



Security Systems for NextGen TV Broadcasts

Executive Summary

Introduction

The ATSC 3.0 standard specifies service and content protection systems that are essential for the security of broadcast transmissions, applications and content. Implementing these systems insures NextGen broadcasts meet the standards specifications, can work correctly with receivers, provide viewers with Internet level security, allows broadcasters to protect content from piracy and provides for future monetization opportunities. The A3SA (ATSC 3.0 Security Authority) was created by the major networks and large broadcast groups, in consultation with the Consumer Technology Association (CTA), to implement these ATSC standards. A3SA is developing the necessary infrastructure and governance to support their adoption, bringing these capabilities to the content creation, broadcast and consumer electronics industries and for the protection of our viewers.

What security technologies need to be implemented?

Signal and application signing provide assurance that the signal is being received from an licensed broadcaster proving the authenticity of our broadcast transmissions and that any associated applications have not been tampered with. Signal and application signing are required in the 3.0 standard. Applications must be signed by the author/developer and separately by any broadcaster transmitting the app.

Content security utilizes the same encryption technology used by Internet streaming services. Its promise has long been desired by content owners, producers and distributors as well as broadcasters looking for the prevention of signal and content theft and for additional monetization opportunities. This is one of the great advances in ATSC 3.0. Content encryption is optional but is commonly required by media companies in their distribution agreements.

Receiver manufacturers have already begun to implement these security features. Depending upon a consumer's settings, a receiver may decline to display an unsigned station's content. For applications, many receivers will not load an unsigned or improperly signed application.

What Do Broadcaster Need to Do?

Broadcasters need to start installing signing ASAP.

Host (Lighthouse) broadcasters need to apply for and purchase signing certificates from A3SA's vendor Eonti. They must be installed in your ATSC 3.0 broadcast equipment and tested for compliance through the A3SA, as soon as possible. Broadcasters do not have to register with A3SA for signing credentials.

The graphic that follows shows the steps necessary to complete the signal signing process. A more detailed explanation and full instructions for completing the full signal signing process is available in the A3SA Application Note - Preparation for NextGen TV Signal Signing available from this URL:
<https://members.a3sa.com/wg/Tech/document/1123>

Broadcasters also need to register with A3SA to obtain the necessary credentials to begin the process of implementing content security. Receiver manufacturers have begun to implement this technology as well. Broadcaster adoption encourages further receiver implementation as well as protecting broadcast content and prepares for new business opportunities. A flow chart of the steps necessary will be published shortly.



How Does it Work?

Because ATSC 3.0 is an IP-based transmission system, these implementations are based on technologies originally developed for the Internet and are currently in wide-spread use by broadband providers and streaming services. They are being adapted for broadcasting by ATSC, A3SA, CTA, Eonti, Widevine and others. Although these services involve complex technical and legal issues, the fundamental concepts are straightforward and mature.

Key to these security systems is the implementation of a Public Key Infrastructure ("PKI") to establish and maintain a set of Certification Authorities ("CAs") to issue trusted digital Certificates. Signal and application signing, and content security utilize digital certificates to prove emissions and applications are authentic. Signing Certificates are issued only to FCC licensed broadcasters to cryptographically sign Broadcaster Applications and Signaling Tables. Device Certificates are credentials that ensure a receiving device can be trusted. Device Certificates are only issued to device manufacturers that comply with the FCC's rules and regulations and have signed the A3SA Adopter Agreement.

A3SA has selected Eonti to provide their proven KPI technology and issue digital certificates for ATSC 3.0 signing. A3SA is providing the administration of this program as a service to the industry, but, there are fees associated with the acquisition and use of Eonti's services/certificates. Note, only 3.0 Host emitting stations (lighthouses) require certificates associated with distribution. However, authors of applications must acquire an additional certificate directly from Eonti for each of their applications.

A3SA has also worked with Google subsidiary Widevine to adapt their proven broadband content protection for digital rights management (DRM) and encryption for ATSC 3.0. This system is licensed through A3SA on an annual basis. All stations are required to have A3SA and Widevine licenses.

What Does It Cost?

| Annual Costs Related to ATSC 3.0 Security Systems | | | | | | |
|---|------------------|---------------------|-------------|--------------------|---------------|--------------|
| Vendor | Signal Signing | Application Signing | | Content Protection | | |
| | (2 certificates) | Author | Distributor | Small Market | Middle Market | Large Market |
| ATSC 3 Security Authority | n/a | n/a | n/a | \$1,000.00 | \$1,500.00 | \$2,000.00 |
| Eonti ¹ | \$998.00 | \$499.00 | \$499.00 | n/a | n/a | n.a |
| Google/ Widevine | n/a | n/a | n/a | none | none | none |
| Heartland Video Services ² | \$250.00 | as required | as required | \$850.00 | \$850.00 | \$850.00 |

¹Eonti costs do not include redundant certificates (\$299 ea.) for backup systems; Eonti also offers discounted two year licensing (\$899 per certificate).

²HVS costs are per engagement.

Arrangements have been made with Heartland Video Services to offer optional technical and operational assistance with the installation, implementation and certification of the signing and content protection systems for broadcasters. Self-certification, at no cost, is also permitted.

Additional Information

Is available from the admin@A3SA.com and our partners www.eonti.com, www.widevine.com, and www.ATSC.org.