Digital Signage Distribution Methodologies Overview

Digital Signage Overview

The past few years have seen a shift across organizations in the type of signage used to deliver important messages to their audiences, including customers, employees, partners, and students. Businesses are moving away from printed signs to more dynamic, flexible, and customizable digital signs, often referred to as digital signage, electronic billboards, or e-signage.

Marketing and advertising budgets are now being directed to this new electronic medium. Financial and retail organizations are taking advantage of digital signage to promote products and services in their branches and stores, and to create richer, more interactive experiences for their customers. Other industries, including government, education, healthcare, sports, entertainment, and transportation, are also implementing digital signage as a tool to enhance customers' and end users' experiences, resulting in new uses of and demands on organizations' network infrastructures.

One of the critical components to a successful digital signage network deployment is a thorough understanding of your network and bandwidth availability. High-quality video files, such as those used in digital signage, are inherently large and can cause serious network congestion problems if not managed correctly. Proper initial evaluation and planning can save time and money—preventing lost productivity, poor network performance, and dissatisfied users.

This white paper articulates the different distribution architectures for digital signage content and the challenges in deploying a digital signage system. Specifically, it addresses the Internet, leased lines, and satellite links.

Physical Distribution Media

Wide-Area Network Distribution

Internet Cable and DSL

In today's businesses, the Internet has become an integrated part of the larger network architecture. Many companies install and configure VPNs over broadband to save on leased-line telecommunications costs. This flexibility and greater cost savings represent a trade-off, however, and can potentially compromise service levels. DSL or cable Internet service providers (ISPs) often throttle the amount of bandwidth that the end (edge) node can consume to accommodate more users on a singe line. You must consider this limitation in advance when streaming content to the digital signage edge node over an open Internet connection. Prepositioning of content and securing a proper failover solution can keep the digital signage network operational even when connectivity is lost.

Private Network Leased Line

A private leased line has been the staple of business connectivity for years. In the early networking market, leased lines were the only method to tie the enterprise data networks together. With private leased lines, businesses manage their own data flows. As a result, most IT departments meet their organization's needs by monitoring data flows and maintaining the lines between sites exactly at the point of saturation by reducing or increasing the committed information rate (CIR) from their service provider.

When installing a digital signage network, you should closely monitor CIR usage statistics to ensure the flow of video content does not affect the normal traffic flow over your network. Private leased lines can be the best option for a digital signage network for streaming content—but also the most costly. You can achieve a good return on investment with a digital signage network, however, by ensuring that bandwidth is used to its maximum potential.

Satellite

Satellite has been used for many years as a video distribution method. Most satellite links are multicast-enabled and therefore are a good distribution medium for video. For instance, satellite TV is a form of the MPEG 2 video format, the most common form of digital signage video today.

The Dish Network uplink center in Wyoming is an example of a satellite installation that uses video encoders to digitally encode a signal into a proprietary MPEG 2 format. The signal is sent through multicast to the satellites, which beam the signal down to antennas (known as satellite dishes). The signal is then decoded by an in-house decoder and converted back to analog, a format that can be displayed on almost any television set.

In the past, IP over satellite was a limited application because of the latency in processing and transport of data through the satellite. However, today's satellites can transmit and receive IP packets with a "round trip" of approximately 0.5 second. Many organizations manage satellite links as backup circuits if a terrestrial link interruption occurs. It is common for these circuits to be underused because they act as backups for primary terrestrial links.

Cisco® now supports a module for its integrated service routers that provides the capability to efficiently move IP traffic across satellite links. With this new innovation, you can use satellite links as a transport medium for digital signage—representing a great way to expand the reach of any digital signage network.

Local-Area Network Distribution

Wired

In most situations, the optimal configuration is attaching a digital media player endpoint directly to the local-area network. Wired networks give organizations a reliable, efficient high-bandwidth distribution medium, enabling many different streams to be run across a wired LAN with minimal effect on the LAN itself. A wired network is the optimal solution for connecting any Cisco Digital Media Player (refer to the section "Cisco Digital Signage Endpoint") back to its central management system.

Wireless

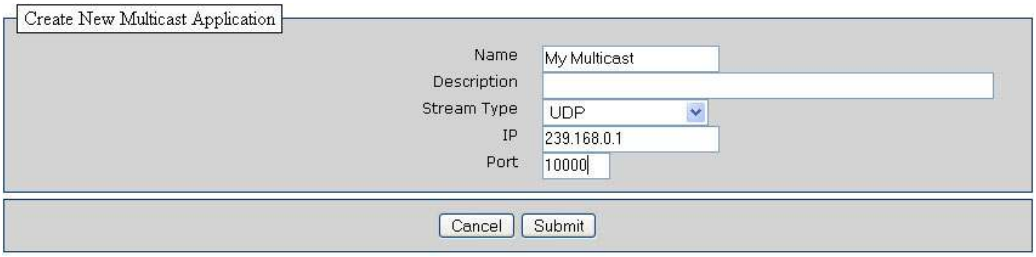
You can use a wireless network if a wired solution is not possible. The combination of a Cisco wireless access point and a Cisco Digital Media Player offers the best connection if hard wiring is not possible. Wireless also allows you to access locations where a digital sign might be effective but is out of range of a physical cable. For example, in a retail store, digital signs are often placed in entrances to welcome customers, but the displays cannot be wired because of high customer traffic.

Streaming Media

Unicast and Multicast

The Cisco Digital Media Player can accept a multicast stream from any User Datagram Protocol (UDP) audio or video stream. To accomplish this scenario, you can set the Cisco Digital Media Manager—the Web-based central management application for all Cisco Digital Media System products—to listen on a specified multicast address and port (refer to Figure 1). Then you can configure the Cisco Digital Media Player to accept and display the stream.

Figure 1. Cisco Digital Media Manager Multicast Setting



Cisco Digital Signage Endpoint

Cisco Digital Media Player

The Cisco Digital Media Player (Figure 2) is an integrated component of the Cisco Digital Media System. The Cisco Digital Media Player is a dynamic, flexible, solid-state device used for the decoding and display of digital media—including high-definition live broadcasts, on-demand video, Flash animations, text tickers, and other Web content—on digital signage displays. This device is small (7.5 x 5 x 1.5 in.) and weighs about 1 lb. It allows for content playback in both full-screen mode and into regions (divisions of screen real estate) within a screen. The regions are customizable from the Cisco Digital Media Manager interface.

The Cisco Digital Media Player has RS-232 connections for control of virtually any market-leading digital displays. It has a built-in GUI for device and content playback management. The Cisco Digital Media Player is built on an embedded operating system, making it highly reliable and low maintenance.

Figure 2. Cisco Digital Media Player

Local Storage Playback (Standalone)

Directly Loading Content on the Cisco Digital Media Player

Prepositioning content is a requirement for some organizations. The Cisco Digital Media Player 4305G model allows up to 2 GB of local data storage on its built-in Secure Digital (SD) card. For this type of distribution and storage method, you can manage the transfer of files to the Cisco Digital Media Player in two ways:

- Use the Cisco Digital Media Manager to easily deliver content and playlist files by FTP to the Cisco Digital Media Player.
- Use your own FTP client to FTP files directly to the Cisco Digital Media Player and then use the Cisco Digital Media Player's Device Manager GUI to instruct the Cisco Digital Media Player to play back content from local storage.

Loading Content Through the Cisco Digital Media Manager

You can use the Cisco Digital Media Manager to preposition content directly to the Cisco Digital Media Player as a failover solution. If the Cisco Digital Media Player detects a 404- or 500-level error for the page it is loading, it automatically plays the designated failover content.

Summary

Choosing the correct player for a digital signage system is critically important, but it is also extremely important to ensure the chosen system can operate on the network without affecting normal operations.

Before beginning any deployment, your planning should include the following:

- Taking inventory of the locations where the digital signs will be placed
- Ensuring network connectivity is available; if not, planning for wireless or standalone units in the targeted locations
- Understanding the different distribution options to choose what would best integrate with the network infrastructure being evaluated

- Ensuring the right content is available to effectively reach targeted audiences (refer to the Cisco white paper “Digital Signage Content Overview”)

By planning for digital signage network integration in advance, you can be assured of a successful deployment.

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**

Printed in USA

C11-385761-01 09/07