Defense Industry Internet of Things (D-IoT)
**DoD Internet of Things (IoT)**

- IoT is a rapidly evolving commercial capability that enables machine-to-machine data collection and creation of actionable data.

- Does IoT have benefit for DoD and Federal applications?

- If so, what are possible use cases?

- Have any proof of concept demonstrators been conducted to validate benefit of use cases?

- What metrics were collected at these demonstrators?

- How does IoT performance compare to legacy systems?
DoD & Federal Internet of Things (IoT)

- BAE Systems, Link Labs and Cisco are developing enabling technology for proof of concept DoD and Federal use cases
  - New wireless protocols performing significantly better than current systems linking sensors to data aggregators
  - Data Aggregation embed in Network Routers
  - Information Security
  - Soldier System Augmented Reality
Generalized System Model for DoD IoT
IoT Use Case Examples evaluated in Proof of Concept Demonstrators

• **Trident Spectre Adjunct Demo** – May 2015 demonstration of small sensors, communications and tracking – Virginia Beach, VA

• **DHS Urban Demo** – June 2015 Precursor demo for Operation Experiment ’15 – First Responder call for help and tracking – Columbia University, NY

• **OP-Ex 15 Demo** – July 2015 First responder evaluation of IoT in reinforced concrete buildings in NYC – NYC DHS Center

• **Army Demo** – August 2015 I2WD demo at Aberdeen of items of interest
DoD Internet of Things (IoT) Demo Kit

Multi-sensor
- 2 Way binary Comms
- Position Reporting
- Proximity Sensor
- Remote Control

Multi-sensor for Demo
(Future)

IoT Wireless Sleeve

Long Range Low Power IoT Data Aggregator and Router

In Demo

IoT Display

- Secure “Off-Grid” Network
- Configure Rules
- Monitor
- Control
- Communicate

Demonstration

Sensors

Feedback/Actuators
First Responder Use Cases and Demo

Project Responder 4

Conclusion: Need for distributed sensor data that propagates in urban environment without large infrastructure.

Key Finding:
Many of the potential technology advances will not be possible without the ability to transmit and integrate multiple sources of data. Many of these advances are dependent on sensor systems that provide real-time data about the location of responders, victims, hazards, and resources, the monitoring of physiological data and the progress of activity on the incident scene. Leveraging this technology could significantly improve the safety of responders and the public. However, without a data communications infrastructure, sensors will be able to collect data but may not be able to transmit it to incident command. Further, without a system to integrate the data, decision-makers may not be able to effectively assimilate and understand the large amount of incoming data. For example, the ability to identify the position of a trapped responder in three dimensions, inside a building, is a useful capability only if that data can be quickly and clearly transmitted to the appropriate persons.
2016 Planned DoD and Federal Demonstrators

- **Spectrum Survey Demonstrators** – White Space for 3.5 GHz, DoD spectrum situational awareness. Optimized Sensors for Spectrum Survey

- **Drone Relay** – IoT sensor collection (Store & forward) using commercial drones

- **Targeted First Responder Sensor** – UHF sensor for call for help/lack of motion detection. Prototype of indoor navigation

- **IoT Gateways** – IoT Sensor data collection with Legacy Radio backhaul into tactical network