



U.S. ARMY

NETWORKING THE SOLDIER

ARMY TACTICAL NETWORK MODERNIZATION

**“THE ARMY WILL
FIELD A NETWORK
THAT IS EASY TO
USE, WORKS IN
ALL ENVIRONMENTS,
IN ORDER TO
PREPARE FOR WAR,
AND TO WIN AND
FIGHT WARS.”**



THE NEED

The Army is committed to delivering a tactical network that guarantees we can prepare for war and fight and win against any adversary. Today, as part of the network modernization strategy, the Army is addressing the most critical operational shortfalls and pivoting to a new acquisition and requirements methodology to deliver a converged mission command network.

The Army is executing a modernization strategy to develop and field a network that is less complex, better protected, more expeditionary and that enables the sharing of mission command information in a Joint and multinational partner environment. The strategy is designed to target these network challenges and enable the Army to “fight tonight” while also actively seeking next-generation solutions to stay ahead of potential adversaries.



THE STRATEGY

The strategy is a fundamental change in the Army's approach to tactical network modernization, which is now focused at keeping pace with threats in the near term and developing an optimized future network through rapid insertion of new technology.

The strategy contains four supporting efforts focused on: institutional reforms, policy and governance, research and development, and more experimental and exploratory science and technology. Today, the Army is executing this strategy - enacting institutional and cultural change in how we will modernize the network to fully capitalize on private sector advancements and innovation.

In terms of developing and providing capability, the strategy focuses on: halting programs that do not address operational requirements; fixing the existing efforts that are necessary to fulfill the most critical operational shortfalls; and employing new acquisition and requirements methodology. This approach to mission command network modernization will allow rapid insertion of new technology, by leveraging commercial systems not specifically designed to exact military-grade standards, it also may reduce long-term cost.

Additionally, in order to incorporate real-time operational feedback and generate less prescriptive requirements, the Army intends to pursue the proven industry practice of developmental operations (DevOps), which places developers side by side with Soldiers and commanders in operational units to evaluate potential technology solutions. These assessments will inform future capability requirements, resourcing and acquisition decisions, and help the Army and its industry partners to evolve the network at the pace of warfighter demands and commercial innovation.



THE NETWORK-CROSS FUNCTIONAL TEAM

In the past, disconnects across the requirements definition, testing and acquisition communities, and warfighting units led to delivery of some capabilities that did not match operational needs. To mitigate this from happening in the future, the Army established Cross Functional Teams (CFTs) composed of operational community, capability managers, acquisition/contracting professionals and policy experts. Today, the Network CFT is developing capability documents through experimentation and technical demonstrations, coordinating network-related R&D and S&T with a near-term focus on automation and intelligence, resilient communications, and situational understanding of the electromagnetic environment; and prioritizing network related resources to ensure the Army is poised to quickly procure promising commercial capability. The CFT will support the rapid transition of leader-approved capability requirements to the Army Acquisition System and will address network disconnects and misalignments by horizontally and vertically integrating requirements while seeking available solutions for experimentation, demonstration and evaluation by Soldiers and leaders in the field.



ARMY NETWORK MODERNIZATION LINES OF EFFORT

The Army's strategy will focus on four modernization priorities, known as lines of effort (LOEs): creating a unified network transport layer; building a common operating environment (COE) for mission command applications; improving Joint Force and Coalition interoperability, and improving command posts' mobility and survivability.

LOE 1: UNIFIED NETWORK TRANSPORT

This effort will provide Army units communications and network services in a contested environment. Current focus includes Air to Ground networking, utilization analysis of Low Earth Orbit Satellites to augment communications and development/procurement of integrated tactical networks that support multi-domain operations.

LOE 2: COMMON OPERATING ENVIRONMENT (COE)

This LOE provides a simple, intuitive, single common operating picture through a single mission command suite. It will also support collaboration using a common picture with Joint and coalition mission partners, and leverage cloud and edge computing capability. This LOE delivers an integrated body of requirements that meet operational needs.

LOE 3: INTEROPERABILITY

The intent for this LOE is to define and develop the Mission Partner Environment (MPE) to improve network Joint interoperability and coalition accessibility. Going forward, the Army will procure solutions, such as gateway capability, that will incorporate the ability to leverage common commercial standards and/or widely recognized military interoperability standards.

LOE 4: COMMAND POST

This LOE will implement network capabilities that enable the Army to employ command posts across the operational spectrum, from early entry to major combat operations, and that resolve current issues with set-up and tear-down, survivability, mobility, suitability and footprint. This LOE will focus on developing and obtaining approval of requirements for integrated command posts, then delivering these integrated command post designs to Army units.



INTEGRATED TACTICAL NETWORK

The Integrated Tactical Network (ITN) effort is intended to satisfy existing gaps in the current network architecture. Focusing on a simplified, independent, mobile network solution at the Battalion level, ITN is intended to provide network availability down to the small unit dismounted leader through a composite network that integrates the Army's current tactical SECRET environment (applications, devices, gateways and network transport) with commercial network components and transport capabilities.

It aligns to the Unified Network Transport LOE by leveraging a network environment allowing for the secure exchange of information through a unified yet diverse network - taking advantage of both commercial and military transport - to enable communications in disrupted, disconnected, intermittent and limited bandwidth environments.

Initial experimentation to achieve enhanced integrated tactical network capabilities are already underway with operational units providing feedback to augment Army Network and Soldier systems, programs and efforts. The Army is codifying a deliberate process of experimentation to identify technologies, performance, testing and incorporation of Soldier feedback. Within the Army, the acquisition community will collaborate closely with the Network CFT to identify and deliver the components of the Army's integrated tactical network.



MODERNIZATION IN SERVICE

Tactical Network Technology Modernization in Service (TNT-MIS) is a major effort in-line with establishing a unified network transport layer. Current TNT-MIS 'next-generation' capability enhances cyber security, simplifies tactical network operational use and initialization and reduces component size, weight and power (SWaP). MIS efforts also include technical refresh of end-of-life/nonsustainable commercial tactical technology and other IT component equipment, enabling the implementation of a standards-based architecture.

MIS enables inserting commercial capability to make the Army's network more expeditionary, including the ongoing fielding of the Network Operations Center and Tactical Communications Node-Lite versions, which greatly reduced component SWaP, enabling integration on lighter vehicle platforms. MIS IT enhancements also will improve the Army's network Regional Hub Nodes and other critical SATCOM support capability.



EXPEDITONARY NETWORK COMMUNICATIONS (SIGMOD/SATCOM)

The Army's continually evolving suite of expeditionary network transport equipment enables commanders to see first and act first, while increasing speed of maneuver and operational flexibility. These new expeditionary capabilities augment and expand the network to suit mission requirements.

- Enroute Mission Command (EMC), utilizing the Army's tactical satellite network, provides critical in-flight mission command to the Global Response Force (GRF) while onboard an aircraft en route to an objective.
- Once on the ground Soldiers can rapidly set up their Transportable Tactical Command Communication (T2C2) inflatable satellite terminal, which enables continuity of mission command during the initial phases of operation. Both the T2C2 Lite (1.2-meter satellite terminal) and Heavy (2.4-meter satellite terminal) provide robust high-bandwidth network communications and mission command for initial entry and forward operations.

To further meet mission requirements for increased maneuverability, the Signal Modernization program, delivers expeditionary network capabilities that collectively increase network resiliency through range and bandwidth, operate in satellite denied environments and provide significant reductions in SWaP over legacy systems.

- The small form factor Terrestrial Transmission Line Of Sight (TRILOS) radio will provide a significant reduction in SWaP compared with the legacy at-the-halt High Capacity Line Of Sight (HCLOS) radio and improve the robustness of the tactical network by providing increased range and 12x the bandwidth with low to no latency versus SATCOM.
- Next-generation Troposcatter Transmission (Tropo) capability significantly extends network range and throughput, and greatly reduces SWaP over current Tropo capability. Tropo bounces signals off of the Earth's atmosphere to provide beyond-line-of-sight capability without using expensive and limited satellite resources.
- The small form factor Modular Communications Node-Advanced Enclave (MCN-AE) augments the existing intelligence network, enabling intelligence users to connect to all of the same resources they have when using the traditional Trojan Intelligence Network, but instead using the tactical network.

- Commercial Coalition Equipment (CCE) can be rapidly reconfigured to provide secure tactical access for coalition or commercial networks to support both civil and military operations. CCE provides a Radio Bridging Voice (RBVC) capability that enables radios on different frequencies, or different equipment such as radios or cell phones, to seamlessly connect to each other.
- Secure Wi-Fi uses the National Security Agency-approved Commercial Solutions for Classified solution to provide classified and unclassified wireless capability to the Command Post (CP). Following Command Post setup, units can turn on their Secure Wi-Fi hotspot and the network can come up first instead of last, in minutes instead of hours, and Soldiers can stay connected longer when jumping the CP.



2-CHANNEL LEADER RADIOS (LR)

The successor to the single-channel Rifleman Radio, the two-channel LR enables Soldier communication via Single Channel Ground and Airborne Radios System (SINCGARS) and Soldier Radio Waveform (SRW).



2-CHANNEL MANPACK (MP) RADIOS

The two-channel, software defined HMS Manpack radio provides line-of-sight/beyond-line-of-sight communications through current and future bandwidth waveforms, enabling connectivity at the lowest echelons.

TACTICAL RADIO MODERNIZATION

Path diversity is an important component of a resilient communications network. The Army is executing commercial-off-the-shelf (COTS) IT procurement and leveraging continued commercial development of software defined radios under the Handheld, Manpack and Small Form Fit (HMS) program to enable the incorporation of advanced industry-developed waveforms. Product lines under HMS include the single-channel Rifleman Radio (RR), twochannel Leader Radio (LR) and Manpack (MP) Radio.

The HMS effort is flexible and as additional capability and waveforms emerge the program office will work with industry to integrate desired capability. The Government has conducted extensive market research and will continue to do so on an annual basis to assess industry technology advances with possible on-ramps after the initial contract award. All vendors, including those previously off-ramped, will be eligible to compete at the on-ramp. As an example, the program office, working with the Army's Network CFT, is aggressively working to port the TSM waveform onto Generation 2 Manpack radios by early FY20.

“The commander has to mentally fuse information to make decisions. We will now get one picture that has every overlay of all warfighting information needed to make rapid and informed decisions.”



MISSION COMMAND

The Army is migrating toward a Common Operating Environment (COE) for mission command software and hardware systems. COE will be an approved set of standards and technologies that enable mission command applications and allows warfighters to adapt and configure the network as conditions change.

This cornerstone of the network modernization strategy provides solutions for current issues with stovepiped mission command systems that function well individually, but do not integrate easily with each other. It also supports collaboration using a common picture with Joint and coalition mission partners. One tactical solution, the Command Post Computing Environment (CP CE), leverages commercial solutions already working for Combatant Commands, Special Operations Forces, other Services and military forces worldwide, and shifts the COE strategy away from a government-owned and government-developed model. CP CE, which will deliver a true Common Operating Picture to the command post, will begin initial fielding in FY19.

Currently, the Army is also consolidating to a single software baseline for all mission command applications across Army, Army Reserve and Army National Guard formations. Standardization of mission command software and implementation of a universal baseline decreases the number of software patches and security updates that must be developed, tracked and introduced in the field. It also helps with release of CP CE by creating an environment for interoperability. Additionally, within the next five years all units will be synchronized with the same upgraded mobile mission command software called the Joint Battle Command-Platform (JBC-P), and a version of the Army's new standardized tactical computer, the Mounted Family of Computing System (MFoCS). The combined capabilities of JBC-P and MFoCS deliver the Army's next-generation friendly force tracking system.



MODERNIZING THE COMMAND POST

To improve units' expeditionary command post capabilities, the Army is launching a modernization effort to provide mobile, scalable and survivable combat and tactical vehicles. In late 2017, the Army authorized the implementation of the Command Post Integrated Infrastructure (CPI2) effort to address mobility issues and to ensure communications hardware and mission-command application integration across platforms.

Phase 1 of the CPI2 effort, underway now, will equip selected units with mobile platforms, secure wireless and intelligent power solutions. Units will conduct their own integration of systems onto platforms in order to inform future command-post designs. Phase 2, beginning in FY19, involves equipping five Brigade Combat Teams with mobile command post prototypes. The outcome of this experimentation will inform both the CPI2 requirements and designs going forward. Together these phases will enable final command post solutions to be designed, integrated and provided to the Army through an established program of record.



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