Digital Signage Content Overview

What Is Digital Signage?

Digital signage means different things to different people; it can mean a group of digital displays in a retail bank branch showing information about the bank's products and services to customers in the lobby or waiting in line; digital signs in a large department store showing real-time marketing promotions; television screens placed around a university campus with the day's class schedules; or monitors at an airport with up-to-date flight schedules. In fact, digital signage applications are almost as unlimited as your imagination.

Digital signage is often referred to as narrowcasting, retail TV, captive audience networks, out-of-home television, or electronic billboards. Whatever the terminology, digital signage dynamically delivers information, including live and on-demand video, graphics, animations, text, and other Web content, on a high-quality display to a targeted audience at a targeted time.

For example, financial services organizations can now easily promote banking products and services on digital signs in the branch to drive sales and improve customer experience. In addition, retailers are experiencing increased revenue at the point of sale (POS) and delivering real-time messages to consumers at the point of purchase (POP).

By shifting more marketing and advertising budgets to this new electronic medium, organizations are creating a more interactive in-branch or in-store experience, speeding up the time to communicate, delivering more effective advertising, generating additional revenue, and influencing customer purchases. Other industries that are also rapidly adopting digital signage include government, education, healthcare, sports, entertainment, and transportation.

This white paper discusses digital signage content creation and formatting, specifically for use with the Cisco® Digital Media Player (Figure 1), an integrated component of the Cisco Digital Media System.

Figure 1. Cisco Digital Media Player

What Content Is Most Effective for Digital Signage?

A common principle in the world of marketing and advertising is “content is king”. Deliver a great piece of content through a low-quality, low-resolution display and you will immediately see how important it is to use the right technology---”technology is queen.” However, with the combination of compelling, consumer-engaging content and a dynamic, high-definition digital signage display, customers will stop and stare. Digital signage content should include high-quality video, images, or text that can convey a compelling message to viewers.

The following sections explore different types of media available today and how you can use them in a digital signage system, address common questions about content for digital signage, and cover “do’s and don’ts.” This information can help you avoid common mistakes when initially planning for a digital signage network.

Picture Formats: JPEG and BMP

JPEG

JPEG File Interchange Format (JFIF) is a minimal file interchange format used across a variety of applications and platforms. The JPEG image is compressed and does not include any of the features found in formats such as TIFF or any other application-specific file formats. Today, this image format is the most common one on the Internet and is the preferred method for mass distribution.

BMP

BMP (bitmap), the native format of the Microsoft Windows operating system, does not use any file compression; it accomplishes compression through a Run Length Encoding (RLE) data compression algorithm. Although BMP is a good choice for storing image data, it is not the image format of preference for digital signage. Because of its file size, bitmaps have a lower image quality relative to JPEG. You can use any standard image file editor, such as Microsoft Paint or Draw!, to convert BMP images to JPEG images for digital signage delivery and display.

Video Formats: NTSC and PAL

National Television System Committee (NTSC) and Phase Alternation Line (PAL) are both worldwide video formats. NTSC is typically used in the United States, whereas PAL is typically used elsewhere. PAL has a higher spatial resolution (more lines per image) and NTSC has a higher temporal resolution (more frames per second).

With an aspect ratio of 1.33:1, 4 x 3 PAL has a standard resolution of 720 x 576 pixels, and 4 x 3 NTSC has a standard resolution of 720 x 480 pixels. For widescreen applications, 16 x 9 Enhanced PAL has a resolution of 538 x 576 pixels, and 16 x 9 Enhanced NTSC has a resolution of 538 x 480.

Video Compression Formats: MPEG and Flash

MPEG

MPEG is the Motion Picture Experts Group subcommittee of the International Standards Organization (ISO) that is in charge of the development of standards for coded representation of digital audio and video. Established in 1988, the group has produced all MPEG standards that exist today. MPEG is a defined standard for compressing analog sources into digital formats that can be easily stored and distributed. Following is a brief summary of each of the MPEG formats.

MPEG 1

MPEG 1, originally known as just MPEG, is the oldest implemented standard for video compression. The MPEG 1 standard allows for better compression and a smaller file size than MPEG 2 (refer to MPEG 2 section) but lacks the quality of the content that is achieved by using MPEG 2. The format size is 352 x 240 for NTSC and 352 x 288 for PAL. It has a maximum bit rate of 1.5 Mbps.

MPEG 2

MPEG 2 is the video compression format used for DVD and cable television set-top boxes today. It has been used for many years and is well established within the industry; subsequently it is the most popular format for the distribution of full-frame video over IP and is usually encoded between 2 and 6 Mbps. If used to compress high-definition (HD) content, the MPEG 2 standard can usually result in an output of two to four times higher than its common encoding rate.

Adobe Flash Animation

The Adobe Flash animation format is a proprietary file format originally developed by Macromedia (now Adobe). One of the primary advantages of Flash animation is that it supports the ActionScript programming language, allowing for a Flash animation to be embedded in an HTML page and played back with a browser plug-in rather than requiring an external application to be launched in the operating system background to play the file.

Digital Signage Content Best Practices

Dividing Screen Real Estate into Regions or Zones

Screen zoning, a relatively new concept to digital signage, refers to dividing the real estate of a digital signage screen into separate regions or zones where multiple types of information can be displayed simultaneously on a screen. Each region or zone supports multiple content formats and is an independent component that can be easily updated or changed.

Figure 2 shows a live video being streamed from a network streaming server in the left zone and a Flash animation being delivered in the right zone. The zone on the lower portion of the screen is a ticker displaying text information. The logo at the top of the screen is also a Flash animation.

Figure 2. Screen Zoning

Scheduling Content: Day-Parting

Day-parting defines the scheduling of digital signage content to be displayed at particular times throughout the day. In the past, day-parting has been complicated and difficult to manage, but it is one of the most important benefits of digital signage. Being able to easily change content in real time to communicate to specific audiences is critical in today's business environment. Splitting the day into smaller segments allows organizations to display relevant information to match a typical customer profile for a specific time of day.

For example, a retail bank branch can use digital signage to promote mortgage loan products and services from 8 and 11 a.m., the prime time for corporate employee traffic. Between 11 a.m. and 2 p.m., the bank branch can display advertisements targeting retirees on mid-day personal errands. Digital signage creates a better messaging system to more closely match an organization's business needs and opportunities. To develop a baseline for a day-part schedule, you can evaluate customers' buying patterns against common day schedules, such as start of the workday, lunch, and dinner timeframes.

Creating, Managing, and Deploying Content

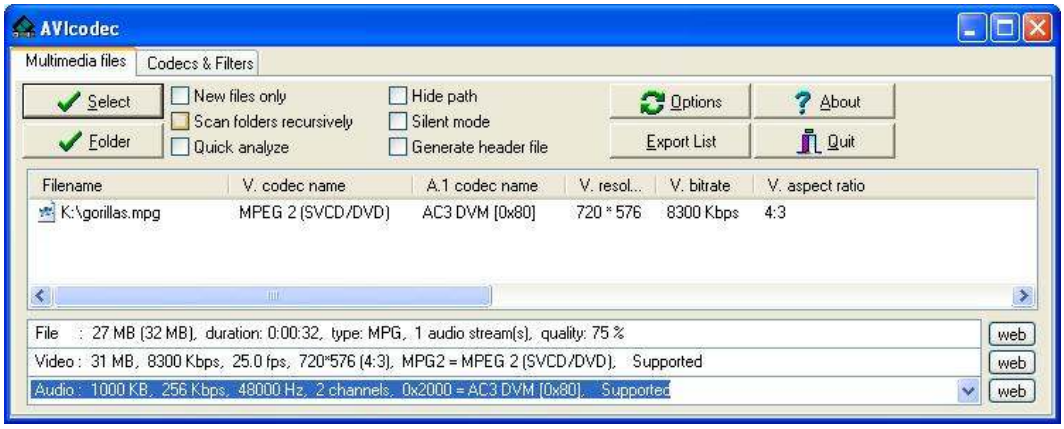
Many sources of content exist for digital signage. Some content can be reused without modification for display through a digital signage network, further increasing the reach of existing content originally created for other delivery mediums—and thereby extending the effect of existing content to allow employees or customers in dispersed locations to receive important information. This scenario can lead to greater brand loyalty and product awareness, better and more informed employees with a better sense of "connectedness", and more effective marketing and communications.

Although using preexisting content is a good starting point, it is no substitute for creating new content that is focused and tailored to the specific environment where digital signage is located. Many organizations use external marketing agencies to create content that is more relevant and influential.

Determining Codecs

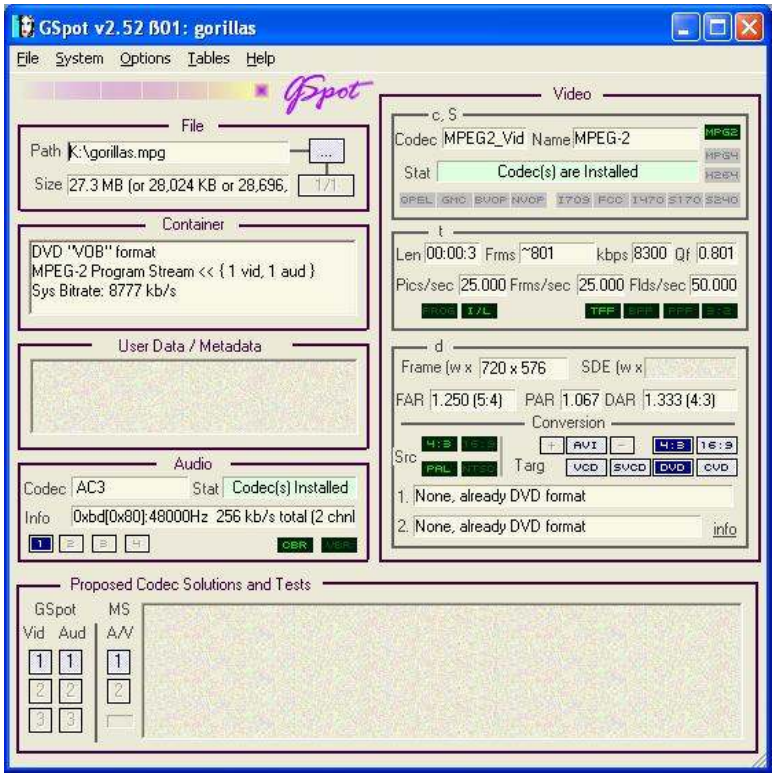
Many tools are available to analyze a video file to determine what codec was used during encoding. One is AVIcodec, which you can download from http://avicodec.duby.info. The program recognizes most video file formats and delivers additional details in an easily viewable interface. Figure 3 shows a sample of the download output.

Figure 3. AVIcodec



Another program that is simpler is GSpot, which you can download from http://www.free-codecs.com/download/GSpot.htm. Figure 4 shows the output of the same file when viewed with GSpot.

Figure 4. GSpot



Summary

Do:

- Evaluate and plan your digital signage deployment before you begin your installation, including what content and messages you will display.
- Understand the audiences you are trying to influence and when you will target them.
- Prepare and organize your content in advance and plan a uniform file format for all content.
- Create new content that you may need to fit your audience and messaging objectives.

Don't:

- Underestimate the importance of a solid content strategy for a successful implementation.
- Use content that does not fit your audience profile or is not relevant to their interests.
- Try to distribute large amounts of content over an underequipped network or one that lacks the bandwidth for critical data.

Glossary

Codec: A device or program capable of performing encoding or decoding of a digital stream of data. Although it has many other definitions, the term "codec" has become synonymous with digital video playback and encoding.

PES (Packetized Elementary Stream): Defined by MPEG as an Elementary Stream (ES) that is “packetized” by adding a packet header to a predetermined number of bytes. An ES contains only one type of data, either audio or video.

Pixel: Pixel is short for “picture element,” a discrete spatial point of an image. A color pixel is traditionally represented by blending different intensities of the three primary colors—red, blue, and green.

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

C11-385196-02 09/07