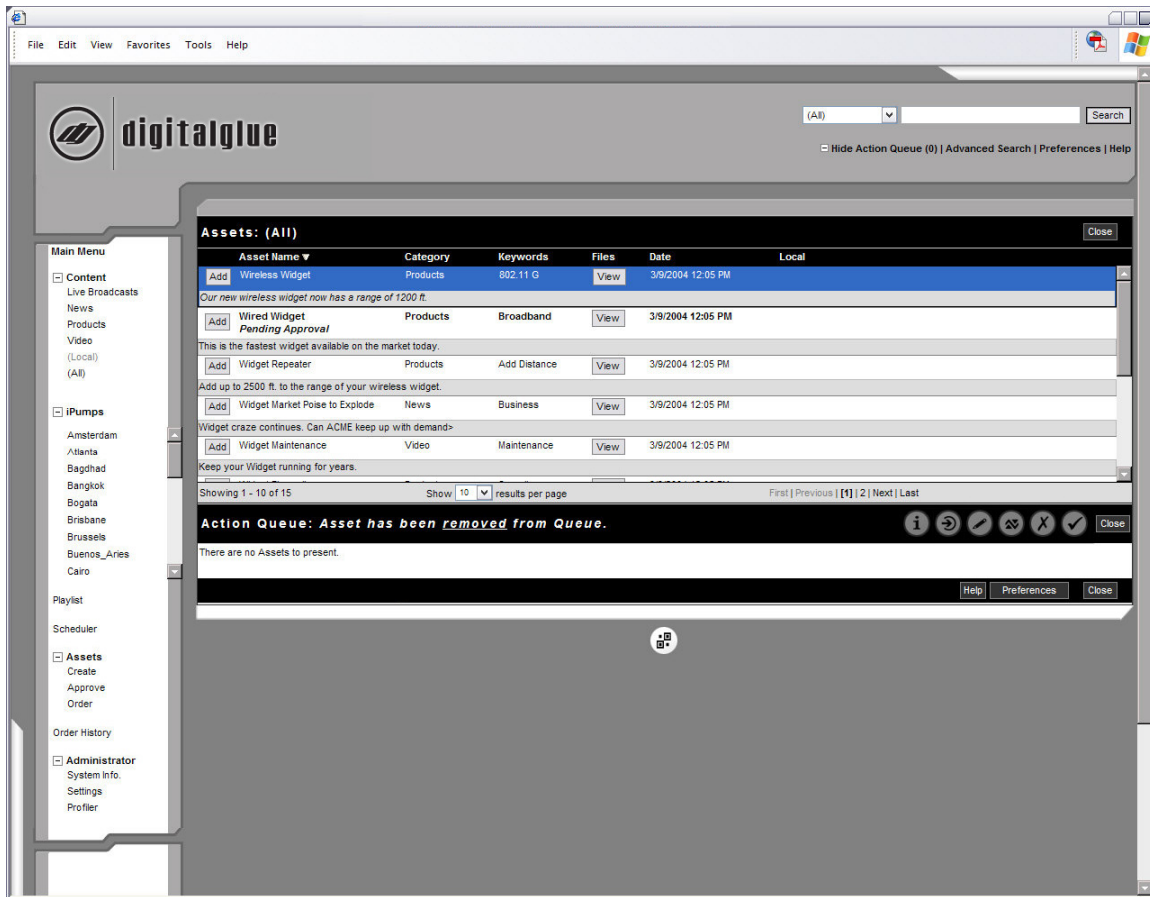


## Content Management System (CMS)



ASP.NET Web Site – User interface to the CMS

SQL Server – metadata storage, configuration, user management, order history, etc.

Windows Service (C# .NET with TCP/IP remote monitoring)

XML Web Services

Supporting tools and utilities (C# .NET)

Problem - An equipment manufacturer, who primarily builds IRDs and Edge Media Servers, needed a content management system to provide a complete solution to their customers. Their expertise was in Linux based systems for equipment control and authorization. They had sold a number of large projects requiring content management, and had a very short time frame to deliver. Digital Glue completed the initial CMS in less than 4 months. Its modular design allowed easy modification for their future customer requirements.

The solution provided consists of 3 major components; A Web based user interface, a Windows Service processing engine, and the supporting SQL Server database schema which includes much of the business logic in stored procedures and triggers.

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## **SQL Server 2000 application**

Supports highly configurable user roles (such as read, edit, approve, view, and delete)

Sophisticated metadata filtering profiles

An “External Stored Procedure” was developed by Digital Glue to extend the functionality of SQL Server. This .NET DLL allows SQL Server to trigger events in the CMS Windows Service. This allows the Service to respond to requests initiated in the Web UI immediately without the overhead of unnecessary polling.

It was designed with two options for syncing users, groups, and receiver with external legacy systems - XML WSDL SOAP using the Service and an ODBC SQL DTS method for larger configurations.

## **Web UI**

State-of-the art .aspx and JavaScript

3rd party large file uploader to support GB sized media files

## **Windows Service**

The main function of the CMS Service is to provide a communications and control link to the broadcast equipment. This is achieved using Web Services to pass XML messages between the Windows Service and the Linux and SCO UNIX based equipment.

The CMS Service offers a TCP/IP socket using .NET Remoting. Over this interface a .NET client application is used as the GUI to the service and allows real-time monitoring of messages and configuration of certain parameters that control the operation of the system.

A second client application provides “monitor only” capability. This connects to the service from anywhere on the LAN and provides CMS operators the ability to monitor messages from the service in real time.

At the request of the customer, Aladdin USB HASP key control was implemented which gracefully degrades the service and warns the user if the authorization key is missing.

Other features include full logging, both to the Windows Event Log and to text files that automatically cycle on a daily basis. There is a full log of all messages, a log of only error messages, if any, and a comma separated value (CSV) log of orders, which can be used for billing purposes, if needed.

Since delivery of the CMS system, Digital Glue has added customized features while maintaining a single code base for easy maintenance.

## **Special Versions include:**

*TV News Support*

The CMS was integrated into an Avid iNews environment.

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iNews items arriving in a monitored hot-folder on the CMS are converted into CMS assets in real time. Operators immediately work on verifying the metadata and adding video content before ordering the item for broadcast to affiliate stations.

In this application, there are several Media Ingest Stations available to create broadcast quality video files for each news asset. The CMS uses metadata tagging to direct which ingest station(s) is to be used. (For example, video for a political story might only be available at the Washington DC bureau.)

Another feature unique to the News application is the ability for an operator to specify that certain affiliate stations be “embargoed” for certain news items which should not be made available in a particular market. The CMS system allows operators to make these embargo notations during their normal workflow and parses them out before any broadcast orders are sent.

## *Radio Spot Insert Support*

A radio network customer needed the CMS to be integrated into a Scott Broadcast environment. The Scott system controls the network programming schedules. The CMS needed to be aware of these schedules to prioritize the delivery of content and send commands to the edge devices which effectively create the playback schedules based on play lists.

In this case, a helper Windows Service was created that, on a defined schedule, connects to the legacy scheduling system and navigates through a collection of “token files”. As new files are discovered, they are parsed and used to identify audio WAV files to be pulled into the CMS system.

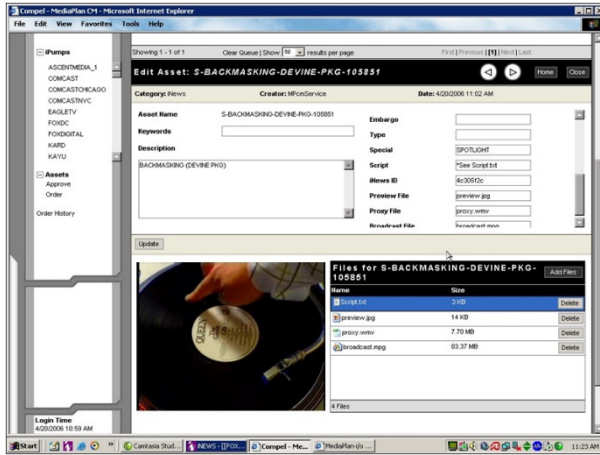
Each WAV file in this application has been tagged by the Scott system with additional information embedded in the WAV file’s RIFF format. The CMS uses these tags as metadata to automatically create complete audio assets which are inserted as spots on a given schedule.

The CMS system includes a suite of tools to support this customer:

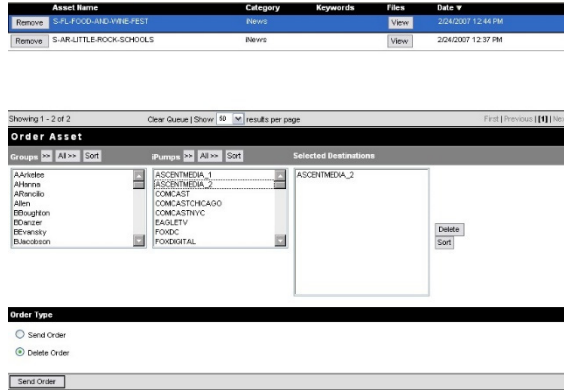
- Segment Definitions (time of day break definitions)
- System Readiness Testing
- Station-Region Mapping

The content management system can be configured as a completely redundant fail-over system using a duplicate set of server hardware. Data is kept in sync using SQL Server Replication Services and subdirectory/file mirroring.

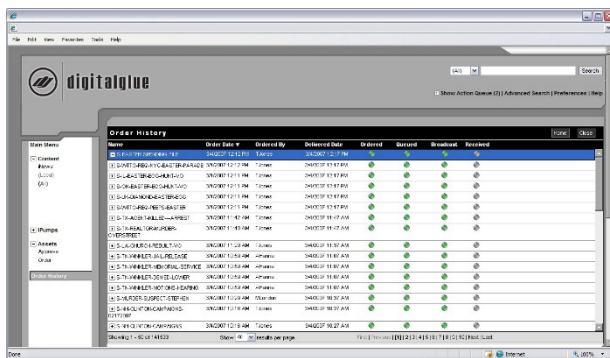
## Sample Screens



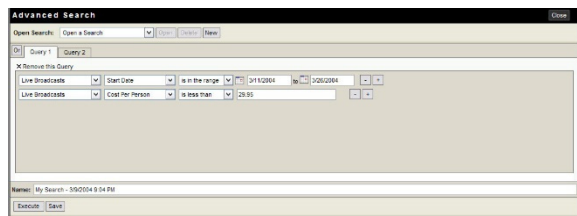
Asset Editing and File Upload



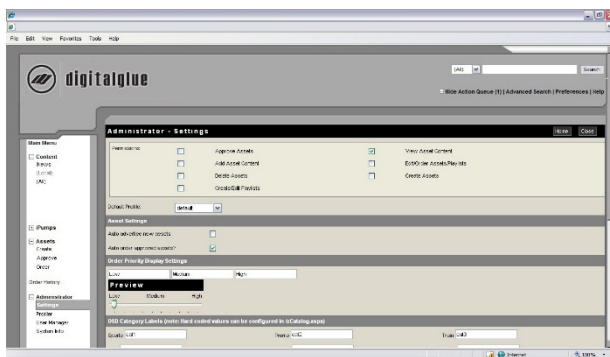
Asset Ordering and Deleting to Site(s) and Group(s)



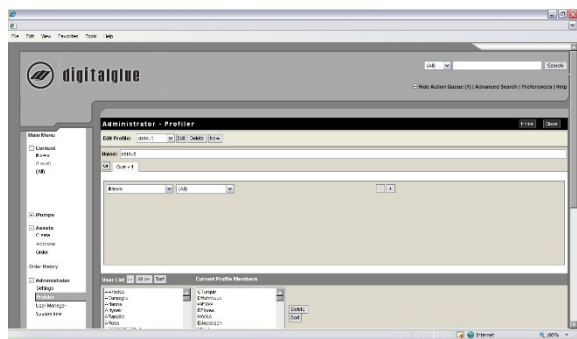
Order History



Advanced Metadata Searches



Site and User Administration



Profiles for Filtered Web access and Targeted Delivery

## Technical Features

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- Standards Based – Web Browser Interface, SQL, ODBC, XML, FTP, .Net, JAVA, DHTML, and WSDL/SOAP.
- Scalable – Running SQL2000, the only limitation to number of users and database size are a result of CPU, memory, and disk storage. The maximum database size is roughly 1,000,000 terabytes.
- Secure Access – Password protected login.
- Profiled Views – Users are presented with a filtered view of assets based upon system rights and metadata profiles
- Asset Approval – Automatic and manual distribution of approved assets
- Automatic Targeted Delivery – Based upon an advanced profiling algorithm, only sites that pass specific metadata logic receive authorized assets
- Metadata Support – Open metadata template design allowing the System Administrator to configure the system based upon their specific needs. A metadata editor is included allowing the creation on an unlimited number of templates.
- Data Fields – Support for all types of data fields such as text, numbers, dates, decimals, and enumerated values. Data entry can be a text box, multi-line box, default value, or drop down.
- Simple and Advanced Searching – Quick database searching with the provided simple search. The powerful advanced search allows expanded search criteria across multiple fields and asset types. Advanced search logic can be saved for future use.
- Sorting – All columns in the asset views can be sorted for easier viewing.
- Efficient Asset Control – Utilizing an asset queue, functions such as approval, editing, playlists, and ordering can be applied to multiple assets. User queues are saved in the database allowing a user to retrieve in a future session or even from another computer.
- Preview Snapshot – A JPEG image can be added to an asset for a visual indicator of asset file content.
- Media Runtime – Runtimes of all media files are automatically calculated and added to the database.
- Support for All File Formats – Files including .avi, .mpg, .wav, .mp3, .pdf, .doc, .xls, .ppt, and .zip are easily uploaded into an asset using a drag-and-drop interface.
- Asset Ordering and Priority – Assets can be sent to any combination of sites and groups. The system allows multiple levels of delivery priority and need by date/time.
- Visual Playlist Builder – Playlists can be created for remote play out on one or multiple Edge Devices. They can be sent with or without the required video files.

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- International Date Format Support – Individual user preferences can be set for screen resolution and date format.
- Site Asset Inventory – CMS tracks all asset transmissions and reconciles against a real-time return path reporting to provide an up-to-the-minute view of assets located on each Edge Devices in your network.
- Device Refresh – Assets can automatically be resent to a replaced unit in the field.
- Transmission Records – Complete accounting of all transmissions are logged in the database. This data can be mined using Crystal Reports, an ODBC connection, and automatically generated Excel pivot tables.
- Redundancy and Replication – CMS can be configured for load balancing, replication, and redundancy using up to 32 geographically dispersed servers.
- Automatic Ingest – Through FTP or SMB upload, Media Ingest Station or legacy systems can automatically add assets and files into the CMS database.