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2:00 pm - 2:20 pm

Enabling Spectrum Dominance: Real-Time Signature Management and Spectrum Situational Awareness

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Abstract:

Spectrum dominance is reliant upon real-time understanding of the electromagnetic spectrum (EMS) and intuitive presentation of actionable information to Commanders without reliance on subject matter experts. Spectrum situational awareness is inherent in requirements for signature management, dynamic deconfliction, emission control (EMCON) policy distribution and enforcement, and spectrum agility for reliable communications. Automated capabilities leveraging AI/ML solutions for distributed sensor orchestration, data aggregation, and analytics are necessary to reduce the cognitive burden to the Warfighter and to alert to emerging problems that impact survivability in the field.

The OSCAR (Operational Spectrum Comprehension, Analytics, and Response) technology was developed to address current and emerging needs including tactical use cases such as Blue Force Monitoring, EMS signature comprehension, adaptive network resiliency, and real-time adaptive spectrum management. OSCAR utilizes a distributed network of passive RF sensors, including vehicle-mounted and man-portable systems, enabling real-time spectrum comprehension while on the move, with intuitive representations and alert propagation into a Common Operating Pictures (COP). Automated workflows enable real-time EMCON alerts, signal localization, and signature projections to inform physical and spectrum maneuvers. Further, autonomous spectrum analytics improve network robustness, rapid interference resolution, and localization of unauthorized / adversarial signals activity.

OSCAR has been thoroughly tested over the past year at multiple DoW exercises and in INDOPACOM deployments. In these events, OSCAR was operated by Army personnel to evaluate capabilities for tactical use cases. Results demonstrated multiple deployment configurations, real-time signature comprehension, interference mitigation, signal of interest (SOI) geolocation, network assessment, and EMCON policy adherence. Lessons learned from these events were utilized to improve OSCAR functionality for Army requirements.

This presentation will discuss the application of OSCAR for signature management and EMCON enforcement in tactical use cases. Results from prior test events and feedback from early adopters in INDOPACOM will be presented, along with discussion of lessons learned for spectrum dominance.