COMARK Communications

HITACHI Inspire the Next

Transitioning to ATSC 3.0

CDS Powered by *TITAN Live*

Hitachi-Comark provides high performance, award winning television transmitters and encoding solutions that are backed by more than 45 years of leadership in broadcast technologies. Comark Digital Services (CDS) is paving the way in integrated ATSC 3.0 solutions.

ATSC 1.0 vs 3.0

ATSC 1.0 was built upon MPEG2 compression technology allowing for a mix of HD and SD programs. ASI is the typical interface between equipment in the encoding and transmission work flow.

ATSC 3.0 is a fully IP connected solution using HEVC compression technology. HEVC yields approximately a 4x improvement in efficiency over MPEG2 compression. ATSC 3.0 also allows for a better image, utilizing HDR and WCG technologies to enhance depth and color. While UHD / 4K is possible with ATSC 3.0, broadcasters will likely adopt 1080P60 / HDR as the de facto resolution transmitted via the over-the-air (OTA) signal as it provides a good compromise between video quality and utilized bandwidth.

Physical Layer Pipes (PLP's)

ATSC 3.0 allows broadcasters to specify the trade-off between payload capacity and signal robustness. Each OTA signal can be configured with multiple PLP's that can be setup for anything from high bit rate services (UHD / HD) to low bit rate services (NRT / mobile) and everything in between. One simple example is to use one PLP for HD programs (1080P60 / HDR) and a second PLP for distributing multiple lower resolution programs. Due to the flexibility that ATSC 3.0 offers, each broadcaster must decide how to best utilize the capacity of their 6MHz RF channel in ATSC 3.0.

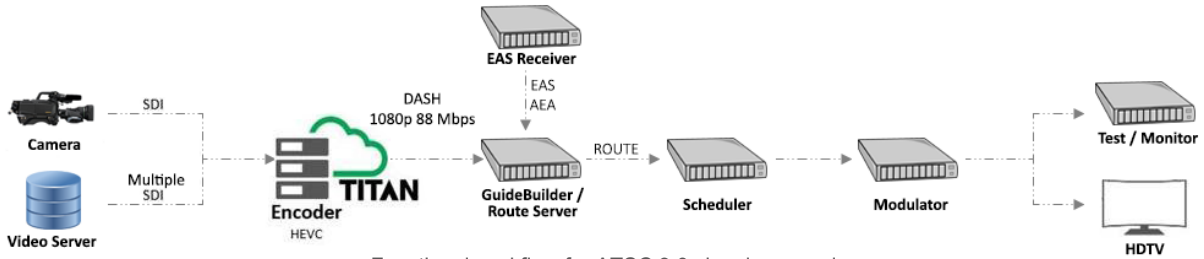
Converged Software for ATSC 3.0

CDS Powered by ***TITAN Live*** is a converged, software-based solution for live video compression, stream processing, and control / management. The CDS encoding solution is particularly suited for ATSC 1.0 and ATSC 3.0 since the encoding software is licensed per input program. Each encoding license supports multiple outputs, including MPEG2, H264, and HEVC, at no additional cost.

Transitioning to ATSC 3.0

OTA stations moving towards Next Gen DTV will require additional hardware / software to meet the ATSC 3.0 standard. The first device, a ROUTE server (i.e. the Enensys vCaster) is used to deliver all of the data streams, including video, audio, and captioning. A broadcast gateway (i.e. the Enensys vBG or virtual Broadcast Gateway) provides encapsulation and sends the signal via the STL to the transmitter's ATSC 3.0 enabled exciter(s). Both products are typically installed at the studio or the network operations center.

Newer transmitters from Hitachi-Comark are equipped with EXACT-V2 exciter platforms that are software upgradeable. A new license key is supplied for each DTV exciter, unlocking its ATSC 3.0 capabilities. Older transmitters can be potentially upgraded with new exciters, however the RF output power needs to be confirmed since ATSC 3.0 has a 3dB higher peak-to-average ratio compared to ATSC 1.0. Total output power may need to be de-rated from 1.0 to 3.0 operation.



Functional workflow for ATSC 3.0 signal processing

ATSC 3.0 HIGHLIGHTS:

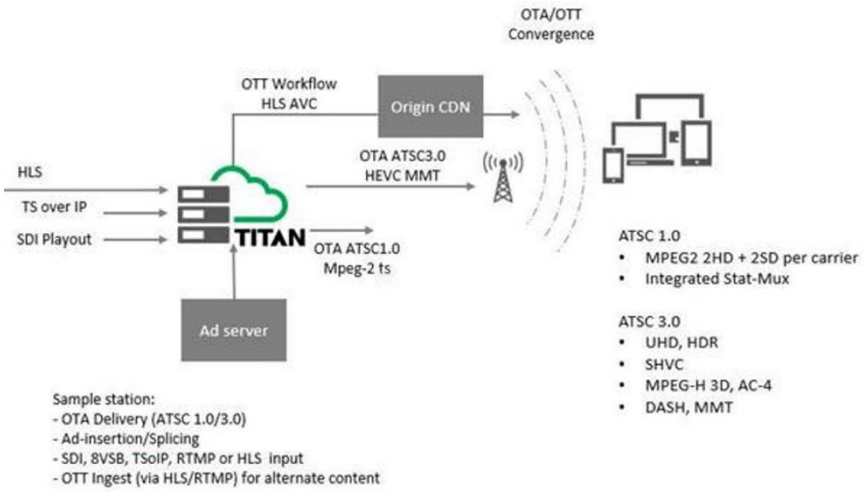
- Scalable Solution, Buy Only What is Needed, Upgrade Later
- Web-Based GUI, User-Friendly Management Solution
- Very High Quality H.265 / HEVC Encoding for SD / HD programs
- OFDM RF Waveform with 28Mbps Typical Throughput
- Complies with A/324 IP Studio to Transmitter Link Specification
- IP Optimized Platform Maximizes Technology Evolution

Convergence of OTA and OTT

The ATSC 3.0 standard is "IP enabled" by design. This allows for simple and effective distribution of content simultaneously to viewers of the over-the-air (OTA) signals as well as over-the-top (OTT) feeds. The convergence of OTA and OTT is therefore done by design and mainly a function of the home gateway and / or the DTV set. These devices need to manage the synchronization between both distribution paths.

OTA and OTT workflows are based on DASH (Dynamic Adaptive Streaming over HTTP). DASH, similar to HLS (HTTP Live Streaming) enables HQ streaming of content over IP connections.

TITAN Live provides not only source HEVC encoding, but also the DASH packager in the same platform. Therefore, you can have .ts, HLS, DASH, and even MPU's synchronized together to enable multiple, parallel distribution paths.



Functional workflow for Converged OTA and OTT services

Moving from Hardware to Software

With the advent of faster CPU's and the intellectual property that is the foundation of ***TITAN Live***, encoding has been able to move from FPGA to general purpose CPU. This allows the encoding solution to run on premises, virtually in the cloud, or a hybrid of both without any "proprietary hardware boxes" to manage or ship around.

Virtualization and the Cloud

Moving to processes running purely in software using standardized commercial off-the-shelf servers, we do not need dedicated hardware platforms for each operation. We simply need to have enough processors for peak performance demands as well as software processing start-stops. This strategy is known as "virtualization". The principles of virtualization can be applied at a number of levels of the ATSC 3.0 signal processes. Using VM's for each step of the signal processing chain can now be accomplished via cloud computing.

Virtualized ATSC 3.0 Processing Modules

In addition to CDS Powered by ***TITAN Live***, the following software modules are also available as virtualized applications for deployment via commercial off-the-shelf server(s) or cloud-based environments.

vCaster is the virtualized software designed to support the delivery of live content from HEVC encoders or non-real-time content over ROUTE/MMTP protocols, generating all the ATSC 3.0 signaling (LLS & SLS) to enable a perfect service scan & decode by DTV receivers.

vBG is the ATSC3.0 virtualized Broadcast Gateway that encapsulates MMT, ROUTE, ALP, or any other IP streams into an ATSC multiplex, inserts synchronization data from Single Frequency Network (SFN) broadcasting, allocates data into the different Sub-Frame / Physical Layer Pipes (PLP's), and generates STLTP output packets (A/324 compliant).

Get our free White Paper at www.comarktv.com

ORDERING INFORMATION

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