AVECO

Integration with Harmonic Spectrum XE
Automation Open to any Broadcaster

OVERVIEW

Harmonic Spectrum XE Integrated Playout Device

The Spectrum XE from Harmonic combines integrated play-out features with encoding and rendering. This makes it an ideal device for capturing and broadcasting digital television signals over satellite, cable, terrestrial, and IP networks, as well as for regionalizing programs.

ASTRA Control

ASTRA controls the Spectrum XE by using its native API to take advantage of all of its advanced features. Combined with ASTRA MAM capabilities, ASTRA can control the entire workflow from ingest, file transfers, transcoding and frame accurate playout.

Harmonic Spectrum XE

ARCHITECTURE

### ASTRA / Spectrum XE Integration – Remote Ad Insertion

In this example, there is a Hub which provides a central ingest and QA facility, centralized storage, and a traffic system. Each region contains a Spectrum XE for playout of a program with local ad insertion.

ASTRA controls the entire workflow:

- ASTRA downloads the playlist from traffic, converts it to a Spectrum XE playlist and send it to each region's Spectrum XE.

- ASTRA looks at the playlist, identifies what files need to be sent to each Spectrum XE and transcodes them (if needed) into the required format.

- ASTRA retrieves the "as run" log and list of files back from Spectrum XE for reconciliation. Any missing clips or events are identified and automatically downloaded again.
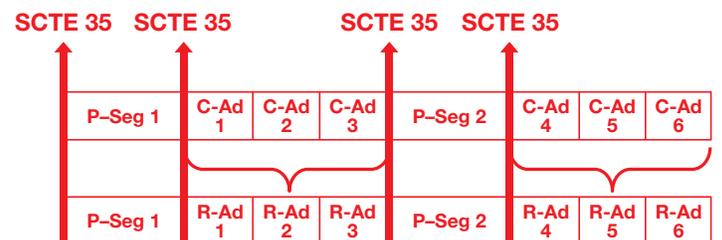
- ASTRA sends the program feed to an ASI encoder and inserts SCTE 35 triggers to indicate the start and end of a commercial break.

- ASTRA receives status information from each Spectrum XE – and shows to operator the real-time status of each regional playout.
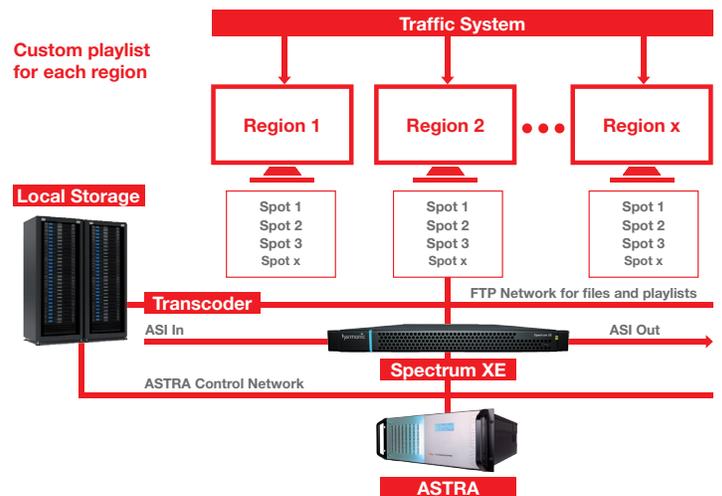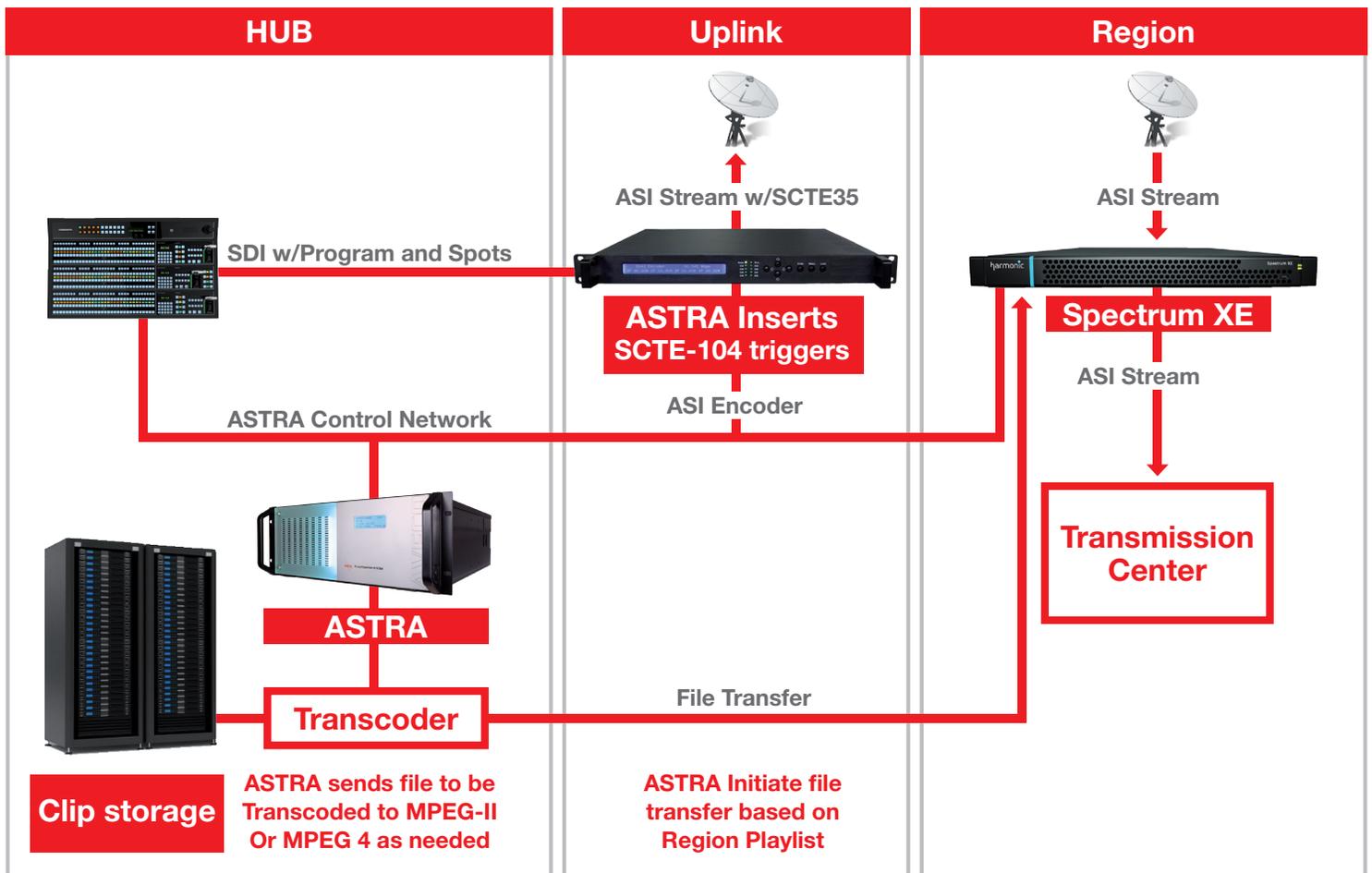

Data flow diagram under ASTRA control.

ASI Stream

The ASI Stream sent to the regions will contain commercial breaks and program segments. At the beginning of each commercial break, an SCTE 35 trigger (digital cue tone) tells Spectrum XE when to start its playlist. At the end of the break, Spectrum XE switches back to the program stream.

	SCTE 35	SCTE 35				SCTE 35	SCTE 35		
P–Seg 1	C-Ad 1	C-Ad 2	C-Ad 3	P–Seg 2		C-Ad 4	C-Ad 5	C-Ad 6
P–Seg 1	R-Ad 1	R-Ad 2	R-Ad 3	P–Seg 2		R-Ad 4	R-Ad 5	R-Ad 6

The top diagram shows the feed into Spectrum XE. The bottom diagram shows the insertion of regional ads triggered by SCTE 35 triggers.

HUB | **Uplink** | **Region**

SDI w/Program and Spots

ASI Stream w/SCTE35

ASI Stream

ASTRA Inserts
SCTE-104 triggers

ASI Encoder

Spectrum XE

ASI Stream

ASTRA Control Network

ASTRA

Transmission Center

File Transfer

Transcoder

Clip storage

ASTRA sends file to be Transcoded to MPEG-II Or MPEG 4 as needed

ASTRA Initiate file transfer based on Region Playlist

Typical configuration for regional ad insertion

Digital Cue Tone Insertion (SCTE 35 triggers)

The ASI Stream needs to have triggers inserted in order for Spectrum XE to know when to start inserting ads. An SCTE 35 trigger is analogous to the cue tone used today. SCTE 104 commands are defined as a protocol for traffic to generate SCTE 35 triggers. ASTRA uses the SCTE 104 protocol to program either the ASI encoder or an SDI inserter which will embed SCTE 104 triggers in the SDI stream prior to ASI encoding. If SCTE 35 triggers are not available, ASTRA can also use a third-party digital cue tone device for control.

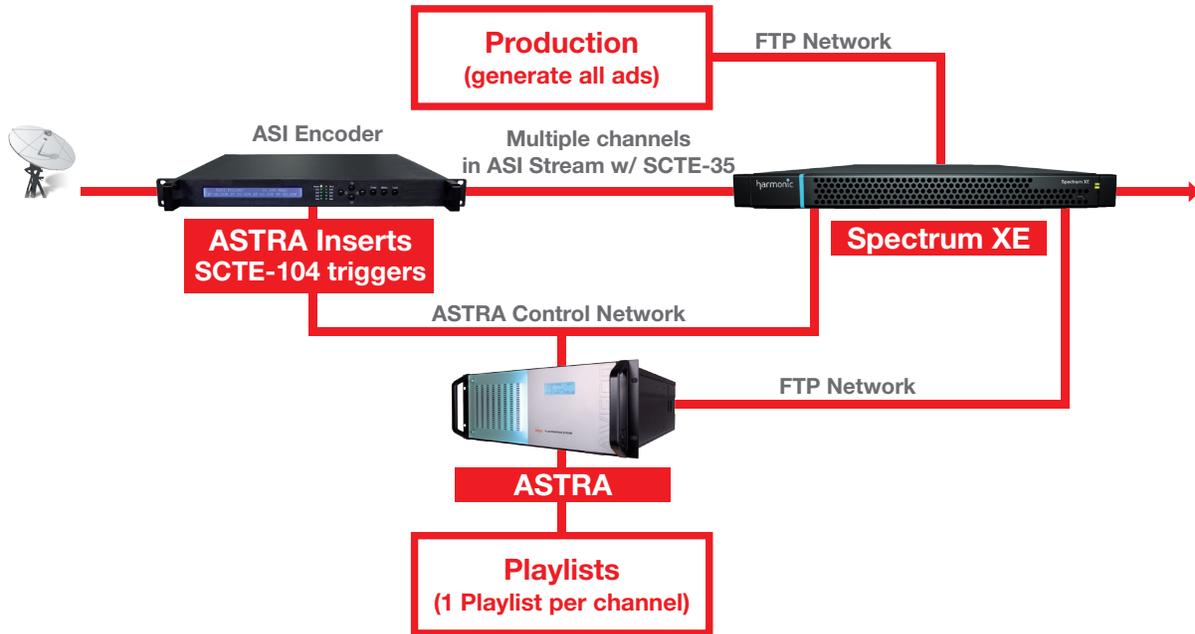## Simple Use Case – Ad Insertion for 20 Channels

For a clean transition between regional ad playout and program playout, the inserted regional break should be frame accurate so no black is shown (if too short) or the last clip is cut (if too long). This is ideally planned in traffic when the regional playlist is generated. Spectrum XE's unique MPEG frame-accurate insertion capability enables these seamless transitions.

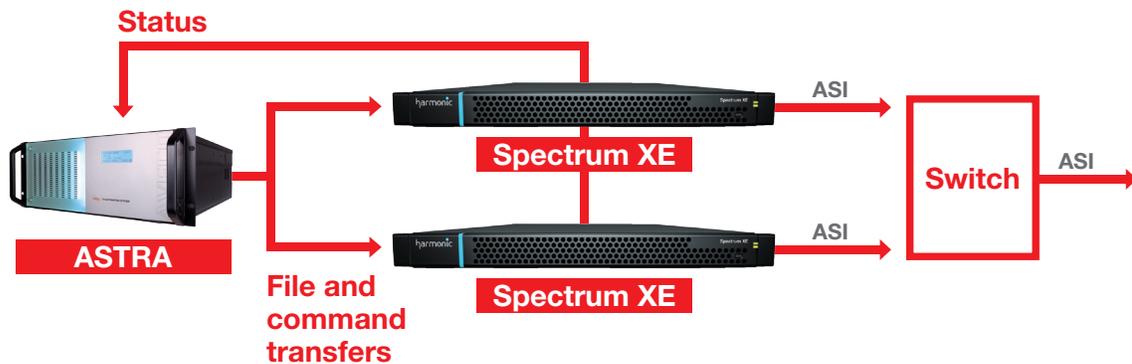## Playlist Distribution, File Transfers, and Transcoding

Critical and smooth operation is delivered by automating as much of the workflow as possible. ASTRA provides all the tools to automatically download the regional playlists, copy the required files to the regions and transcode the clips to MPEG-2 or MPEG-4 for playout in Spectrum XE. Manual intervention for any of the above functions is always available for last minute changes.

Real-time Monitoring and Redundancy Options

For redundancy at the region, ASTRA can control mirrored Spectrum XE devices. Commands are sent to both as if they were both on-air. If one fails, the region simply switches over to the backup Spectrum XE. ASTRA continually monitors the devices for status and displays it in ASTRA's monitoring window.

Production
(generate all ads)

FTP Network

ASI Encoder

Multiple channels
in ASI Stream w/ SCTE-35

Spectrum XE

ASTRA Inserts
SCTE-104 triggers

ASTRA Control Network

FTP Network

ASTRA

Playlists
(1 Playlist per channel)

Spectrum XE playout server

Status

Spectrum XE

ASI

ASTRA

Switch

ASI

File and
command
transfers

Spectrum XE

ASI

ASI

Real-time monitoring & redundancy options

✓ **SUMMARY**

ASTRA can control Spectrum XE in a variety of different workflows for regional ad insertion or other workflows. In addition, ASTRA can monitor the whole workflow including ingest, content management, insertion of SCTE 35 triggers, file transfers, file transcoding, and downloading of the playlist to multiple sites. ASTRA provides the operator an easy to use interface that helps eliminate operator errors and reduces complexity for the control of the many different regions.