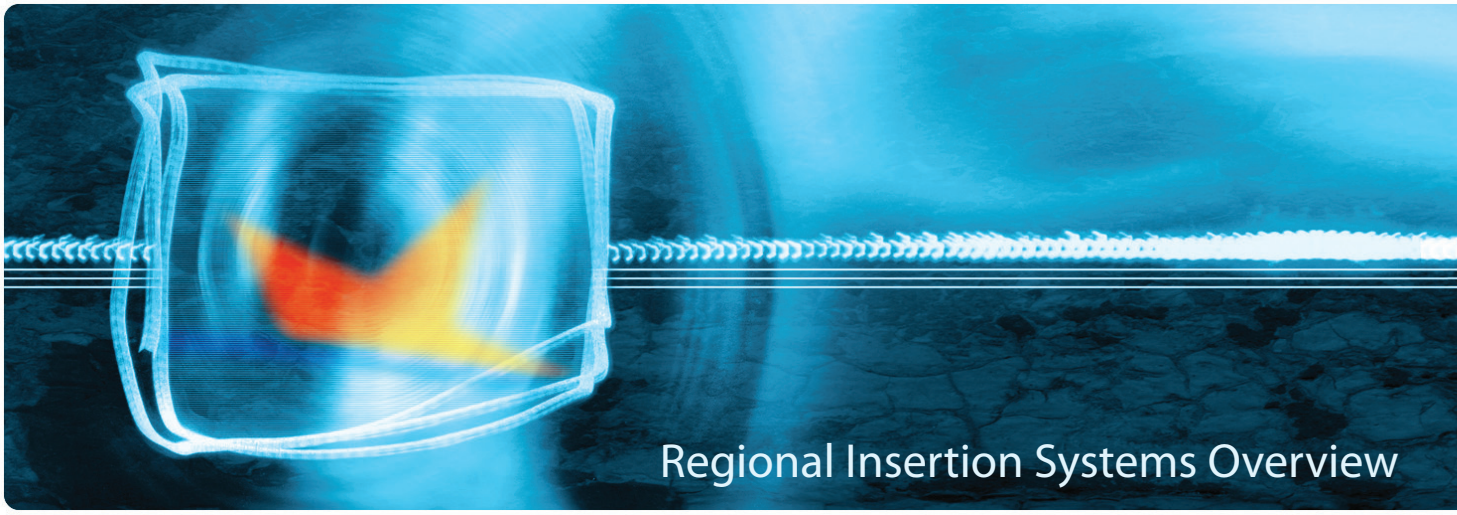

Regional Insertion Systems Overview

Starfish Technologies has a successful track record of designing and delivering Regional Insertion Systems to European broadcasters.

A typical system will be implemented using a combination of Starfish off-the-shelf software, traditional broadcast transmission hardware and be-spoke software developed by Starfish to work within, and interface with, the existing broadcast scheduling and transmission automation system.

Typical System Architecture

The system architecture is defined solely by the broadcaster's workflow requirements; however typical configurations are built as two main parts. The local or central site (there may be more than one) and the remote transmitter site (there may be many). The locations of the regional material ingest and playout systems will then define the basic architecture as:

Local Ingest – Remote Playout

Remote Ingest – Remote Playout

Local Ingest – Local Playout

Local Ingest – Remote Playout

Ingest - The regional opt-out material is ingested at the local (or central site). The material will be checked for quality assurance and then using a WAN connection, (which could be a simple ADSL link) the schedule and opt-out material is transferred to the remote playout location. The service opt-out signal is encoded into the network feed VBI.
Playout - The remote site will consist of a dedicated playout server and a video switch. The regional schedule is received via a WAN connection and this will start the process of loading the required clips (advertisements or programmes) onto the playout server.
The service opt-out signal is decoded from the network feed and this triggers playout of the regional content from the transmission server, and simultaneously switches the system output from the network feed to the server output. At the end of the regional opt-out another VBI signal will instruct the system to switch back to the main network feed.
Starfish software maintains the local database of regional material and in emergency situations will playout appropriate pre-stored 'rescue' clips. The system also manages the utilisation of the remote storage and files are automatically deleted if they have not been used for some time, and are not scheduled for re-transmission in the near future.
As-run logs are formatted and sent back via the WAN link to the central site for analysis.
This system can be simply expanded to provide multiple channels of regional opt-out services by expanding the number of regional transmission sites.

Possible Workflow

The system workflow will be similar to that outlined below. Because the system works as a set of asynchronous processes, there are several operations running simultaneously.

- Ingesting of playlists and metadata from 3rd party scheduling system
- Media encoding or transcoding and QC
- Delivery of playlists to remote transmitter sites
- Remote transmitter sites collect required media when it becomes available
- Cueing and transmission of playlists
- Retrieval of as-run logs from remote transmitter sites
- Ongoing transmission monitoring as required
- Ongoing compliance recording as required
- Ongoing management of video server disk space at the remote transmitter sites
- Ongoing collection and presentation of status information and reports

Starfish supplied a system with this configuration and workflow to TV4 in Sweden in 2004. The system played out regionalised advertisement breaks from 32 remote and unmanned server sites.

Remote Ingest – Remote Playout

In this configuration, ingest of the regional opt-out material takes place at the remote server location, and there is a direct network connection from the ingest system to the playout server.
Schedules are typically generated at the main (central site) and a WAN connection allows delivery of the opt-out schedule to the playout system.

Possible Workflow

The system workflow will be similar to that used with local ingest – remote playout, apart from the Media encoding or transcoding and QC which now takes place at the remote site.
Starfish installed a system with this architecture in Moscow in 2008, used for regional advertisement insertion and programme replacement.

Local Ingest – Local Playout

When using this architecture, ingest and QC of the material is at the central site and the broadcast switching now takes place directly between the main channel network feed and a regional playout server located at the central site.
Because this architecture requires full broadcast bandwidth for transmission of every opt-out service, it is typically only used when the main transmission signal is multiplexed DVB. The remote sites are now only responsible for de-multiplexing the appropriate channel from the DVB stream.

Possible Workflow

The system workflow will be similar to that outlined below. Because the system works as a set of asynchronous processes, there are several operations running simultaneously.

- Ingesting of playlists and metadata from 3rd party scheduling system
- Media encoding or transcoding and QC at the central site
- Direct delivery of opt-out playlists to local regional playout systems
- Regional playout servers loaded with opt-out content via direct connection from local ingest system and storage
- Cueing and transmission of playlists via local control
- Playout and switching of Opt-out system via direct control of the central system
- As-run logs passed via local network for analysis
- Ongoing transmission monitoring as required
- Ongoing compliance recording as required
- Ongoing management of video server disk space
- Ongoing collection and presentation of status information and reports

Starfish installed a system with this architecture for 30 channels of regional news and advertisement insertion at TV4 in Sweden in 2008.

Starfish Components

A system is typically built from a number of Starfish products as detailed below.

PC and Operating System

We use the latest generation enterprise grade servers and Windows 2008 64-bit operating system.

Tessera Scheduling System

Tessera is a fully featured broadcast scheduling system based on a mirrored SQL server pair which stores schedules, a media library, playout details and other associated metadata.
Tessera will import commercial break schedules from the broadcasters existing media scheduling and Ad sales systems and use these to manage the media ingest and file delivery to the appropriate regional playout server. After transmission, Tessera will collect as-run information from the regional playout server and present an as-run report in the broadcaster's specified format.

Starfish Automation Hardware (used in Remote playout systems)

Starfish produces a range of SDI hardware for VBI management and triggering of remote devices using VBI based commands, or SCTE signalling standards. We typically include our own system for managing insertion of Break ID and control instructions. At the remote site our InVision server includes a VBI/SCTE decoder application that directly connects to the Media Management application within InVision.
The order and timing of the transmissions is controlled by signalling including CUE XXX, PLAY and STOP commands. The insertion of these commands is controlled directly by the broadcasters existing central automation system. The requirement for a CUE command that is specific to each commercial break or channel opt-out ensures breaks cannot be played out of sequence as a result of a PLAY or STOP command being lost in the transmission path. This is a very important feature and benefit of this solution and offers significant reliability improvements over traditional 'tone based' or 'white-line' switching techniques.
There may be a number of devices which need to be switched in order to change from network transmission to local playout and back, and these are managed and controlled directly by the InVision Decoder application.

Immedia

In this application Immedia is used for media collection - via ingest from tape or transcoding of existing files. Immedia can analyse media during this process and produce browse quality copies and timecode information.

InVision

InVision is the playout server engine. The exact specification of the server used is agreed with the broadcaster and can be a traditional 3rd party broadcast server or a Starfish Regional Insertion System server that incorporates the InVision functionality and a playout server in a single system.
InVision accepts playlists and responds with acknowledgements which include whether the media in the playlist is already present on the server. It manages its own disk space and deletes files that have not been used for some time, and that are not scheduled for re-transmission in the near future.
After transmission, InVision will return detailed as-run logs. System and error logs are also delivered back to the Tessera server for appropriate handling. InVision is designed for remote operation with only intermittent communication back to the scheduling system. If media is not present at the time of transmission, InVision will fill in gaps with "rescue clips" to maintain the structure of the playlist as far as possible without inadvertently switching back to network output ahead of time.

Third Party Interfaces

Our systems will typically interface to several systems currently in use at the broadcasters transmission centre.

Scheduling System Interface

Starfish implement the opt-out schedule control with the Tessera scheduling system.

Automation System Interface

The broadcasters existing transmission automation system will control the Starfish Automation hardware to insert the system control commands into the network feed signal. These commands are decoded by the Starfish system at the remote site.

As-Run reports

The broadcaster provides a playlist format for Starfish to implement the required As-Run report structure.
The direct interface to the current scheduling system, to produce the regional opt-outs schedules, and the generation and delivery of compatible as-run files are major benefits of the Starfish system. This results in minimal re-training in the scheduling department and automatic generation of regional reports for analysis and advertisement billing etc..

Reading Enterprise Centre, Whiteknights Road, Reading, RG6 6BU. United Kingdom.
Tel: **+44 (0)118 935 7253** Fax: **+44 (0)870 132 6277** email: **sales@starfish.tv**