



# WGBH

## Digital Asset Management Prototype Lays Foundation for Lower Costs, Increased Efficiencies, and Enhanced Services

*An IDC eBusiness Case Study  
Sponsored by Sun Microsystems, Inc.*

### THE ORGANIZATION

Based in Boston, Massachusetts, WGBH is one of the leading public broadcasting stations in the United States. More than one-third of the Public Broadcasting Service's (PBS) prime-time lineup is produced by WGBH, including programs such as Nova, Frontline, American Experience, Antiques Roadshow, Masterpiece Theatre, Arthur, Between the Lions, Mystery!, and Zoom.

### THE OBJECTIVE

Develop a prototype for industry-first Digital Asset Management solution, with key business objectives that include (1) lower total cost of operations through the integration of existing tools; (2) increased efficiencies; (3) enhanced quality of programs through greater access to digital archives; and (4) greater services available to educators, students, and individuals.

### THE SOLUTION

Sun Services, with assistance from iForce Partner Artesia Technologies and Sony Electronics, Inc., helped WGBH design and implement a Digital Asset Management prototype, on which the Sun Digital Asset Management Reference Architecture is based. Storage area network (SAN) infrastructure powered by Sun StorEdge software and hardware technologies as well as Artesia Technologies' TEAMS software. Front-end interface powered by Sun Java Enterprise System platform, J2EE and XML technologies, Oracle9i database, and other open standards-based products.

### WHY SUN

*"Sun was able to provide a comprehensive solution, ranging from its long-standing embrace of open standards, to its extensive iForce Partner community, to robust software and hardware product offerings, to the technical expertise of Sun Services."*

### RESULTS

End-to-end system for rich media and broadcasting; architecture design achieved in less than 4 months; contingent upon nature of production projects and roles of production personnel, IDC projects that WGBH may be able to improve production productivity by 10% to 40%.

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## EXECUTIVE SUMMARY

WGBH is one of the leading public broadcasting stations in the United States. To lower its total cost of operations while improving the efficiency of delivering programming both by repurposing existing assets and managing new content, WGBH turned to Sun Microsystems, Inc., iForce Partner Artesia Technologies, and Sony Electronics, Inc. to develop a Digital Asset Management solution. The solution, which was used as the basis for Sun's Digital Asset Management Reference Architecture, will allow WGBH to maximize the value of the content it creates and acquires by enabling editors, producers, and production assistants to catalog, retrieve, reuse, and repurpose digital media in virtual real time for use in content creation and distribution in virtually any medium, including radio, Web, and television broadcasts — tasks that have been time-consuming and costly.

The Digital Asset Management prototype is powered by components of the Sun Java Enterprise System platform, Java 2 Platform, Enterprise Edition (J2EE) and eXtensible Markup Language (XML) technologies, and Artesia Technologies TEAMS software residing on Sun Fire servers running the Solaris 9 Operating System. The core of the prototype is based on a storage area network (SAN) solution consisting of Sun StorEdge hardware and software technologies. Potentially containing 15 petabytes of digital data and archiving 2 terabytes of new content daily, the Digital Asset Management solution is projected to help WGBH reduce total cost of operations. Depending on the nature of production projects and the roles of production personnel, IDC projects that WGBH will improve production productivity by 10% to 40%.

**Figure 1: WGBH Digital Asset Management Prototype Solution at a Glance**

<b>Core Functionality</b>	Prototype designed to enable editors, producers, and production assistants to acquire, catalog, retrieve, reuse, and repurpose digital media in virtual real time for use in radio, Web, and television broadcasts in production.
<b>Application Services Infrastructure</b>	Application services powered by Sun Java System Message Queue, J2EE and XML technologies, Apache Web Server, Artesia Technologies TEAMS, Darwin Stream Server, Telestream Flip Factory, and Oracle9i database. Proposed portal services to external users include technology components such as Sun Java System Portal Server 6.0, Sun Java System Access Manager, and JXTA technology.
<b>Platform Infrastructure</b>	<b>Storage area network:</b> Sun StorEdge 3960 system and T3 disk arrays; Sun StorEdge Availability Suite; Sun StorEdge Utilization Suite for SAM-FS and Sony PetaSite Robotic Tape Library, model DMS 150. <b>Server platform:</b> Sun Fire V480 servers running the Solaris 9 Operating Environment.
<b>Solutions Approach and Architecture</b>	Sun Services, working with the WGBH IT team, iForce Partner Artesia Technologies, and Sony Electronics, Inc., helped design Digital Asset Management prototype using the SunTone Architecture Methodology for architecture design, project management, and development of best practices.
<b>Partners</b>	iForce Partner Artesia Technologies and Sony Electronics, Inc.
<b>Sustaining Services</b>	SunSpectrum Platinum agreement; training from Sun Services: Java technology, Sun Java Enterprise System software platform, Sun StorEdge technologies, the Sun Fire platform, and the Solaris Operating Environment.

Source: IDC, 2005

## SITUATION ANALYSIS

### BACKGROUND

#### Digital Rights Management Expected to Grow

*"The emerging market for digital rights management (DRM) continues to change rapidly and consolidate. After several years of preparation, the market appears poised for considerable growth as the use of the technology breaks free from the perception that it is a technology solely for protecting digital music to the perception that it is a technology which will affect and enable four major areas — commerce, the enterprise, software, and wireless. The market is expected to grow aggressively to \$563.2 million by 2007 at a 62.8% compound annual growth rate."*

– Abstracted from *Worldwide Digital Rights Management Forecast and Analysis 2002–2007* (IDC #29409, May 2003)

Established in 1951, WGBH Boston is a nonprofit educational media company and one of the leading public broadcasting stations in the United States. It is recognized for exploring new media outlets to expand its educational mission, with radio in 1951 and television in 1955. In 1972, WGBH pioneered the world's first captioning for deaf and hearing-impaired viewers. WGBH produces more than one-third of the Public Broadcasting System's (PBS) prime-time lineup, including television programs such as *Nova*, *Frontline*, *American Experience*, *Antiques Roadshow*, *Masterpiece Theatre*, *Arthur*, *Between the Lions*, *Mystery!*, and *Zoom* and public radio programs such as *The World and Sound & Spirit*. WGBH has been recognized with hundreds of honors, including Emmys, Peabodys, duPont-Columbia Awards, and two Oscars.

Many broadcasters are evaluating technology solutions for the management of their digital assets. Cost reduction is a major consideration as management of digital asset archives can incur significant maintenance expenditures. The need for virtual real-time storage and retrieval of digital footage — both video and audio — is becoming increasingly important as broadcasters seek to improve efficiency in storing and accessing content. Within the public sector, broadcasters want access not only to their own video and audio footage but also to content from other producers. Finally, with more and more of their audiences watching or listening through digital delivery mechanisms such as broadband cable, broadcasters are seeking new ways to deliver content and information to audiences.

### THE NEED: A DIGITAL ASSET MANAGEMENT SOLUTION

For a number of years, dating back to the mid-1990s, WGBH sought ways in which it could store and make its program information accessible for production activities. The initial goal revolved around providing easier access to program material, whereby producers could download the material and view it directly from their workstations.

In 1994, Chief Technologist and Asset Management Architect David MacCarn, under a charter from Vice President and Chief Technology Officer David Liroff, embarked on an investigation of technologies that would serve as the basis for the development of a Digital Asset Management solution. After reconnoitering several potential technologies, WGBH — on the recommendation of MacCarn — formed a steering committee, which was initially chartered with delineating clear business drivers for the solution and accompanying technology requirements. Further investigation by MacCarn — with the assistance of WGBH Director of Information Technology and Asset Management Systems Amy Rantanen — showed that the additional users of a Digital Asset Management solution may eventually include educators, students, researchers, and individuals interested in select topics covered in past programs.

## Decision-Making Process

*"Our Digital Asset Management system is a mission-critical undertaking for us. The selection of the underlying technology, and moreover the solution provider, was pivotal for success. We ultimately selected Sun technology and services because of compliance with open standards, the willingness of Sun consultants to share valuable intellectual capital through knowledge transfer, and the opportunity to tap Sun's extensive iForce Partner community."*

– David Liroff, Vice President and Chief Technology Officer, WGBH

*"We are quite pleased with Sun's methodological approach. Knowledge transfer from Sun Services — encompassing architectural, development, and ongoing management issues — is something that we view in an extremely positive light."*

– Amy Rantanen, Director of Information Technology and Asset Management Systems, WGBH

As many organizations within the broadcast industry reevaluated their business strategies, WGBH continued to seek innovative ways to reach its diverse audience. In an effort to keep broadcast and production costs under control and continue its mission of providing educational and entertainment content to a vast audience over a number of different media channels, WGBH made a decision to move forward in developing and deploying a Digital Asset Management prototype system.

## KEY BUSINESS DRIVERS

The key business drivers behind the Digital Asset Management prototype fall into several different areas:

- **Lower total cost of operations.** Ongoing storage, maintenance, and retrieval of audio and video program materials are expensive undertakings. Lowering costs is of particular importance to WGBH because it produces more than one-third of the content aired on PBS, which would require approximately 2 terabytes of content to be archived each day. The processes of cataloguing, determining, and clearing rights to content and retrieving that content are time- and labor-intensive efforts. Producers searching for audio or video footage of past events may expend days or even weeks looking for and/or listening to program materials.
- **Enhance quality of programming.** Most broadcasters have gone to elaborate lengths to preserve and make prior program material available. Based on manual processes, these asset management systems are cumbersome to use. In addition, as certain program material may simply go "undiscovered," producers do not always have the most relevant materials at their disposal.
- **Provide educators, students, and others with research channel.** Providing access and search functionality to digitized content for external users is also important. WGBH wants to allow teachers, students, school administrators, professors, and others from the education arena as well as various other members of its audiences to access digitized program materials.
- **Accommodate proliferation in access channels.** Because of advances in technologies, audiences and users of program material produced by WGBH have a burgeoning number of channels from which they want to access content. In particular, audiences and users no longer want to be tethered to programming schedules; rather, they want to have the ability to access content and programs anytime, anywhere using both wire-line and wireless devices.

**Technology  
Innovation:  
Digital Asset  
Management at WGBH**

*The enormity of WGBH's storage requirements — potentially 15 petabytes of content from the past 50 years with approximately 2 terabytes of new content generated daily — necessitated the design of a highly sophisticated, hierarchical storage environment that supports online, near-line, and offline storage access. The architecture for the Digital Asset Management solution, which is serving as the basis for the development of a Sun Digital Asset Management Reference Architecture, is powered by Sun StorEdge software and hardware technologies, Artesia Technologies TEAMS, the Sun Java Enterprise System software platform, Sun Fire servers, as well as J2EE and XML technologies.*

*"We selected the Sun Java Enterprise System software platform for our Digital Asset Management solution for two primary reasons. To begin, it is tightly integrated with the Solaris Operating Environment, which serves as the basis of our datacenter environment. Second, Sun Services has the expertise to help design and implement solutions on the Sun Java Enterprise System software platform as well as to provide ongoing support to help meet quality-of-service requirements."*

– Peter Miller, Assistant  
Director of Information  
Technology, WGBH

## **ACTION PLAN AND DECISION PROCESS**

### **INITIAL STEPS: SELECTING THE "RIGHT" SOLUTION**

WGBH would be breaking new ground with its Digital Asset Management prototype. Successful deployment was contingent on selecting the underlying technology components as well as the primary technology consulting vendor. Specifically, WGBH sought a technology vendor that would work alongside its IT team from inception to completion, from identifying technology requirements and initial architecture design, to collaborating with other third-party technology vendors, to managing the project, to providing sustaining support.

WGBH and Sun enjoy a long-standing relationship that dates back to 1994. The relationship between WGBH and Sun evolved as Sun helped WGBH design its consolidated relationship-marketing database, which contains more than 800,000 data records on the membership of WGBH.

WGBH was thus inclined toward Sun technologies and services when it began evaluating solutions for its Digital Asset Management prototype system. Accordingly, though WGBH considered solutions from other technology vendors, including IBM, in late 1999 the organization ultimately determined that Sun was the right choice. Corroborating the ongoing collaborative relationship between Sun and WGBH, Sun allocated joint funding for the project, seeing the strategic value of the initiative as an opportunity to develop a Digital Asset Management Reference Architecture. Rantanen summarizes the reasons behind the selection of Sun: "Sun was able to provide a comprehensive solution, ranging from its long-standing embrace of open standards, to its extensive iForce Partner community, to robust software and hardware product offerings, to the technical expertise of Sun Services."

### **KEY TECHNOLOGY CHALLENGES**

In early 2001, WGBH moved forward in the final phases of its decision processes for the selection of a technology solution. As it was in the initial phases of engaging Sun, WGBH identified a number of key technology challenges and objectives. Some of the key elements WGBH identified include:

- **Open-standards technologies and products.** WGBH required a solution that would enable it to plug-and-play different software and hardware components. The public broadcaster wanted to avoid a solution that required the use of proprietary technologies. With this in mind, WGBH found that Sun's commitment to open standards across various software and hardware components met its goals in this area. Such components range from the support and connectors for Web services within the Sun Java Enterprise System software platform, to J2EE technology for enterprise applications, to the use of open Compression/Decompression standards (CODECs) for compressing and decompressing files.

*"The open standards-based solution from Sun, which includes various pieces of the Sun Java Enterprise System software platform as well as Java and XML technologies, provides us with a highly flexible and adaptable foundation for future growth, one that will accommodate new business requirements while concurrently delivering on other quality-of-service requirements such as scalability, availability, maintainability, and manageability."*

– David MacCarn, Chief Technologist and Asset Management Architect, WGBH

*"The SunTone Architecture Methodology provides a solid architectural and development framework that helped us speed time to market while reducing development risks."*

– David MacCarn, Chief Technologist and Asset Management Architect, WGBH

*"The selection of Sun StorEdge Availability and Utilization suites was an easy choice. We have huge data volumes that require online, near-line, and offline management. We also need to be able to virtualize data, not as disks or LUNS, but as volumes or groups of volumes. Both Sun StorEdge Availability Suite and Sun StorEdge Utilization Suite help us meet both of the requirements."*

– Peter Miller, Assistant Director of Information Technology, WGBH

- **Architectural expertise and knowledge transfer.** Based on interaction with several Sun customers and consultants from Sun Services during the evaluation phase, WGBH determined that Sun Services had the expertise to help design an industry-first architecture for Digital Asset Management. Additionally, Sun Services was able to work with WGBH to develop an end-to-end prototype, providing project management throughout the implementation. Both Sun's methodological approach and focus on transferring knowledge throughout the engagement enable customers to acquire valuable intellectual capital throughout the project.
- **Sun iForce Partner community.** The architecture and deployment of the Digital Asset Management prototype would involve several third-party technology vendors. WGBH felt that Sun's network of iForce Partners would prove beneficial in designing and implementing the result.
- **Robust, high-performance platform.** With the potential of more than 300,000 hours of programming material comprising 15 petabytes and the generation of approximately 2 terabytes of new content daily, WGBH required a highly robust, high-performance storage and server platform. These massive volumes required WGBH to build its solution on an infrastructure platform that would accommodate rapid scale. Based on its prior experience using Sun servers and storage platforms, coupled with Sun Services' design, implementation, and management support, WGBH believed that Sun had the best solution in this area.
- **Sophisticated functionality.** WGBH identified a number of business requirements that will need to be met in terms of end-user functionality. First, end users must be able to archive and search for digital content based on a vast array of metadata tags. WGBH viewed Artesia Technologies TEAMS, coupled with Sun StorEdge technologies and Sun server hardware, as a highly robust solution. In addition, security requirements based on individual user privileges and content restrictions required sophisticated network identity management. WGBH's desire to provide access to content for both internal and external users magnified the importance of network identity management. WGBH saw Sun as a leader in network identity solutions with software components including Sun Java System Portal Server and Sun Java System Access Manager and the proven architecture and implementation experience of Sun Services.

## SOLUTION PROFILE AND IMPLEMENTATION APPROACH

### DEVELOPMENT APPROACH AND TIMETABLE

In January 2001, WGBH and Artesia Technologies began tests for a Digital Asset Management prototype, which resulted in a joint development effort between Artesia and WGBH. In April 2002, WGBH and Sun kicked off the architecture design for the Digital Asset Management prototype. Sun consultants, over a period of eight weeks, worked with WGBH to establish the architectural parameters of the solution through the development of select use cases. In August 2002, with solidification of the architecture design and underlying technologies in place, Sun and WGBH, with assistance from iForce Partner Artesia Technologies and Sony, moved forward in building out and implementing the architecture in complete detail. WGBH currently has more than 1 million records now contained in the Digital Asset Management prototype system.

A project manager from Sun Services oversaw the activities of the various parties involved on the project, helping to break the design and development phases into manageable "chunks." Use cases, which are a key component of the SunTone Architecture Methodology, allowed WGBH to focus on designing, testing, and implementing functionality related to certain business requirements. Some of the key use cases that were completed include catalog (based on metadata tags), ingest (the process of introducing and storing new media objects), asset retrieval, search, and repository management. The overall iterative development approach of the SunTone Architecture Methodology is expected to help WGBH speed time to market while lowering development risks.

### **CORE FUNCTIONALITY AND TECHNOLOGY REQUIREMENTS**

The Digital Asset Management prototype, which is now being rolled out by Sun and WGBH as a Digital Asset Management Reference Architecture, will provide personnel at WGBH with Web-based access to ingest, store, search, and retrieve millions of content files.

Following the first phase of the project, WGBH, with the assistance of Sun, determined that the architecture design of the solution would need to accommodate some key technology requirements, including:

- The volume of data necessitated a storage solution that would provide online, near-line, and offline storage access.
- Various copyright and other legal constraints along with the desire to deliver access to internal and external constituents prompted the need to provide built-in security protocols through metadata tagging and role- and policy-based access. WGBH also needed to develop a centralized system for tracking production media usage and workflow.
- WGBH chose Artesia Technologies TEAMS, which serves as the "hub" for the management of its digital assets. On top of Artesia Technologies TEAMS core structure, WGBH uses metadata tagging based on the Dublin Core Metadata Standard, which supports interoperable metadata standards, to allow for the distribution and sharing of digital assets. Core functionality includes video editing, rights management, content-type transformations, archiving, search, retrieval, and export.
- Rapid growth in content means that WGBH needs a highly robust software and hardware platform that will scale while providing high availability and reliability. "Because of the mission-critical nature of our business, our data-center is largely powered by Sun Fire and Sun Enterprise servers, which total more than 100," notes Assistant Director of Information Technology Peter Miller. "We have a long-standing experience with the Sun server and storage platforms and have had an extremely positive experience."
- To avoid vendor and technology "lock" and thereby higher total costs of ownership, WGBH aimed to use commercial-off-the-shelf (COTS) products and technologies.

*"The Sun StorEdge 3960 system, which we will eventually combine with Sun StorEdge 6920 systems, provides us with a highly robust, hierarchical storage solution."*

– Peter Miller, Assistant Director of Information Technology, WGBH

*"Artesia Technologies, a Sun iForce Partner, strongly values its relationship with Sun. The various technologies from Sun — servers, storage, and software — coupled with the expertise of its services organization and its vast fabric of relationships with other third-party best-of-breed technology vendors are the perfect mix. In addition, Sun's iForce Centers provide partners like Artesia Technologies with a strategic advantage, helping to shorten sales cycles while allowing customers to speed time to market."*

– Michael Barros, Vice President of Business Development, Artesia Technologies

## ARCHITECTURE DESIGN

Sun consultants helped WGBH design a services-oriented architecture for the Digital Asset Management prototype, whereby different services are broken into separate layers. This architecture promotes quality-of-service requirements, such as availability, security, scalability, and flexibility, and also allows for concurrent development efforts by separate teams on services contained in the same tier. The SunTone Architecture Methodology serves as the basis for project management, application development, and architecture design.

*"We use Sun Availability Suite for two purposes. First, it allows us to create a large virtual storage pool for our digitized assets. Management of tape and disk space is separated from management of the assets themselves. This makes sense and allows us to establish separate workflows and systems to address those concerns. Second, it is a useful system for backup/restore and active preservation. Being rules based, we can automate what would be a manual and labor-intensive process in any other system."*

– Peter Miller, Assistant Director of Information Technology, WGBH

Because of the scope of the storage requirements, Sun consultants helped WGBH to design a hierarchical storage management system prototype, whereby digital assets are categorized into different access areas: online, near-line, and offline. For business continuity, online storage management is configured as a SAN powered by a Sun StorEdge 3960 system connected to the application services platform through two Sun StorEdge Network FC 12-Port switches. Sun StorEdge Availability Suite and Sun StorEdge Utilization Suite reside on a Sun Fire V480 server running the Solaris 9 Operating Environment. Sun StorEdge Utilization Suite is integral for managing the hierarchical storage solution, controlling the migration of digital assets between disk and tape, and exporting tapes to near-line storage in a Sony PetaSite tape library storage system. Sun StorEdge Availability Suite provides a point-in-time copy service — instant snapshots of data without disruption of business processes — and remote mirror services — replication of data between physically separate servers.

The application services platform prototype, from which digital assets are stored, retrieved, ingested, searched, cataloged, and managed, breaks the different services logic into separate tiers. The platform includes separate tiers for client, presentation, business, integration, and data. Artesia Technologies TEAMS, which is at the core of managing digital assets, resides on a Sun Fire V480 server running the Solaris 9 Operating Environment and encompasses the presentation, application, and database tiers. Closely integrated with Sun StorEdge Availability Suite and Sun StorEdge Utilization Suite, Artesia Technologies TEAMS strictly controls access through standardized asset access services.

The client tier of the prototype leverages J2EE and XML technologies to serve as the conduit to the Digital Asset Management system, which will support a variety of standard Web browsers. The adoption of XML technology interfaces will also allow WGBH to deliver content over both wire-line and wireless devices.

Apache Web Server, which runs on the same Sun Fire V480 server as Artesia Technologies TEAMS, powers the presentation tier of the prototype, routing user submissions and queries through Java servlets to appropriate business logic and returning information and content in the form of JavaServer Page (JSP) technology.

The application logic tier consists of business logic and integration logic components. The business logic is powered by the Tomcat servlet engine, which resides on the same Sun Fire V480 server. Java servlets serve as transaction agents for functionality such as search, storage, ingestion, repository management, and retrieval.

*"The enormity of our storage requirements necessitated that we maintain both online, near-line, and offline storage. The Digital Asset Management Reference Architecture from Sun, which includes Sun StorEdge hardware and software at its core, provides the technology foundation for a hierarchical storage environment."*

– David MacCarn, Chief Technologist and Asset Management Architect, WGBH

The integration logic, dubbed the "video parser" service by WGBH and Sun, is a custom-developed application that extracts a section of a video file from a larger file to address the challenge of moving only the relevant part of a file to the user. This helps minimize the need to send large video files across the network. The interface between the front-end interface and digital content within the prototype is facilitated by Sun Java System Message Queue residing on the Sun Fire V480 server running the Solaris 9 Operating Environment. Sun Java System Message Queue controls Java APIs for XML (JAXM) that facilitates communications between different applications involved in the management of digital assets. Java Database Connectivity (JDBC) technology serves as an interface to the data tier of the prototype through SQL queries.

***"The announcement of the Sun Java Enterprise System is very important to us. We spend considerable time managing our Sun Java Enterprise System platform, which is spread across a large number of Sun Fire and Sun Enterprise servers. Availability of a service that tightly integrates the deployment and management of all the different pieces of the software platform across the enterprise will help us lower total cost of ownership through system administration savings while improving the overall reliability and manageability of our software environment."***

**– Peter Miller, Assistant Director of Information Technology, WGBH**

The database tier is powered by Oracle9i database, which resides on a single Sun Fire V480 server running the Solaris 9 Operating Environment connected to a Sun StorEdge T3 disk array for network attached storage. The data tier stores metadata that is at the core of the functionality provided by Artesia Technologies TEAMS.

Artesia Technologies worked with WGBH and Sun consultants to integrate Sun Java System Portal Server 6.0 and Sun Java System Access Manager into the application services platform. Both servers, which make up part of the Digital Asset Management Reference Architecture, will reside within the presentation and identity layers, providing WGBH with the ability to provision content to a broader constituency of internal and external users. Access to digital content, which is controlled through metadata tags powered by Artesia Technologies TEAMS, will be based on role- and policy-based protocols. "We're extremely excited about exposing the Digital Asset Management prototype system to our internal audiences," says Miller. "The addition of Sun Java System Portal Server and Sun Java System Access Manager provides us with a vast array of functionality while helping us to maintain a secure, rich environment."

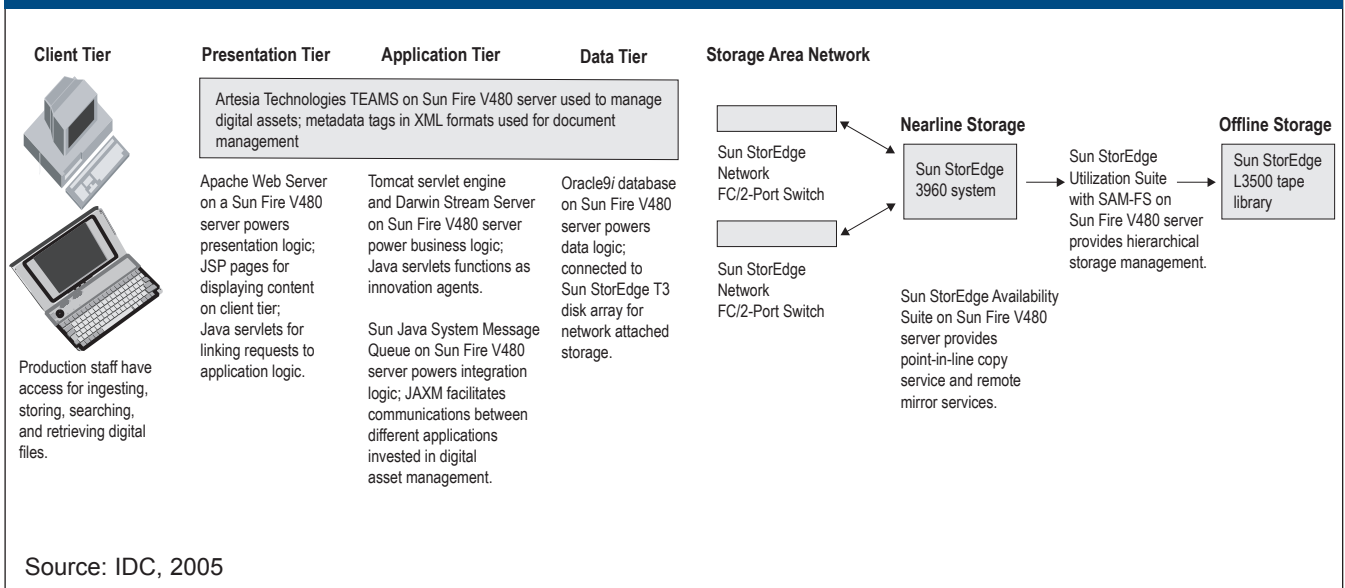
### **MEETING QUALITY-OF-SERVICE REQUIREMENTS**

With broadcast operations being mission critical, WGBH has a SunSpectrum Platinum agreement for around-the-clock online and onsite support, a variety of online self-service resources such as access to software releases and patch access (Online Support Center and SunSolve Online Knowledge Database via Sun.com), and mission-critical escalation. WGBH is also tapping Sun Services for ongoing skill assessments and training on Sun software and hardware technologies, including the Sun Fire and Sun Enterprise platforms, Sun StorEdge software and hardware technologies, the Sun Java Enterprise System platform, Java and XML technologies, and the Solaris Operating Environment. The public broadcast leader has also leveraged its SunSpectrum Platinum agreement for quarterly reviews of its datacenter environment, which totals more than 100 different Sun Fire and Sun Enterprise servers, as well as employee development planning. Currently, both the training and the support agreement from Sun play a key role in helping WGBH to sustain more than 99.99% availability for its mission-critical applications across its datacenter.

***"With the assistance of Sun, Artesia [Technologies], and Sony Electronics, WGBH Boston has been able to develop a Digital Asset Management prototype that is on the leading edge of both the public and private sectors. We are poised to revolutionize the management of digital media, with tangible benefits from lower total cost of operations, to enhanced productivity of production staffs, to improved quality of broadcast production."***

**– Amy Rantanen, Director of Information Technology and Asset Management Systems**

**Figure 2: WGBH Digital Asset Management Prototype Architecture**



**Figure 3: WGBH Digital Asset Management Prototype Implementation Timetable**

Activity	April 2001	Nov. 2001	April 2002	May 2002	Aug. 2002	Jan. 2003	April 2003
Digital Asset Management Investigation Initiated	●						
Selection of Technology and Technology Solution Provider		●					
Project Kickoff			●				
Completion of First Phase (Inception) of Architecture Design				●			
Second Phase (Elaboration) Initiated					●		
Completion of Second Phase — B2E Interface in Production						●	
Announcement of Digital Asset Management Reference Architecture							●

Source: IDC, 2005

## **BUSINESS RESULTS**

With the assistance of Sun and iForce Partner Artesia Technologies and Sony, WGBH is demonstrating why it is seen as a leader in public broadcasting. Once deployed, the Digital Asset Management system will help to transform program production by providing real-time or virtual real-time access to millions of assets accumulated over the past 50 years.

By laying the groundwork for the current prototype, WGBH estimates that Sun, Artesia Technologies, and Sony helped reduce time to market for the architecture design. Once the solution is deployed, production staff are expected to realize improvements in productivity by having the ability to ingest, store, search, and retrieve content in virtual real time. IDC research shows potential gains of 10% to 40% depending on the nature of production projects and the roles of production personnel. The solution will be deployed eventually to external users — such as educators, students, researchers, and various other members of the WGBH audience — allowing them to access and use digital content based on the roles and privileges assigned to them by the network identity management services.

The Digital Asset Management prototype builds on the existing relationship between WGBH and Sun. WGBH estimates that once all digitized assets are ingested and stored and the prototype is deployed into full production, it will be able to reduce total cost of operations. Eventually capable of containing 15 petabytes of content, the Digital Asset Management prototype is designed to be capable of pushing 20 megabytes to 30 megabytes of data to individual stations per second while sustaining high availability and reliability. Demonstrating its thought leadership, WGBH made a strategic decision to work with Sun to take valuable intellectual capital related to the architectural components of the Digital Asset Management prototype and create a Digital Asset Management Reference Architecture. In addition, seeing the value of Digital Asset Management sharing and collaboration across multiple public broadcasters — and perhaps private commercial broadcasters — WGBH is working with Sun, Sony, and Artesia Technologies to evangelize widespread adoption of the solution. Part of this process includes serving as a Sun iForce Center.

**Figure 4: Overview of WGBH's Business Results**

<b>Business Process Area</b>	<b>Nature of Benefit</b>	<b>Description or Metric</b>
Customer Service	Strengthened relationships	Once deployed the solution will help to provide greater access to digitized content; eventually, as the solution matures, new online services will be available to other public and private broadcasting companies as well as any number of audience constituencies such as educators, students, researchers, and others.
System Functionality	Robust, high-performance storage management	Architecture design to support storage of approximately 2 terabytes of data each day, with potentially up to 15 petabytes of total storage; hierarchical storage environment allows for online, near-line, and offline storage; designed to push 20 megabytes to 30 megabytes of data to individual stations per second.
System Performance	High availability, reliability	Applications across the datacenter currently sustaining up to 99.99% availability.
Time to Market	Reduced implementation time, greater flexibility	Achieved faster time to market with assistance of Sun, Artesia Technologies, and Sony; development best practices from Sun Services and open standards-based architecture may reduce future development cycles.
System Support Costs	Cost reduction, efficiency gains	Projected to eventually lower total cost of operations.
Operations	Improved productivity	IDC research shows potential of 10% to 40% improvement, depending on nature of production project and roles of production staff.

Source: IDC, 2005

### CASE EPILOGUE

WGBH is transforming how it conducts operations and delivers services to its audiences and is helping to prompt change across all of public broadcasting in North America. The potential operational benefits are noteworthy. WGBH, other broadcasters, and both public and private sector organizations with comparable business requirements that adopt the Digital Asset Management Reference Architecture can focus on delivering targeted, personalized content across various mediums. Adoption of the solution by a large portion of the broadcast industry will bring standardization and position the industry to make significant strides in the experiences of its audiences.

Integral to the success of WGBH is its carefully crafted technology solution partner selection process. By recognizing the long-term benefits of developing a solution that could potentially drive new revenue across any number of industries and by working with technology leaders such as Sun and Artesia Technologies, WGBH was able to leverage Sun's allocation of special funding to support the development of the solution. The value of Sun Services was proven in the architectural expertise and guidance its consultants brought to the project.



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