Cisco StadiumVision Director Server Architecture

First Published: March 7, 2013
Revised: June 20, 2013

The standard Cisco StadiumVision Director network consists of all components of the solution implemented at a single site or venue. Cisco StadiumVision Director Release 3.1 introduces support for a centralized Cisco StadiumVision Director server that can be used to manage and control content for multiple venues using a distributed architecture of Cisco StadiumVision Director Remote servers connected to the central site over the Cisco Connected Stadium wide-area network (WAN).

This module describes the network architectures supported in Cisco StadiumVision Director Release 3.1 and the new server platforms used to implement the solution. It includes the following topics:

- Standard Cisco StadiumVision Director Network Architecture, page 1
- Centralized Cisco StadiumVision Director Network Architecture, page 4
- Server Platforms, page 6

Standard Cisco StadiumVision Director Network Architecture

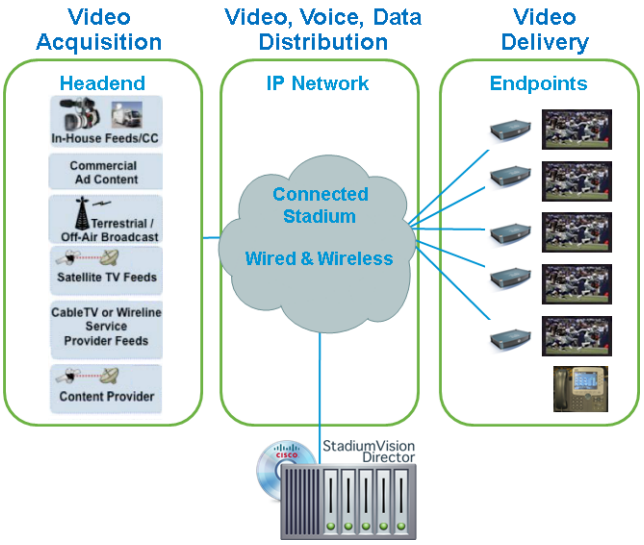
The three primary areas of the standard Cisco StadiumVision Director network architecture include:

- Headend

  The Cisco StadiumVision headend is designed to acquire, process, and encode the video content used in the Cisco StadiumVision solution.
- IP network
- Endpoints

Figure 1 shows the basic network architecture for a Cisco StadiumVision Director network.

Figure 1 Basic Cisco StadiumVision Director Architecture



Cisco StadiumVision Director Server Redundancy

Cisco StadiumVision Director supports an environment of two servers that run the Cisco StadiumVision Director software, where one of the servers operates as the primary active server, and the other server operates as a secondary backup server. If a failure occurs, you can configure the backup server to become the active server, but the failover process is not automatic.

Figure 2 Cisco StadiumVision Director Server Redundancy

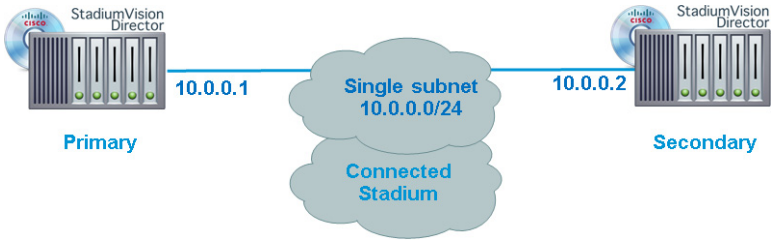


Figure 3 shows the architecture of Cisco StadiumVision Director server redundancy under normal network conditions and operation. The primary and secondary servers are addressed as independent hosts with two different IP addresses on the same subnet in the Cisco Connected Stadium network.

While the secondary server is still connected to the network, notice that communication and control only occurs between the primary Cisco StadiumVision Director server and the rest of the network, including the Digital Media Players (DMPs).

The secondary server is only connected to the network to be made available as a backup to the primary should a failure occur. In addition, the secondary server can (and should) be configured to be backed up with data from the primary server on a scheduled basis so that it can be ready as a warm standby.

Figure 3 Cisco StadiumVision Director Server Redundancy Under Normal Operation

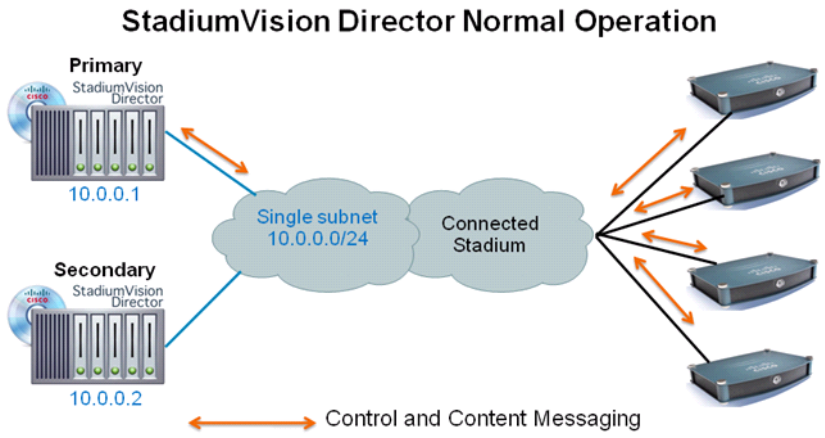
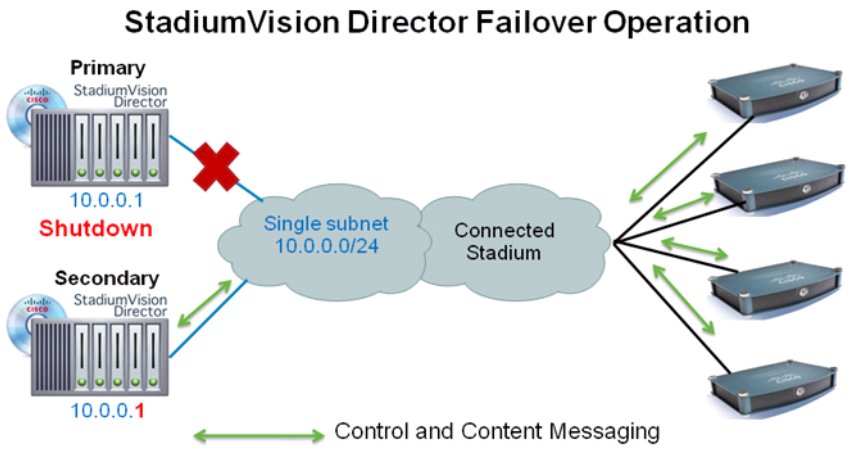


Figure 4 shows the redundancy environment when connectivity from the primary Cisco StadiumVision Director server fails. When the primary server fails, a manual process must take place to restore the secondary server from a backup, shut down the primary server, and activate the secondary server as the primary.

Figure 4 Cisco StadiumVision Director Server Redundancy Under Manual Failover



Notice that the secondary server must be reconfigured to use the same IP address the original primary server. In this example, the secondary server IP address is changed to 10.0.0.1 (from 10.0.0.2) to match the primary server address. When the process is complete, communication and control only occurs between the newly activated secondary server and the rest of the network.

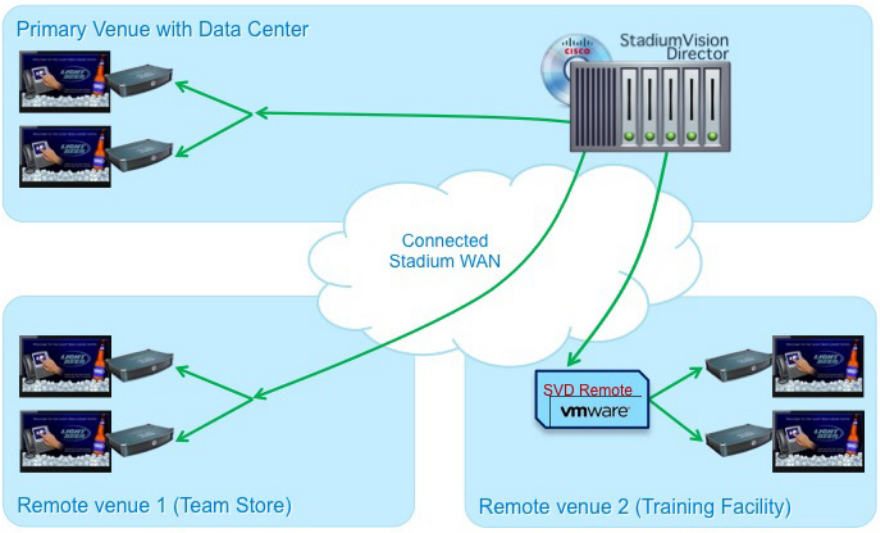
Note The word "failover" does not mean automatic activation of a secondary server. The failover process is manual with the secondary server acting as a warm standby.

For more information about how to perform the failover process, see the "Configuring Failover Between Redundant Cisco StadiumVision Director Servers" module on page 15.

Centralized Cisco StadiumVision Director Network Architecture

Figure 5 shows a central Cisco StadiumVision Director server connected to the headend, with network connections over the Cisco Connected Stadium WAN to multiple remote sites to Cisco StadiumVision Director Remote servers.

Figure 5 Centralized Cisco StadiumVision Director with Remote Sites



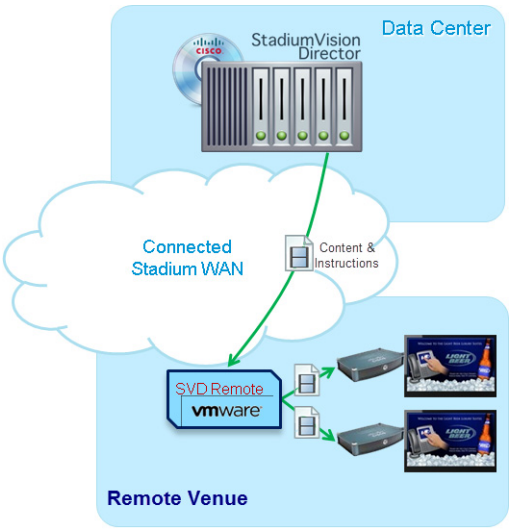
Cisco StadiumVision Director Remote Servers are installed at remote sites to provide a way of targeting site-specific content to locally-installed DMPs in a distributed Cisco StadiumVision Director network environment, where event operation can also be limited to designated venue operators.

WAN Optimization

In the non-distributed Cisco StadiumVision Director environment, the Cisco StadiumVision Director server multicasts all staged content to every DMP over the local network. This multicast distribution of content is not efficient for the smaller and more expensive WAN links in a distributed Cisco StadiumVision Director architecture with remote servers.

Figure 6 shows how transmission of data is optimized over the WAN in the distributed environment, where the central Cisco StadiumVision Director server sends each content piece directly to the Cisco StadiumVision Director Remote server once, rather than sending multiple transmissions of that content to each remote DMP. The remote server then sends the content it receives to each of the DMPs that it supports on its local network.

Figure 6 Scalable File-Based Content Distribution



WAN optimization has the following benefits:

- Improved performance by having each content piece cross a WAN link one time (per venue with Cisco StadiumVision Remote server).
- Reduction in staging time.
- Increased bandwidth availability for other business applications.
- Reduced WAN infrastructure costs.

In addition to WAN optimization, deployment of Cisco StadiumVision Director Remote servers also improves efficiency of messages to the remote DMPs using multicast optimization. For more information, see the "Multicast Optimization for Remote Venues" section on page 26.

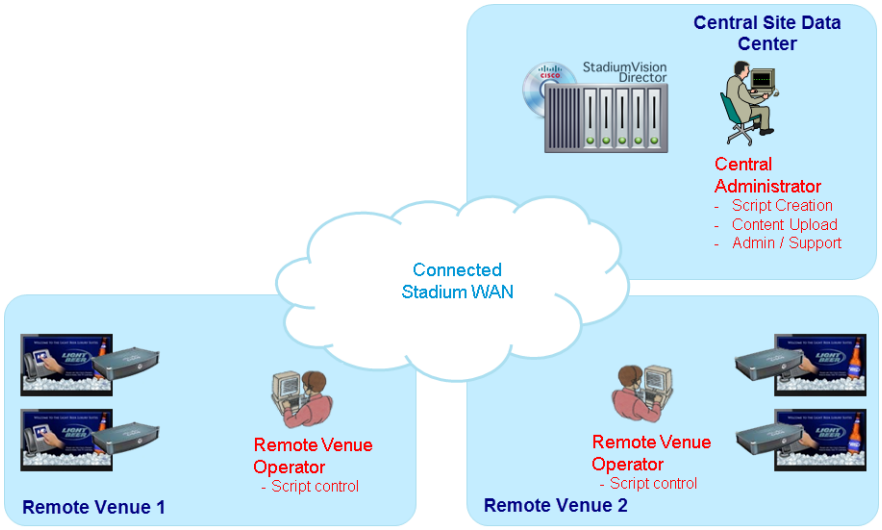
Hierarchical Management

The centralized Cisco StadiumVision Director architecture implements control of multiple venues using Hierarchical Management, which includes the following areas of functionality:

- Introduction of the Venue Operator role that can be used to limit access and control of event operation at one or more assigned remote sites.
- Organization of venue operator, location, playlist, and script objects into site-specific groups by the Administrator role using venue association to manage access and control.

Figure 7 shows the use of Hierarchical Management in Cisco StadiumVision Director, where a central site user with administrator role-based access control (RBAC) permissions is located at the central site data center where the primary Cisco StadiumVision Director server resides.

Figure 7 Hierarchical Management in Centralized Cisco StadiumVision Director



The administrator can perform all venue-related functions, including assigning venue operators, content and scripts into their corresponding venue-specific scopes of control. At the remote venues, the remote venue operators can control the scripts associated to their assigned venue scope-of-control.

For more information, see the following modules of this guide:

- For a description of the supported user roles in Cisco StadiumVision Director, see the "User Management in Cisco StadiumVision Director" module on page 5.
- For information about configuring remote venues in a centralized Cisco StadiumVision Director network architecture, see the "Configuring Cisco StadiumVision Director for Multiple Venue Support" module on page 23.

Server Platforms

This section describes the server platforms supported by the Cisco StadiumVision Director server and the Cisco StadiumVision Director Remote server:

- Cisco StadiumVision Director Servers, page 6
- Cisco StadiumVision Director Remote Server, page 8

Cisco StadiumVision Director Servers

The Cisco StadiumVision Director Release 3.1 software can be supported on the following platforms:

- Cisco StadiumVision Director Platform 2 Server, page 7
- Cisco StadiumVision Director Platform 3 Server, page 7

Cisco StadiumVision Director Platform 2 Server

Cisco StadiumVision Director Release 3.1 requires a minimum of four data drives. Therefore, the Platform 2 server *must* have two additional 300 GB drives installed to support Cisco StadiumVision Director Release 3.1.

Note The extra drives are mandatory for Release 3.1. For more information about the installation of additional hard drives on the Cisco StadiumVision Director Platform 2 server, contact your sales representative.

Figure 8 Front Panel of a Cisco StadiumVision Director Platform 2 Server

Cisco StadiumVision Director Platform 3 Server

The Cisco StadiumVision Director Platform 3 server (Cisco UCS C220 M3 server) is the newest platform to support Cisco StadiumVision Director Release 3.1 and has six drives in its default configuration for SV-DIR-DIRECTOR-K9 product ID (PID).

Note If you order a spare Platform 3 server (SV-PLATFORM3=) only 2 drives are in the default configuration. Therefore, 4 additional data drives are required (SV-HD-A03-D300GA2=).

Figure 9 Front Panel of a Cisco UCS C220 M3 Rack Server

Cisco StadiumVision Director Remote Server

You can use your own server or install a Cisco UCS C22 server to run the Cisco StadiumVision Director Remote software. If using your own server, then the configuration *must* meet the miminum system requirements in Table 1 and support a VMware ESXi virtualized environment.

Table 1 Minimum System Requirements for the Cisco StadiumVision Director Remote Server

System Component	Minimum Requirement
Hard Drive Capacity	300 GB **Note** The hard drives must be configured as a single logical drive.
Virtual RAM (VRAM)	16 GB

For details about the Cisco UCS C22 M3 Rack Server, see the *Cisco UCS C22 M3 Rack Servers Data Sheet*.

For more information about installing the Cisco UCS C22 M3 Rack Server hardware with the Cisco StadiumVision Director Remote software, see the *Cisco StadiumVision Director Remote Installation and Upgrade Guide*.