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WHITEPAPER

Implementing File-Based Workflows

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This whitepaper discusses the market drivers influencing broadcasters implementation of file-based workflows. Reflecting its unique understanding of current and emerging technologies as well as shifting business models and organizational structures, Grass Valley™ provides recommendations for broadcasters desiring to transform their workflows.

The Race To Get On-Air

Disruption. This is and has been the state of the broadcast industry for at least the last 10 years. With the analog-to-digital conversion, spectrum challenges, IPTV and OTT, HD and 3D, and the rise of social media, consumers are enjoying more content, in more places, on more devices than ever before.
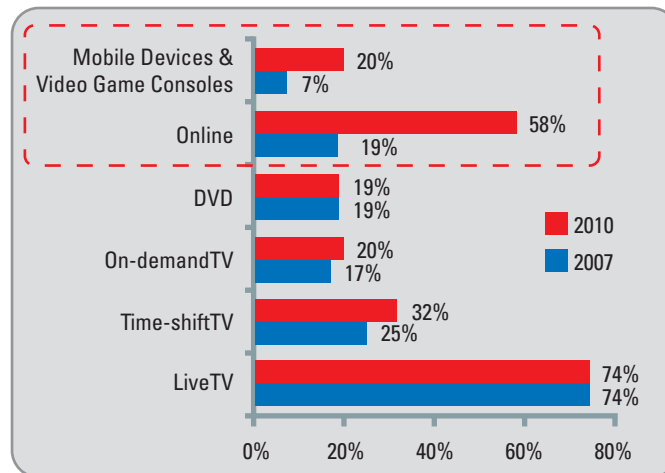
This, however, poses a significant challenge for traditional broadcasters. They are faced with getting content on-air more quickly than ever before, and preparing—not repurposing—that content in more formats for more channels.

The industry is changing and the foremost challenge is that of optimizing content.

The axiom "content is king" has been challenged as technology industry pundits claim that the device or the "app" is king. However, all of these technological advancements serve the same master: content. The app simply presents that content in a new way.

Consumers are demanding real-time access to news, sports, and entertainment content, regardless of their location. This means they are consuming content on a wide variety of devices from TVs to PCs and smartphones to tablets. Each of these devices is connected by a different type of network, including cable, DSL, 3G, WiFi, and emerging 4G and WiMax networks. The days of creating content for sole delivery to a TV over a free-to-air broadcast channel are long gone.

How Viewers Watch Favorite Shows
Source: Deloitte, *State of the Media Democracy*, 5th ed., 2011.

Category	2010	2007
Mobile Devices & Video Game Consoles	20%	7%
Online	58%	19%
DVD	19%	19%
On-demand TV	20%	17%
Time-shift TV	32%	25%
Live TV	74%	74%

In addition to multi-channel, multi-device distribution, broadcasters must also compete with alternate sources of content. They range from social networks to user-generated content. These alternatives have changed the expectation regarding quality, accuracy, reliability, and timeliness. Broadcasters can differentiate themselves when it comes to quality, accuracy, and reliability, but are challenged when it comes to the speed with which they can get content on-air or online. The challenge is not one of journalistic integrity or the availability of technology. It is operational and it is cultural.

In response to demands for more efficient operations, broadcast technology itself has been changing. Rather than proprietary devices connected by manual efforts

(remember the movie *Broadcast News* with Joan Cusack racing to get a tape cassette on air) or cumbersome integrations, much of today's broadcast workflow can be easily integrated and automated.

The development and use of APIs has simplified equipment and application integration. For example, while content is still captured by a server, it is available as a low-resolution proxy almost instantaneously. Those proxy files can be viewed on a computer network, edited (while the file is being recorded), and marked with metadata (to build a highlight reel). The ability to integrate all aspects of the workflow from capture to playout, and get content on-air faster, is a competitive differentiator for any broadcaster.

The File-Based Workflow

In the past, broadcast workflows were cumbersome, highly complex, and only moderately efficient. While the concept of the tapeless workflow was introduced more than 10 years ago, broadcasters have been cautious about implementing end-to-end workflows until the last few years. External forces have compelled broadcasters to reconsider their business models. As they consider alternative monetization tactics, they are looking internally at core operations, searching for solutions to decrease costs and improve productivity.

At the same time, broadcasters are still focused on getting live news on-air, broadcasting global sporting events, or producing entertainment programming. The path to gaining operational efficiency requires assessment of human roles and capabilities as well as the underlying technologies. The result will be a streamlined workflow that supports all other imperatives such as multichannel distribution, video-on-demand, and IP networking and content delivery.

The top priority when it comes to workflow, is a file-based workflow. What is a file-based workflow? It is an end-to-end workflow, from ingest to playout, where digital media is contained in files (unlike digital videotape which only records media digitally, but not as a file). While broadcasters have been moving to file-based workflows for more than 10 years, the challenges in managing this transition are more than technological in nature. The primary hurdles to achieving a true file-based infrastructure and reaping its benefits are people and process.

Broadcasters employ hundreds of employees who have skill sets specific to each phase of the workflow. Using a file-based workflow allows broadcasters to increase productivity, increase flexibility in creating content for multichannel distribution, and focus resources on defining new revenue-generating business models, with the same number of staff, or potentially less.

The primary operational benefit of file-based workflows is the collaboration it enables between all users and the speed it gives those users in doing their assigned tasks. These users range from journalists to editors to graphics to producers and directors. For some, this cross-functional access to the workflow is disconcerting as the workflow now incorporates both production functions as well as business applications. The exposure of content to these non-technical resources raises concerns about who and why different users can access content. However, the efficiencies gained through easy access to centralized assets used for both production and other purposes outweigh these concerns. An effective workflow will incorporate access management rules and network security.

Access management will control read, write, copy, and edit access to stored assets. The availability of both high-resolution and proxy files minimizes requirements to copy and move large media files. Storage management will help determine the location of assets in online, near-line, or offline storage and version control of these assets. Shared storage increases operational flexibility as it reduces the time to transfer assets between applications. As users access, edit, and create content, a defined approval process alerts those responsible for review and approval. Again, incremental efficiencies are gained through the ease of access to content and the presence of all approvers within the defined workflow.

In the digital domain, broadcasters are now able to build content for linear and nonlinear channels simultaneously. A safe assumption is that content will be distributed across a variety of networks (e.g., broadcast, cable, Internet, and mobile) to a wider variety of devices (e.g., TV, desktop computer, tablet, and smartphone). Incorporating distribution needs into the workflow allows broadcasters to produce content in multiple formats while reducing or eliminating the high cost of repurposing content.

How can broadcasters manage the digital transition and its demand for a file-based workflow? They need to focus on their business needs and goals. Are they presenting live news, live sports, or entertainment programming? Who and where is their audience? How will they acquire, manage, and prepare content for playout, distribution, and consumption? The key is understanding current operations, and assessing roles, responsibilities, and workflows to identify areas for improvement.

Global Services, Localized Solutions

Grass Valley Global Services brings more than 50 years of broadcast expertise drawn from the development of products serving the needs of the industry. The knowledge gained from deploying those products in a wide variety of environments, from studio to stadium, provides Global Services with the insight to help broadcasters optimize their workflow environments. Vendors across the broadcast technology market have also faced the challenge of transitioning from analog to digital. In the process of creating products to fulfill the demanding requirements of customers, some have gained unique insight into the operational needs of those customers. Grass Valley is unique in the value it brings to clients. It not only provides world-class products and technologies, it delivers industry experts eager to collaborate with clients.

Designing or re-designing an effective broadcast operation requires a detailed focus on a customer's unique workflow, the ability to architect an integrated design, an understanding of the challenges of integrating products, tools, and platforms, and the ability to deploy on time and on budget. Grass Valley Global Services leverages a global methodology to mitigate risks in design, deployment, and interoperability.

Fortunately, broadcasters can benefit from the introduction of workflow systems designed using a service oriented architecture (SOA). An SOA is a design model that loosely couples workflow components as modular services that can be published, discovered, and used by computer clients. This model allows flexibility in the definition and integration of desired workflow components, the functionality of each component (e.g., ingest, edit, transcode) is abstracted and represented as a service within the SOA workflow and presented to the user in a common user interface. User roles are defined and users perform their functions within the framework of defined user interface. The need to log in and out of different applications or systems is not necessary to perform the various functions that are part of the defined workflow. Bottom line, an SOA simplifies the creation and definition of file-based workflows.

Understanding the benefits and architecture of an SOA workflow system gives Grass Valley additional insight into design to optimize user workflows.

Grass Valley's approach is to consult with broadcasters to understand their individual goals. While specific objectives may range from reducing costs to monetizing assets to achieving operational efficiencies, Grass Valley solution architects collaborate with customers to identify functional processes and organizational dependencies. How do they capture, ingest, store, manage, and produce content? Who performs these roles and how do they interact with each other?

Grass Valley digs deep to uncover the clues to designing an optimized file-based workflow through discussion of the customer's:

- Recording Process – number of cameras, codecs, and sources of material

- Production – audio/video ingest channels, production formats, access to additional media, and user interfaces

- Content Management – searchable metadata, file formats, image sizes, frame rates

- Storage – access management, search, retrieve, read/write, copy

- Playout & Distribution – number of channels and networks

- Management & Monitoring – workflow configuration, status, notifications, network quality

- Solutions/Tools Being Used – capture, ingest, store, edit, transcode, playout, distribute, etc.

Gaining an understanding of a customer's goals and requirements on these topics enables the design of an interoperable, flexible, and scalable file-based workflow. Grass Valley is experienced in defining end-to-end workflows with a focus on optimizing the specific operational environment to get archived and re-usable content to viewers.

Implementing an SOA

Grass Valley's STRATUS™ provides the foundation for optimizing workflows for your environment. Rather than integrating tools together, STRATUS is a complete workflow system. Administrative tools allow users to assume roles and activities while simplifying how tools are exposed to the users in a configured workspace. Each user can easily customize their user interface, with simple drag-and-drop, to reflect their needs. Depending on the user and the role that they play, the workflow permits them to dynamically add notes, highlights, graphics, and more. Users will only see the tasks related to their defined roles, while managers can oversee the entire workflow from their workstation.

STRATUS alleviates IT challenges with configuration options to manage system security, third-party interfaces, and interoperability. Any content owner's main concern is content safety. Most broadcasters' biggest fear of moving closer to the IT world is that of viruses infecting precious content. Grass Valley solution architects work with customers to establish a domain controller within the broadcast domain to authenticate users while also establishing anti-virus software protocols to protect the servers. They will work with clients to assess broadcast streams and ensure the workflow configuration will support the volume of content.

Moving Forward

Grass Valley Global Services' expertise brings years of global experience in large and small broadcast environments. This knowledge is evident throughout the design and deployment stages of implementing a new workflow. From requirements definition to workflow design, Grass Valley collaborates to assess existing workflows, identify challenges, and review required applications and tools, from Grass Valley and others. Upon reaching agreement, Grass Valley project managers will facilitate site prep, product implementation, acceptance testing, and solution launch. Throughout the process, Grass Valley provides documentation in the form of workflow design, site assessment, implementation plans, test plans, and more.

Grass Valley's goals in defining optimized workflows are threefold:
- Design of an integrated workflow exceeding customer expectations
- Ensuring a trouble-free implementation within agreed upon timelines
- Coordination of deliverables and resources

The results are a return on investment measured through the maximization of your budget, increased collaboration and productivity, and cost-effective production of content that is professional and timely. Grass Valley is your trusted partner who has the knowledge and expertise to help you manage your transition to a seamless, integrated, file-based workflow.

GLOBAL SERVICES

Grass Valley Global Services specializes in the defining of, deployment of, and support of today's dynamic file-based workflows, based on Grass Valley and third-party solutions. With Grass Valley Global Services, you can achieve your operational goals in the most efficient and cost-effective way possible with a partner you can trust.

www.grassvalley.com/support

Define: We help you to define your business and technology requirements and then design solutions to meet them.
Deploy: Our professional service organization, backed up with proven project management methodologies, can take you from design through deployment, commissioning, and training.
Support: We offer a complete Support Agreement portfolio to keep your systems running and help plan for your long-term maintenance needs.

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