TATRC TIMES

TATRC's MISL Lab Hits the Range at Ft. Dix for their Annual Research Event

ATRC's Medical Intelligent Systems Laboratory (MISL) has been at it again. Last summer the MISL team conducted another research event at Joint Base McGuire-Dix-Lakehurst (JB MDL) ranges in New Jersey. This year's event concentrated on collecting data on the latest research project that is focused on cloud capability on a military tactical radio network. In Multi-Domain Operations, with a near-peer adversary capability, commanders need near real-time situational awareness on the battlefield. A mobile cloud system can provide needed casualty information to the commander and the receiving higher level medical treatment facility.

The research event was hosted by the Army Futures Command (AFC) and Combat Capabilities Development Command (CCDC), Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center at JB MDL. The C5ISR provided the necessary vehicles required and established the closed-loop military tactical network. The focus of the event was centered on research of medical technologies performing specific and discrete types of interactions to obtain medic feedback and collect data related to the performance and network characteristics of the technologies.

The research concept and objective was to integrate cloud servers on a mobile Soldier Network Extension vehicle to simulate a Battalion communication point. Medical personnel in the field and medics in the ambulance would transmit medical data to the Medical Data Cloud Dashboard, which is being developed by the AFC CCDC Aviation & Missile Center Systems Simulation, Software and Integration Directorate. The medical device and sensors used by the medical personnel, collected the simulated casualty data while the medics were performing Tactical Combat Casualty Care on the mannequins with a variety of casualty wounds. The medical devices used during this research event to capture



FY 19 MISL Architecture (High Level Comms) diagram.

and collect data were the U.S. Air Force Research Laboratory's (AFRL) Battlefield Assisted Trauma Distributed Observation Kit (BATDOK) and Philips Remote Diagnostic Technology's Tempus ProTM physiological monitor.

As the medics pushed the simulated medical data to the Medical Data Cloud Dashboard, a medical provider back at the simulated Brigade Medical Company, used a laptop browser connected via a SATCOM LAN to view the medical data on the Medical Data Cloud dashboard; streaming vital signs telemetry and the Tactical Combat Casualty Care card. Even though the data was only one directional, future research is underway to create two-way voice communication, texting capability, and transmission of video and still imagery.

The other cloud capability being researched was the Naval Surface Warfare Center Dahlgren Division's Medical Common Operation Picture (MedCOP). This research capability utilizes Radio Frequency Identification (RFID) to track patient movement. The proof of concept worked very well as the casualty moved from the casualty collection point onto the ambulance, where an RFID reader collected the data and transmitted it to the MedCOP server which alerted the Medical Regulator. Then, when the ambulance arrived at a medical treatment facility and was off loaded, the RFID reader registered the casualty arriving. Additional research in tracking medical logistics and resupply via RFID is being explored and if additional RFID readers were available, the casualty could have been tracked from the point of care through the medical treatment facility's wards.

Mr. Carl Manemeit, TATRC's Deputy Lab Manager for MISL stated, "Our annual research event allows us to obtain critical feedback directly from the medics in the field. Only from Soldier-user feedback and direct observation of performance on real, tactical networks, can you effectively assess the potential of new medical information technologies for operational use."