



Integration with Harmonic Spectrum XE

Automation with the IT-based Playout and Compression Device

OVERVIEW

Harmonic Spectrum XE

The Spectrum XE from Harmonic combines integrated playout 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

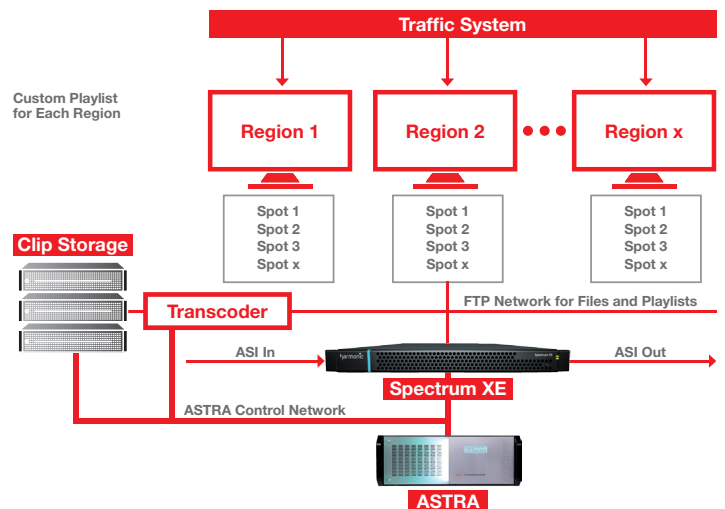
ASTRA / Spectrum XE Integration, Remote Ad Insertion

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 and sends 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.

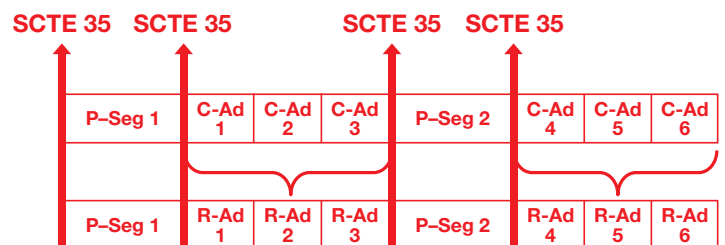
- ASTRA sends the program feed to an ASI encoder and inserts SCTE 35 triggers to indicate the start and end of a commercial break.
- ASTRA continuously monitors each Spectrum XE – and shows to operator the real-time status of each regional playout.



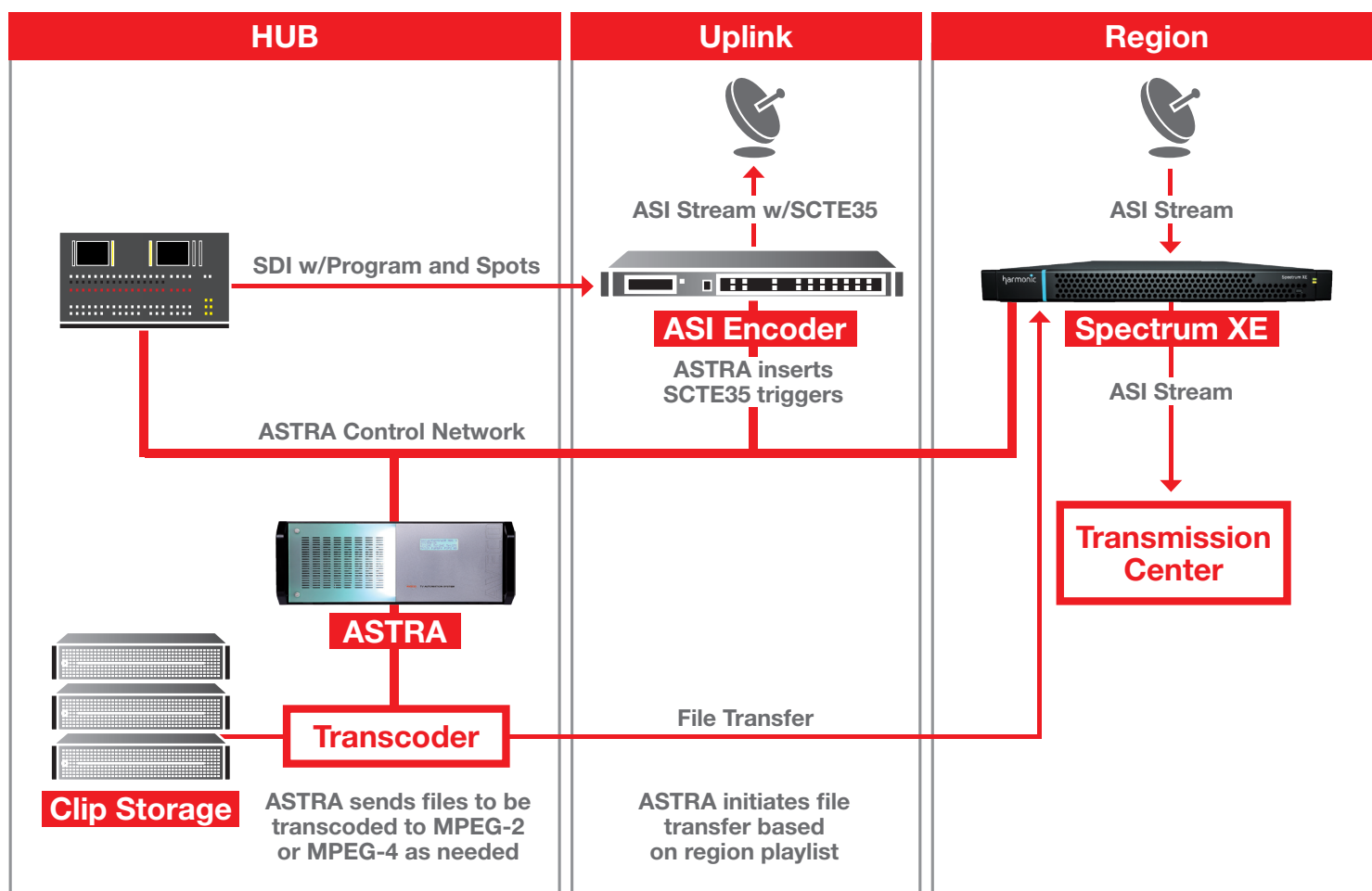
Data flow diagram under ASTRA control

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.



The top diagram shows the feed into Spectrum XE, that consists of program segments and ad breaks. The bottom diagram shows the insertion of regional ads triggered by SCTE 35 triggers.



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. 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.

Timing Considerations

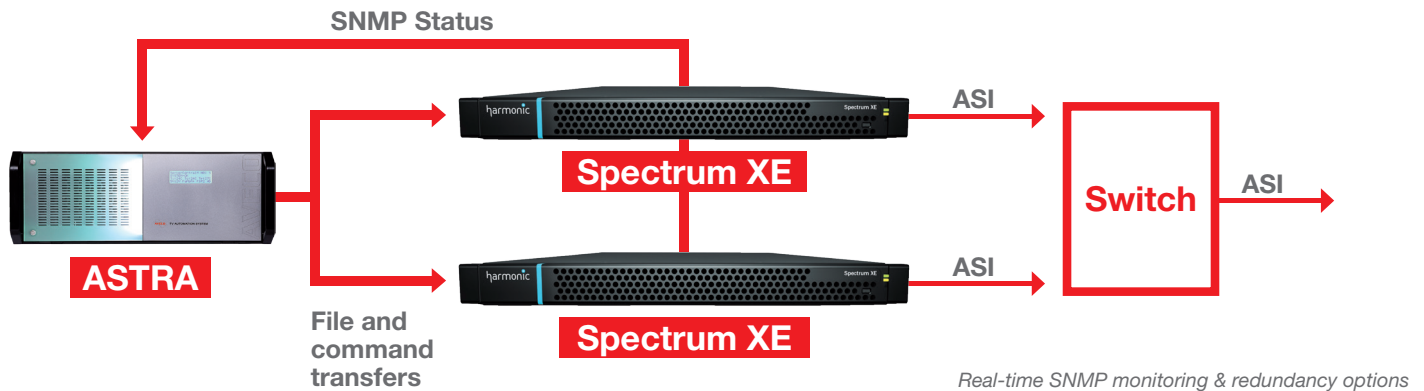
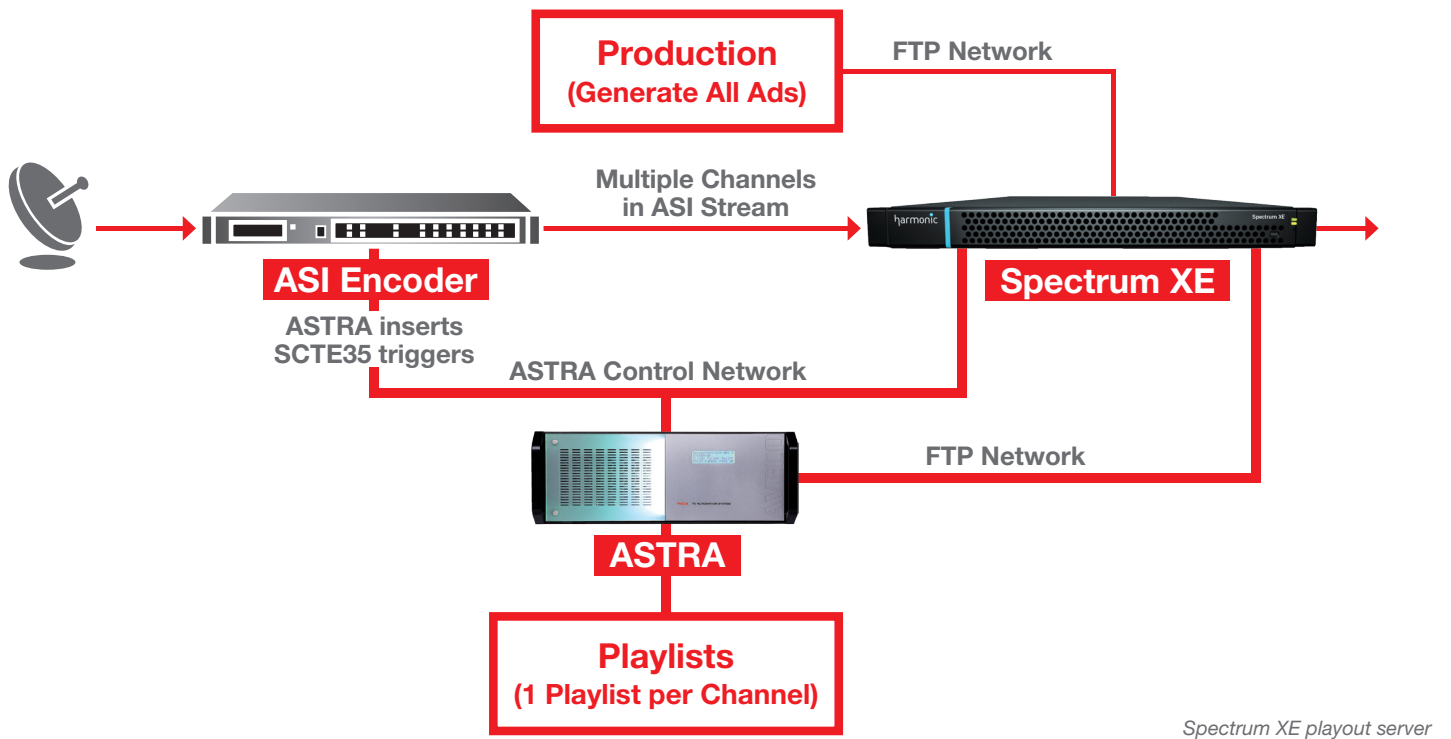
For a clean transition between regional ad playout and program playout, the inserted regional break should be frame accurate so no black is shown (if too short) or the last clip is cut (if too long). This is ideally planned in traffic when the regional playlist is generated. Spectrum XE's unique MPEG 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 SNMP 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 status of the devices and displays it in ASTRA's monitoring window.



SUMMARY

As broadcasters seek for additional revenue streams, the technologies for ad insertion as well as niche channels or on-off channels are gaining importance.

The integration of ASTRA automation with Spectrum XE playout engine is the perfect answer to this challenge, that is easy to deploy, efficient to operate, providing the viewers the required set of services.

ASTRA as a full scale automation system can control

at the broadcast facility both the premium TV channels, newsroom studios, niche channels as well as the regional ad insertion. Even if this combination may bring a need of variety of new media manipulation and playout workflows, all of them are automatic, hidden behind the unified, easy to use ASTRA GUI. The benefit of this architecture is that it allows to introduce more sophisticated commercial strategies and campaigns that are coordinated and real-time synchronized across all channels, all news bulletins as well as properly timed social media messaging.