Cisco Vision Content Planning and Specifications Guide

Dynamic Signage Director

CV-HD, CV-UHD, DMP-2K, SV-4K

Release 6.1

First Published: 2018-07-10

Contents

About This Guide

First Published: 2018-07-10

This document serves as the master reference guide for creating content for the Cisco Vision Director solution. It is intended for Cisco Vision technical marketing engineers, product managers, creative services delivery team, and customers to prepare the graphics and content they want to deploy with Cisco Vision Dynamic Signage Director.

This section includes the following topics:

- Cisco Creative Services for Cisco Vision, page 7

- Cisco Vision Dynamic Signage Director Documentation Go URL, page 7

- Document Revision History, page 8

- Document Organization, page 8

- Related Documentation and Resources, page 9

Cisco Creative Services for Cisco Vision

The Cisco Vision solution combines high-definition video delivery with state-of-the art digital signage to deliver distinctive in-venue experiences. Several crucial factors contribute to the success of any digital signage deployment—not the least of which is the quality of the content. To sponsors and advertisers, the quality of the displayed content can significantly contribute to the effectiveness of their advertising campaign. To a venue, the quality of the displayed content can make an even greater contribution to their ability to generate incremental sponsorship revenue.

To help venues ensure the quality of their content and to achieve a high level of return on their investment, Cisco Systems offers Creative Services. This service provides a comprehensive content strategy designed to address the goals of both sponsors and advertisers and of the venue, with top-quality digital content created by our team of award-wining creative experts.

To more information, please contact the Cisco Creative Services team or your local Cisco Systems account representative.

Cisco Vision Dynamic Signage Director Documentation Go URL

For more information about Cisco Vision Dynamic Signage Director hardware and software installation, configuration, and operation, see the documentation available on Cisco.com at:

www.cisco.com/go/stadiumvisiondocs

Document Revision History

Table 1 lists the technical changes made to this document since it was first published.

Table 1   Document Revision History

Date	Change Summary
2018-07-10	Initial publication of this Release 6.1 guide. The following updates were made since 6.0: ■ Daktronics Scoreboard Controller Integration now supports NFL™ football

Document Organization

This guide includes the following modules:

Chapter	Description
Overview of Content Support	Defines content such as images, videos, external content (URL) and widgets that are supported by Cisco Vision Dynamic Signage Director Release 6.1 software.
Overview of Content Deployment	Describes various pieces of the display and how to organize content for the best experience based on limitations of the venue.
Video Wall Planning	Describes how to deploy video content smoothly so each DMP has interesting, unique and engaging content.
Screen Template Specifications	Describes various types of screen template specifications such as full-screen video, full-screen graphics, 3-region L-wrapper, and full-screen dual video. Use a template or customize your own.
Content Guidelines and Specifications	Describes the guidelines on how to format, locate, design, and size your content exactly so it will display optimally.
HMTL Content Creation Guidelines	Describes general guidelines for creating HTML5 content for playback on the media players in Cisco Vision Dynamic Signage Director.

Related Documentation and Resources

Cisco Vision Documentation Go URL

For more information about Cisco Vision hardware and software installation, configuration, and operation, see the Cisco Vision documentation available on Cisco.com at:

www.cisco.com/go/stadiumvisiondocs

Release-Specific Documents

- Release Notes for Cisco Vision Dynamic Signage Director Release 6.1

- For the listing page of all Cisco Vision documentation, go to:

    http://www.cisco.com/c/en/us/support/video/stadiumvision/tsd-products-support-series-home.html

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Related Documentation and Resources

Overview of Content Support in Cisco Vision Dynamic Signage Director

First Published: 2018-07-10

Cisco Vision Dynamic Signage Director provides both basic and more advanced methods of content ingestion to achieve high levels of visual impact at your venue. This module provides a high-level introduction to the content types and data sources supported in Cisco Vision Dynamic Signage Director.

Content is defined as any digital media that is presented on a TV display using a digital media player (DMP) in Cisco Vision Dynamic Signage Director. Cisco Vision Dynamic Signage Director supports a variety of content types and sources to create an impressive presentation of digital content at your venue.

Cisco Vision Dynamic Signage Director is a very flexible content design and presentation system. It allows you to:

- Upload existing content

- Integrate external content or data

- Design content presentation using widgets and templates

Cisco Vision Dynamic Signage Director supports three primary categories of content:

- Images (locally stored)

- Videos (locally stored or streamed)

- External Content (variety of content forms and data integrations)

This module provides a summary of the types and sources of content supported in Cisco Vision Dynamic Signage Director:

Images

Images are static graphic assets used for advertisements or informational messages that do not require motion. This could include Welcome messages for luxury suites or directional information after an event. They are also used as backgrounds for other content such as menu boards.

Images are uploaded to the content library in Cisco Vision Dynamic Signage Director and are stored locally on the media players when content is staged. Once the image is in the content library, it can be used in the graphic component of the Widgets tool or in a non-video template region. Images can also be used in a "Video or Mixed Media" template region.

Images also can be uploaded as icons for assignment to channels in Cisco Vision Dynamic Signage Director channel guides.

Note: Video, widgets, and external URLs are also scalable.

Videos

Videos can be locally stored by upload to the content library in Cisco Vision Dynamic Signage Director, or they can be streamed from a variety of sources and display methods.

Video streaming can be implemented through the following content sources and display methods:

- Video streamed from the headend.

  Video streamed from the headend can be in-house, terrestrial TV, satellite, or cable-provider feeds, which are typically multicast. The format of video provided from the headend is dependent upon the source.

  For more details, see Cisco Vision Video Headend Design and Implementation Guide (available to qualified Cisco Vision partners).

- Video locally stored in Cisco Vision Dynamic Signage Director.

  Locally-stored video is an external video that is uploaded to the Cisco Vision Dynamic Signage Director content library. It is stored in Cisco Vision Dynamic Signage Director and played through a video or mixed-media playlist.

- Video streamed to a local HDMI-In channel (HDMI-In Pass-Through).

  Note: Local HDMI-In video is supported by the CV-UHD and SV-4K DMPs only, for HDCP-compliant devices and content.

  Use the local HDMI-In channel when you want to easily send local content to a single TV display using the HDMI-In port of the DMP on a CV-UHD or SV-4K device. See Content Deployed From Local HDMI-In (HDMI-In Pass-Through), page 24.

- DMP-encoded video streamed as a multicast channel for video only (no audio).

  DMP-encoded video can be deployed from several sources:

  - (Introduced in Release 6.0) Full-screen DMP display output (including multiple template regions). Also known as *display encoding*.

  - (Introduced in Release 6.0) External URL channel content (including HTTP, HTTPs, and HLS channels).

  - (Release 5.0 and later releases) Local HDMI-In channel content.

External Content

External content includes a number of different forms of content and supported data integrations, from referenced external URLs and HTML pages, to data feeds and scoreboard controller integrations, among others.

- External URLs, page 13
- Data Integration Sources, page 16

External URLs

There are several ways to bring content from external URLs into Cisco Vision Dynamic Signage Director and for different reasons. Table 2 on page 13 summarizes these methods, why you might use them, and where to configure them.

Table 1   Summary of External URL Ingestion Methods

Ingestion Method	Why Use	Where Configure
Channels	■ Display the entirety of content from a URL as a multicast channel to which other DMPs can be tuned. ■ For HTTP, HTTPS, and HTTP Live Streaming (HLS) content, including full HTML pages.	**Tools > Control Panel** > **Setup** > **Channels**
Data Integration	For more advanced data customization, you can: ■ Introduce a sample XML schema. ■ Select certain data objects. ■ Create custom mapping expressions for the output. ■ Design custom content layout for the data using Widgets tool. See "Generic Data Sources" in Data Integration Sources, page 16.	**Tools > Control Panel** > **Setup** > **Data Integration**
HTML Pass-Through	■ Simple HTML browser content (not full HTML pages) with restrictions. ■ Content intended for more limited or short-term use.	**Library** > **External Content**. **Right click > Create**

Note: Use only external URLs that do not set the X-Frame Options header.

Detect X-Frame-Options in External URLs

This enhancement checks if the external URL asset or external URL channel contains XFrame-Options in the HTTP header that prevents it from being rendered by the DMP. Test the URL and validate it for rendering its content on the DMP.

1. Go to **Tools > Control Panel > Setup > Channels** tab.

2. Click **Basic Info** tab.

3. In **Source Type** drop-down menu, select: **External URL**. The **Test** button appears (Figure 1 on page 14).

Figure 1   Testing External URL Content for X-Frame Option
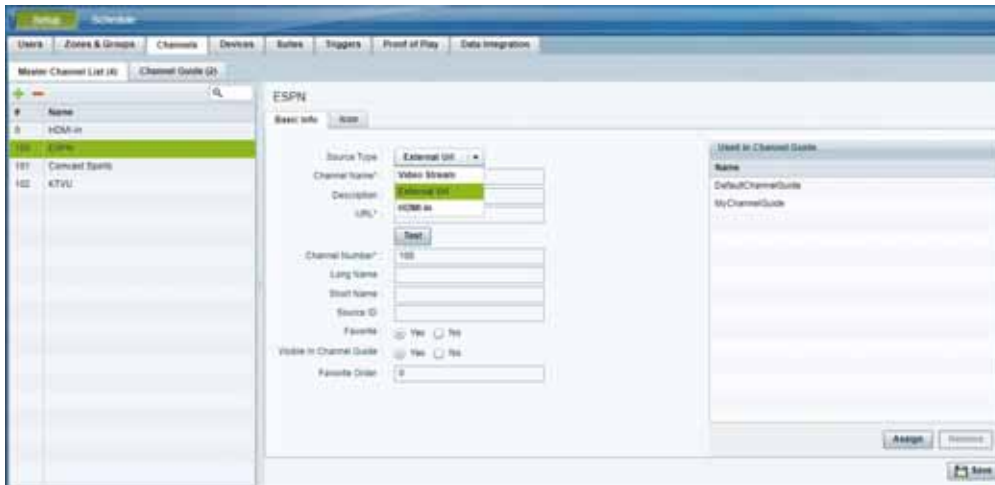
4. Fill in the fields and click **Save**.

5. Click **Test**.

If X-Frame is present in the content, an error message appears.

The TEST function is also available whenever you create a new external URL connection.

If your external content is unlikely to render to the DMP, you get a caution symbol until you clear it (

Figure 2   Caution Symbol Indicating this Content will Not Render on the DMP
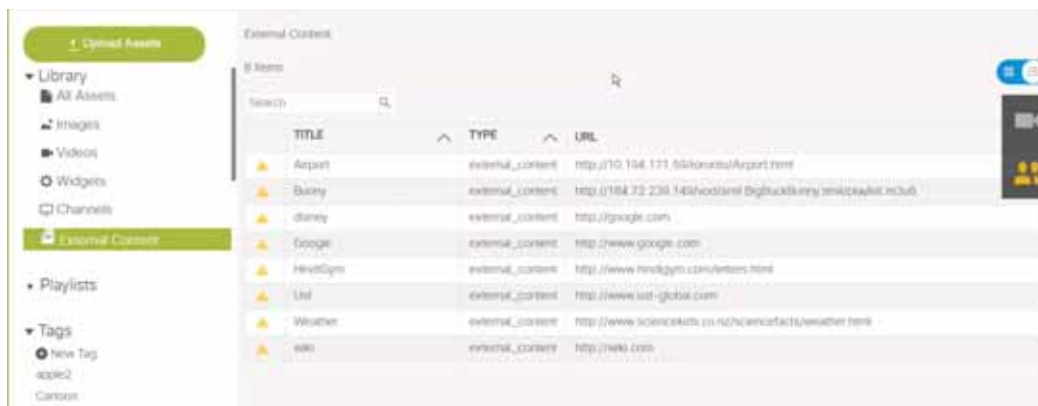
External URLs as Channels

External URL is a channel source type that allows you to specify an HTTP, HTTPS, or HTTP Live Streaming (HLS) source as a channel, including HTML page sources. Use an external URL as a channel when you do not need synchronization of content, but you would like to be able to tune to that content from a script, User Control API, IP phone, or IR remote. External URL channels also can be streamed to a DMP-encoded multicast channel but do not support audio when streamed in that form.

HLS sources are hardware-accelerated on the DMP. The content is specified as an External URL source type in the Channels setup. The system recognizes the content as an HLS source based on the Allowed HLS file formats designated in the **Management Dashboard**. The default extensions allowed are m3u and m3u8.

IMPORTANT: For External URLs as channels to stay at the **bottom layer**, make sure that video layers are ordered at the **bottom** of the list of layers on the template editor using the Designer tool.

For more information, see Channel Content Deployment, page 23.

HTML Pass-Through

The HTML Pass-Through feature is a legacy feature that supports reference to an external URL in the Control Panel Content screen. When you select **Library** > **External Content,** then right click > **Create** to specify the external URL, an external URL asset is created in the content library. When referencing an external URL in this way, you can render simple HTML browser content (with some restrictions) on the media players, by including the external URL object in a playlist and scheduling it in a script. Figure 3 on page 16 shows creating new external content URLs.

Note: Use only external URLs that do not set the X-Frame Options header.

Figure 3   Referencing an External URL to Content
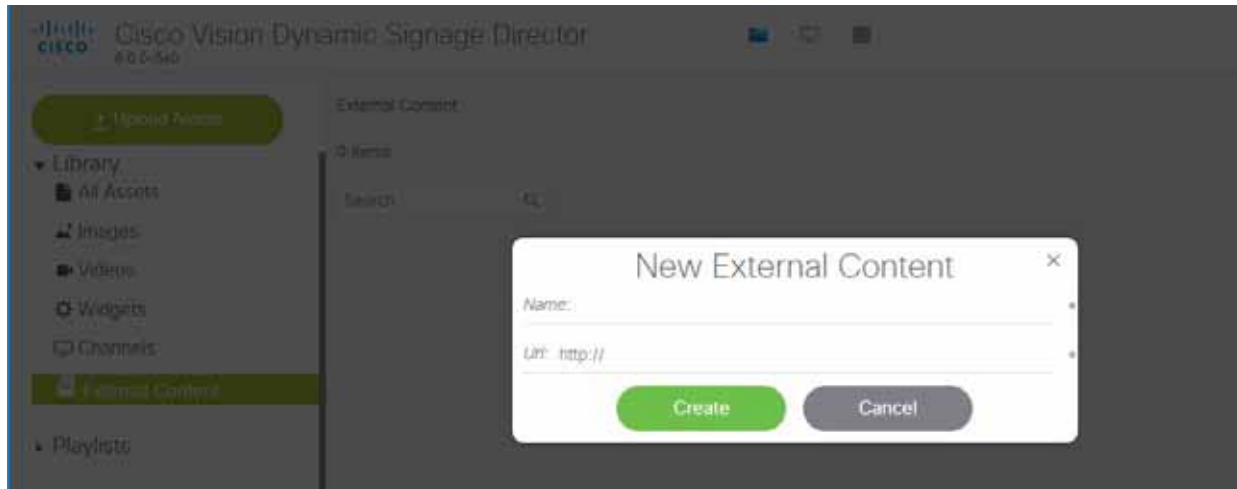
Although the External Content URL is referenced in the content library, the content itself is not actually stored in the content library in Cisco Vision Dynamic Signage Director. Any changes to the content on the external site page are dynamically updated on the media players when the external URL is referenced, such as when the external URL playlist item is played.

Data Integration Sources

Cisco Vision Dynamic Signage Director predefines some data structures for ease of integration with the system. Configure these sources with **Tools > Control Panel > Setup > Data Integration** in Cisco Vision Dynamic Signage Director. Use the Widgets tool to design layouts. For details, see Cisco Vision Director Data Integration Guide.

■ Content Feeds

    – Atom Feed

    – RSS Feed (RSS 2.0)

       A ticker is a region that displays content received from an RSS feed (news, weather, or other dynamic information) over a customizable background. RSS feeds can come from external or internal sources. Venue operators can use RSS feeds to publish their own in-house promotions or other proprietary messaging.

■ NFL Content

    – National Football League (NFL) Game Statistics and Information System (GSIS) Cumulative Statistics

    – NFL GSIS Game Clock

■ Scoreboard Controllers

    – Daktronics All Sport 5000 Scoreboard Controller (basketball, NFL™ football, and hockey only)

    – OES ISC9000 Intelligent Scoreboard Controller (basketball and hockey only)

■ POS Data Sources

    – Generic PoS

    – Internal Database PoS

    – Menu Theme

■ Generic Data Sources

Generic data sources can be used for other forms of XML or JavaScript Object Notation (JSON) sources that you want to ingest into Cisco Vision Dynamic Signage Director whose format does not conform to some of the standard out-of-the-box data source types, such as RSS 2.0.

Cisco Vision Dynamic Signage Director also can support Generic Data Sources in JSON or XML format from the following source types:

– Database—Supports automatic translation of MySQL, PostgreSQL, and SQLServer database formats to XML data in Cisco Vision Dynamic Signage Director.

– FTP

– HTTP/HTTPS

– TCP

– UDP

■ Table Lookup

The Table Lookup feature for data integration allows users to create multiple tables, each having multiple key-value mappings. Users can upload tables from a TSV file or create tables and mappings from the Cisco Vision Director UI. Once tables are created, a custom XPath function can be defined to look up values from these tables for specified keys.

The Table Lookup feature for data integration supports the following primary use cases:

– Custom Suite Welcome Messages

– Translation of Point-of-Sale (POS) codes to names for menu boards.

Widgets

Widgets are content objects for external data. Use the Widgets designer tool to create a widget used to map real-time statistics or content from external data sources for output display in Cisco Vision Dynamic Signage Director.

The Widgets tool includes image-based and text-based components and a tabular list component to help you design the layout of external data.

As content assets, widgets are stored in the Cisco Vision Dynamic Signage Director Library once published from the Widgets tool. Use the standard template, playlist, and script configuration elements to deploy the widget.

Note: Widget content is not scalable.

For details, see Cisco Vision Director Data Integration Guide.

Widgets

Overview of Content Deployment in Cisco Vision Dynamic Signage Director

Before you begin to deploy content at your venue, it is important that you understand all of the requirements for the types and methods of content that you want to deploy.

There are limitations and specifications for the content size and formats supported by Cisco Vision Dynamic Signage Director. These vary depending upon a number of factors including the TV display resolution, the media player used in the venue, the screen template region layout, and the TV proximity to the fans.

Note: For a full range of content planning and design services available from Cisco Systems, contact the Cisco Creative Services team.

Workflow Summary for Content Deployment

Table 1 on page 19 gives an example of what a workflow plan might look like.,

Table 1   Content Deployment Plan

Content Deployment Task	For more information see. . .
Plan the type of content that you want to create.	Overview of Content Support in Cisco Vision Dynamic Signage Director, page 11.
Plan how you want to deploy and control the content.	Channel Content Deployment, page 23.
Plan where the content will be deployed.	Zones, Groups, and Locations, page 20.
Understand the content guidelines and best practices.	Content Guidelines and Specifications for Cisco Vision Dynamic Signage Director, page 51.
Plan and create the screen template and region sizes for your content.	Screen Template Specifications for Cisco Vision Dynamic Signage Director, page 41.
Create your content and get it into Cisco Vision Dynamic Signage Director.	Overview of Content Support in Cisco Vision Dynamic Signage Director, page 11.
Create a playlist for your content (as needed).	Playlists, page 22.
Create a script to define when your content is displayed (as needed).	Scripts, page 23.

Overview of Configuration Objects for Content Deployment

Table 2 on page 20 provides a simple description of the different configuration objects in Cisco Vision Dynamic Signage Director that are used for content deployment.

Table 2   Summary of Configuration Objects for Content Deployment

Configuration Object	Think of it as...	Purpose
Zone/Group/Location	*Where* content is displayed	Determines on which DMPs to display the content.
Template	*Way* content is displayed	Determines the layout of content on a DMP display.
Playlist	*What* content is displayed	Determines the order of content items to be displayed in a template region.
Script	*When* content is displayed	Determines the timeline during an event for which content is displayed in what area of the venue.

Zones, Groups, and Locations

Digital content, in the form of still or animated graphics and video ad insertions, can be targeted and delivered—with accompanying event video—to any display or group of displays throughout the venue.

When you have hundreds or thousands of TVs on which you want to display different video signage, sponsored content, TV channels, and menus, you need a way to automate the configuration and manage the endpoint locations.

Cisco Vision Dynamic Signage Director defines a hierarchical architecture of Groups, Zones, and Locations that allows you to easily identify the location of the displays and manage the content that they are playing.

Zones

A *zone* is typically a physical area in the venue. Concourses, clubs, and team stores are examples. Groups and zones allow you to apply attributes to a number of screens with a single action. They simplify the control of advertisements in sponsored areas of the stadium, enabling all the screens in a sponsored zone to have the same branded messages, the same playlists, and the same video content.

Group and zone associations can be made any time prior to pushing an event script and can be used for multiple events.

Groups

A *group* defines a collection of devices (DMPs/TVs) that all display the same content, using the same template. Groups are the second level in the hierarchy and are subsets of a zone. Groups contain a set of locations in the hierarchy.

To understand the use of groups, consider the TVs in a concourse area on which you want to show a game feed with sponsored advertising. Rather than configure each individual TV to show this content, you can configure them as a group and change all of the TVs with a single action. The group is associated to a zone to identify the area of the stadium where the TVs are located.

Locations

Locations are the lowest level in the hierarchy. A *location* is a subset of a group that defines a specific place in the venue where a TV and DMP reside. After DMPs are deployed, they must be linked to Locations to change their state to "Ready" so that you can stage content to the DMP.

Locations help you keep track of exactly where a TV and DMP is physically located in the stadium. For example, if someone tells you that a TV in a restroom at the concourse 100 level is not working, you can refer to the location information to quickly find the TV and fix it.

Note: Be careful not to confuse the *civic location* on Cisco Catalyst switches with the DMP Location in Cisco Vision Dynamic Signage Director.

Figure 1 on page 21 shows an example of a nested hierarchy, with naming conventions that help describe the area and use of a group of devices.

Figure 1   Zone, Group, and Location Example
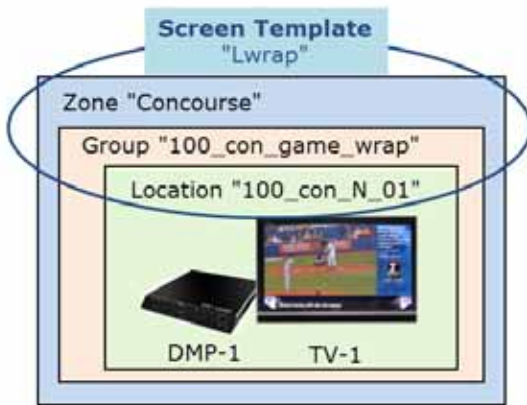
In Figure 1 on page 21, a zone named "Concourse" is at the top level, with a group named "100_con_game_wrap" that is part of the "Concourse" zone. As indicated by the name of the group, this is for all of the TV displays using the game wrap format (from a screen template) in Concourse 100 of the venue. A location named "100_con_N_01" indicates that the TV-1 and DMP-1 are located on the North Concourse 100 level.

Best Practices for Groups and Zones

- The more groups and zones you have, the more complicated the deployment becomes. Plan carefully.

- Keep the number of unique advertising areas, exit directions, and welcome screens to a minimum.

- While it is possible for a zone to have different screen templates throughout the course of an event, the more screen templates you use, the more complex the deployment and administration becomes. To simplify the system management, limit the number of screen templates for a given zone.

For more information about guidelines for zones and groups, see the Cisco Vision Dynamic Signage Operations Guide, Release 6.1.

Templates

Templates are not technically part of the device hierarchy. However, screen templates are an important concept to understand within the group-zone hierarchy because they are assigned to groups and zones to define the format of the TV displays within them. Screen templates define how a particular TV display is divided into regions to show different arrangements of video, signage, and advertising.

Note: Every device belonging to the same group will display the same template as shown in Figure 2 on page 22.

Figure 1 on page 21 shows that a screen template named "Lwrap" is associated with the TV display in location "100_con_N_01," which is part of the "100_con_grame_wrap" device group. This example shows only one location, but if there were many locations within the group, the same template would apply to all of those TV displays.

Figure 2   Zones, Groups, and Locations and Screen Template Association
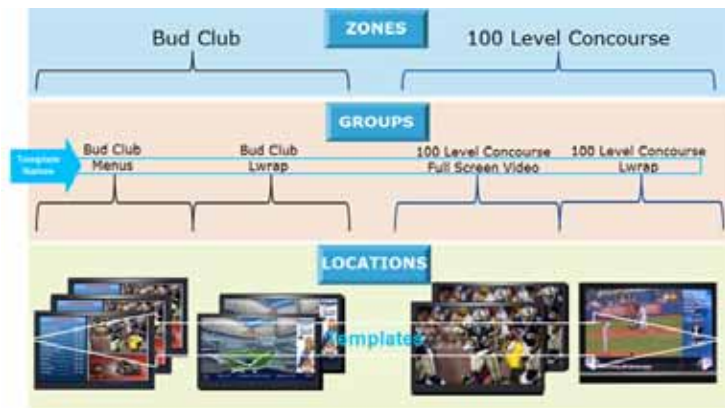
Playlists

For content to appear, it has to be put into a playlist. A *playlist* is a series of content items (static images, video, widgets, external URLs) that are grouped together to display in sequential order (one after the other) for a set duration and repeat. The playlist is associated with and appears in a given area of the screen called a *region*. Regions are defined by the screen template.

Each playlist runs independently of other playlists, and multiple playlists can be run in any given event script in separate regions.

Playlists are defined by the type of content that they contain—either static images only (Non Video), or video/other content types (Video or Mixed Media). A playlist that is configured as "Video or Mixed Media" can contain both video and static images, as well as other content types.

One of the most common uses of a playlist is in a screen template region where a series of advertisements cycle based upon a preset rotation. Playlists also can include tickers and full screen messages, among a number of other types of content.

Figure 3 on page 22 shows an example of a playlist that contains five static images that will each display for a set duration in Region 2 of the screen template.

Figure 3   Playlist Example of Static Images for Display in Template Region 2

Note: Playlists become part of an event script. Stage, or pre-load, event scripts to the DMPs prior to the event from the **Tools > Control Panel** > **Control** screen.

Scripts

Event scripts and event states control *when* certain content displays on the TV screens in a venue over the course of an event.

You create event scripts and event states ahead of an event, allowing you to predetermine what will display at a given time and location on each screen in the venue. Prior to the event, stage and validate the script. Make necessary adjustments so everything displays correctly.

Run the script at the scheduled event time. Initiate the script manually or automatically. Once the script is running, use the many features of Cisco Vision Dynamic Signage Director to further manage the ads, content, graphics, and video displayed throughout the course of the event.

Figure 4 on page 23 shows an example of the progression of a script through different stages of the event. At each change in the event state (Pre-Game, In-Game, Post-Game) the screen template and content applied to the TV displays changes within the group and/or zone.

Figure 4   Example of the Progression of an Event Script

Channel Content Deployment

This section includes the following topics:

- Overview of Channel Sources, page 24
- Content Deployed From Local HDMI-In (HDMI-In Pass-Through), page 24
- Video Streaming Methods, page 26

Overview of Channel Sources

Table 1 on page 11 provides a list of the types of content that can be used as channel sources in Cisco Vision Dynamic Signage Director Release 6.1. It also summarizes where you can control that content as a channel source.

Table 3   Channel Support Summary

Channel Source Type	Audio/ Video	Sync Across DMPs	HDCP Compliance Required	Where Can Control as a Channel				
				Dashboard	IP Phone	IR Remote	Script Action	User Control API
External URL: HLS, HTTP or HTTPs	Both	No	No	No	**Yes**	**Yes**	**Yes**	**Yes**
HDMI-In	Both	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**
Video Stream: DMP-encoded	Video only[1]	**Yes**	n/a	**Yes**	No	No	**Yes**	**Yes**
Video Stream: Multicast (UDP, RTP)	Both	**Yes**	No	No	**Yes**	**Yes**	**Yes**	**Yes**

1. All DMP-encoded video stream channels support video only when Display Streaming is used. When *HDMI-In streaming* is used for a DMP-encoded video stream using a local HDMI-In channel source, both audio and video are supported.

Note: Channel sources on 2nd video region will not play audio, in general.

Note: Use only external URLs that can be embedded in an iframe. To prevent the site from being embedded in an iframe (such as for security reasons), add X-Frame-Options in the headers. To test the X-Frame option in the external content, see Detect X-Frame-Options in External URLs, page 13.

Content Deployed From Local HDMI-In (HDMI-In Pass-Through)

Note: Local HDMI-In content is supported by the SV-4K and CV-UHD DMPs only.

Local HDMI-In support is simplified in Release 6.0, where DMP encoding of the local HDMI-In port is automatically set up in the system as a default channel (Channel 0). This means that all you have to do is plug an HDCP-compliant device into the HDMI-In port on an SV-4K or CV-UHD and it automatically plays content on Channel 0 in Cisco Vision Dynamic Signage Director (Figure 5 on page 25). You can tune to the channel from a script, User Control API, IP phone, or IR remote.

Use the local HDMI-In channel when you want to easily send local content to a single TV display using the HDMI-In port of the DMP on an SV-4K or CV-UHD device. The primary use case for HDMI-In pass-through is for a gaming console or external video source that you want to display on the one TV to which the source is connected.

Figure 5   Local HDMI-In Pass-Through to Single TV Display

When you are playing content through the DMP HDMI-In port, the content is "always on" on Channel 0, much like any other streamed channel on a TV. To stop playing the content, stop it on the source device connected to the DMP or tune to a different channel in Cisco Vision Dynamic Signage Director. If you are tuning to the channel by script, change states or stop the script.

Streaming Options for Local HDMI-In to Multiple DMPs

The local HDMI-In channel is intended for a single-content source to be shown on a single TV display.

To distribute the local HDMI-In content to multiple DMPs in the system, use one of two streaming methods summarized in Table 4 on page 25. Both streaming methods require configuration of a DMP-encoded video stream channel to which the encoded video is sent and where other DMPs can be tuned. See also Video Streaming Methods, page 26.

Table 4   Streaming Options for an HDMI-In Channel Source

Streaming Method	Audio/Video Support	Sync Across DMPs?	Where Invoke as a Video Stream	Release Introduced
HDMI-In Streaming (Encoding of HDMI-In source only)	Audio and Video	Yes	■ Dashboard[1] ■ IP phone ■ IR remote ■ Script action ■ User Control API	Release 5.0
Display Streaming (Encoding)	Video only	Yes	■ Dashboard[1] ■ Script action ■ User Control API	Release 6.0

1. Controlling starting and stopping of streaming from the Management Dashboard is intended for testing only.

Note: When you upgrade from Release 5.0 to Release 6.0, the **Local HDMI-In** video source will be replaced by **Channel HDMI-In** in the Available Channels section of the Edit Actions dialog box for a script.

Video Streaming Methods

This section includes the following topics:

Display Streaming

Display streaming renders a full-screen display (including multiple template regions) as a multicast stream *without audio*. You can control display streaming by the new **Start Display Streaming**/**Stop Display Streaming** script state actions, from the User Control API, or the **Script Control** interface.

Note: Display Streaming supports *video only* (no audio). However, if you want to stream DMP-encoded HDMI-In channel content only, then both audio and video are available if you use *HDMI-In Streaming* rather than Display Streaming as a script state action applied on the designated video stream channel.

Use a DMP-encoded video stream channel with display streaming to do the following with your content:

- Broadcast full-screen output from a DMP display to multiple other DMPs in the system.

- Support DMP-to-DMP synchronization (non-video wall).

- Display video only (without audio).

Figure 6 on page 26 shows an example of an HTML page configured in the system as an External URL channel and streamed to a DMP-encoded Video Stream multicast channel using display streaming.

Note: Use only external URLs that do not set the X-Frame Options header. To test the X-Frame option in the external content, see Detect X-Frame-Options in External URLs, page 13.

Figure 6   External URL Example with Display Streaming to a DMP-Encoded Multicast Channel
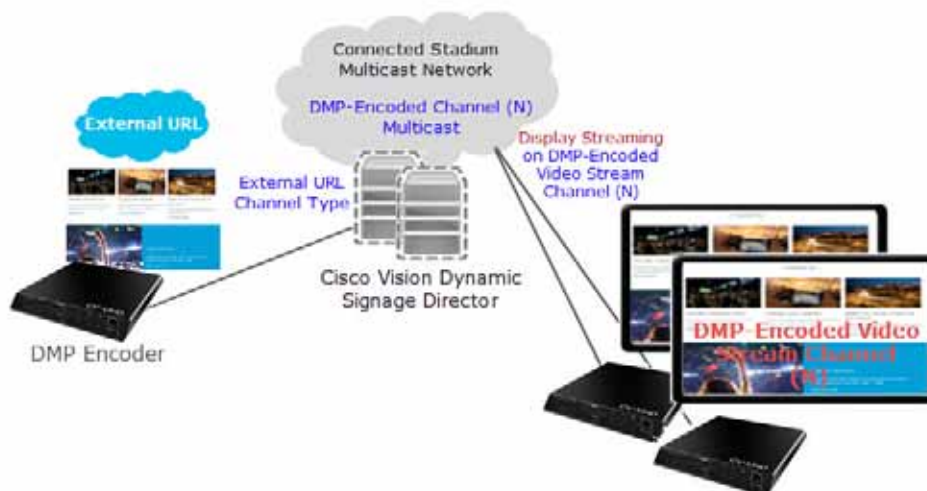
Summary Workflow

1. Configure an External URL channel with the URL of the content that you want to stream.

   Note: The system will determine an HTTP Live Stream (HLS) based on the file extension in the URL.

2. Configure a Video Stream channel with DMP encoding enabled.

3. Create a group containing only the DMP to be used for the encoding of the URL.

4. Create a script and select a video template as an action for the DMP Group in Step 3. on page 27.

5. Assign the External URL channel to the video region.

6. Select the **Start Display Streaming** action and choose the DMP encoded channel that you set up.

HDMI-In Streaming

Note: Local HDMI-In content is supported by the SV-4K and CV-UHD DMPs only.

When combined with use of a DMP-encoded video stream channel, you also can choose to broadcast a local HDMI-In channel to a DMP-encoded channel for availability of the content to other DMPs in the system.

Note: HDMI-In streaming is only supported for content sourced by the HDMI-In port on the SV-4K or CV-UHD.

Figure 7 on page 27 shows an example of streaming content to a DMP-encoded video stream channel from a device connected to the DMP HDMI-In port.

Figure 7   HDMI-In Streaming Example from Single DMP to Multiple DMPs

Summary Workflow

1. Connect an HDCP-compliant content source to the HDMI-In port on the DMP (the encoding DMP).

   Note: Because the HDMI-In port has an internal, universal identifier representing the local HDMI-In of the device, the encoding DMP must be in its own Group in Cisco Vision Dynamic Signage Director.

2. Configure the destination Video Stream channel where the HDMI-In content will be streamed (*never* Channel 0). This must be a DMP-encoded video stream channel.

3. Create a group containing only the DMP to be used for the encoding of the URL.

4. Create a script and select a video template as an action for the DMP Group in Step 3. on page 27.

5. Select the **Start HDMI-In Streaming** (encoding) action and choose the DMP-encoded video channel that you set up in 2. on page 27.

6. To receive (decode) the stream on other DMPs in the system, tune to the DMP-encoded channel.

Restrictions for HDMI-In Streaming

The HDMI-In port on the SV-4K media player can only be supported either as a source to video region or source to encoder as a channel, but not both.

Therefore, if you want to connect a TV display to the DMP encoder's HDMI-Out port, while also doing HDMI-In streaming from that DMP, you cannot tune that TV to Channel HDMI-In (Figure 8 on page 28).

Figure 8   Unsupported DMP Encoder Configuration for HDMI-In Streaming

However, you can connect a TV display to that DMP encoder, as long as it is tuned to the DMP-encoded video stream channel and not Channel HDMI-In (Figure 9 on page 28).

Figure 9   Supported DMP Encoder Configuration with TV Display for HDMI-In Streaming

Video Wall Planning in Cisco Vision Dynamic Signage Director

First Published: 2018-07-10

This module describes information about how to plan deployment of video content in Cisco Vision Dynamic Signage Director. It includes the following topics:

Video Walls

A *video wall* is a group of displays that show synchronized content and convey a single, much larger screen. Cisco Vision Director supports different video wall design methods depending on the type of media player controlling the video wall. A common use for video walls is to vary the video wall layout and content over the course of an event.

Dual Video

Dual video regions allow you to overlay two video regions—a secondary local or multicast video region and a primary video region. The dual video template provides the following capabilities:

- Shows two video feeds at the same time.

- Places video-based advertisements.

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- Promotes a moment of exclusivity during an event.

- Applies luminance (luma) keying to the secondary video region.

Video Synchronization

For display of synchronized local content (video or images) in your video wall, daisy-chain the DMPs. To support different types of content on each display in the video wall, such as four different TV channels, use a direct connection per TV display.

In this cabling method for local video synchronization, a single media player is connected to each TV display in the video wall using the HDMI Out and RS-232 connections, see Figure 1 on page 30. It can be used for video walls playing local video that do not rely on the tile matrix capabilities of the TV.

Figure 1   Cabling Video Wall with One DMP Per TV Display
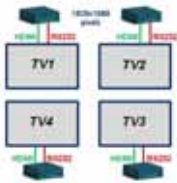
With this architecture, you can develop content at 3840x2160 resolution. Then, divide your video into four 1920x1080 pieces for synchronized playback. This method will use the maximum resolution for each display giving you the highest possible quality for your presentation.

Macroblocking

Macroblocking is a video artifact where areas of a video image appear as small blocks or squares. Video content that contains large IFrames can cause macroblocking during playback on DMPs, as shown in Figure 2 on page 30.

Figure 2   Macroblocking Video Content Example

Using constant bit rate (CBR) video is a requirement. Adhere closely to the content guidelines to reduce the issue. If you are using the Adobe Creative Cloud video encoding tool, you might have to use the special settings to work around a problem with non-standard H.264 support. The rendition settings include using VBR as detailed below.

Note: Please pay special attention to the Key Frame Distance setting below.

Render Settings

- VBR, 1 pass

- Target: 10 Mbps

- Max: 12 Mbps

- Key Frame Distance: 9

For more information, see CSCut02474 in the Release Notes for 6.1 Cisco Vision Dynamic Signage Director.

Multicast Video Scaling

Multicast video scaling means many video monitors can display formatted (scaled) content simultaneously. It is intended for use with video walls and allows scaling of a multicast video region across a video wall display for both portrait and landscape orientation.

Note: Content scaling works on multicast video and local video, as well as external URLs and HTML.

Supported Video and Audio Formats

The tables below define the supported video and audio formats for full-screen video stored locally on the media players and played through a video playlist.

Note: For best performance, we recommend constant bit rate (CBR) for local video playback on the media players. Variable bit rate (VBR) will also work but synchronized video playback could be compromised.

Note: Cisco Vision Dynamic Signage Director supports UHD/HD and video content with 4K resolution (local and streaming video) on the DMPs. Graphics with 4K resolution are not supported. DMP-2K media players only support HD/SD content.

Table 1   Supported Video/Audio Formats for Localized Files for the SV-4K (UHD) and CV-UHD

Format	SV-4K (UHD) and CV-UHD
Models	HD/SD is supported. Video content with UHD resolution is supported only on the SV-4K player. Refer to for 4K video content specifications. MPEG-2 TS (transport stream) required for seamless looping of video files MPEG-4 Cisco Vision Dynamic Signage Director supports: .mpg, .mpeg, .mp4, .m2t, .m2ts, and .ts file types. mp4 is recommended to reduce black frames. H.264 Specifications: Support for Main or High Profiles up to Llevel 4.2, AAC audio, CBR audio (VBR is not supported).
Video Resolution	Max supported resolution: 3840x2160
Aspect Ratio	Widescreen 16:9 (1.0 square pixels)
Field Order	Progressive
UDP Multicast and File-Based Video	Codec: H.264 Encapsulation: MPEG2-TS or MPEG-4
Video Bit Rate Encoding	Recommend 30-40 Mbps constant bit rate. Note that a second video recorder can simultaneously support a second 1080p video at up to 40 Mbps.
Audio Streaming	Cisco Vision Dynamic Signage Director does not support streaming audio, for example audio-only tracks.
Local Audio Sample Rates	48kHz

Table 2   Supported UHD Resolution Video Formats for the UHD and CV-UHD

Format	UHD and CV-UHD
Models	Only video content with UHD resolution is supported. Graphics with UHD resolution are not. MPEG-4 highly recommended. Other formats have not been tested.
Video Resolution	3840x2160
Video Encoding	H.265 High Efficiency Video Coding (HEVC). H.265 version 1 profiles only—Main and Main 10.
Main Profile	If your display components support HDMI 2.0, you can display a 4K video at 60p; encode the file using the Main 10 profile (10 bits of color depth with 4:2:0 chroma sampling) at level 5.1. If your display components do not support HDMI 2.0, you can display a 4K video at a max of 30p (with 8 bits color depth). Use a Main profile at level 5.0
Video Encode Bit Rate	2000 to 25000 Kbps
Bitrate	CBR between 30 and 40 Mbps. Note that the second video decoder can simultaneously support a 1080p video at up to 40 Mbps.
Max Streaming Bit Rate (with HDMI-In Encoding	We recommend two times the video encode bit rate.

Table 3 Supported Color Depths for UHD Video

Resolution	8bit	10bit	12bit
4Kp24 4Kp25 4Kp30	4:4:4 (RGB)	4:4:4 (RGB)	4:4:4 (RGB)
4Kp50 4Kp60	4:4:4 (RGB) 4:2:0	4:2:0	4:2:2 4:2:0

Table 4 Supported Video/Audio Formats for Localized Files for DMP-2K and CV-HD

Models	DMP-2K and CV-HD
Format	HD/SD is supported. MPEG-2 TS (transport stream) MPEG-4 Cisco Vision Dynamic Signage Director supports: .mpg, .mpeg, .mp4, .m2t, .m2ts, and .ts file types. mp4 is recommended to reduce black frames. H.264 Specifications: Support for Main or High Profiles up to level 4.2, AAC audio, CBR audio (VBR is not supported).
Video Resolution	1920x1080
Aspect Ratio	Widescreen 16:9 (1.0 square pixels)
Field Order	Progressive
UDP Multicast and File-Based Video	Codec: H.264 Encapsulation: MPEG2-TS or MPEG-4
Video Bit Rate	Recommend 30-40 Mbps constant bit rate. Note that a second video recorder can simultaneously support a second 1080p video at up to 40 Mbps.
Audio Streaming	Cisco Vision Dynamic Signage Director does not support streaming audio, for example audio-only tracks.
Local Audio Sample Rates	48 kHz

Note: Test the devices that you plan to connect to the SV-4K HDMI-In port to stream content for support of HDCP. Most Mac OS and Windows laptops should work for HDMI-In video encoding for non-copy-protected content. It is up to the device manufacturer and OS whether or not HDCP pass-through is supported.

Static Graphic Formats

Static graphics are used for advertisements or informational messages that do not require motion. This could include Welcome messages for luxury suites or directional information after an event. Static graphics are stored locally on the media players. lists the allowable formats for static graphics.

Note: Content scaling is supported for .png files, widgets, external URL content, and external URL channels. Content is scaled down so it will not bleed over the region sides. Aspect ratio is maintained for .png files and widgets. External URL (content and channel) will fill the region.

Table 5   Static Graphic Formats

Graphic Format	CV-HD, CV-UHD, SV-4K and DMP-2K
JPEG, non-progressive, 8-bit RGB CMYK, grayscale, and duotone are not supported.	Yes
JPEG, progressive	Yes
PNG	Yes 8 16, 24, and 32-bit (24-bit with 8-bit transparency) recommended

Guidelines For Static Graphics

- Best practice: upload files in batches of 100 files or fewer. The total file size must be less than 100 MB.

- For vertical content in Release 5.0 and earlier, graphics and video are not auto-rotated by the DMPs. Create them in a vertical format and then rotate them 90 degrees for a vertical screen. Since Release 6.0 and later, vertical content can be rotated at the DMP.

- DMPs can be configured (using the dmp.Portrait parameter in Display Specifications) to automatically rotate content for proper orientation on vertically-positioned displays. See Content Orientation, page 51.

- Content file names can have "-" and "_", but not white space(s) and other special characters.

- Content scaling is supported for static graphics, widgets, local and multicast video, external URLs, and channels (multicast video and external URLs).

Event States and Event Scripts

Event states and event scripts control when and what content displays over the course of an event. For example, a Welcome message for Pre-game, a food promotion at halftime and an Exit message at the end of the game. An event state is a period of time in which the group of screens will exhibit the same behavior (e.g., the same screen template, playlists and channel). Event states can change over the course of time (Pre-Game, In-Game, Post-game, etc.).

Guidelines for Event States and Event Scripts

Consider the following guidelines when creating event states and event scripts:

- Cisco Vision Dynamic Signage Director displays the default video channel / non-event state on the media players when an event script is not running on it.

- When you use Proof of Play (PoP) content in your playlist, and especially when your PoP content is included near or up to the end of the playlist, define a final script state (without any PoP content) that runs for at least 60 seconds so that all PoP data has time to be captured by Cisco Vision Dynamic Signage Director. This last event state is commonly set up to turn off the displays in the venue.

- When you configure a script action for a zone, by default, all groups within that zone inherit the defined action. You can override this inheritance by configuring a script action for a particular group within that zone.

- When a zone contains multiple groups, and if you configure script actions for a particular group, those actions will apply only to that group.

- Cisco Vision Dynamic Signage Director supports only one RS-232 command per event state.

Table 6 on page 35 describes some guidelines for general script support in Cisco Vision Dynamic Signage Director.

Note: While these limits have been tested with basic Cisco Vision Dynamic Signage Director operation, the combination of maximum values and complexity of your system and content can potentially impact the actual limit. Test your script content for expected behavior before using in production.

Table 6   Script Guidelines and Limitations

Script Guideline	Limit
Max number of simultaneous scripts (when per-script multicast is in use)	20
Max number of event states per script	50
Max number of items per event script	2,200

Guidelines for Video

Consider the following guidelines for deployment of video content in Cisco Vision Dynamic Signage Director:

- Video files can range in size. Release 5.0 and later releases support a maximum 4 GB file size.

- Be sure that your video content meets the requirements described in Supported Video and Audio Formats, page 31.

- Be sure to test the devices that you plan to connect to the SV-4K or CV-UHD HDMI-In port to stream content for support of HDCP. Most Mac OS and Windows laptops should work for HDMI-In video encoding for non-copy-protected content. It is up to the device manufacturer and OS whether or not this is supported.

- Generally speaking, stretching a piece of content across multiple screens is not supported. However, scaling of multicast video is supported. See Content Scaling, page 53.

Note: Content scaling is supported for static graphics, widgets, local and multicast video, external URLs, and channels (multicast video and external URLs).

Best Practices for Video Walls

When implementing video walls, consider the following best practices:

- Use the same media player model (All SV-4Ks, or all DMP- 2Ks, and so on) throughout the video wall.

- Use the same TV model throughout the video wall with a uniform bezel size (ultra narrow bezel strongly recommended).

  Note: TV screens with an ultra narrow bezel help ensure the best viewing experience without important text or data being cut off.

- While using multicast videos for both video regions is supported, we recommended using a combination of multicast and locally-stored videos for the video regions (or local video for both video regions).

- Create video to be the same size as the video region where it will be rendered. This avoids any unnecessary video scaling.

- Use consistent video aspect ratio.

- Design video regions so that they are consistent with the aspect ratio of video content.

- Use constant bit rate (CBR) for local video files for best performance in video walls.

Prerequisites for Video Walls

Before you deploy video walls and create the content for them, meet the following conditions:

To play local video or image content in a video wall:

1. First create the overall format of the video wall.

2. Edit the content into separate 1920x1080 files that contain the segment of content to be shown on each display.

   For example, in a 2x2 SV-4K video wall (4 screens), the original content should be in 3840x2160 format (that is, 2 times 1920x1080).

3. Break the content into (in this example, four) individual files of 1920x1080 format to show the appropriate portion of the content for the 4-screen display.

For DMP content synchronization:

– Each media player must be in its own group.

– For each region, the playlists must have the same number of items, type of item, and duration of each item, or have no playlist at all in the region (empty).

Table 7 on page 36 shows an example of playlist content for a 2x2 SV-4K video wall with a mix of local video and image content. Notice that all first items in each of the four playlists are of the same type (PNGs), with the same duration, but the content itself is not the same. Likewise, the second item in each playlist is video content with the same duration, but different files.

Table 7   **2x2 Video Wall Playlist Example for the SV-4K**

Content Item	Playlist 1	Playlist 2	Playlist 3	Playlist 4
1	30s: PNG 1-1	30s: PNG 1-2	30s: PNG 1-3	30s: PNG 1-4
2	34s: MP4 2-1	34s: MP4 2-2	34s: MP4 2-3	34s: MP4 2-4
3	21s: MP4 3-1	21s: MP4 3-2	21s: MP4 3-3	21s: MP4 3-4

– Trim local video item duration to boundaries in seconds and not fractions of seconds.

Note: If your imported video content duration is in fractions of seconds, then the content screen shows the actual item duration for the video. However, the system actually rounds that content duration for the playlist to even time boundaries (in seconds). Also, if you manually change the item duration within the Cisco Vision Dynamic Signage Director UI, the content playback will be truncated.

For zone-based video wall synchronization:

■ Put each media player in its own group.

■ Collectively, place the groups that are part of the video wall in a zone.

■ Select the "Use as Video Wall" checkbox when you create the zone for the DMP groups.

■ Go to **Tools > Management Dashboard > Dynamic Signage Director Configuration > System Configuration > Global DMP Settings (6) > Audio/Video/Closed Caption >** set **Zone Based Video Wall Synchronization** to "true."

Restrictions for Video Walls

Before you create video walls, consider the following restrictions:

■ All screens in the video wall should use 1920x1080 format.

- Widgets, external URLs, and multicast video tuning synchronization are supported by the DMP-to-DMP content synchronization feature.

- When using zone-based content synchronization for video walls, one device controls synchronization. If that device stops showing video, then all displays in the video wall stop showing content.

Video Wall Design Examples

This section provides examples of some of the more common and currently deployed video wall designs in Cisco Vision Driector venues.

TIP: Be sure to consult with the video wall experts from the Cisco Creative Services team for any of your video wall ideas, including non-standard configurations. This team can help you with ideas, best practices, and wiring diagrams to ensure a successful deployment.

2x3 TV-Based Tile Matrix Video Wall Example

Figure 3 on page 37 shows a video wall commonly used in a concourse area, with a larger game feed for groups of patrons to watch, along with rotating sponsor content displayed beside the game.

Figure 3   2x3 Video Wall Content Example

A 2x3 video wall is the most common video wall that Cisco recommends because in the left 2x2 group of displays, the game feed maintains the proper 16:9 aspect ratio of the HD game feed.

The right 2x1 group of displays can work independently from the game feed and show sponsor, social, or other content throughout the game. The user also can change the type of content that plays during the game. For example, during half-time or period break, when there is no game feed, the user can switch the 2x2 to play full screen sponsor content, while changing the 2x1 to show upcoming events or team branded content so that there are not any sponsor conflicts.

Figure 4 on page 38 shows the cabling for the 2x3 video wall example, where two Cisco DMPs are used to break the wall into different display areas.

The first DMP provides the 2x2 game feed and the second DMP provides the 2x1 sponsor ads.

Figure 4   **2x3 Video Wall Cabling Example Using TV Tile Matrix Functionality**

These dedicated DMPs provide the video signal for the group of TVs that the DMP is connected to through the daisy-chain. Depending on the screen manufacturer, the RS- 232 connections can also be daisy-chained if this feature is available.

When operating in tile matrix mode, the TVs are fed the same video signal. Based on the TV's tile matrix configuration, the TV knows to first scale input video to the size of the configured x,y dimensions, and then to display its "piece" of the overall display based on its configured position within the matrix.

Note: If you want to show multiple types of content, such as four different channels on each of the screens, connect a Cisco DMP behind each TV.

Other Video Wall Configurations

While the 2x3 video wall is the most commonly used video wall configuration, using the information and concepts for the video wall examples, you can create any number of different video wall configurations.

Figure 5   **4x4 Video Wall Example**

Video Wall Design Examples

Figure 6   3x5 Video Wall Example

Figure 7   2x7 Video Wall Example

Screen Template Specifications for Cisco Vision Dynamic Signage Director

First Published: 2018-07-10

This chapter defines the screen templates supported by Cisco Vision Dynamic Signage Director. Use a default screen template or create your own custom template.

Default Screen Templates

The following templates are standard in Cisco Vision Dynamic Signage Director. The standard templates can be identified by the lock icon that appears next to the template name. The default screen templates make it easy to create event scripts.

- 3-Region Lwrapper

- Full Screen Dual Video

- Full Screen Graphic

- Full Screen Video

shows the 3_region Lwrapper template.

Figure 1   Default Templates in Cisco Vision Dynamic Signage Director
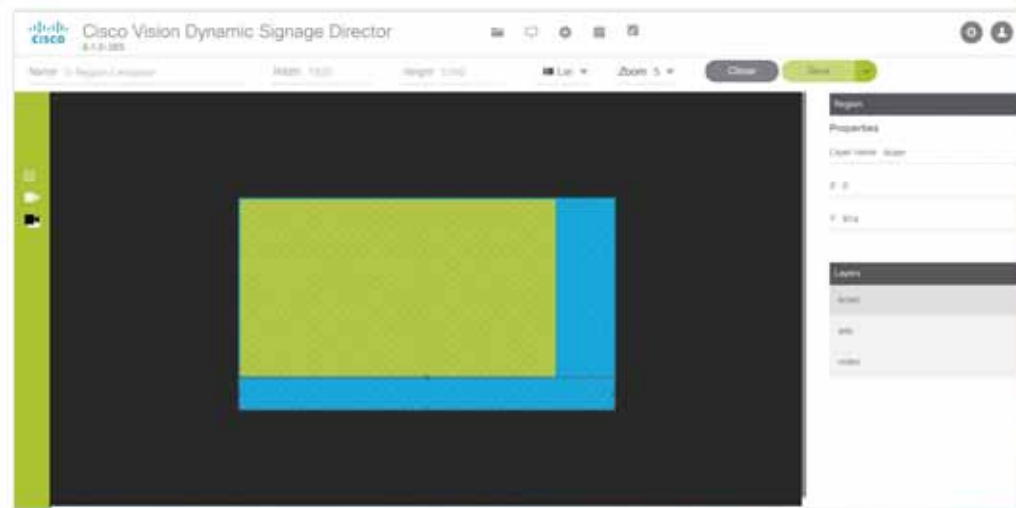
Default Screen Template Dimensions

The dimensions for the default screen templates are fixed and cannot be changed.
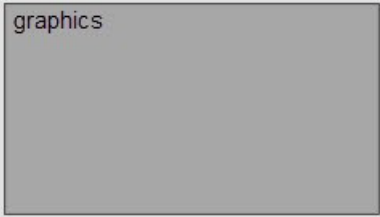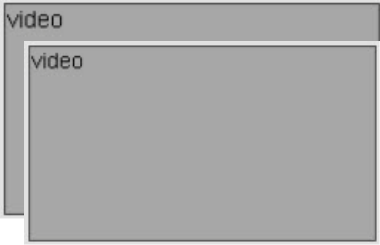
Alternatively, you can create custom screen templates (where you specify different sizes for the screen template regions) and overlay screen templates (where you have a non-video or video region overlapping a video or mixed media region).

Table 1 on page 43 defines the default screen templates that are included in Cisco Vision Dynamic Signage Director.

Note: Obsolete templates (such as 3-Region, 3-Region double, Emergency, Exit, Outside Emergency, Welcome) might still appear in your system if you have upgraded from earlier releases. Installing a full ISO image will remove previously available templates.

Table 1   Default Screen Template Summary

Template Name	Content Type	Dimensions	Region Layout
Full Screen Video	Video Mixed Media	1920x1080	
Full Screen Graphic	Static Image	1920x1080	
3-Region L-wrapper (Also known as just "L-wrapper.")	■ Video (Live video or replay; Mixed media in Region 1) ■ Advertisements (Playlist of advertisements in Region 2) ■ Ticker (Feed of scores or news in Region 3)	■ Video: 1624x914 ■ Ads: 296x914 ■ Ticker: 1920x166	
Full Screen Dual Video	Video in each region. Using a luma key on the video in region 2 (the top-layer video region), you can enable select areas of video content in region 1 to be visible through the video in region 2. **Note:** A luma key on 4K video is not supported. However, an HD video in the secondary region can use a luma key over a 4K video in the primary region. The Full Screen Dual Video template is available.	Video 1 (bottom video): 1920x1080 Video 2 (top video): 1920x1080	

Template Resolutions

The default Cisco Vision Dynamic Signage Director screen template size is 1920x1080.

General Guidelines for All Screen Templates

When creating screen templates and populating content, consider the following guidelines:

- Templates are ordered by name.

- For Proof of Play, you can have more than one region with an ad playlist.

- Regions are listed from top-to-bottom layer order, where the top layer appears at the top of the list.

- Layers are numbered, if a screen template contains a non-video region and a video or mixed media region, the video or mixed media region always appears at the bottom of the list.

  Note: You can manually drag a video region to be on top of other regions; however, the rendering of the regions below the video region will not be predictable and can be completely invisible.

- A plus sign icon adds a non-video region.

- A film icon adds a video or mixed media region.

- Switching a non-video region to a video region might produce a warning if there is already an existing video region.

- Saving an existing template with regions removed will produce a force dialog for confirmation. In addition, when a template that is used in an event script is edited (including when one is adding a region) a force dialog appears for confirmation. You should also edit the scripts that use the changed template to verify that the added or removed regions contain the appropriate content and changes occur as expected.

Note: The SV-4K and CV-UHD media players support HD/SD and video content with 4K resolution. Graphics with 4K resolution are not supported. The DMPs only support HD/SD content and do not support 4K video streaming. Review the list of supported content in the Overview of Content Support in Cisco Vision Dynamic Signage Director, page 11.

Full Screen Default Templates

Use the full-screen templates that come with Cisco Vision Dynamic Signage Director to display full-screen video (or mixed media), or full-screen graphics. Figure 2 on page 45 shows an example of a video (or mixed media) in the full screen template. Figure 3 on page 45 shows an example of a graphic in the full screen template. Both are fixed screen templates and cannot be customized.

Full Screen Default Templates

Figure 2   Full Screen Video (or Mixed Media) Template Example

Table 2   Full Screen Video or Mixed Media Template Dimensions

Content Type	Dimensions
Full Screen Video or Mixed Media	Region 1: 1920x1080

Figure 3   Full Screen Graphic Template Example

Table 3   Full Screen Graphic Template Dimensions

Content Type	Dimensions
Full Screen Graphic	Region 1: 1920x1080

3-Region L-Wrapper Default Template

Figure 4 on page 46 shows the region numbering for the 3-Region L-Wrapper default template. Table 4 on page 46 describes the characteristics of each region. This is a fixed screen template and cannot be customized.

Figure 4   Region Numbering and Layout of a 3-Region L-Wrapper Template

Table 4   3-Region L-wrapper Region Template Dimensions

Region	Content Type	Dimensions	Description
1	Video or Mixed Media	1624x914	16:9 aspect ratio. - Supports live video broadcasts or video replay. For more details on video formats, refer to the Cisco Vision Director Video Headend Design and Implementation Guide for your release (available to qualified Cisco Vision partners).
2	Non-Video	296x914	- Supports playlists of advertisements. - Due to the small dimensions of Region 2, use graphic-intensive ads rather than ads that have a lot of small text in this region.
3	Non-Video	1920x166	- Designed for displaying a graphic and/or information in the form of a ticker. - The ticker content can be from a compatible RSS feed approved by the venue. - The ticker region can be customized with the venue logo (with the ticker content playing in the remaining space).

Figure 5 on page 47 shows an example of content in the 3-Region L-wrapper template.

Figure 5   3-Region L-Wrapper Template

Full Screen Dual Video Default Template

A full-screen dual video default template is available for the DMPs. Dual video regions allow you to overlay two video regions—a secondary local or multicast video region and a primary video region.

The dual video template provides the following capabilities:

- Show two video feeds at the same time.

- Place video-based advertisements.

- Promote a moment of exclusivity during an event.

- Apply luminance (luma) keying to the secondary video region.

Note: Do not apply a luma key to video content with 4K resolution on the SV-4K or CV-UHD media player. Luma keying is only supported for dual video when an HD video in the secondary region uses a luma key over a 4K video in the primary region.

Table 5 on page 48 lists the specifications of dual video regions.

Table 5   Full Screen Dual Video Template Specifications

Region	Specification
Video 1	■ Can be controlled using an infrared remote (IR) remote or local control. ■ In the template, video region 1 appears as the bottom or primary layer. ■ Supports audio. ■ Source: Local or multicast video.
Video 2	■ Cannot be controlled through an IR remote or local control. ■ In the template, video region 2 fully overlaps video region 1. ■ Luminance (luma) keying is applied to second video region (it cannot be disabled or changed in the template). It cannot be applied on 4K content. ■ Does not play audio. ■ Source: Local or multicast video.

Note: The luma key default is set to #ff2000. To enable luma keying, click the checkbox.

To change the global luma key value:

Go to **Tools > Management Dashboard > Dynamic Signage Director Configuration > System Configuration > Global DMP Settings > Audio/Video/Closed Caption.**

For additional information on luma keying, refer to the Cisco Vision Dynamic Signage Director Operations Guide.

Guidelines for Dual Video Screen Templates

When using the dual video template for the media players, consider the following:

■ A combination of up to full-HD (1920x1080) at either 30 or 60 fps for local video and multicast video are hardware-accelerated.

■ Using multicast videos for both video regions is supported, we recommend using a combination of multicast and locally stored videos for the video regions.

■ Place video regions below any non-video content for consistent playback and performance.

■ Match the template region aspect ratio with the aspect ratio of the video content that will play in that region.

■ If the secondary video region is not displaying, verify that there are no staging errors, that the secondary region is not behind the primary region, and the resolution does not exceed 1920x1080.

■ In the dual video template, the secondary region (video 2) will appear above the primary region (video 1). Using luma keying on video region 2, you can enable select areas of video region 1 content to be visible through video region 2. To change the order of the dual video regions, copy the locked template to create a custom template and change the order accordingly.

■ Do no apply a luma key to video content with 4K resolution on the SV-4K and CV-UHD media player. Luma keying is only supported for dual video when an HD video in the secondary region uses a luma key over a 4K video in the primary region.

Custom Screen Templates

In addition to using the standard templates that come with Cisco Vision Dynamic Signage Director, you can also create your own custom or overlay template.

Custom screen templates allow you to change the size and arrangements of the regions on the screen to fit the sponsor/venue needs. See Figure 6 on page 49 for an example.

Figure 6   Custom Template Example

Guidelines for Custom Screen Templates

Consider the following guidelines when creating custom screen templates:

■ Regions can contain non-video content (static graphics), video, or a combination of both (in a mixed media region).

■ Up to 5 regions are supported for each screen template—more than 5 may cause degradation. Results may vary depending on what type of non-video content is used. For example, a very simple widget may not cause degradation but a very complex widget could.

■ A custom template can contain up to two video regions.

    – Dual 4K video regions on the SV-4K and CV-UHD are not supported.

    – Using luma keying on video content in Region 2, you can enable select areas of video Region 1 content to be visible through video Region 2.

    – Change the order of the video regions by changing their relative layer order in the template.

■ When layering regions, the non-video content (graphics, widgets, etc.) will always appear on top of the video content.

Note: When layering two video/mixed media regions, if the playlist for the first video/mixed media region includes both video and non-video content, the non-video content in the first region will always appear **on top** of the video in the second video region.

TIP: If you must include non-video content in Region 1, create a local video of the static content and use that in the playlist so that it remains in the primary region.

- To optimize performance, the video and graphic aspect ratio sizes should match the aspect ratio of the region. Multi-screen template stretching generally is not currently supported. However, multicast video and local video scaling is supported on all digital media players.

- All regions must fit within the 1920x1080 dimensions. If you are using an overlay, then you can have two regions that are both 1920x1080.

Note: The DMPs support negotiation to many resolutions. However, when the negotiated resolution is less than 1920x1080, the template will cropp to that lower resolution.

Table 6 on page 50 provides the number of content regions you can have when creating custom templates.

Table 6   Number of Allowed Regions When Creating Custom Templates

Region Type	DMP 2K, SV-4K, CV-UHD	CV-HD
Non-Video Graphic	0 or more	0 or more
Video Region 1 or Mixed Media	Up to One	Up to One
Video Region 2 or Mixed Media	Up to One	Not Supported

Custom Overlay Screen Templates

Overlay screen templates are custom templates that allow a non-video region (graphics) to overlap a video (or mixed media) region on the media players. You also can create a custom screen template with dual video regions (or you can use the default full-screen dual video template).

The screen overlay feature can be assigned to any region. Using the overlay feature you can display:

- A full-screen video (or mixed media) region with a full-screen non-video (graphic) content region overlaid on top.

- A brand/graphic overlaid in a small region of the screen.

- A ghosted brand/graphic such as a transparent logo where some of the colors in the logo are transparent and others are not.

Note: When creating an overlay screen template that has a primary video and a non-video region on top, be sure that the image is designed to fit on the canvas. If the image is placed off the canvas, only part of the image will appear.

Guidelines for Graphics in Overlay Screen Templates

- Use 8-bit or 24-bit PNG (transparent pixels supported) file format.

- Make the pixels transparent in the .PNG for the full-size video region.

- Do not use JPG files because they do not preserve transparency.

Note: Graphics always overlay video. You cannot place video over graphics.

Content Guidelines and Specifications for Cisco Vision Dynamic Signage Director

First Published: 2018-07-10

Before you import content, verify:

- Content is in the correct format

- Content is the appropriate size

- Content has the correct dimensions for where it will be displayed.

If the content is not the correct size for the Cisco Vision Director region into which it is placed, the image will be cropped or there will be blank space in the region.

Content Dimensions

Content dimensions for images depend on whether the image will play in full screen mode or in one region of a multi-region screen template.

- If the content is shown in full screen mode, then the image should match the resolution of the graphics screen:

  Full Screen HD/SD Mode: 1920x1080 (maximum supported by all DMPs)

- If the content is shown in a region of a multi-region screen template, then the image should match the dimensions of that specific region.

Note: For the CV-UHD and SV-4K, 4K video can be displayed in full ultra HD resolution (3840x2160) when using any of the Dynamic Signage Director templates using the primary video region. For additional information, refer to Restrictions for 4K Video Content, page 54.

Content Orientation

The default orientation for all content in Cisco Vision Dynamic Signage Director is landscape mode.

Portrait Mode Auto-Rotation

Note: The term "auto-rotation" does *not* mean that the content will rotate automatically with physical rotation of the TV display (such as happens with Apple iPhone screens). It means that the *DMP* rotates the content for display in 1080x1920 orientation. From a TV's usual horizontal mounting position, the TV should be rotated 90 degrees (clockwise) for proper display of portrait mode content.

Portrait mode auto-rotation allows DMPs to automatically rotate all content for proper orientation on vertically-positioned displays, according to the following guidelines:

- Supports all content sources for a single TV display.

- For multicast streaming video only, supports scaling of content across multiple display screens.

- Is enabled using the "dmp.Portrait" display parameter when configuring TV display specifications in the Control Panel.

Flexible DMP Content Rotation

Release 6.0 introduced portrait-view content display. We enhanced that feature by allowing you to rotate the content 90 degrees and -90 degrees (or +270 degrees). This works for all content like videos, static images, widgets, local and multicast video, and external URLs. For situations where the display monitor has already been installed in a portrait position and to show your content the way you want, rotate the content.
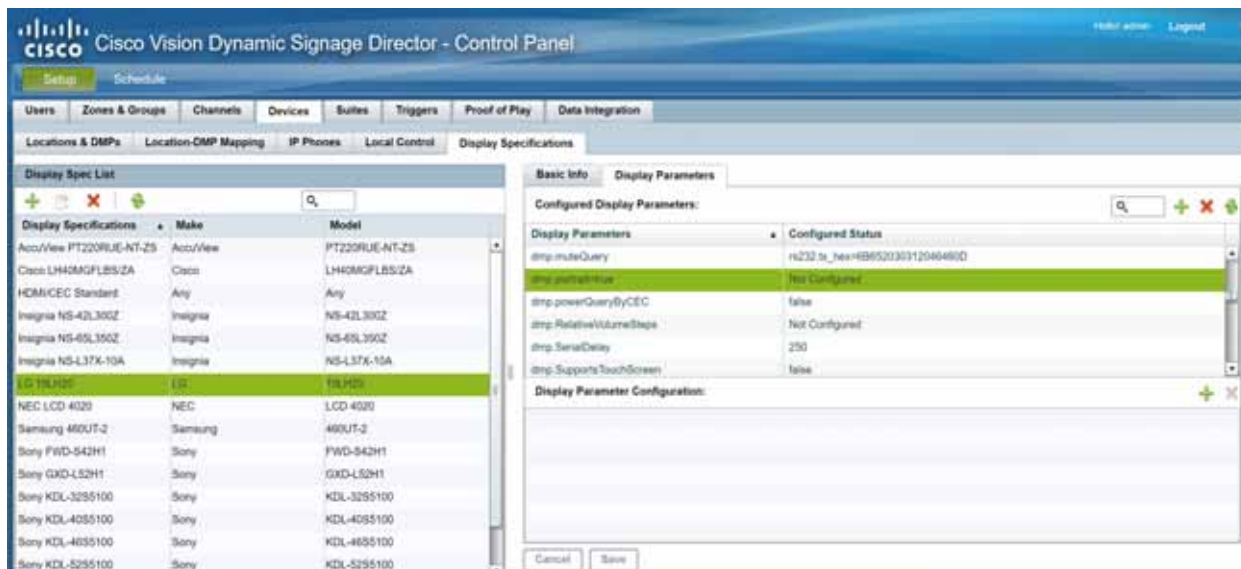
To rotate content:

1. Go to: **Tools** > **Control Panel > Setup > Devices > Display Specifications**.

2. Choose the specific display from the list on the left panel and click the **Display Parameters** tab in the right panel.

3. Add a Display Parameter called dmp.portrait or dmp.portrait.clockwise and set it to "true" to achieve the proper rotation value you need (see Figure 1 on page 52).

   Note: By default, if you use dmp.portrait and set "true" to your content, it rotates the content 90 degree. If you set dmp.portrait.clockwise to "false," it will rotate the content 270 degrees (or -90 degrees).

4. Reboot the DMPs after setting this parameter. Go to: **Tools > Management Dashboard > DMP and TV Controls > DMP Commands > Reboot Device**.

Figure 1   Adding Content Rotation Specifics to Display Parameters

Figure 2 on page 53 is a figure displaying rotated content 90 and -90 degrees. Use clockwise and counter clockwise. You can only use 90 and -90.

Figure 2   90 Degrees and 270 Degrees, Content Rotation
Clockwise   Counter clockwise

Content Scaling

Scaling refers to support of two things:

- Stretching of the content.

- Showing only a portion of the content per display in a multi-screen video wall.

Note: Content scaling works with multicast video and local video, as well as for static graphics, widgets, and external URLs.

Note: Scale down large content and keep the correct aspect ratio. If your image or widget resolution is smaller than the region, the content resolution will not scale up.

No need to configure. This is just an added feature/ability of Cisco Vision Director. For video walls, videos always scale to the region. However, if your region is out of spec, it may not display. For non-video, content will be scaled down (scale-to-fit for images and widgets, maintaining aspect ratio; scale-to-fill for external URL). This feature will scale non-video content down so it will not spill over beyond the region size.

Limitation: If you have content that is too small for your region, you can scale up—for video only.

Best practice: Match content resolutions with region resolutions.

Guidelines for Video Content

To deploy video content in Cisco Vision Dynamic Signage Director, use the following guidelines

- Video files range in size. 4 GB is the maximum file size.

- Be sure that your video content meets the requirements described in Supported Video and Audio Formats, page 31.

- Test the devices that you plan to connect to the SV-4K or CV-UHD HDMI-In port to stream content for support of HDCP. Most Mac OS and Windows laptops should work for HDMI-In video encoding for non-copy-protected content. The device manufacturer and OS determine whether or not this is supported.

- Using multicast or locally-stored videos for both video regions is supported, we recommend using a combination of multicast and locally-stored videos for the video regions (or local video for both video regions).

- For best performance of local video playback on the media players, use Constant Bit Rate (CBR). Variable Bit Rate (VBR) will also work but synchronized video playback could be compromised.

- Create video content that is the same size as the video region in which it will be rendered. This avoids any unnecessary video scaling.

- The audio track for any local video content should be sampled at 48 kHz.

■ All local video content must include an audio PID (even if silent, without an audio source present).

■ Use progressive video modes instead of interlaced to achieve optimal video display.

Additional Guidelines for 4K Video Content

■ Best Practices for 4K Video Content, page 54

■ Restrictions for 4K Video Content, page 54

Best Practices for 4K Video Content

Before preparing video content with 4K resolution for the SV-4K media player, consider the following best practice:

■ When using any templates with native 4K video, it is best to design all content/regions for HD 1920x1080. The image content that is displayed with the 4K video will resize proportionally to a 3840x2160 canvas size automatically.

4K video is displayed in full ultra HD resolution (3840x2160) when using any of the Cisco Vision Dynamic Signage Director templates using the primary video region.

Restrictions for 4K Video Content

Before preparing video content with 4K resolution, consider the following restrictions:

■ Video content with 4K resolution is only supported by the SV-4K and CV-UHD DMPs.

■ H.264 video encoding is not supported. Be sure that your content tools support H.265 encoding.

■ Videos with 4K resolution are not supported for HDMI-In streaming.

■ Display of dual 4K video regions is not supported.

■ The 4K video region should be played in the primary video region only. A secondary video region can support up to HD (1920x1080) video resolution.

■ No luma key can be applied to 4K video content. Luma keying is only supported with 4K for dual video when an HD video in the secondary region uses a luma key over a 4K video in the primary region.

■ The Screen Template editor in Cisco Vision Dynamic Signage Director presents all region sizes based on an HD 1920x1080 canvas size. Do not configure templates based on the ultra HD size of 3840x2160 when using a 4K display.

■ If you are using a 4K display, configure a fixed resolution value of 3840x2160x60p in the sv4k.videoMode serial command in the TV display specification.

For more information about how to specify the TV display resolution, see the "Configuring Resolution Under Control Panel Display Specifications" in the Cisco Vision Dynamic Signage Director Operations Guide.

HTML Content Creation Guidelines for Cisco Vision Dynamic Signage Director

First Published: 2018-07-10

This module provides some general guidelines for creating HTML5 content for playback on the media players in Cisco Vision Dynamic Signage Director.

Note: These guidelines should generally work for the media players in Cisco Vision Dynamic Signage Director. However, certain elements may not render as expected. Test all of your HTML content before putting it into production. For more information, see Verification of HTML Content in Cisco Vision Dynamic Signage Director, page 58.

Best Practices for HTML Features with Hardware-Acceleration

Note: This section describes some of the hardware-accelerated features and guidelines that generally should work for the media players. There may be limitations that are not documented here.

The following features and effects are hardware-accelerated and recommended:

- SVG graphics combined with CSS transforms

- Effects that use `-webkit-transform` (preferred), or `transform`

- Animations that use `-webkit-animation-*` and `-webkit-keyframes`

- Any CSS transitions (for example, `-webkit-transition`)

Note: It is not required to use the "`-webkit-`" prefix, but we recommend it as a best practice.

The following features are not hardware-accelerated and should be avoided:

- `-ms-transform`, `-moz-transform`, or `-o-transform`

> **Note:** This restriction includes avoiding other unsupported Chromium features that begin with -ms- and -moz- and -o-.

- Javascript-based animations and effects

- Video only when tagged with the `hwz` attribute

  Note: The video element, by default, is not hardware-accelerated and is not recommended or supported—unless you tag the video with the `hwz` attribute. Only 2 video regions can be on the screen at the same time. This includes other live and local video regions from Cisco Vision Dynamic Signage Director.

Content Restrictions for HTML5

The following content restrictions are associated with HTML5 pages:

- Do not use HTML5 content as a general purpose web browser. The media players are an HTML5 player with interactive capabilities, not a web-surfing tool.

- The media players do not support Flash content. Any HTML5 pages that have embedded Flash content will not display correctly. Most Flash-authoring applications, including the Adobe Creative Suite, have tools that allow you to export Flash content as HTML5.

- The media players do not support Media Streaming Extensions (MSE).

- Certain video streaming sites use codecs that are unsupported.

- The image size on HTML5 pages is limited to 1920x1080x32bpp. The media players will fail to display pages that contain images that are larger than this restriction.

- Avoid loading or referencing sites that load all content into one, very large HTML page. That requires a large amount of physical and virtual memory.

- Do not use warping animations when displaying a new piece of content. This does not work well with video because the hardware decoders require rectangular video content.

Guidelines for Creation of HTML5 Pages

Follow these guidelines when creating HTML5 pages:

- Verify the HTML5 page has the same aspect ratio as your signage display.

  If you are displaying HTML5 content in a widget that is smaller than the screen, fit the page to the same aspect ratio as the widget.

- Use a master Div aligned to 0,0 when building an HTML page. This will ensure correct alignment.

- Be aware of page refresh behavior. Every time a page refreshes, the player will retrieve all page elements again (without caching them). If the page is being hosted on a remote server, the page elements will be loaded as they arrive over the connection, resulting in poor aesthetics for pages that are frequently refreshed.

  For pages that will refresh often, include code (for example, JavaScript, Ajax, other) so only dynamic elements on the page reload when the page refreshes.

- If you are using the web page for digital signage, consider hiding scrollbars.

  To hide scrollbars, add the following snippet to your CSS code:

  ```
  ::-webkit-scrollbar { width: 0px; height: 0px;
  background: black;}
  ```

HTML5 for Touchscreens

For proper touchscreen operation with HTML5 pages, verify your touchscreen devices are human interface device (HID)-compliant and use standard HID drivers.

Note: Some manufacturers *claim* support for HID but use custom drivers. Verify standard HID drivers are used.

Animations and Add-on Libraries

This section provides some general rules about support for animations and add-on libraries for the WebKit engine on the media players, including:

- JavaScript Animations, page 57

- Vector Animations, page 57

- Bitmap Animations, page 57

- CSS Transforms, page 57

- Add-on Libraries, page 58

- Push Technology, page 58

Caution: Performance is not guaranteed or tested for external web content. External web content can negatively impact the operation of your DMPs. Test external web content.

JavaScript Animations

Animations that use JavaScript timers, including the JQuery .animate() library, do not make an efficient use of GPU resources and are not accurate enough to achieve smooth animations. We recommend using CSS animations whenever possible. The JQuery Transit library uses CSS animations and provides an API similar to the .animate() library.

Vector Animations

Use the SVG protocol to specify vector animations.

Bitmap Animations

Bitmap animations display smoothly when they are 1/3 or less of a 1080p HTML canvas. Setting the canvas size to 720p allows for larger high-quality animations to occupy the screen.

CSS Transforms

All CSS transforms should be specified as WebKit transforms. When performing a transform on a `<div>` or graphics element, we do not recommend specifying the transform in-line.

Animations that use the "top" and "left" properties are rendered using the CPU. We recommend using the `translate()` and `translate3d()` methods instead, to offload work onto the GPU, ensuring smoother animations.

The following code shows an example of an effective CSS transform:

```
<style>
.flipme{
-webkit-animation-name:flipon;
```

```
-webkit-animation-fill-mode:forwards;
-webkit-animation-iteration-count:1;
-webkit-animation-duration:2s;
}
@-webkit-keyframes flipon
{
0% {-webkit-transform:rotateY(0deg);}
30% {-webkit-transform:rotateY(-90deg);}
100% {-webkit-transform: rotateY(360deg);} image
}
</style>
```

Add-on Libraries

The jQuery and Prototype libraries are supported on the media players. As a general rule, any add-on libraries for animation will work if they use WebKit-based transformations. To verify if a certain library is compatible, look at a non-minified version of the library to see if it uses WebKit-based transforms.

Push Technology

We have tested and proven on the media players the WebSocket protocol and long polling technique.

Network Latency Workaround

When the media player loads HTML content from a URL, there might be a delay based on network latency. Add a preloaded image to lessen this issue.

Verification of HTML Content in Cisco Vision Dynamic Signage Director

The best practice is to always test your content with Cisco Vision Dynamic Signage Director and the DMP.

- Although you can choose to test your HTML content independently of the Cisco Vision Dynamic Signage Director system, performance varies from browser to browser.

- Results that you get from independent testing on your laptop is not a guarantee for expected results within Cisco Vision Dynamic Signage Director.

  Your computer has virtual memory and physical memory beyond the capacity of the DMP, as well as differences in graphics processing.

To do high-level testing of renditions only to test basic functionality of HTML features, consider the following guidelines:

- Install a version of Chromium browser software on your laptop that matches the DMP firmware for your release.

- The version of Chromium varies by DMP firmware release.

  DMP firmware for Cisco Vision Dynamic Signage Director Release 6.1 uses Chromium version 45.

Rotated 4K Output

Displaying an HTML page and rotated video while using a 4K output mode will cause the video to flicker. This is the case even if the video is not part of the HTML page.

Time Localization in JavaScript

The JavaScript `toLocaleTimeString()` call does not retrieve localized time formats (i.e. 24-hour vs. 12-hour clock). Instead, the hour/minute clock defaults to 24-hour time on the media player. The below code provides a workaround in JavaScript to display time using a 12-hour clock:

1. Create the following function:

```
function format12Hour(date)
{
var zero = '0';
hh = date.getHours();
mm = date.getMinutes(); ss = date.getSeconds() if((hh % 12) == 0) hh = 12; else
hh %= 12;
// Pad zero values to 00 hh = (zero+hh).slice(-2); mm = (zero+mm).slice(-2);
ss = (zero+ss).slice(-2);
return hh + ':' + mm + ':' + ss + ' ' + ((date.getHours()
< 12) ? 'AM' :
'PM');
}
```

2. Optionally, to not display seconds information, replace the above "return" line with the following:

```
return hh + ':' + mm + ' ' + ((date.getHours() < 12) ? 'AM' : 'PM');
```

3. Implement the function in the HTML script as follows:

```
var dateString = (startJSDate.getMonth() + 1) + "/" + startJSDate.getDate();
if (!startDateTime.isDateOnly()) {
dateString += " -- " + format12Hour(startJSDate);
}
```

Verification of HTML Content in Cisco Vision Dynamic Signage Director