Cisco StadiumVision Director Server Architecture

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The standard Cisco StadiumVision Director network consists of all components of the solution implemented at a single site or venue. Cisco StadiumVision Director supports 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 4.1 and the server platforms used to implement the solution. It includes the following topics:
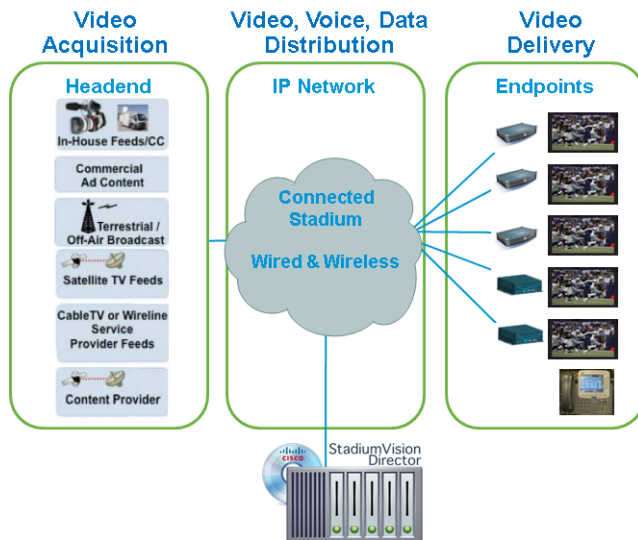
Standard Cisco StadiumVision Director Network Architecture

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.

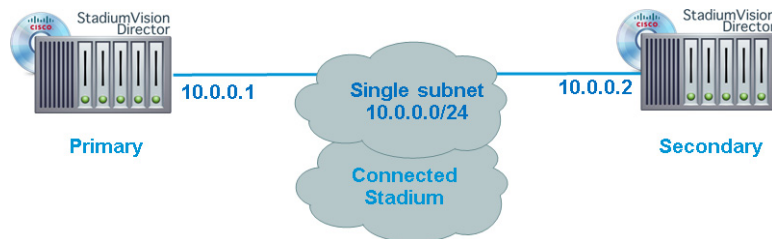*Figure 2*   ***Cisco StadiumVision Director Server Redundancy***

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*
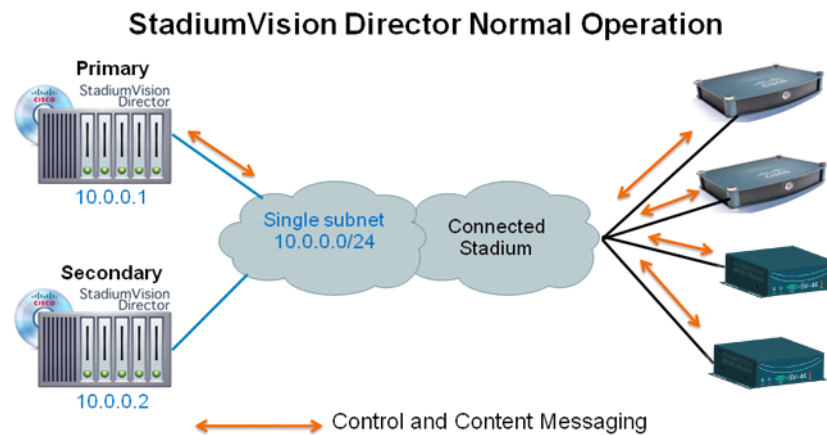

Figure 4 shows the redundancy environment when connectivity from the primary Cisco StadiumVision Director server fails. When the primary server fails, a manual process must take place to restore the secondary server from a backup, shut down the primary server, and activate the secondary server as the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

Figure 4   *Cisco StadiumVision Director Server Redundancy Under Manual Failover*
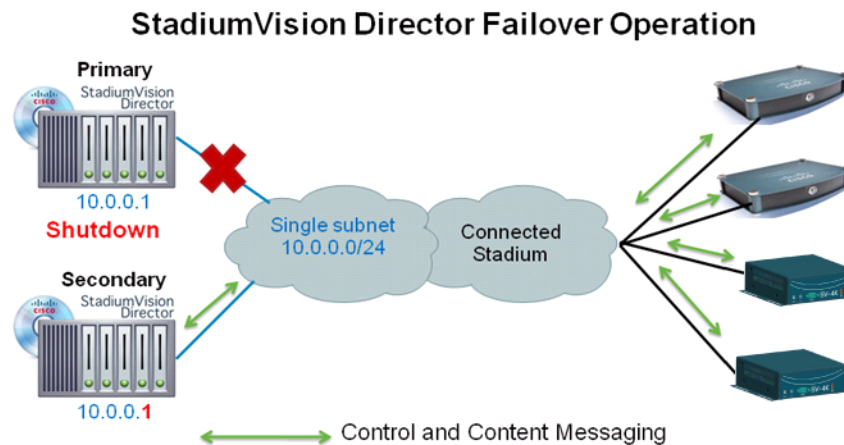
Notice that the secondary server must be reconfigured to use the same IP address the original primary server. In this example, the secondary server IP address is changed to 10.0.0.1 (from 10.0.0.2) to match the primary server address. When the process is complete, communication and control only occurs 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 103.

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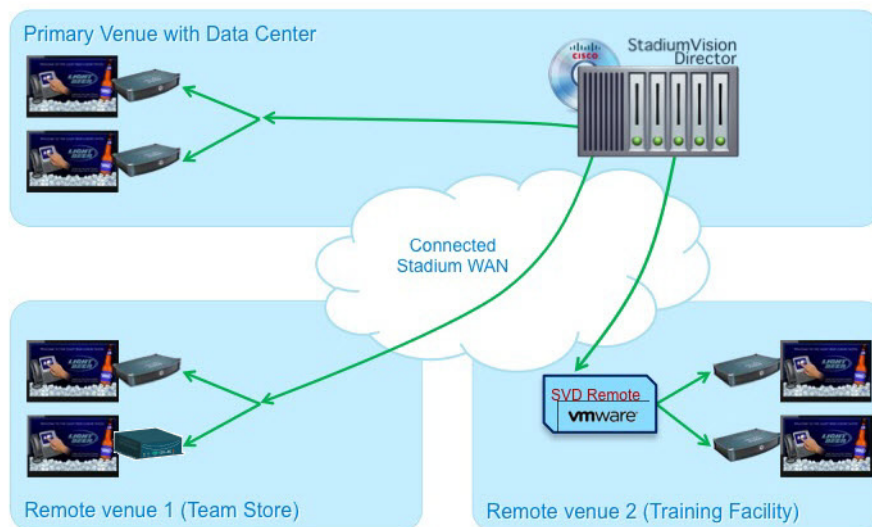
Cisco StadiumVision Director Remote Servers are installed at remote sites to provide a way of targeting site-specific content to locally-installed DMPs in a distributed Cisco StadiumVision Director network environment, where event operation can also be limited to designated venue operators.

Note SV-4K and DMP-2K media players are not supported with Cisco StadiumVision Director Remote servers. The SV-4K and DMP-2K can be located at remote venues, but it must be controlled by the central Cisco StadiumVision Director server as shown in Figure 5. For more information, see the "Restrictions for Configuring Multiple Venue Support" module on page 58.

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 6 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 6   *Hierarchical Management in Centralized Cisco StadiumVision Director*
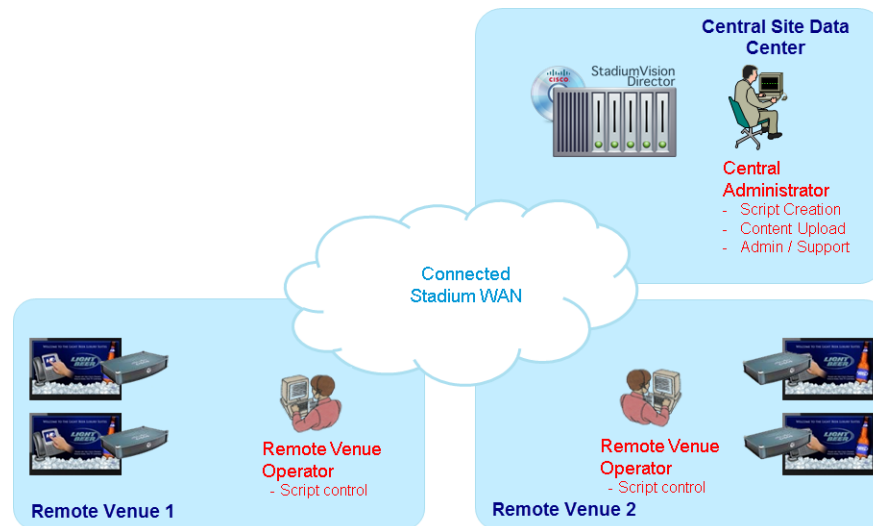
The administrator can perform all venue-related functions, including assigning venue operators, content and scripts into their corresponding venue-specific scopes of control. At the remote venues, the remote venue operators can control the scripts associated to their assigned venue scope-of-control.

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 81.

- 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 57.

Server Platforms

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

- Cisco StadiumVision Director Platform 3 Server, page 8
- Virtual Server Support, page 8

> **Note** The Platform 2 server (Cisco UCS C200) is no longer supported in Release 4.1 due to memory and performance limitations. Any venues currently using Platform 2 servers must migrate to a virtual server environment.

Cisco StadiumVision Director Platform 3 Server

> **Note** The Platform 3 server has reached end-of-sale.

The Cisco StadiumVision Director Platform 3 server (Cisco UCS C220 M3 server) has six drives in its default configuration for SV-DIR-DIRECTOR-K9 product ID (PID).

> **Note** If you ordered 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 7   *Front Panel of a Cisco UCS C220 M3 Rack Server*

Virtual Server Support

You can use another Cisco device or third-party server to run the Cisco StadiumVision Director software. Be sure that your configuration meets the minimum system requirements in Table 1 and supports a VMware ESX virtualized environment with a compatible ESX version (See "VMware vSphere Tested Versions for Cisco StadiumVision Director" section on page 9.)

> **Note** Cisco StadiumVision Director servers are meant to be physically located close to the DMPs that they operate with, and communicating to the players over a LAN. For information about installation-related licensing compliance, see the "Installation Requirements for Licensing Compliance" section of the *Release Notes for Cisco StadiumVision Director Release 4.1*.

Table 1   Minimum System Requirements for the Cisco StadiumVision Director Server in a Virtualized Environment

System Component	Minimum Requirement
Processor	Two processors each equivalent to an Intel Xeon Processor E5-2460 (15 MB cache, 2.50 GHz clock, 7.20 GT/s Intel® QPI)
Forward write (fwrite) operations per second	10,000
Virtual CPUs	24
Virtual Disk Space	900 GB
Virtual RAM (VRAM)	32 GB

Table 2 provides additional information about the tested VM hardware and OS specifications that you should use when configuring a virtual machine to support Cisco StadiumVision Director.

Table 2   Virtual Machine Hardware and OS Specifications Tested for Cisco StadiumVision Director Server

System Component	Specification
VM Hardware	Version 8
Guest Operating System	RedHat Enterprise Linux 5 (64-bit)
Network Adapter	E1000
SCSI Controller	LSI Logic Parallel or LSI Logic SAS
Disk Provisioning	Thick

VMware vSphere Tested Versions for Cisco StadiumVision Director

Cisco StadiumVision Director has been tested with VMware vSphere version 5.1 and 5.5. Other VMware vSphere versions cannot be guaranteed to work with Cisco StadiumVision Director.

Note   Any VMware license that does not allow your virtual machine to be set to the minimum requirements described in Table 1 is not supported.

For more information about installing Cisco StadiumVision Director servers, see the *Cisco StadiumVision Director Software Installation and Upgrade Guide, Release 4.1*.

Restrictions for Virtual Server Support

Be sure that you consider the following restrictions before you configure a virtual server environment for Cisco StadiumVision Director:

- Migrating to a virtualized environment on your existing Platform 2 or Platform 3 servers is not supported. For more information, see the "Important Migration and Upgrade Notes" section of the *Release Notes for Cisco StadiumVision Director Release 4.1*.

- When using a virtual server environment, Cisco Technical Support only provides support for the Cisco StadiumVision software. No support is provided for third-party hardware or the virtual OS environment installed by the customer.

- The recommended configuration is for a dual virtual server environment to support a primary and backup server using the standard Cisco StadiumVision Director backup/restore and failover tools.

- Cisco has not tested and does not provide support for any VMware tools in a Cisco StadiumVision system. If your site chooses to use backup, recovery or other tools outside of the Cisco StadiumVision Director software to manage your virtual servers, then you accept the risks and responsibility associated with securing your data.