Full-Motion Video Streaming

High-Efficiency Video Coding for DoD/SOF Applications

Availability of high-quality, low latency video can significantly impact Department of Defense, and in particular Special Operations Forces, mission success in real-time decision-making.

HEVC
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H.265

DoD/SOF generally have limited bandwidth across which to transport tactical data from multiple sources such as satellites, UAVs, and autonomous robotic systems. Bandwidth constraints present a bottleneck even as actionable video data increases with the widespread deployment of surveillance cameras and the growing reliance on mobile content capture and delivery from warfighters and agents on the ground via smart phones, tablets and other IP-connected devices.

Beyond the sheer volume of video data streaming into ISR operations today, larger resolutions such as HD and Ultra HD exponentially increase the raw content to be processed and delivered to warfighters and agency officials. Full-motion video can be compromised by video files so large they cannot be properly transmitted or so poorly compressed that they lose vital image acuity.

Overcoming Bandwidth-Constrained Networks with HEVC

DoD/SOF access to video streams is often confined to closed network televisions supported by set-top boxes or customized PCs equipped with streaming players. The fixed-function hardware upon which these enterprises have long relied may provide high performance and good picture quality for specific applications such as standard definition (SD) TV over traditional networks. However, long product life cycles mean the technology has a low likelihood of keeping pace with rapid advances in video formats and resolutions required to provide the full picture for war fighters, ISR analysts and governmental agents.

Video compression that can supply large volumes of HD content in real time for backhaul over constricted networks and to do so in a minimal footprint addresses this issue. HEVC is designed to provide high-quality video at substantially lower bitrates as compared to MPEG-2 and H.264. Proven, commercial broadcast-grade HEVC solutions can support DoD and SOF applications such ISR and video backhaul contribution.

AWS Elemental Deploys HEVC

The computational intensity of HEVC lends itself to the processing performance advantage available with graphics processing units (GPUs). AWS Elemental has deep experience developing video codecs from open specifications to full implementation using general-purpose programmable architectures (GPUs and CPUs). With a flexible software-based architecture, video processing solutions from AWS Elemental offer support for HEVC via a seamless software upgrade.

Easing the transition to HEVC within legacy MPEG-2 and H.264 infrastructures, upgradable solutions like those from AWS Elemental can incorporate new compression approaches much more quickly than existing fixed hardware encoding and decoding platforms. Flexible software running on massively parallel hardware makes the AWS Elemental computing platform an ideal fit for HEVC.
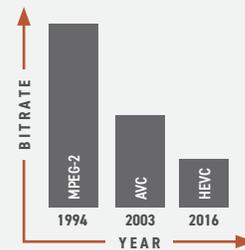
Full-Motion Video-Ready

AWS Elemental provides the ability to implement flexible and scalable HEVC video processing for the DoD/SOF. AWS Elemental video processing enables video backhauling using HEVC up to the point where AVC H.264 can be practically used to get vital video content over the network.

AWS Elemental support for HEVC also eliminates configuration complexity, optimizes mobile video delivery and reduces total cost of ownership. Because AWS Elemental builds software designed to run on off-the-shelf CPUs and GPUs instead of fixed-function processors, a mix of MPEG-2, H.264, and HEVC video content can be processed using a single platform.

AWS Elemental video processing solutions also perform real-time, full-motion video for UAV applications and are DIACAP compliant. They are ideally suited to an array of DoD/SOF applications including internal broadcasts, remote training, location monitoring, IPTV distribution, content library conversion and global communications.

HEVC ADVANTAGES

- Bitrate reductions of up to 50% for fixed video quality compared to H.264
- Higher quality video at the same bitrate
- Maintenance of line 21 closed caption (CC) data
- Ability to pass through encoded KLV metadata
- A standard syntax to simplify implementation and maximize interoperability
- Network-friendly support – multi/unicast delivery via MPEG transport streams

BITRATE

| MPEG-2 | AVC | HEVC |
| 1994 | 2003 | 2016 |

YEAR

AWS ELEMENTAL WORKFLOW

RPA

ISR

ENCODING
AWS Elemental **LIVE**

SATCOM

TERRESTRIAL COMMS
MPLS, Multicast

TACTICAL COMMS

SATCOM
Mobile ISR

TACTICAL/MOBILE
Devices

ISR NETWORK
Control Center

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