BLACK BOX®
NETWORK SERVICES

Digital Signage for schools

Deliver real-time communications, including emergency messaging, to students, teachers, and staff.

Planning It   Shopping for It   Implementing It

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Introduction

For school districts, digital signage can be a very effective—and affordable—communications medium. Today's media-savvy youth respond well to a medium where the message is projected and amplified on a larger scale. So using digital signage as a colourful message board in the educational environment is a bit of a no-brainer.

This is true if you're charged with implementing technology to enable better campus- and building-wide communications or part of a team tasked with ensuring the safety of students and staff. Digital signage can play an important role in the mission of educational institutions: to educate, inform, notify, and alert.

Use digital signage to:

• **Promote events in your schools.** Install large LCD or plasma screens around buildings to get the word out about upcoming activities, including band concerts, sporting events, college fairs, and the like. Mount screens anywhere students frequent: cafeterias, gyms, and auditorium lobbies, outside your main office, in your school's foyer, and so on. More eye-catching—and less wasteful—than repeatedly creating and taping posters to walls, digital signage enables organizations and staff to promote an event or academic program without it getting lost in the flurry of flyers tacked on bulletin boards.

• **Disseminate important up-to-date information.** School districts spend a lot printing class schedule guides and other time-sensitive publications, only to deal with mass confusion when the information included in those printed materials changes. Keeping students and parents informed through the district's Web site and e-mail notification has helped alleviate the headaches, but dynamic message boards, updated in real-time, help reach students who aren't near their computer or don't take the time to check their e-mail. It's also helpful to staff, too. Signage in the faculty lounge can keep them informed of the day's events, schedule changes, professional development opportunities, HR-related information, and more.

• **Broadcast emergency alerts and instructions.** Emergency messaging systems are essential in educational institutions. The same digital signage you use to broadcast everyday info can also be used to alert students and staff to inclement weather, emergencies, lockdowns, and evacuations. Sending prerecorded evacuation instructions or other messages to digital signs buildingwide can even be a virtually automated procedure, activated by the entering of a code into a cell phone by school security or other authorized personnel. This way, there's no scrambling to get instructions on the air when panic ensues.

• **Aid your instructional efforts.** Large, hi-def panels communicate concepts to students in larger classrooms more clearly than blackboards and older, projector-based solutions. They also serve video-extension and distance-learning setups well. Broadcast a lesson held in one classroom to a large screen in another room—all while using a building's existing copper cabling. Or set up an IP-based digital signage system to stream a staff training seminar at a high school to teachers in distant elementary schools via the Web. For interactivity, digital whiteboarding tools can be used by students to upload work they've done on a laptop to the screen seen by all. Students benefit from the convenience and you benefit from the wise use of your resources.

• **Centralize the distribution and production of content.** School districts painstakingly enact policies to ensure an accurate and consistent presentation of information to both internal and external audiences. With a digital signage system administered from a single console, you can effectively become a clearinghouse and the *gatekeeper* for all multimedia content in your district. If you want to stream media stored on multiple servers, use a digital signage system that integrates easily with an existing LAN. Some digital signage players do this particularly well, and even come bundled with templates and other design tools, so you can create professional-looking presentations without the need for dedicated designers.

How to plan it

Considering the many available digital signage solutions might seem like an overwhelming task. But taking some time to research and understand your options will be well worth the investment for your school. Follow these key steps:

1. **Define your goals and objectives:** What do you want to achieve? Also, think about scalability, i.e. how well you want the system to serve you long term. Putting up a screen in your school's lobby certainly constitutes a big step in improving communications in your institution. But how will that hardware expenditure work when you want to expand? Approaching digital signage deployment in piecemeal fashion can be fiscally problematic.

2. **Clearly define the content:** The success of any digital signage system starts, of course, with the content. It must look fresh, exciting, and professional. Who will create it and how will it be presented? Do you have internal resources and expertise, or will you need to outsource content creation? A good source of creative and editorial help can be found in aspiring graphic designers culled from the student ranks, in addition to your school's art department, yearbook and newspaper staffs, and TV studio (if you have one).

3. **Invest the time to understand your options:** Once you've decided on content, you need to consider the infrastructure that will deliver it and study your display options: LCD vs. plasma? Zones? RSS feeds? Live video? Dynamic content? Remote management? Playback verification? The options will seem limitless, so taking time to sort through them is imperative.

4. **Involve all the appropriate stakeholders:** The communications/information department should be involved at the start, considering that your digital signage will likely be used for external community relations. In addition to your district's administration (superintendent, principals, and purchasing personnel), don't forget to include instructional technology staff; the AV department; maintenance and security staff; your curriculum, athletic, and cafeteria directors; and key school board members—along with all the usual IT suspects: network and database managers, webmasters, and infrastructure engineers.

5. **Figure out how you're going to pay for it:** When it's used to simply advertise or promote school events, digital signage can be seen by some as a luxury item—particularly with shrinking school budgets and rising instructional expenses. But because it can also be used as a tool for emergency communications and notification, administrators can easily make the case to their school boards that digital signage is a must-have component of any crisis plan—especially in this day and age when school violence incidents capture news headlines. Consider government and private sources of funding for your digital notification system (see box at **right**). And whether it's earmarked entirely as an IT expenditure or apportioned across multiple departments in your budget, you need a spending roadmap in addition to a developmental one. The hardest part with this may be determining the total cost of ownership over the life of the system, including any additional expenses with ongoing licenses and upgrades.

6. **Decide how to implement the solution:** Based on your deployment size and scope, decide if you can implement it in-house or if you need the help of a professional integrator. A number of "out-of-the box" systems can be set up with relative ease. But the more dynamic and complex the system, the more complicated the implementation and ongoing management—and the more likely you'll need outside help.

Possible funding sources:

If you plan to use the signage system for security purposes, there might be different local or national funds available from various government or state organisations.

If your system will serve as a tool for communicating with buildings on the outskirts of your district, see if your state has distance-learning funds available.

Beyond federal and state sources of funding (grants and technology-related awards) also consider applying to foundations and tapping individual benefactors in the community, as well as corporate sponsors and local businesses.

Or consider partnering with a local municipality and library on an integrated, community-wide signage system. This way, you spread the cost among multiple government entities. Be aware, however, such partnerships can create administrative headaches and, without complete control over content, you may have accountability issues to deal with, as well as conflicts of interest.

The roadmap to digital signage

The next step is to ask seven basic questions (in box at **right**) that will quickly help you identify the right system and infrastructure for your needs.

Question 4 is an important one if your district is experiencing shrinking enrolment, which may necessitate staff cuts later. Administrators often expect internal staff to manage the content, so the system has to offer relative ease of use and won't necessitate repeated calls for outside help. Simultaneously, you might want a player system that gives school staff the ability to customize screens to their specific departments. But with their heaver workloads, will they have the time or inclination to take on this extra responsibility and keep up with it?

After considering the basic questions, see our more advanced checklist of questions in the chart **below**. It cross-references the questions in detail and suggests the appropriate digital signage system based on your answers. Once you have determined a system that you believe will work well, check out our detailed descriptions of each system, along with commentaries from Black Box digital signage experts beginning on **page 7**.

Identify the right system for your needs

1. What type of content do you want to display (e.g., static images, video, RSS feeds, live TV, etc.)?

2. How many locations and displays do you want to run the content on?

3. Will the content be the same on each screen or do you want to show different content on different screens?

4. How do you want to manage content and be able to update it? Centrally? Ad-hoc at the screen? Which department will be responsible for the sourcing of content and the actual uploads? Are you confident that the staff will be available later to carry them out?

5. Do you want to remotely control the on/off and volume functionality of the screen or confirm when content is played?

6. Based on display locations, will you have potential security issues? (Can someone simply turn off the display, change channels, or even tamper with or remove the player?)

7. Do you have the network bandwidth that can support the added traffic for digital signage multimedia?

Questions to consider when choosing a digital signage system

	Ultra-Affordable €	Moderate €€	Moderate (w/TV capability) €€€	Advanced €€€€
What do you want to display?				
Static content?	●	●	●	●
Static content with a couple of photos?	●	●	●	●
Static content and streaming video?		●	●	●
Static content, streaming video, and an RSS feed?		●	●	●
Corporate information, static content, streaming video, and an RSS feed?		●	●	●
Corporate information, static content, streaming video, video (TV), and an RSS feed?			●	●
Control your screens from a media player?		●	●	●
How many locations and displays do you want the content to run on?				
Content on one screen?	●	●	●	●
Content on multiple screens at one location?		●	●	●
Content on multiple screens at multiple locations at one site?		●	●	●
Content on multiple screens at multiple locations at more than one site?				●
Play different content at multiple locations?				●
How do you want to manage your content?				
Real time remote player static check?		●	●	●
System log and content reporting?		●	●	●
Remote-control features to poll the detailed player status, screen controls, volume controls, reboot players, and software upgrades?				●
Real time alerts?				●
Do you want to confirm what content is played?				
Will you need a reporting matrix?				●

Other considerations in planning:

Before beginning any digital signage project, you will need to assess your site and your resources by:

Surveying the site where the digital screens will be placed.

Ensure that you can adequately mount, power, and have room to troubleshoot the installed LCD, plasma, or other screen. Be sure to have a technician and/or electrician verify the power levels for every location, so that it's clear of line noise and consistent, and that you're not creating any safety hazards for students. Plus, ensure there's enough airflow. Excessive heat can cause sensitive electronics to perform inadequately or even fail.

What about lighting? If it's under fluorescent lighting or in areas with a lot of sunlight, such as school lobbies, you may need panels with suitable coatings, the kind that reduce the amount of reflective light. And along with the ambient light, determine how much ambient noise is present. You may have to use larger speakers, at different angles, for your school's application.

Don't forget to take into account the size of the audience you plan to reach. Plasma screens with wider viewing angles may serve you better than LCDs in certain spaces. Examining traffic flow patterns in school corridors at different times of the day will also help you determine optimal screen placement.

Ensuring that you have the necessary network connections.

If you don't, you may have to look into setting up a wireless link, which is also ideal for deploying digital signage in historic, architecturally significant school buildings where wiring isn't feasible. Or consider using standalone content player units near the signage (admittedly, this won't allow you to stream live video from off-site or via the Internet, but it offers a solution if you're just playing prerecorded content, such as slideshows).

If you have a wired Internet connection for content delivery or plan to use a private VPN over public broadband link, verify that your ISP can support your needs. Many providers limit the amount of bandwidth that customers can use. If this happens to you, your Web-routed content may be unable to stream content to digital signage nodes at the edge of your applications.

Even if you don't use the Internet, keep in mind that the larger the files, the more bandwidth and processing power you'll need. Industry pros will tell you that DVD-quality video (for standard resolution of 720 x 480 Hz) requires approximately 40 MB of file space per minute. For 1080i digital signage, you'll need 140 MB per minute. What's more, data-heavy files can cause bottlenecks on your school's network and if not provisioned for appropriately, can lead to costly downtime or slow-loading education-related applications. You may even want to consider a private leased-line connection.

Evaluating and planning content.

When it comes to content creation, you have a few options to consider. You can create the content internally using your own resources and staff, outsource the content creation to an agency skilled in creating displays for school institutions, or do some of both. You need to consider a number of factors to determine the best approach for your needs, goals, and budget. The good news is that many of today's digital signage players come with a wide selection of templates and user-friendly design tools that make in-house content creation a viable, affordable option.

The first step in planning content is to outline what you want to display, how you want to display it, and how often you want to change it. Do you want to show live streaming video, along with RSS news feeds from the Internet? Do you want to share breaking news stories? Do you want to deliver messages according to a playlist? With digital signage almost anything is possible.

Today's digital signage solutions offer you a wide array of options and nearly endless presentation opportunities, including video, audio, still images, HTML, and Flash animation. You can display the same content at multiple screens or you can display unique content at each individual screen. You can even schedule the content to change at regular intervals or times based on your desired messaging or school audiences.

You can also display one message or incorporate multiple messages on the same screen in "zones." Some zones can change while others remain fixed. One zone might show a streaming video or live TV feed, while another shows the local weather update. Still another area might show a changing school menu, list of athletic events, or schedule of club meetings. It's up to you. Your digital signage system can be as simple as a rotating PowerPoint® slide show or as complex as a very elaborate six-zone display with live feeds, real-time messaging, and dynamic content scheduling.

Know your options

When it comes to deploying digital signage, schools have an almost unlimited amount of options. We've organized them into four major categories to help you select the most appropriate system to support your objectives, application, and budget:

- **Ultra-affordable:** Single-screen/single-zone/single-room display

- **Moderate:** Multiple-screen/multiple-zone/multiple-room display—same content on all screens

- **Moderate with TV capability:** Multiple-screen/multiple-zone/multiple-room display with live TV—same content on all screens

- **Advanced:** Multiple-screen/multiple-zone/multiple-room display with extensive functionality, such as individual screen messaging (may or may not include live TV tuner capability)

The solutions

NOTE: Estimated prices for solutions include a 42" LCD screen, media player, and digital signage software. Prices can vary depending on a number of factors.

Ultra-affordable (€3500 to €5000) — €

Single-screen/single-zone/single-room display

This category represents the "down-and-dirty" solution—one screen, one media player, and one USB or flash drive. This type of solution is not networked; instead, staff members in a particular school building or classroom transfer new content to screens by inserting USB or flash drives into media players on-site.

"This type of solution is ideal for a lobby, behind the desk in the main office, or outside a gym or auditorium. It's a relatively low-cost method of creating and displaying messaging," says Brian Kutchma, Black Box Director of Marketing. "It's a great way for smaller schools with a limited budget to capitalize on some of the benefits of digital signage. With a plug-and-play AC power outlet media player, an LCD or a plasma screen, and a little effort to learn some out-of-the-box software, you can easily implement digital signage."

There are no instant-messaging capabilities, and the screen must be turned on and off manually. This system provides a single-zone (PowerPoint like) presentation with looped content. On more advanced systems, you can display one message or incorporate multiple messages on the same screen. Typically, that's not the case with these entry-level type players.

But the single zone look may actually work to your advantage if the signage is an area with a lot of foot traffic—an area where people are unlikely to stop and take the time to peruse a screen streaming a mix of content fields. If there's one message you want to get out at any given time—"Wear your school colours today!" "Track meet is cancelled," "School pictures tomorrow"—then the single-image screen approach may be best.

Kutchma recommends coming up with a content strategy early in the process. "The most challenging part of any signage system is the content. It's critical that anyone considering signage has a plan in mind and the resources in place to create and manage the content."

Districts using ultra-affordable solutions like this one usually have a one-screen deployment, so changing content and turning the screen on and off manually isn't an issue. Also, users usually like the plug-and-play ease of this kind of system.

Best areas for use: School offices, lobbies, cafeteria food-service lines, libraries, employee break areas.

Content-delivery method: Removable storage devices: USB drives, compact flash, SD memory cards.

Pros: Low-cost, easy-to-manage solution for one-screen deployments and single locations; plug-and-play operation.

Cons: Low flexibility. Content must be manually changed through removable storage devices. Content is displayed in a single-zone, looped play with no instant-messaging capability. Screens must be manually turned on and off. Lack of scalability.

The solutions (continued)

Moderate (€4500 to €7000) — €€

Multiple-screen/multiple-zone/multiple-room display—same content on all screens

The biggest differences between the moderate and ultra-affordable systems are that with moderate systems, you can display more than one area (zone) of content within a presentation and the same content can be seen on multiple screens in multiple rooms at single site. What's more, the players are often network enabled and support streaming of video (not just from a file loaded onto a storage device). Plus, you typically have the ability to stream live Web feeds as a standard feature.

A zone is an on-screen area (measured by pixels or as a percentage of entire screen) that shows content from its own playlist. Because moderate-priced systems support multizone presentations, you can play different media in different screen areas. Some zones can change while other areas remain fixed. The zones may or may not be resized or moved to a different location on the screen. In most cases, each zone can be managed individually so you can dynamically change the content as needed. One zone might show video, while another shows the local weather forecast. Still another area might show a changing menu or schedule. It's all up to you.

Because this type of system also supports multiple screens, it's great for broadcasting information to different areas of your building or campus. Plus, because it can be installed on a network, you can control multiple screens from a central PC. This control can be in real time and include instant-messaging capability. Some systems also give the administrator the ability to turn the screens on and off. In addition, screens can also be controlled remotely with a browser and an IP address for additional flexibility for the administrator who has to be away from his or her command station throughout the day.

These systems frequently include a tool for aggregating RSS feeds, so you can collect and automate the distribution of Web-based info, such as live CNN news or National Weather Service bulletins, as video crawls on your signage. This is a time-saver because the administrator no longer has to constantly gather Web content, worry as much about inappropriate subject matter streaming to the screen accidentally, or write any extra code. These feeds can also be from local law enforcement and internally created sites, from teacher blogs and departmental sites, for instance. Still, because it requires an Internet connection, you have to have adequate bandwidth, and initial and ongoing IT support, as well as deal with permissions, access, and admin rights.

Best areas for use: Small to midsize school buildings with multiple entrance points, food-service lines, and lobbies where students and the public gather; also for schools with a building-wide network infrastructure and various departmental Web sites.

Content-delivery method: Existing or designated network infrastructure.

Pros: Multiple screens can be controlled via the network connection; content and screen operations can be updated remotely from a central PC; enables RSS feeds and other real-time content from the Internet, including streaming video.

Cons: Adding an IP connection means IT involvement; advanced software may require additional training; potential bandwidth and network maintenance issues, as well as the increased content "gatekeeper" role of the administrator.
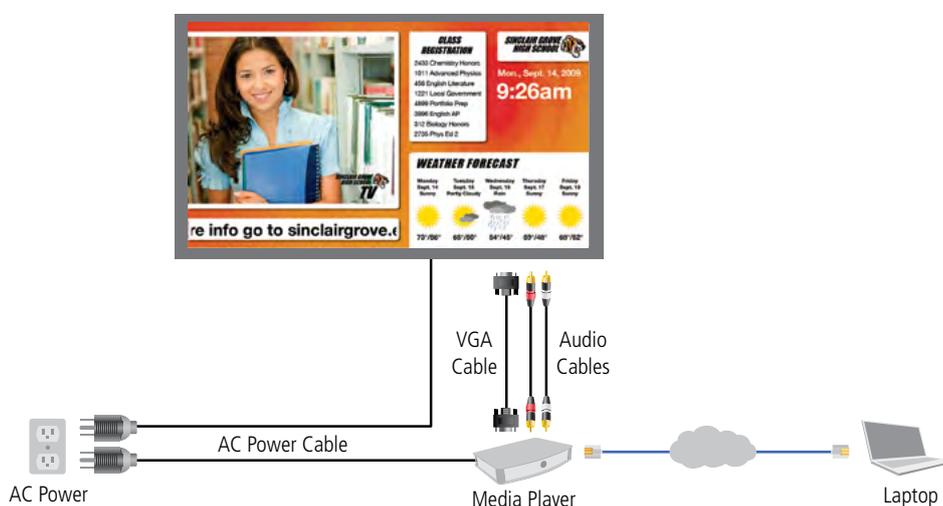
The solutions (continued)

Moderate with TV capability (€5500 to €8000) — €€€

Multiple-screen/multiple-zone/multiple-room display with live TV capabilities—same content on all screens

This system is very similar to the moderate system, except that this level gives users the ability to integrate live TV into the digital signage content. This is done via a TV tuner or capture card that is part of the media player. It picks up TV signals via satellite or digital cable, much like a receiver on consumer TVs.

This becomes particularly useful if you don't readily have the ability to update content. In lieu of this content, your displays can show programming from acceptable sources—network news channels or your local community's public access channel, for example—in a split-screen configuration on your signage. It's also nice for situations when you need up-to-the-minute information, like updates from the Weather Channel or bulletins from the Emergency Alert System (EAS).

Typically, when reaching the moderate and TV-tuner level, you use a higher level of digital signage software. Higher-end software not only enables you to create multiple content zones on the screen, but also easily schedule content for each zone (so you can schedule content for the day, week, or month by zone) and better control elements on the TV feed, as well as content override features for interrupting routine content streaming with emergency alerts programmed from a remote location.

Best areas for use: Same as areas listed on previous page; but because of TV input, can be useful in school cafeterias or any room for extracurricular events, faculty break rooms, and school TV studios and media production departments.

Content-delivery method: Network infrastructure, satellite feeds, cable television.

Pros: Provides live TV feeds to complement on-screen content; can provide instant messaging and emergency notification; usually includes more content-management capabilities and functionality.

Cons: Maintenance of a satellite or TV feed and IP connection; more advanced software training required; potential bandwidth and network maintenance issues; additional ongoing maintenance and software licensing costs.
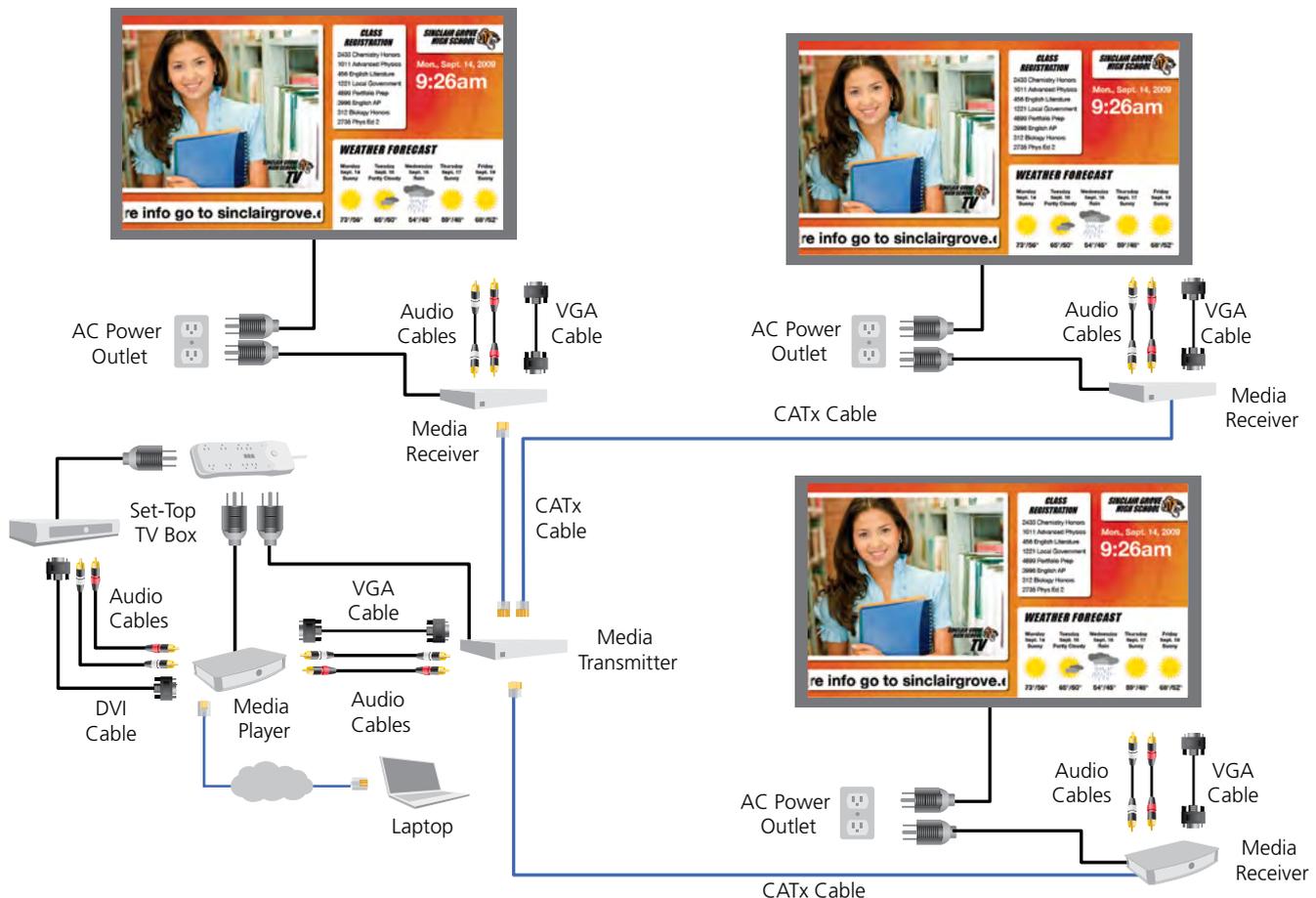
The solutions (continued)

Advanced (€8000 and up) — €€€€

Multiple-screen/multiple-zone/multiple-room display with extensive functionality, such as individual screen messaging

Advanced digital signage systems can deliver the ultimate in management, control, and functionality for school institutions. These state-of-the-art systems feature heavy-duty processors for playing bulky media files and streaming seamless video in higher resolutions. They're fully networked, large-scale solutions that are designed for scalable, multiscreen, and even multilocation deployments.

These types of systems are well-suited for large school districts with many buildings in different locations, specifically districts that need to be able to display a wide range of bandwidth-heavy media and stream (or narrowcast) unique content to the individual screens based on location and time of day, *and* be able to verify playout on those screens.

"This stage adds a video server residing on the network, which means you can add live video through the use of connected cameras as well as streaming and stored video capability," says Keith Kazmer, Black Box Multimedia Products Manager.

The price of these systems is really infinite, as you have the ability to add as many screens as possible. But once you go into multiple locations, you want immediate central management capabilities.

"Once you get into more sophisticated systems, you want play logs for advertising, etc., but most of all, you want the remote-management capabilities to know if screens are on, if the media delivery system is working, and if the content is being displayed," Kutchma said. "You also want the full capability of making real-time changes to react to last-minute district-wide decisions, athletic event cancellations, changes in bus schedules, or other events. Literally within seconds, changes can be made, deployed, and seen in one location or over the entire network in many locations."
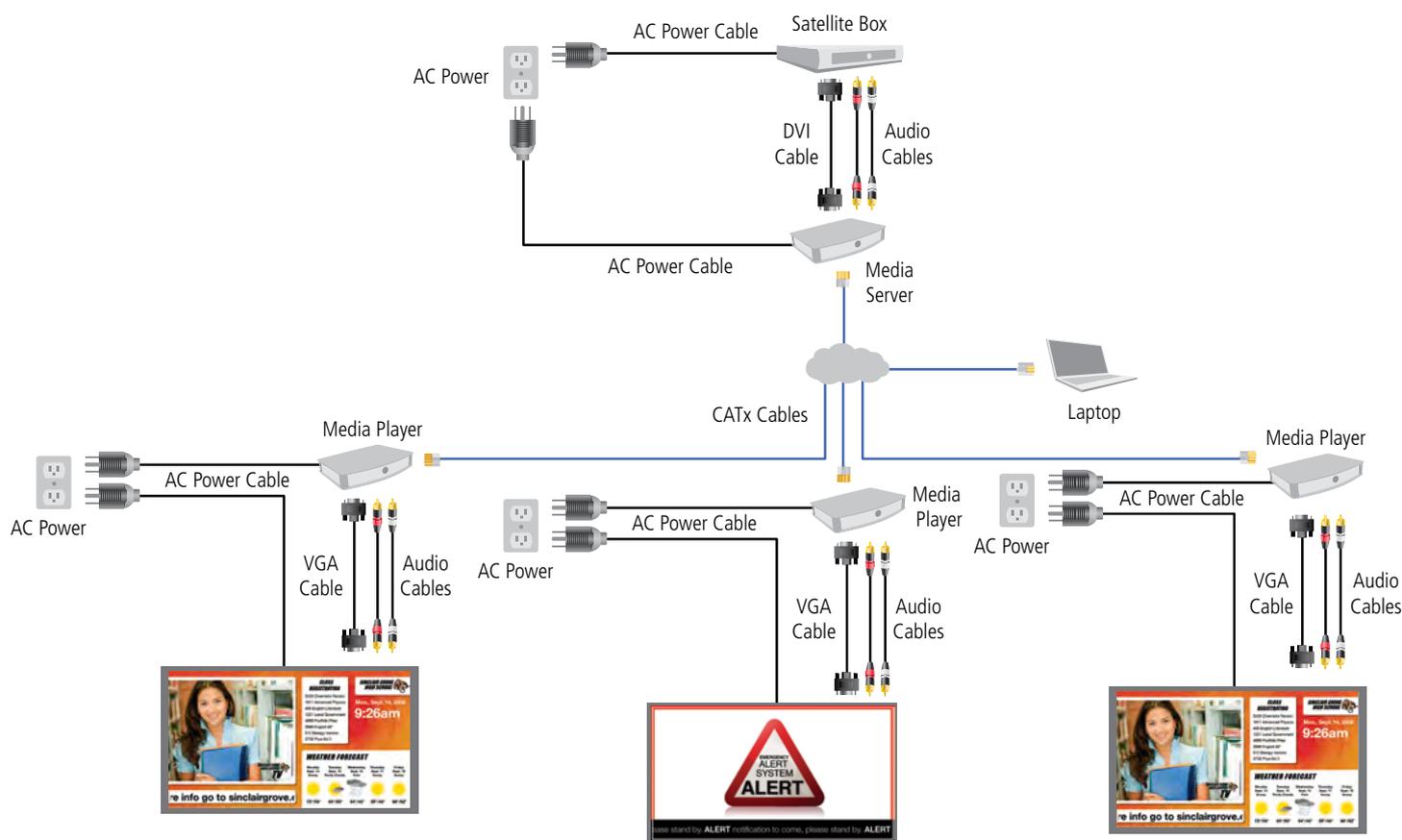
The solutions (continued)

Advanced (€8000 and up) — €€€€ (continued)

Many school district campuses have implemented digital signage as part of their emergency-notification system with override messaging that can be activated remotely in the event of a school crisis. If a crisis occurs, administrators or security personnel can issue evacuation notices or lockdown alerts in real time from wherever they are using a browser-enabled smartphone or cellular paging.

Some top-of-the-line systems can even be integrated into larger digital media systems, including those used for classroom desktop video, interactive whiteboarding, and campus broadcast TV production, as well as CCTV video surveillance platforms.

Obviously, the more complex the network, the higher the initial and ongoing cost of ownership. You will also need to consider ongoing costs, such as licensing fees, maintenance fees, software upgrade fees, and additional system training. The actual cost per screen and total cost of ownership can vary greatly, but the general rule of thumb is that cost per screen decreases as the number of screens increases. The good news is: As more suppliers enter the market, equipment costs are coming down.

"Today, just about anything is possible with digital signage. It really comes down to what you want to do today, what your district's vision is for the future, and the investment you are prepared to make," Kutchma said.

Best areas for use: Anywhere students, staff, and visitors congregate; entrance points, stadiums, and parking lots where directional guidance (wayfinding) can be helpful for getting from one place to another; well-suited for larger school districts with widely distributed buildings, including those where separate channels of content (logos and information specific to school and grade level) are managed by personnel in different locations.

Content-delivery method: Network infrastructure, satellite, cable, cellular.

Pros: Highly scalable—network has the potential to grow as big as it needs to be; can provide extensive features, including live videoconferencing, dynamic content delivery, extensive management, monitoring and control; most systems include extensive and customisable reporting.

Cons: High startup costs; ongoing licensing, training, and upgrades; usually will require dedicated personnel; generating content and keeping it current may require a heavy buy-in from different departments; may require coordination from staff not accustomed to receiving creative and editorial contributions from others; if content originates from various sources, quality control and accountability can be challenges, too.

Conclusion

If you are considering digital signage, start by developing a plan like the ones outlined here. For small-scale deployments, consider an out-of the-box solution. For a relatively small investment, you can implement a very good system.

If you're considering a larger deployment with a fully integrated network solution, enlist the help of a seasoned digital signage professional. Extensive negotiations, including a number of RFPs and RFQs, may be necessary to specify and negotiate the price of the system for your needs. Pay attention to any Software as a Service (SaaS) fees outside of hardware and labour expenses.

Plus, be sure it's adaptable for the future. You don't want to have to go before your school board several years from now and tell them that the technology you recommended earlier is obsolete or can't be scaled to meet future needs. Similarly, you and others in your district will want to extensively test drive the system or sit in on in-depth product demos before negotiating price.

Also nail down support costs and the availability of technical support after hours, and make sure the vendor's business is stable enough to support you long term—and not be limited to the AV type components. New companies have entered the burgeoning digital signage marketplace. Many have a lot of experience installing audio and video system components—they know the electronics and how to wire them for optimum viewing—but they're not IT or data networking pros. Providing a totally integrated solution and supporting that system over the long haul may be beyond their technical expertise. Check their credentials and involve your IT department in the system-evaluation process.

About Black Box

Black Box Network Services is a leading digital signage and multimedia solutions provider, serving 175,000 clients in 141 countries with 192 offices throughout the world. The Black Box catalogue and Web site offer more than 118,000 products including media players and digital signage appliances for plug-and-play implementation of high-impact digital signage in large or small applications.

The company's premier digital signage offering, iCOMPEL™, is an all-in-one, integrated hardware/software solution that gives businesses, schools, and government institutions an affordable, easy way to set up high-impact digital signage without any ongoing licenses or fees. More information is available on your local Black Box website.

Black Box also offers LCD and plasma screens, assorted audio and video extenders, splitters, switches, and converters, as well as cabinets, racks, cables, connectors, and other video, audio, and data infrastructure products. To view Black Box's comprehensive digital signage offering, view our interactive e-catalogue at:
http://www.pmidigital.com/blackbox/blackboxdmp221.html

Black Box is also known as the world's largest technical services company dedicated to designing, building, and maintaining today's complicated data and voice infrastructure systems.