BUSINESS BRIEF

Smarter Systems Create Smarter Special Forces

Intel® Edge technology keeps forces up-to-date with real-time mission information

Mission Support

Special Operations Forces can now access new types of information to enhance their real-time decision making in remote environments by leveraging Intel® Edge technology with LoRaWAN* communications. By transforming system data into useful information through edge compute at the earliest point of data availability, Special Operations Forces can both communicate and receive real-time, relevant information about the world around them independent of central command or cloud connectivity. Technical advances have created new usage models that can now be leveraged to the real-time availability of mission information.

Examples Showcased at SOCOM

- Wearables that can silently recognize and communicate gestures, soldier activity such as running, walking, or laying prone, and biometrics such as pulse
- Vibration Monitoring that can identify, classify, and detail movements of vehicles and equipment out of visual range to provide advanced insight
- Chemical Sensors that can detect designated gases and communicate to a handheld device with prolonged battery life

New with the Technology Advances

Edge data computation and notification creates new mission operational flexibility – no tether to centralized command centers or data systems

By driving the compute process to the earliest point of data ingestion, data can become information to assist in remote missions without having to rely on traditional analytics processing that requires data to be sent to a centralized command data center. Data processing occurs on multiple devices and platforms including the sensor, gateway, and handheld devices, without relying on datacenter or cloud connectivity. This approach brings compute to the data rather than data to the computation.

The Intel® Knowledge Builder Toolkit is a machine learning algorithm development platform for Intel® Quark™ SE microcontrollers that help developers quickly create Pattern Matching Algorithms called knowledge packs. Developers can embed these knowledge packs into devices to create smarter sensors and wearable technology for special operations missions. Knowledge packs are easily updateable and hardware optimized and are created with the Intel Knowledge Builder Toolkit using only trained examples rather than more difficult DSP and custom coding techniques. This innovation, paired with security, provides new ways to generate information directly on the smart sensors and soldier wearable devices.

Using Wind River* Linux 8 as base on Cisco Gateways*, such as an IR829, paired with an interface module for LoRaWAN, developers can create custom modules for both analytical computation and notifications. Using tools that run on top of Wind River Linux, new opportunities to fuse information from multiple sensors can create real-time insights during analytical computation resulting in notifications sent directly from the gateway to another edge device, such as a handheld.

To securely manage the edge from both a system and data perspective, intermittent connectivity back to the data center may be required to support the system. However, mission operations do not require connectivity tethers unless there is a need to do system updates, such as algorithms for compute or security, and data exchange with a centralized command center system.

LoRaWAN communications – extended distance between system components and longer battery life

Our solution uses LoRaWAN - unlicensed low-power, wide area (LPWA) wireless connectivity. As a result, with the combined use of LoRaWAN and edge compute, the battery life of the sensors can be extended. Additionally, this innovative system design can do remote condition-based monitoring based on the fact that LoRaWAN greatly extends the communications distance between different nodes of the system.

Technology Summary

New Intel® technologies paired with LoRaWAN are allowing us to advance our connected, managed, secured platforms to support a real-time remote condition-based monitoring with new usage models that don't tether us to run operations with the centralized command data centers. This new flexibility frees systems users to use technology in new and innovative ways in theater.

Key Contacts:

- **Pete Schmitz** for DoD Business Development
  pete.schmitz@intel.com
- **Tiffany Sargent** for IoT Federal Solutions
  tiffany.a.sargent@intel.com
- **Tim Appleton** for Intel® Knowledge Builder Toolkit
  timothy.m.appleton@intel.com

0517/CAT/JW/PDF

♻ Please Recycle

335930-001EN