 and Series 3 Media Players, page 22

- Guidelines for NTP and PTP on the Series 2 and Series 3 Media Players, page 23

- Modifying the Standard NTP and PTP Configuration on All Series 2 and Series 3s in the System, page 24 (optional)

- Verifying PTP Operation for the Series 2 and Series 3 Media Player, page 26

Restrictions for NTP and PTP on the Series 2 and Series 3 Media Players

Before you configure PTP on the Series 2 and Series 3 media players, consider the following restrictions:

- By default, PTP messages will not cross VLANs and PTP master candidates need to be identified for each VLAN and configured in the Management Dashboard.

- The system supports a configurable Precision Time Protocol (PTP) Time To Live (TTL) setting in the Management Dashboard. The PTP TTL specifies the number of VLANs that can be crossed for selection of a PTP master. The default value of 1 (recommended) means that each VLAN will elect its own PTP master.

    Note: For ease of configuration for venues with multiple VLANs, the system is configured by default to list all Series 2 and Series 3 devices as eligible PTP master candidates. However, be aware that although this simplifies configuration, the time that it takes for the devices to arbitrate a master device in each network will vary, and depends on the number of eligible devices in each network.

- Content synchronization for video playback on the Series 2 and Series 3 media player relies on precise time across DMPs using PTP. If SV-4K devices are playing video and one of the devices reboots, the rebooting unit will restart video playback from the beginning and will only synchronize with the other players when the next item in the playlist is rendered.

■ If Series 2 and Series 3 devices are participating in zone-based content synchronization for video walls, with some enhanced synchronization capability, the rebooting unit will synchronize with the current item being played by the device leader in the video wall. For more information, see "Working with Video Walls" in Cisco StadiumVision Director Operations Guide.

Guidelines for NTP and PTP on the Series 2 and Series 3 Media Players

Before you configure NTP and PTP on the Series 2 and Series 3 media players, consider the following guidelines:

■ For new installations of Cisco Vision Dynamic Signage Director, PTP is the default time source for the Series 2 and Series 3 media players, with NTP as the default time source for the elected PTP master.

NTP Guidelines

■ Each Series 2 and Series 3 media player designated as PTP master (per VLAN) will use NTP as its time source. The other devices in the network operate using a PTP reference clock from the elected PTP master.

■ When PTP is disabled (not recommended), all Series 2 and Series 3 devices use NTP to set their local clock.

Note: For synchronized video playback, NTP alone cannot be relied upon for Series 2 and Series 3 devices and PTP must be used.

■ The default NTP synchronization interval with the host time server is one hour and is configurable.

■ An NTP source must be configured in Cisco Vision Dynamic Signage Director. By default, the Cisco Vision Dynamic Signage Director server is configured as the Series 2 and Series 3 NTP host.

PTP Guidelines

■ PTP version 2 is supported only for the Series 2 and Series 3 media players and applies globally to all devices in the Cisco Vision Dynamic Signage Director network when configured.

■ PTP configuration includes a PTP domain and a set of master candidates:

– PTP domain—Default is 0.

Be sure that this domain does not conflict with any other PTP domain (and multicast addressing) in use in your network, and revise as needed. See table "Global SV-4K and DMP-2K Settings—PTP Property Values" for more information.

– PTP master candidates—Default is *.

This specifies that all Series 2 and Series 3 devices in the network are eligible as master candidates and will go through arbitration to designate a master for their respective subnets.

■ If you revise the default PTP master candidates configuration, you must configure one or more Series 2 and Series 3 devices as master candidates in a semicolon-separated list of IP addresses for each VLAN.

A minimum of two master candidates per network is recommended.

■ If there is an in-house PTP master for your network, leave the "PTP master candidates" property value blank. However, this configuration is only supported for venues without multiple subnets.

Modifying the Standard NTP and PTP Configuration on All Series 2 and Series 3s in the System

By default the NTP and PTP services are automatically enabled and configured for Series 2 and Series 3 media players. Use this task if you need to modify the default settings described in Table 1 on page 24 and Table 2 on page 25.

Table 1   Global SV-4K and DMP-2K Settings–PTP Property Values

| Property (Registry key)	Description	Values
PTP domain (Globaldmpsetting.common.init.ptp.domain)	Domain number for the PTP network, which defines the multicast address for PTP communication.	For IEEE-1588 PTP, possible values are: **0**–(Default) 224.0.1.129 **1**–224.0.1.130 **2**–224.0.1.131 **3**–224.0.1.132
PTP master candidates (Globaldmpsetting.common.init.ptp.master.host)	Eligible Series 2 and Series 3 devices for master candidate selection.	Possible values are: ■ *****–(Default). Wildcard pattern that specifies all Series 2 and Series 3 devices in the network as eligible PTP master candidates. ■ Semicolon-separated IPv4 addresses of Series 2 and Series 3 devices for each subnet. **Example:** 10.0.0.3;10.0.0.4;192.168.0.5;192.168.0.6 ■ blank–Specifies that a PTP master source external to Cisco Vision Dynamic Signage Director is used. This configuration is only valid for a venue without devices in multiple subnets.
PTP time-to-live (Globaldmpsetting.common.init.ptp.ttl)	Number of VLANs that can be crossed for selection of a PTP master.	1 (Default) **Note:** Best practice is to retain the default value of 1 for election of a PTP master per video wall. With a TTL > 1, degradation in local video synchronization can occur.

Table 2   Global SV-4K and DMP-2K Settings–NTP Property Values

Property (Registry Key)	Description	Values
NTP Host (Globaldmpsetting.common. deploy.ntpc.hostname)	IPv4 address of the NTP server.	Default–IP address of the Cisco Vision Dynamic Signage Director server.
NTP sync interval (Globaldmpsetting.common. deploy.ntpc.interval)	Number of seconds that the Series 2 and Series 3 waits before trying to synchronize its time with the configured NTP host.	**3600** (Default)
Timezone (Globaldmpsetting.common. deploy.ntpc.timezone)	Code for the timezone to be used.	**GMT** (Default)

To modify the standard NTP and PTP configuration on all Series 2 and Series 3s, complete the following steps:

1. Log into the Cisco Vision Dynamic Signage Director server as an administrator.

2. Go to the **Management Dashboard**.

3. Go to **Dynamic Signage Director Configuration** > **System Configuration** > **Global DMP Settings** > **Time Source** ().

Figure 8   Global DMP Settings for NTP and PTP on the Series 2 and Series 3
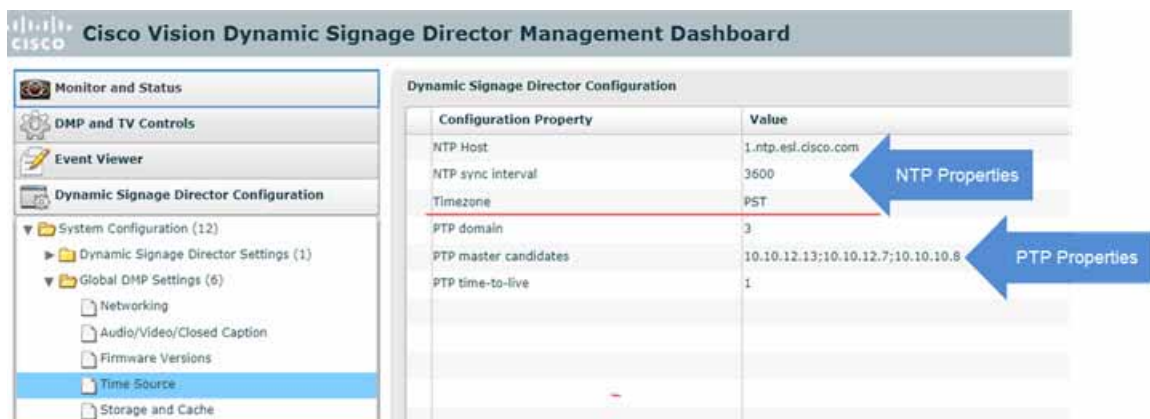
4. (Optional) Change the global PTP properties as required for your network. Refer to .

5. (Optional) Change the global NTP properties as required for your environment. Refer to .

6. Click the disk icon to Save changes.

7. Reboot the Series 2 and Series 3 devices.

Verifying PTP Operation for the Series 2 and Series 3 Media Player

This section describes how to verify the PTP configuration and also the operation of PTP for your Series 2 and Series 3 devices.

To verify the PTP operation for the Series 2 and Series 3 media player, complete the following steps:

1. Open your browser and navigate to one of the DMPs:

   http://_sv4k-ip-address_**/ptp.html**

2. Identify the PTP master by finding the unit that has an "offsetFromMaster" value of 0.0.

highlights the PTP master and shows a network where PTP is operating successfully with 12 members.

Figure 9   Successful PTP Clock Operation

Configuring Multicast Ports for Cisco Vision Dynamic Signage Director

This section includes the following topics:

- Information about Multicast Support in Cisco Vision Dynamic Signage Director, page 27

- Prerequisites for Configuring Multicast Ports in Cisco Vision Dynamic Signage Director, page 31

- How to Configure Multicast Ports in Cisco Vision Dynamic Signage Director, page 31

Information about Multicast Support in Cisco Vision Dynamic Signage Director

This section includes the following topics:

- HDMI-In Encoding on the SV-4K and CV-UHD Media Players to Stream Video as a Channel, page 28

- Per-Script Multicast Optimization, page 28

- Multicast Registry Keys in Cisco Vision Dynamic Signage Director, page 29

HDMI-In Encoding on the SV-4K and CV-UHD Media Players to Stream Video as a Channel

In Release 4.1 and later releases, Cisco Vision Dynamic Signage Director supports streaming video from a laptop or other supported device connected to the HDMI-In port on the SV-4K or CV-UHD media players to be played as a multicast-based channel in Cisco Vision Dynamic Signage Director.

The allowable multicast range to use for this feature in the Connected Venue (Connected Stadium) network is 239.193.20.0/24.

Note: If you want to maintain privacy of channels, create a DMP-encoded channel per suite with a unique multicast address (from 239.193.20.0/24 range), and create a separate channel guide per suite. For example, if you have 10 suites—create 10 separate DMP-encoded channels with unique multicast addresses, create 10 different channel guides for each DMP-encoded channel, and assign each suite to a different channel guide.

For more information about configuring this feature, see the Cisco Vision Director Operations Guide.

Per-Script Multicast Optimization

In Cisco StadiumVision Director Release 3.2 and later releases, the original Multicast Optimization introduced in Release 3.1 is replaced by Per-Script Multicast Optimization (for up to 20 different scripts) to reduce the number of multicast messages that each DMP must process.

Per-Script Multicast Optimization is designed to reduce the load on DMPs when the following conditions are present in Cisco Vision Director:

- More than one event script is run simultaneously in a venue.

  The scripts can be running across multiple venues or scripts running in a single venue.

- The External Content Integration feature is used, which sends multiple messages to the DMPs in a script.

Table 3 on page 28 provides a summary of the two different multicast optimization features supported in Cisco Vision Dynamic Signage Director.

Table 3   Summary of Multicast Optimization Features in Cisco Vision Dynamic Signage Director

Feature Name	Release	Scope	Remote Servers Required	Default
Multicast Optimization[1]	3.1 only	Per Site	Yes	Automatic when multi-venue support is enabled.
Per-Script Multicast Optimization	3.2 and later	Per Script (20 maximum)[2]	No	Disabled.

1. For information about per-site multicast optimization in Cisco StadiumVision Director Release 3.1, see the "Multicast Optimization for Remote Venues" topic in the "Configuring Cisco StadiumVision Director for Multiple Venue Support" module of the *Cisco StadiumVision Director Server Administration Guide, Release 3.1*.

2. If you are running more than 20 scripts, then the first 20 scripts operate using per-script multicast channels, and the additional scripts are run over the global multicast host port.

Benefits of Per-Script Multicast

In releases of Cisco StadiumVision Director 3.1 and earlier, the server uses a single multicast channel for all DMPs. In Release 3.2 and later, you can configure multiple multicast channels, over which the server sends only the multicast messages needed for a particular event script for up to 20 scripts.

If you are running more than 20 scripts, then the first 20 scripts operate using per-script multicast channels, and the additional scripts are run over the global multicast host port.
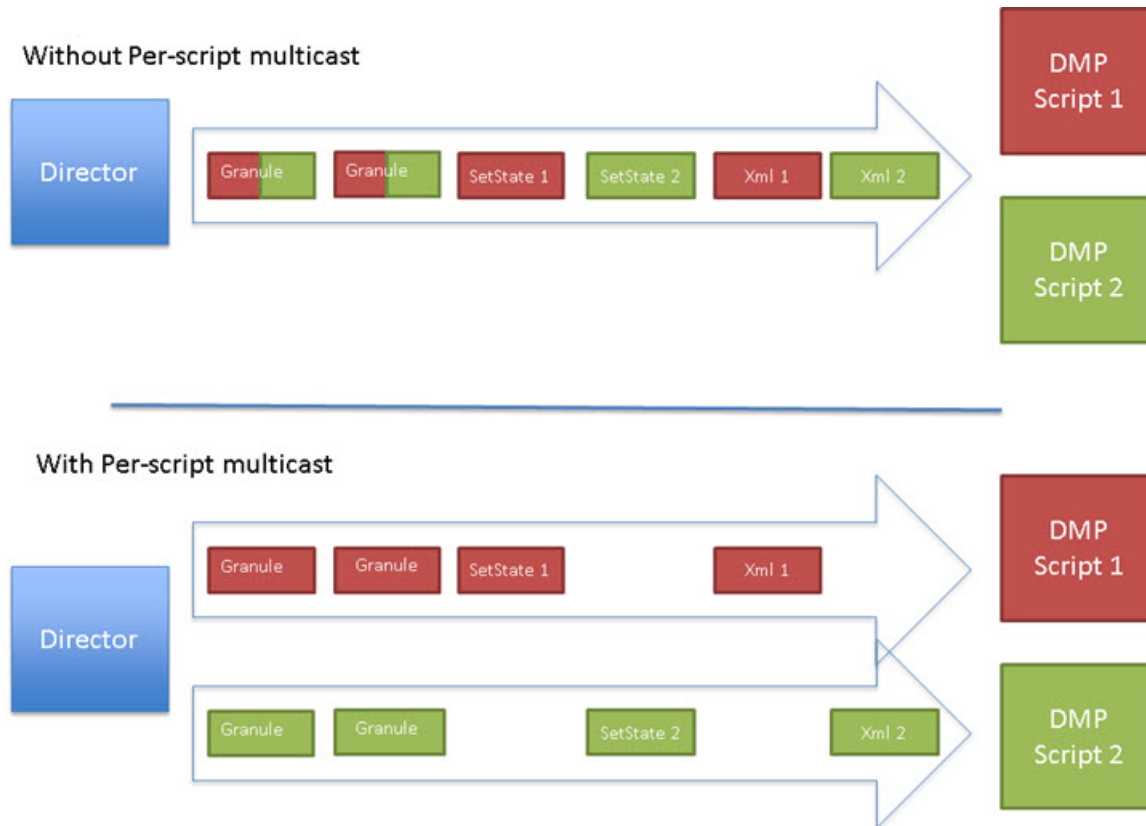
Figure 10 on page 29 shows this message separation. Each DMP goes from seeing four packets to seeing two. More importantly, each DMP now only has to process one XML payload, which is important when the XML payloads are sizeable.

Figure 10   Multicast Messaging With and Without Per-Script Multicast Optimization

All DMPs, including those associated with a remote site, listen on these per-script multicast channels.

For messages that apply to multiple event scripts, the message is duplicated and sent to each multicast channel. Therefore, this feature can increase the load on Cisco Vision Dynamic Signage Director servers (increasing the number of messages sent and copying of messages) as a tradeoff for reducing the number of messages seen and processed by DMPs. However, this load is expected to be negligible.

Multicast Registry Keys in Cisco Vision Dynamic Signage Director

Cisco Vision Dynamic Signage Director uses multicast messages for DMP control-plane operation. Cisco Connected Venue (Connected Stadium) network design assigns the following multicast group addresses for use by Cisco Vision Dynamic Signage Director:

- 239.193.0.0/24—For control communication

- 239.192.0.0/24—For video communication (This network should be avoided for the multicast configuration described in this module.)

Multicast addressing is configured using registry keys from the Cisco Vision Dynamic Signage Director Management Dashboard.

describes the registry keys in Cisco Vision Dynamic Signage Director that control the multicast configuration.

Note: The default PTP domain 0 uses multicast address 224.0.1.129. For more information, see .

Table 4   Multicast Registry keys in Cisco Vision Dynamic Signage Director

Registry Key	Default Value	Description
Globaldmpsetting.sv4k.init.dmpsync.multicast.address	239.193.0.253	Sets the global multicast address used for zone-based synchronization on the Series 2 and Series 3.
Globaldmpsetting.sv4k.init.dmpsync.multicast.port	50001 **Note:** The system automatically uses an additional port based on this default (default + 1) for secondary video. In the case of the 50001 default, 50002 is also reserved for secondary video use.	Sets the default port for the primary video for zone-based synchronization multicast address on the Series 2 and Series 3.
MulticastHostPort	239.192.0.254:50001 **Caution:** This default multicast address should be changed after installation to use the **239.193**.0.0/24 address range, or the network that is configured in your Cisco Connected Stadium network for Cisco Vision Dynamic Signage Director control.	Sets the global multicast address and port for Cisco Vision Dynamic Signage Director.
transport.dynamic.enable	■ False (for upgraded servers) Per-Script Multicast Optimization is disabled and the Cisco Vision Dynamic Signage Director server sends all communication over the MulticastHostPort address directly to all DMPs, including all remote DMPs. ■ True (for new installations)	Enables and disables Per-Script Multicast optimization.
transport.dynamic.send_range	50080–50099 If the MulticastHostPort registry key is 239.193.0.254:50001, then 239.193.0.254:50080–239.193.0.254:50099 is used as the range of Global hostports for the running scripts.	Specifies the range of ports for Per-Script Multicast Optimization. These ports are used with the network specified in the MulticastHostPort registry key, to define a range of additional global hostports to be assigned for running scripts.

Prerequisites for Configuring Multicast Ports in Cisco Vision Dynamic Signage Director

Before you configure multicast ports, be sure that the following requirements are met:

■ Be sure that you understand the multicast addressing in use for all areas of your Cisco Vision Dynamic Signage Director network, including Cisco Connected Venue and Cisco Vision Mobile networks. Confirm that there are not any multicast address/port overlaps.

Caution: Because of the large number of ports that per-script multicast configuration requires, and the possibility for hard-to-diagnose failures if video is routed to a DMP's control channel (which can occur when the port numbers are the same and even if the group/host portion is different), it is critical to verify that the port ranges you plan to use are not used by any other source of multicast in the network.

– For more information about the recommended multicast addressing for the Cisco Connected Venue network, see the *Cisco Connected Stadium Design Implementation Guide* available to authorized partners and from your Cisco Systems representative.

■ The network is properly configured to route the global multicast host port to be visible for all DMPs in the Cisco Vision Dynamic Signage Director network, including those at remote venues and associated to venues in a multi-venue environment.

How to Configure Multicast Ports in Cisco Vision Dynamic Signage Director

This section includes the following tasks:

■ Configuring the Global Multicast Host Port in Cisco Vision Dynamic Signage Director, page 31 (required)

■ Configuring Per-Script Multicast in Cisco Vision Dynamic Signage Director, page 31 (recommended)

■ Configuring Multicast Support for Zone-Based Content Synchronization for the Series 2 and Series 3, page 33 (optional)

Configuring the Global Multicast Host Port in Cisco Vision Dynamic Signage Director

The global multicast host port is used by Cisco Vision Dynamic Signage Director to send messages to DMPs when they are not part of a script, when per-script multicast is disabled, or when the number of scripts running exceeds to configured maximum of per-script multicast ports.

It is configured in the "MulticastHostPort" registry key in the Management Dashboard.

Note: The default value currently uses the address 239.192.0.254:50001 and should be changed to a network address in the range 239.193.0.0/24.

To verify or configure the multicast addressing for Cisco Vision Dynamic Signage Director, complete the following steps:

1. From the Management Dashboard, select **Tools** > **Advanced** > **Registry**.

2. Scroll to the "MulticastHostPort" registry key in the Parameters list and confirm the entry for the registry.

3. Click on the value field and specify a multicast address in the range 239.193.0.0/24 and port number.

   Note: Be sure to use the value that is configured in your Cisco Connected Venue network for Cisco Vision Dynamic Signage Director control messages and include the :port. The recommended default is :50001.

4. Click **Apply**.

Configuring Per-Script Multicast in Cisco Vision Dynamic Signage Director

By default, Per-Script Multicast Optimization is disabled and the Cisco Vision Dynamic Signage Director server sends all communication over the MulticastHostPort address directly to all DMPs, including all remote DMPs.

To configure per-script multicast, complete the following steps:

1. From the Management Dashboard, select **Tools** > **Advanced** > **Registry**.

2. To enable per-script multicast, change the values of the following registry keys:

   – **transport.dynamic.enable**–Specify a value of **true**.

   – **transport.dynamic.send_range**–(As Required) Change the range of ports to comply with your network configuration. The default is 50080-50099.

      Note: Be sure that these ports do not overlap with other multicast ports in use on your network.

3. Click **Apply**.

4. Reload the Flash template on all DMPs:

   a. From the DMP and TV Controls dashboard drawer, navigate to and select the following command: **DMP and TV Controls** > **DMP Install** > **Stage Template**.

   b. Select all of the DMP devices where the command should be applied.

   c. Click the Play button to run the command on the selected devices.

5. To verify the configuration:

   a. Start and stop event scripts and change states.

   b. Verify that the multicast port that the DMP is listening on is one of the per-script ports (50080-50099 by default), rather than the global multicast hostport (50001).

If the scripts do not start and stop, see .

Troubleshooting Per-Script Multicast Configuration

This section includes information about troubleshooting the following behaviors when per-script multicast optimization is enabled:

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Scripts Unable to Start or Stop

Verify that the multicast packets are reaching the DMPs using any or all of the following methods:

- Look at the sv_msg_mcast_trace.log available from the Troubleshooting menu of the TUI for Cisco Vision Dynamic Signage Director in the Control logs.

- Use a packet sniffer device at Cisco Vision Dynamic Signage Director and/or at the DMP.

- Inspect the multicast configuration of the Cisco Connected Venue switch by turning on debug for multicast group subscriptions.

Tip: It is valuable to know the multicast group/port that a specific DMP should be listening on. This can be validated using the dmpconfig debug feature, by going to the URL:

http://svd-ip:8080/StadiumVision/dmpconfig/000000000000?ipaddr=_x.x.x.x_,

where _x.x.x.x_ is the IP address of the DMP to be debugged. In the XML output provided, you will see the multicast IP address and port in use.

DMPs Rebooting

DMPs rebooting or becoming unresponsive while per-script multicast is enabled is most likely due to some multicast video port overlap with the ports used for multicast control.

To diagnose this condition:

■ Inspect all multicast port numbers in the configuration to investigate any multicast group/port overlaps.

■ Using a packet sniffer, inspect network traffic on a separate box and via port span rather than on a DMP.

Configuring Multicast Support for Zone-Based Content Synchronization for the Series 2 and Series 3

Zone-based content synchronization provides enhanced recovery for video walls if an Series 2 and Series 3 reboots during the running of a playlist. Zone-based video wall synchronization is an alternative form of synchronization available for devices participating in a video wall. It makes use of a mechanism native to the devices that helps a group of media players stay in content sync with a leader device over multicast.

The general guideline is to use zone-based video wall synchronization for dedicated video walls that are playing video content longer than 15 minutes. While you can use this form of synchronization for all video walls, the synchronization benefit is best seen with longer-playing video wall content.

The default multicast address and ports are automatically configured to support zone-based content synchronization for the Series 2 and Series 3 upon installation of the Cisco Vision Dynamic Signage Director software; however, the feature is not enabled by default.

Use this task to change the default multicast values as needed, when you assess your system-wide multicast addressing needs.

Note: By default, zone-based content synchronization is not enabled. For more information, see the "Working with Video Walls" section of the Cisco Vision Director Operations Guide.

To configure multicast support for zone-based content synchronization for the Series 2 and Series 3, complete the following steps:

1. From the Management Dashboard, go to **Dynamic Signage Director Configuration** > **System Configuration** > **Global DMP Settings** > **Networking**.

2. Verify that the following default values for the following properties are compatible for your network, and change as required:

   – **Content sync multicast address**—239.193.0.253

   – **Content sync multicast port**—50001

3. Save your changes.

What To Do Next

After you have configured the system settings for your Cisco Vision Dynamic Signage Director servers, do the following:

■ Configure the backup environment between your primary and secondary servers. For more information, see Backing Up and Restoring Cisco Vision Dynamic Signage Director Servers, page 63.

■ For more information about configuring Cisco Vision Dynamic Signage Director to support multiple venues, see Configuring Cisco Vision Dynamic Signage Director for Multiple Venue Support, page 35.