



## High Definition Video In the Enterprise

by  
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### Overview of HD – Why Now?

High definition (HD) video, along with an abundance of new, next generation digital technologies, is overwhelming the marketplace. Much of this is driven by the Federal Communications Commission (FCC) mandate for local television stations to be digital by February 2009. The intent of the mandate is to free up over-the-air bandwidth to accommodate other services such as cell phones, mobile television, Internet access, etc. However, it is influencing the movement to 16 x 9 and HD display screens as well as the production and delivery of content in HD, thus skipping the intermediate step of digital standard definition.

Why is this impacting the enterprise space? Historically, much of the video production equipment and systems used in the business environment are similar to, if not the same as, what is used by the broadcast television industry. A somewhat lesser quality and lower cost selection of equipment, which is a derivative of the broadcast systems, is targeted for use in enterprise operations... Hence, all things for or by broadcast television have a direct impact on what is used in the enterprise.

Another key factor influencing the move to HD is the proliferation of digital signage, where flat screen televisions and large display screens are virtually everywhere, providing news, information, and advertising content. The perception by most people is that flat screens **are** HD, or that digital **is** HD. Although this is not the case, the significantly improved quality of the picture over traditional analog televisions is contributing to the market mindset. This is enhanced further by broadcasters and cable companies (and the production studios) providing HD programming and services.

Essentially, the market is conditioned for what the industry is providing: video and rich media in HD. As a result, the manufacturers have responded to, if not led, the market by leap-frogging past standard definition video equipment and offering HD solutions. In turn, enterprise organizations that are upgrading their video production equipment and systems have very little choice but to invest in HD as well. Otherwise, they will be investing in soon-to-be legacy technology, should it even be available.

Fortunately, the capabilities of these digital technologies are unlimited and the cost for most equipment is reasonable. However, there is a bit of confusion during this time of technology and format transition in determining what equipment and systems are best suited for any given video production facility as well as implementing a migration strategy to leverage the value of existing assets while not jeopardizing ongoing operations. The following may be of assistance.

## **Considerations & Issues for Migration to HD**

Content creators, distributors, communications and media managers recognize the need to deliver their programming and information to the targeted viewing audience when, where, and how they prefer to receive it and on the viewing device(s) of their choice. Clearly, there are factors that an organization has control over. However, with the way in which video and rich media are overwhelming the business environment, expectations for quality are being driven by other sources, such as the news media (broadcast outlets) and consumer (therefore, typical employee) mindset. For organizations that produce any content for out-of-house viewing, they must meet the respective quality and format requirements.

The industry is experiencing a revolution in the way video content is created, acquired, edited, and ultimately, distributed to the audience. The platforms on which content are delivered are as varied as the content itself. Compounding the situation, organizations need to adjust their approach to purchasing and maintaining their new equipment/systems. For all practical purposes, the world of video is based on technologies not much different than what IT departments are familiar with, e.g.: computers and computer components. Whereas, previous generations of video equipment was built to last, in many cases for ten plus years, the life expectancy of many of the new technologies is considerably less, such as editing systems and many of the cameras and recording formats. Fortunately, they are more favorably priced than the systems they may be replacing. For instance:

High quality cameras with good optics are now small enough to comfortably fit in the palm of the videographer's hand, record on media the size of a coin, and can be purchased at most consumer retail outlets.

Expensive, high-maintenance tape machines and edit systems have been replaced, in many cases, by laptop computers with external hard drives.

Based on the experience of Enliten associates, who produce content for the broadcast and enterprise markets, and Enliten's experience in working with numerous enterprise organizations, this section will attempt to address what we are finding to be key factors and influencers impacting the migration to HD and next generation technologies. At the very least, organizations need to evaluate current and future video and new media requirements and establish a plan (typically over a two to three year period) for a technology migration, system upgrade.

Typically, Enliten recommends the evaluation process commencing with determining the interests of the target audience, the viewing environment and viewing devices, and of course, the message/content. However, we have elected to put significant issues and challenges specifically related to the HD migration at the head of the list.

## HD Migration in the Enterprise

- **Market Direction**  
**The FCC digital mandate is driving digital and HD.**  
Viewers, including employees, are demanding HD content and display.  
Manufacturers are driving, and responding to, the market opportunity.  
With digital and IP delivery comes the television (video) and PC convergence.
- **Existing Equipment**  
**Existing video equipment and systems are soon to be legacy formats.**  
Tape-based production/acquisition (with a few exceptions) is disappearing as industry moves rapidly toward file-based workflow.  
Manufacturer support has started to ramp down, and at a rate that will only increase over the next few years.  
Parts and service support will be difficult to find.  
Some equipment/systems have good value on secondary market – Today!  
Leverage if/where appropriate.  
**Life Expectancy of Existing Systems**  
Remaining book value – should influence, but not jeopardize communications!
- **New Technologies/Formats**  
**Reasonably priced.**  
Affordable systems are available from acquisition through editing in addition to higher-end broadcast solutions.  
**Convenience and improved workflow.**  
Smaller cameras and acquisition formats.  
Mobility – on-site editing via laptop computers.  
Filed-based systems accommodate rapid ingestion of content and access from multiple edit stations.  
Improved transcoding process for delivery and display in multiple formats.  
**Quality.**  
HD will be the expected standard.  
HD content can be downconverted for other delivery/display requirements.
- **Future-proofing**  
**The migration to HD is inevitable.**  
Embrace it!  
Do not be caught on an island!

## Traditional Key Video & Rich Media Considerations & Issues

- **Targeted audience – Quality Expectations**  
Get the content to them in the quality and via the methods they require.

Employees, clients, and vendors will expect the quality and content format to be at least equal to what they've received previously and/or get from other sources.

Broadcast and news media require high quality news and information feeds.

- **Viewing displays/devices and environment**

**Get the content to the target audience when, where, and how they want it.**

The Y Generation work force is accustomed to flat screen displays, desktop video, and mobility (laptops, phones & PDAs).

B2C clients are conditioned for flat screens (digital signage), in common/public areas, and desktop video for on-line viewing.

- **Applications**

Along with the target audience and display systems, the driving applications will dictate the type and quality of content as well as the delivery means, whether it be training, corporate communications, sales or marketing, or third party news and information.

- **Display Screens are now fixtures**

Very common for facilities and/or real estate departments to have responsibility for display screens in common or public areas. Cost is covered as corporate/office overhead.

- **Distribution – Infrastructure - Blend**

HD requires bandwidth. May challenge existing infrastructure.

Will require consideration for CATV head-end distribution as well as purposing content for:

- Satellite-based business television network

- Webcasting

- Hard media for on-site/in-room playback

- Desktop, on-demand (convenience-based) viewing

- Mobile devices (Quad play)

- **Formatting & Transcoding**

Many edit systems are HD ready.

Need a complimentary system to transcode the multiple formats during ingest and for distribution.

- **Digital Rights Management**

Requires careful monitoring and governance.

Licensing is a sensitive issue regarding the viewing and/or display of content for extended audiences as well as distribution medium (e.g.: IP).

- **Crewing/equipping for external, field productions**

Be comparable to, interoperable with, out of house/other sources.

## **Perspectives on HD and Next Generation Technologies**

### **Maintenance**

Parts for Betacam are becoming scarce (i.e.: expensive to obtain). It will become more difficult to find people to maintain them. Given this situation, even though you may not have a driving need to go HD, the industry has made that choice for you. The only standard definition gear being manufactured is for video surveillance.

### **Content Acquisition – Future-proofing**

At this point, any content acquisition that may have multiple uses should be acquired in an HD format. Acquiring content in HD does not mean that it has to be disseminated in HD. However, this strategy will future-proof the content for uses and applications. HD content can always be down-converted (with no measurable loss) for use in an SD environment such as the web, IPTV or personal media devices. The same is not true however when trying to up-convert SD content to HD.

### **Timing**

Enliten believes that enterprise organization should complete their migration to HD within the next 18 to 24 months. Aside from the maintenance and repair costs of legacy formats, the after-market value of this equipment is dropping quickly. Organizations hoping to realize value from the disposal of their SD equipment should do so sooner rather than later.

### **Formats**

There are a handful of low cost cameras that feature excellent picture quality, robust recording media, and ease of use. Production facilities, which are tape-free, will enjoy a file-based workflow process that is flexible and mobile. High quality post-production can happen any where that a laptop is functional. Also, file-based workflow enables the rapid ingestion of content, as opposed to the real-time process required by tape-based media.

### **Quality**

Quality of the video and video content should always be a serious consideration. Enliten is very sensitive to the philosophy of GIGO (garbage in, garbage out). Although broadcast quality is not typically required in the enterprise environment, producing for and delivering at, the lowest quality level is discouraged. Further, the more information (pixels) that the encoder/transcoder has to work with, the end-product will be better.

### **Edit**

Except at the highest, uncompressed levels of HD, linear editing is at the end of its life. Linear editing suffers from quality loss (due to the need for multiple generations) and high costs to repair and maintain systems that are quickly becoming legacy. Non-linear editing is here to stay. Today's systems are reasonably price, if not low-cost. The editing can be achieved on laptop computers, enabling field editing at the time of shoots.

Production facilities with multiple edit suites and a server-based workflow process allows for numerous editors to work with the same content concurrently, even on the same project. The by-product of increased production organization and management is priceless. However, an organization should not rely on the post-production server to be the one and only storage/archival tool.

### **Archiving of Content**

Those with valued content on legacy formats such as ¾”, MII, 1”, Betacam/Betacam SP, Digital Betacam, D1, D2 or D3 (most any TAPE-based format) should make a concerted effort to get the content onto a new-high quality medium for the next generation. Aside from the pending scarcity of machines, tape (recording media) is nearing the end of its useful life. Content which has not been properly stored may already have reached its end of life. The same is true for audio content which resides on tape (1/4”, DAT, etc...). It should be transferred to DVD (given its higher capacity per disk than CD).

Highly-valued content should be archived at two separate locations. Enliten recommends against maintaining all content “online” on a single media server, where the drives are subject to failure. As with most industry analysts, Enliten believes that an optical based medium is the best approach.

At this time, one of the best options is the Sony Blu-ray (XDCAM-HD) format, which allows for 50GB of storage per disk in high-definition at a compression rate of approximately 2:1.

### **Wireless Microphones**

The February 2009 migration of the television broadcast stations will have a drastic impact on the utilization of portions of the frequency band allocated to wireless microphones.