

Insight Engage[®] 3.0

Cloud-based Digital Menu Board Content Management System (CMS)

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Introduction

As part of Delphi's full digital menu solution offering for Quick Service Restaurants (QSRs), we provide a full featured cloud-based Content Management System (CMS) called Insight Engage[®] 3.0, which is our third-generation platform. This document provides an overview of the key features and requirements of the system.

Hardware Requirements

Insight Engage[®] or "Engage" is a hardware agnostic platform, allowing customers to select the player hardware and operating systems that best suit their needs from both a technological and costing perspective. Unlike other CMS providers, Delphi is putting the hardware choices in the customer's hands while guaranteeing professional grade performance and interoperability across all platforms. Interoperability is of utmost important as it guarantees that all platform features are available regardless of media player hardware/OS choices. Customers are also free to run digital menu networks comprised of many different media player types without the need to modify workflows. Delphi's media player software is currently certified to run on the following platforms:

Certified Platforms

- Android
- Microsoft Windows
- Samsung TIZEN
- LG WebOS
- Brightsign
- System on chip (SOC) displays from the following manufacturers: Philips, ELO Touch, Sharp, Panasonic and BenQ

Engage 3.0 CMS

Open Architecture

Built on open architecture, the Engage CMS features a clear and robust Player API and Server SDK which makes it easy to customize, extend, and integrate with third party systems such as Point of Sale (POS), Back of House (BOH), inventory management systems, live data feeds, etc. Engage can be used as a complete end-to-end solution or components can be used to integrate with existing content management, analytics, and distribution platforms.

Advantages of Open Architecture

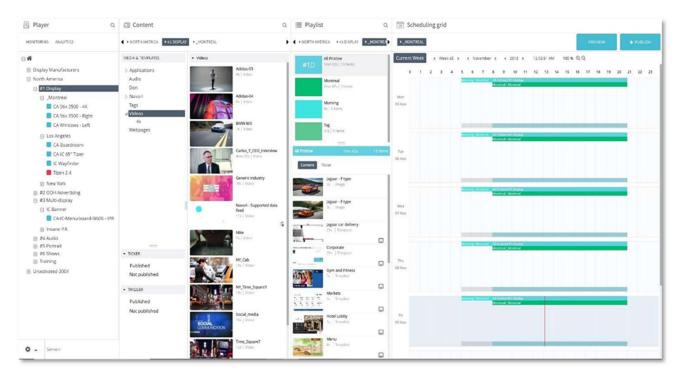
- Available Player API
- Available Server API
- Easy integration with third party systems
- Built with integration in mind
- Customizable software platform

Engage CMS features a simple and intuitive web-based interface while providing all the advanced features and functionalities required from a professional grade software platform. The CMS supports rich content and a Windows application "look and feel" within any HTML5 compliant web browser on any platform, desktop or mobile. The combination of intuitive 'drag & drop' design and robust feature set is what makes the Engage CMS a top choice for QSRs around the world.

Key CMS Features

- Suitable for content management, user management, player management, reporting/analytics and content creation.
- HTML5 based, and compatible with any web browser and platform.

- A tool that requires no local software to be installed on users' devices.
- Feature rich and intuitive.
- Easy to learn and use, regardless of computer skill level.
- Security and stress tested regularly.
- Available in 32 different languages.
- AD and ADFS compatible for user provisioning and single sign-on.



Supported Content and Data

Engage CMS natively supports a wide range of content types and formats, all from a single interface. All commonly recognized media types and formats are supported. Web-based (HTML/HTML5), interactive content and rendering of webpages requiring authentication is also supported natively.

Media

- Audio: Mp3, WAV.
- Image: BMP, JPG, PNG with transparency.
- Video: MP4 H264, WMV, QuickTime H264, MOV, AVI and Div-X.

Web

- HTML and HTML5 content (ZIP), interactivity is supported natively.
- Live URL's, including support for web authentication in order to display password protected webpages and dashboards.

Streaming

- Android/Unicast: HTTP H264 video streams, RTSP.
- Windows/Multicast: UDP, with H264 codec @1080P

Data

- Standard Feeds: XML, RSS, Media RSS, Delphi hosted data feeds including images (Server Feed)
- Social Media: Facebook, Twitter, Instagram
- Productivity: Office365, Microsoft Exchange Calendar, Google Calendar

Content Library

Each group/network level in the Engage CMS features its own content library. To share content amongst multiple sub-groups, simply import the content at the group level and ensure all sub-group users have been given access to the group above their sub-group. Content flows and is inherited going 'downwards' in the network tree, making sharing of content and playlists between groups very easy.

- Users can preview uploaded videos in full screen, directly from the content library at any time.
- Easily swap in new versions of a specified media that has already been placed in playlists and schedules, by using the 'update media' feature in the media properties.
- Trim the duration of uploaded videos directly in the CMS.
- Apply tags and validity periods to any uploaded media, automating your playback workflows.
- Media properties that can be assigned and managed in the CMS:
 - o Descriptive name
 - o Duration
 - Content active/inactive
 - o Duration override
 - File type/extension
 - User account name (who uploaded/edited the content)
 - o Date of the upload
 - Dimensions (resolution, in pixels)
 - o Bitrate
 - Frames per second (fps)
- Playback effects:
 - o Assign bitmap transitions (fade in, zoom out, wipe, slide in with directional options)
 - o Trim video clip (define start frame/end frame to eliminate black frames or to shorten clip)
 - Cropping (for all supported content)
 - Loop content
 - Hide ticker while media is playing
 - Mute audio
- Assign validity period:
 - User may assign one or more validity periods to each media in the library.
 - Validity periods are based on a time/day of the week basis (e.g. clip X can only be shown
 - between 8 and 10 AM weekdays or on specific days and this rule will apply for the next month).
- Keywords
 - Users can assign as many keywords (metadata) as they want.
 - Keywords are taken into account during searches.
- Attached files:
 - Add up to 8 file attachments to each media file.
 - Attached files will be sent with the media file at the next Player update.
- Tag:
 - Partial or Exact match
 - Tags can be inclusive or exclusive.
 - Add one or more meta tags (players with matching tags will play this content)

Playlists

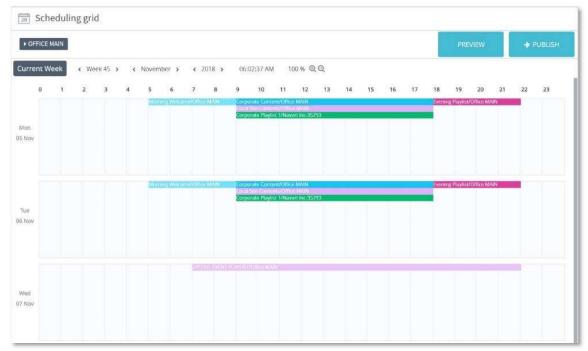
Playlists are lists of media items that you want to schedule. You can create an unlimited number of playlists and assign them to time slots in the planning window. When you update your Players, they will show the playlist's content according to your schedule (time slots).

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- By default, media items will play according to their position in the playlist. Media items can be reordered by drag and drop or you may set the playlist contents to play randomly.
- Users can upload up to 25 media files or assign URLs to each Player (this is called Location Specific Content and configured in the Player Properties). Content is called up by adding one or more placeholders in any playlist. This is so you can assign a playlist to a group of Players and display both shared and local content within the same group. Players that have no content assigned to a placeholder will skip it and play the next item in the playlist.
- Content assigned meta tags will only play on Players with matching tags (and follow the "exact" or "partial" match as configured in the Content Properties.
- Each playlist can have one or more tickers assigned to it. These tickers will be shown until the end of the playlist's programmed time slot.
- Playlists automatically calculate their duration based on the items they contain. You simply add and remove items and the playlist recalculates its duration on the fly. If the assigned timeslot is longer than the playlist, the content will loop until the scheduled end time.
- Playlists can also be assigned to a group that contains multiple levels of sub-groups.
- This will support for example a national, regional and local organization. Playlists in the upper levels can be made available to lower levels permitting global/local playlist management.
- Users can drag and drop multiple items to add them to a playlist simply by holding down the control (Ctrl) key while they select and drag the media items into the playlist.

Scheduling

Each playlist you wish to display on your players must be assigned one or more time slots in the scheduling grid. Users drag and drop the desired playlists into the planning grid and then specify how long they want this playlist to run.



- Pre-schedule content playback as far in advance as desired.
- The planning grid provides a visual representation of weekly programming. If the grid is empty and users push an update to their Players, they will show the default media. To display playlists users must drag and drop them onto the grid and assign a time slot.
- Time slots are assigned in one of two ways.
 - By selecting the start and end time.
 - By selecting the start time and the number of loops. The software will calculate the end time based on the total duration of the items in the playlist and the number of loops.
- The system supports two types of programming techniques.
 - Sequential programming: This is when time slots follow one another. For example, playlist A runs from 8 to 10AM, B from 10 to 11AM, etc.
 - Overlapped programming: This is when two or more time slots overlap one another. For example, playlist A runs from 8 to 10 AM, playlist B runs from 8 to 11 AM, etc.
- When time slots overlap, the system will merge the contents of the playlists together dynamically based on the following rules:
 - Merge sequentially: All the items of playlist A will play followed by playlist B and playlist C.
 - Reorder as selected: You can define how many items in each playlist will play in sequence. For example, 2 items of playlist A followed by 6 items of playlist B and 3 items of playlist C. With this option, playlist A will play its first 2 items on the first pass, the next two on the second and so on.
- It is possible to mix merging rules so one-time slot always plays all the items in its playlist and the second only a pre-set number of items in its playlist at each pass.
- The system supports a maximum of 10 overlapped time slots on any given day of programming, regardless of the options selected.
- Users can zoom in or out the scheduling grid by selecting the zoom factor in the grid.

- Users can edit (stretch or shrink) a time slot interactively using their mouse or by typing in the start/end time.
- Individual time slots or an entire day's programming can be copied and pasted in the grid as many times as required. For example, schedule a time slot on Monday from 8 to 10 AM and copy/paste it into each successive weekday.
- Users can duplicate entire days or an entire week of programming. Programming can be replicated across any period (weeks, months, years). Any programming conflict is automatically resolved according to user defined settings (overlap or replace existing programming).
- Users can also delete programming for the day, week or for any given period.

Player Monitoring

Engage CMS features a built-in and full featured player monitoring window in the web browser. This tool provides you with real time health and status information on all media players connected to the server. Each media player shown in the CMS is color coded to provide a clear view of the health of the entire network of players at a single glance.

Template Designer

Engage CMS lets users create and manage sophisticated templates quickly and efficiently using the built-in Template Designer (no additional software to install). Templates are used to create dynamic multi-zone layouts that enable users to display many different content and data elements on screen at once. Templates are saved in the media library and added to playlists like any other piece of content.



Key Features

- HTML5 WYSIWIG designer application that offers an easy to use and friendly interface.
- Users can design templates with a solid color background or use a bitmap image.
- Templates can be duplicated across groups/networks via copy/paste.
- Templates automatically adjust to the Player's screen resolution. Any bitmap image selected as a background is dynamically resized to match the template dimensions.
- Users can create templates that span multiple screens (video wall applications).

Zones

The following can be added to any template:

- Static text zone.
- Display the current time in a zone. Time is retrieved from the Player PC itself so local
- time at the Player's location will be displayed.
- Display the current date in a zone. Date is retrieved from the Player PC itself.

- Geographic shape (rectangular/oval) with support for borders, solid color background, gradients, transparency.
- Display live data (Media RSS/RSS/XML or self-hosted data) in one or more zones (one data field per zone). Multiple feeds are supported in a single template. Display records from multiple feeds simultaneously without using a data grid. Links to images are supported in Media RSS and XML feeds. Images are resized automatically according to Player's resolution. Ideal for weather forecasts, traffic information, news with images, financial and sports-oriented content.
- Display live text data (Media RSS/RSS/XML or self-hosted data) in a grid (show entire database or select fields in a grid). Multiple data grids/RSS feeds are synchronized. Links to images are supported in Media RSS and XML feeds. Images are resized automatically according to Player's resolution.
- Template image zone. Can contain any image file and when the image is dragged into the template it will become the topmost layer. Only text and template image layers can be positioned on top of media and playlist zones. PNG files with transparent backgrounds are supported. Transparency is retained when the bitmap is dragged onto the ticker area. Bitmaps elements are imported and stored with the template itself. These images are also shared with the ticker designer.
- Media zone. Can contain any type of media. Users can add multiple media items in succession (similar to a playlist but self-contained inside the media zone). Media zones will loop by default, but you can set them to play through once and pause at the end.
- Playlist zone. Can contain any playlist (assuming playlist does not contain a template itself). Zone content is managed at the playlist independently from the template. Playlist zones will loop by default, but you can set them to play through once and pause at the end.
- By default, empty templates are set to 15 seconds and dynamically adapt to the longest media or playlist zones as they are added. If there are multiple content zones, the shorter zone(s) will loop until the end of the longest zone. Users may also set the template to a fixed duration in which case content zones will either loop or play once and pause until the template reaches its conclusion.
- Templates can be assigned one or more Validity Periods, same as for individual media.
- Text, date, time, real-time data zones all support a wide range of typographic controls.
 - Fonts (Any TrueType font installed on the media player can be used. If another font is selected, Player will substitute with the closest Microsoft font equivalent).
 - Font size (user selectable and typed-in).
 - Font style: normal, bold, underline, italicize, align left/center/right.
 - Font color/transparency.
 - Font alignment.
- Text data field support:
 - 3D transitions (fade, fade and grow, horizontal wipe, fade up).
 - Field synchronization.
 - Adjustable data refresh rates.
 - Images and data feed pre-loading
- All types of Media RSS/RSS/XML and social media feeds are supported (including Twitter, Facebook, Google Calendar, etc.). Select which columns/rows of data are to be shown.
- Self-hosted databases are stored in the Server's SQL database. Users enter data via an "Excel"-like grid. Select which columns/rows of data are to be shown.
- HTML5 content it supported (both hosted on a web server or "download and play"). Content interactivity is respected.

Other Key Features

Ticker Designer lets users create and manage the display of live text and data overlays quickly and efficiently. Users can enhance the ticker's design using various graphical tools they access via the **Ticker Designer**. Tickers are shown on a Player's screen as the topmost layer, floating above any programmed media. Tickers are not scheduled like traditional media or templates. Tickers are displayed when any playlist is programmed and/or be shown only during specific playlists. The ticker is an overlay element that will always appear on top of any content being shown on the Player's screen.

Data Feed Manager. Data Feed Manager is an intuitive and built-in tool that comes standard with the Insight Engage Platform. With Data Feed Manager, you can easily ingest and display the following types of data feeds:

- RSS/XML
- Social Media (Twitter, Facebook, Instagram)
- Microsoft Exchange / Google Calendar
- Server Feed acts as an 'Excel' like data table that is hosted directly in the Data Feed Manager.
- Dynamic Data Feeds deliver personalized content such as weather forecasts, pricing, or any other location specific content to any display. Using dynamic data feeds, a single template can be published to all players and each one will retrieve its own unique data. This is the typical approach for integrating digital menu board pricing and product information data with external third-party system such as Point of Sale and Back of House systems.

Content Triggering and Smart Content Automation. The Trigger Software API enables the capability to launch specific content based on an external data source or system input. Such input can be a device (key/remote control/sensor, camera, temperature, weather, etc. The Trigger API contains scripting that allows to easily develop an application to enable the take over the control and override any (or all) running playlist(s) at any moment in time. It can launch and loop a media file (programmed in the playlist or not), a playlist, a video stream with real time URL, system-wide emergency alerts and notifications.

Mobile Integration

Engage Mobile is a localized content management tool that runs on smartphones and tablets. The software is HTML5-based so there is no local app to install. Simply point the device's web browser to the Mobile URL. Engage Mobile is compatible with all mobile devices, regardless of operating system or brand. Once you are logged-in, you can start managing what's playing on Players from any location. Users will be able to modify prices, modify screen programs, reboot players or take a quick photo and publish it instantly. These features are powered by the Server API and leverage web socket communication. The following tasks can be performed remotely via the Engage Mobile tool:

- Trigger content (Media, Notifications and Alerts, Playlists, Templates) in real-time.
- Launch promotional videos or other useful content on-demand.
- Restart, reset and reboot any player device remotely.
- Turn displays on or off, control the volume of any display.
- Complete control over content playback, on-demand.

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Engage Server

Engage Server is the backbone of Delphi's Digital Menu board CMS Platform. The server is delivered as a system service which can be run on any Windows 7, 8, 10 or Windows Server equipped PC. It is also compatible with virtual machines, load balancers and content delivery networks (CDNs). The key benefits of running Engage Server as a service:

- Lower software maintenance costs
- Lightweight hosting footprint (IIS, SQL, Engage Server Service)
- More reliable
- Easier to deploy
- Can be hosted on a physical machine or VM
- Available server API for further customization and automation

Engage Server Architecture

Engage Server is based on three key components: The Engage Server Service, SQL Database and Microsoft IIS. It is compatible with load balancers and content delivery networks (CDNs) and is capable of hosting very large digital menu board networks.

Compatibility and Key Capabilities

- Compatible with all commercially available anti-virus solutions.
- Compatible with all current virtualization and cloud computing technologies.
- Compatible with any content delivery network technologies.
- Compatible with any internet proxy server.
- Compatible with http and https connections.
- Tested and certified by a third-party data security firm.
- Available in SaaS, On-Premise and On-Premise Cloud options
- Any type of load balancer can be used with Engage Server, whether on-premise or cloud based.
- Multiple IIS Servers running Windows server 2012+ and one instance of Engage Server license on each.
- Compatible with any internet proxy server.
- A virtual shared drive which all IIS servers have access to. It is intended to store content. It must be a virtual shared drive compliant with SMB 3 protocol. Tested and certified by a third-party data security firm.
- Microsoft SQL database can be running on-premise or on the cloud. Delphi recommends the use of clustered databases.
- Engage Server's SQL database can be hosted on the local server PC or on any remote SQL Server.
- Administrators can use Microsoft SQL Server Express to start, then migrate to a commercial SQL Server version at any time as their digital menu board network expands.
- Enhanced API now supports the development of native mobile and HTML5 user interface apps.

- Media content can be stored on the local user's PC, on a remote file server or any type of network attached storage device (NOTE: media is not stored in the SQL database itself).
- Users interact with Engage Server using the Content Manager, which is delivered as a responsive, webbased, HTML5 interface. Content Manager supports PC screens, tablets and smartphones. All popular web browsers are supported.
- Engage Server downloads all available software updates automatically. An administrator can then decide when to install the available updates.
- Engage Server is compatible with Microsoft Active Directory which handles user access security and single sign on capability.
- Up to 50,000 Players are supported. Complex operations are performed almost instantly even on very large networks.
- Load balancing and failover support for very large networks via an enhanced load balancing / fail over add-on module: New server back-end architecture supports load balancing and fail over to deliver 99.999% reliability.
- Engage Server features download queue management support. This feature prevents the server from overloading on very large content downloads. Instead of bulk data transfers on each update, content publishing is optimized to match available resources. Smart content transfer technology considers the server PC load and available bandwidth. Data is queued for transfer accordingly.

Engage Server API

The Engage Server API has been developed to provide customers access to features and bypass the main content management UI as needed. It is provided as a set of SOAP web services, available directly from your onpremise server installation. The API is a web service that lets users' access, manage and customize features and workflows through their own software applications or those of third parties. Use the Server API to extend functionality, easily integrate with existing content management, hardware management and analytics toolsets.

- Gives you the ability to create custom interfaces that match your exact needs, both from a server/clientside aspect. Purge expired accounts and players with associated content.
- Has been implemented using the HTTP protocol so you can integrate with preferred programming language and tools.
- Based on Representational State Transfer (REST) protocol.
- Uses the JSON model for all transactions.
- The API supports the following programming languages: JavaScript, Java, PHP, C# and C++

Media Player Software

Delphi's media player utilizes native player software. With so many digital menu media player software choices to choose from, what properties and characteristics should customers be looking for? If high quality, reliable and high-performance player software is what you're looking for, then the you should always be looking for native software.

Native software is developed using programming languages that directly access a device's processor and internal components without the need for any translation. This is why native player applications offer measurable advantages and superior playback quality over web-based applications which are often bloated with non-native 'middleware'. Native software will provide much better performance, greater control over a device's resources and better overall reliability. Browser based programming languages can't deliver the same performance.

Delphi's Engage Player is native player software, which allows you to get better performance out of whichever media player device and operating is selected. Delphi does not rely on any 'middleware' or 'freeware' in the

player software. Technical support on native software is also much more efficient, as there is little reliance on third-party companies for assistance and support.

Key Advantages of Native Software

- Offers measurably superior playback and reliability
- Better performance out of any media player or platform
- Optimized content pre-loading
- Multi-core and multi-threading
- Proprietary rendering algorithms that are precise to the nanosecond
- Single point of contact for technical support
- Better feedback to server for monitoring and analytics

Management

The Insight Engage Platform is a multi-tenant platform. In a multi-tenant environment, groups/networks of players, users and content can be kept entirely separate from one another. The use of player groups and user domains in our multi-tenant environment allows us the ability to host multiple customers from a single server, without each customer knowing that the others even exist. For end users, the use of user domains in a multi-tenant environment allows for the segregation of users, players and content on a per group/network basis. This allows you to provide different regions, departments and locations the ability to manage only the users, players and content that are meant to be under their control.

Domains

User access is controlled via a domain structure. The root level domain is the highest level. User accounts created at this level will have access to the entire network.

- Administrators create domains below the root to provide secure access to any given group. This can also
 include any sub-group below the selected group. Users created at this level will have access to the group
 and sub-groups that part of this domain and nothing else.
- Sub-domains are created to provide secure access to any sub-group. This can include the group directly above the sub-group which is sometimes necessary to let users access content stored at the higher level. Users created at this level will have access to the group and sub-groups selected to be part of this domain.
- It is possible to have multiple levels of sub-groups. Each level can be assigned its own sub-domain. This will support for example a national, regional and local organization.

Access and Rights Management

Domains can only be created by administrators. Every user in a domain shares access to the same group/subgroup structure; however, each user account can have different rights. Administrators can create an unlimited number of user accounts in each domain under their control. Each user account is assigned a domain (or subdomain), a rights profile, an alert profile and an event profile. Administrators can also create custom profiles with rights that can be assigned to a user account:

- Create other users (considered administrator).
- Edit Player properties
- Edit group properties
- Access the Player monitoring window
- Access the content playback reporting
- Edit the on-screen ticker
- Content approval
- User authorization to upload new media to the Server
- User authorization to edit the scheduling
- User authorization to access/modify the playlist merging settings

• User authorization to send updates to the Players

User Roles and Permissions

On a per user basis, administrators can decide which features and functionalities any user can have access to when working in the CMS. The Content Manager provides multi- level user controls and access rights such that each user can only use the features and functionalities that they need. An unlimited number of user accounts can be provisioned in the CMS. Administrators can assign the following rights to each user:

- Which network (group/sub-group) of Players each user can see and access. Visibility can also be limited to a single Player or many players via group and category control.
- Which tasks each user is authorized to perform.
- Which alerts the user will receive based on a predefined profile.
- Which events the user will be notified of based on a predefined profile.
- User accounts can be programmed to become active and expire at any time which lets administrators pre-configure user accounts.
- Administrators can enforce a disk storage quota for each user account. This will limit how much data each user can upload to the system.
- Users can be allowed to access the status of a Player, which playlist is currently being displayed, the username of the person that sent the last update, the state of the Player's content download progress and confirmation of its successful completion. All this information is provided in real time.
- Users can be allowed to review a list of previously recorded alerts and events relative to each Player under their control.
- Users can be notified when content requiring their approval has been uploaded to the QL Server. They can in turn log in to approve the material at which time the user requesting approval will also be notified.
- Users can be allowed to retrieve proof of playback data for any Player under their control. These users can generate detailed reports based on the criteria of their choice.

Content Approval System

The Insight Enage CMS can provide an extra layer of content security by using the content approval system workflow. This workflow is designed so that when specific users upload new media into the content library, that media will not become active in the system until another specified user 'approves' the newly uploaded content. Content approval is an optional step that will help managers prevent employees from uploading and scheduling media and content that is not suitable for playback within the organization. Managers can decide on a per user basis, which users content uploads require approval prior to that content being available for on-screen playback. The content approval workflow is an optional step and is enforced on a per user basis.

When a user marked as requiring approval uploads a new piece of content, the selected approval user will receive an e-mail notification inviting them to review and approve/disapprove of that piece of content. That piece of content will only be available for on-screen playback once it has been approved. The content approval workflow is suitable for:

- Preventing sensitive or unauthorized content from appearing on screen.
- Preventing new or inexperienced users from making errors.
- Ensuring that only content approved by a manager can play on screen.

Security and Privacy

In the Insight Engage platform, the work of generating and reading Web Services -Security- compliant SOAP headers is done by a set of filters. One and Two-Way binding are used for best optimization. Incoming messages are passed through a series of these input filters, modified if necessary, and it generates a related set of programming objects. In the same way, outgoing messages pass through a set of output filters that serialize certain headers as defined programmatically by the Web service objects. These protocols include the following:

- Digital Signatures
- Data Encryption
- Sign-in encrypted with username tokens

By means of our encryption and asymmetric algorithm at the transport level and at the store level, data and message structure are fully protected. The following are supported to maintain a high level of security:

- Internet proxy servers.
- HTTPS.
- Private networks.
- User account controls (assign IP restrictions, account expiry date).
- Specify which content plays where. For example, sensitive or private content can only be displayed at certain times, on specific days. Restrict access to certain playlists. Restrict access to certain aspects of the network via user profiles.
- Control access to select groups and subgroups of Players.
- Control access to monitoring, playback reporting and technical settings.

Active Directory and ADFS for Single Sign On

The Insight Engage CMS supports easy integration with existing LDAP servers for user provisioning and single sign-on. Active Directory can be leveraged natively when running a self- hosted (On-Premise, On-Premise Cloud) server environment. ADFS can be leveraged by customers being hosted on Delphi's SaaS servers. SAML 2.0 is supported for single sign-on.