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Information Advantage at the Edge – Multi-Modal Search in a Tactical Form-Factor

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Abstract:

As the Department of Defense accelerates efforts to operationalize Combined Joint All-Domain Command and Control (CJADC2) – as well as its service-specific implementations such as the Army’s Project Convergence – the need for interoperable, scalable, and edge-capable data capabilities has never been greater. Central to achieving this vision is the ability to conduct Multi-Modal Search (MMS) across diverse, distributed, and often disconnected data environments.

The Ukraine conflict has underscored the urgency of enabling small, mobile, tactically resilient nodes that can operate under constant threat from drones, long-range fires, and EW attacks. Elastic’s Edge Kit delivers critical capabilities in these denied or degraded conditions by enabling real-time search and analytics at the tactical level, without dependence on persistent reachback or cloud access.

Elastic will demonstrate how its MMS platform can be deployed at the Tactical Edge in a form factor as small as a carry-on-approved “Edge Kit”, mirroring the design and scale of systems already deployed by Cyber Protection Brigades (CPBs). This compact solution, leveraging a ruggedized server with integrated NVIDIA GPUs, brings the power of high-performance computing, search, and AI inference directly to the warfighter, enabling decision dominance at the speed of relevance.

Unlike traditional keyword-based tools, MMS fuses disparate modalities, text, imagery, audio, and video, into a unified search experience. This cross-domain capability is essential for modern operations, where mission-critical insights are often hidden within non-traditional data types or siloed repositories. Whether analyzing dense policy documents, full-motion video from ISR platforms, or training archives, warfighters can now derive actionable insights through intuitive, AI-enabled search capabilities.

To bring this vision to life, Elastic will showcase a forward-leaning demonstration of an integrated MMS solution using its industry-leading vector database and a locally hosted large language model (LLM), all running on the Edge Kit itself. This "art of the possible" demonstration illustrates how CJADC2-aligned forces can unlock operational insights across all data types, enabling faster kill chains, better coordination across echelons, and smarter use of scarce bandwidth.

By bridging the gap between core enterprise capabilities and tactical edge needs, Elastic provides a powerful enabler for the DoD’s data-centric modernization strategy. This solution enhances mission effectiveness, accelerates data-to-decision timelines, and supports the broader objectives of CJADC2, Project Convergence, and cross-domain mission integration, ultimately empowering a more agile, informed, and resilient joint force.