

DHS Science and Technology Directorate

Communications and Networking Engine

Technology Engines Concept

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) launched a series of high-profile, high-impact Apex programs to look strategically at the nation's security and address future challenges while supporting today's operational needs. S&T Technology Engines were created to meet cross-cutting needs for all Apex programs.

Impact and Vision

The Communications and Networking Engine (CN-E) ensures first responders and other operators served by Apex programs can exchange information (i.e., voice, video, or data) through any medium. S&T develops many tools for end users that all rely on the foundational ability to transmit information via multiple networks. CN-E provides Apex programs, S&T programs, DHS components, and the Homeland Security Enterprise (HSE) with the most efficient and effective network solutions for reliable connections in any situation.

Description and Approach

CN-E provides Apex programs with integrated networking solutions to ensure interoperable communication across all network platforms (e.g., Wi-Fi, commercial 4G LTE, FirstNet or satellite). This Engine focuses on:

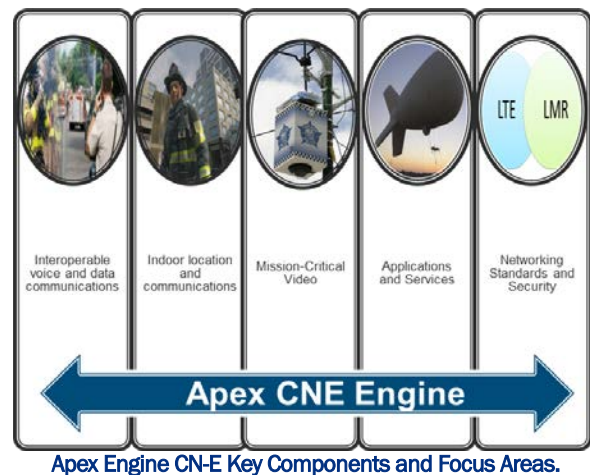
- (1) information exchange between DHS components, responders, and other end users, and
- (2) the network solutions for first responder communications with citizens in the alerts, warnings, and notifications area.

CN-E works towards the goal of keeping the Apex user community connected through the use of flexible network architecture. To achieve this vision, CN-E will accelerate targeted interoperability solutions to better equip end users to protect lives, property, and the nation.

Key Activities

- Work with Apex programs to identify requirements and apply existing capabilities to meet immediate needs.
- Coordinate with other S&T Engines and other S&T organizations to address Apex program needs
- Work with Apex program leadership to identify common-use cases to create interoperable communications and network models that are seamless for the end user.
- CN-E will promote the ability to move between networks without interruption or interference while reducing identified points of failure. The figure depicts key components and technology focus areas of CN-E. The best communications solution varies between different incident and network areas (e.g., communicating over long ranges or through buildings), so each case must be assessed

independently. CN-E will review the needs of and recommend dynamic solutions for each use case. Examples of these solutions include small cell deployable networks, unmanned aerial vehicles, cellular on wheels, or even wearable communications hubs integrated into a first responder's personal protective equipment.



Key Successes

- **Deployed the Datacasting network in Houston, TX to share real-time videos with law enforcement agencies which enhanced safety and reduced response time at the 2016 NCAA Men's Final Four and at the 2017 NFL Super Bowl, as well as during the 2016 Houston flood.** Technology reduced first responder response time to critical rescue efforts during Houston's floods and during major sporting events. The datacasting technology pilot has resulted in officials being able to view live-streaming footage from surveillance cameras stationed throughout the affected areas on their tablets and computers from their command posts.
- **Implemented nation-wide standard to enable interoperability of first responder assets.** CN-E restructured the P25 Compliance Assessment Program. Now P25 land mobile radio (LMR) equipment suppliers will formally demonstrate their products' compliance with a select group of P25 requirements. With compliant P25 LMRs, first responders and border patrol agents are ensured interoperability

CN-E will continue leveraging feedback from the community as well as the latest advancements from academia and industry to serve the Apex programs, S&T programs, DHS components and the HSE.