

U.S. Army Mission Command Network Implementation Plan



Executive Summary 1 October 2018

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Contents

Introduction 3

Framing the Plan 3

 Operational Environment 3

 The Problem 4

 Operational Requirements 5

The Strategy 7

 The Mission Statement 7

 Vision, Ends, Ways and Means 7

The Army’s Implementation Guidance 8

Army Mission Command Network Modernization Framework 10

Lines of Effort and Future Network States 11

 Line of Effort 1: Unified Network 12

 Line of Effort 2: Common Operating Environment (COE) 13

 Line of Effort 3: Interoperability 14

 Line of Effort 4: Command Posts 14

 Supporting Efforts 15

Conclusion 15

Appendices 17

 Appendix 1: Abbreviations, Acronyms, and Initialisms 18

Introduction

This document outlines the Mission Command Network Implementation Plan Framework. It describes how the Army will modernize the Mission Command Network (MC Network). The Mission Command Network is integrated mission command and DoD Information Network-Army (DoDIN-A) Enterprise capabilities, which enable commanders, leaders & Soldiers to exercise mission command (the philosophy) and integrate all warfighting functions and Unified Action enablers (the warfighting function)¹. It allows commanders to develop and maintain situational understanding, maneuver across domains and locations, and conduct joint combined arms operations to accomplish the mission.

The MC Network is central to our ability to exercise the philosophy and warfighting function and encompasses a network of people, processes, technology, etc., known as the MC System. The Mission Command Network Implementation Plan establishes a framework for modernization of the MC System, realizes the *Mission Command Network Vision and Narrative*, and aligns to work within the Army Network Campaign Plan which inherently supports the Army Campaign Plan (ACP). It further supports the Army Leader Development Strategy and Army Training Strategy by focusing on how the MC Network enables training, education, and readiness.

The MC Network Implementation Plan addresses emerging challenges and threats, to deliver an Army with unmatched lethality. This Implementation Plan specifically enables Army lethality by ensuring that Army modernization efforts are matched with a Mission Command Network that enables these new capabilities as they arrive. This implementation plan supports multi-domain operations by enabling the network as a weapons system. It reflects the Army's Principles, Characteristics, and Requirements developed in 2017 that guides Army leaders to synchronize, develop, and deliver capabilities across the force. This will include assessing doctrine, organizational structures, training, materiel, leadership and education, personnel, facilities and policy (DOTMLPF-P) across warfighting capabilities. The MC Network Implementation Plan is in two volumes. Volume 1, Framework, defines the Lines of Effort and Supporting Efforts and describes the ways and means to achieve strategic ends. Volume 2, Execution, describes actions and tasks that implement network modernization across those lines of effort in 3-5 years of successive future states.

Framing the Plan

Operational Environment

To achieve the Army Vision and remain the world's most lethal land force, the Army must continually examine, understand, and respond to the environment in which it operates. The Army will sustain a smaller force and will maintain asymmetric overmatch through innovation and the adoption of advanced technologies to enable mission command and warfighter lethality.

¹ The ADRP 6-0, Mission Command, May 2012

The Army will be a growing and capable force with a balanced posture, forward and CONUS-based, in support of dynamic force employment. The Army will continue to fight jointly with a large and dynamic set of mission partners, and must operate seamlessly with other federal agencies, foreign governments, non-government agencies, local organizations and non-combatants.

U.S. adversaries will include state and non-state military, criminal and terrorist elements, all of whom present blended physical and cyber threats. Nontraditional combatants will continue to emerge as a result of threats from these adversaries as well as continued urbanization and the spread of advanced cyberspace and counter-cyberspace capabilities. The proliferation and availability of commercial technology may allow adversaries to obtain an operational advantage. Technology, including weapons of mass destruction, advanced sensors, augmented humans, autonomous processes and automated decision making, will permeate the battlefield. The speed at which data is disbursed will create an information-rich environment. However, information quality may be low and extraction of mission-relevant content may be challenging. Misinformation will be used as a weapon².

“... the Army is woefully behind on modernization, and our soldiers are increasingly unprepared to confront the harsh realities of 21st century warfare. Analyses by the National Commission on the Future of the United States Army, the Office of the Secretary of Defense, and the Army itself have pointed to glaring capability gaps in mobility, lethality, and survivability. These problems will only get worse as adversaries such as Russia continue to modernize their forces. Put simply, our Army lacks both the adequate capacity and the key capabilities to win decisively.”

Opening Statement of Hon. John McCain, U.S. Senator from Arizona, May 2017 Hearing to receive Testimony on the Posture of the Department of The Army In Review of the Defense Authorization Request for Fiscal Year 2018 and The Future Years Defense Program

The Problem

The Army’s current network is too complex, fragile, and not sufficiently mobile. Additionally, it is not optimized for Joint, interagency and multination-partner collaboration, susceptible to jamming, vulnerable to cyber-attack, and does not meet size, weight and power needs for an agile ground force.

The Mission Command Network Vision and Narrative identifies the problem going forward as “how does the Army achieve expeditionary, uninterrupted mission command; a network that is intuitive, secured, standards-based, adapted to commander’s requirements, and integrated into a common operating environment; network capabilities that are assured, interoperable, tailorable, collaborative, identity based, and accessible at the point of need in operations that includes the widest range of Unified Action Partners?”

In 2017 the Chief of Staff of the Army, General Mark A. Milley, described the state of the problem: “The current Network Modernization path will fall short of the survivability, effectiveness, interoperability and suitability operational Warfighter requirements for an expeditionary Army in all environments against all enemies.”

² Shaping the Army Network: 2025-2040, (2016), pg. 9

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In the spring of 2017, the First Principles, Characteristics, and Requirements were developed to guide modernization for the network. The First Principles describe the “why” of modernization efforts, the Characteristics describe the attributes of the network that best suit the Army’s mission and the Requirements show the minimum needs to support the Warfighter and develop an effective, technical network.

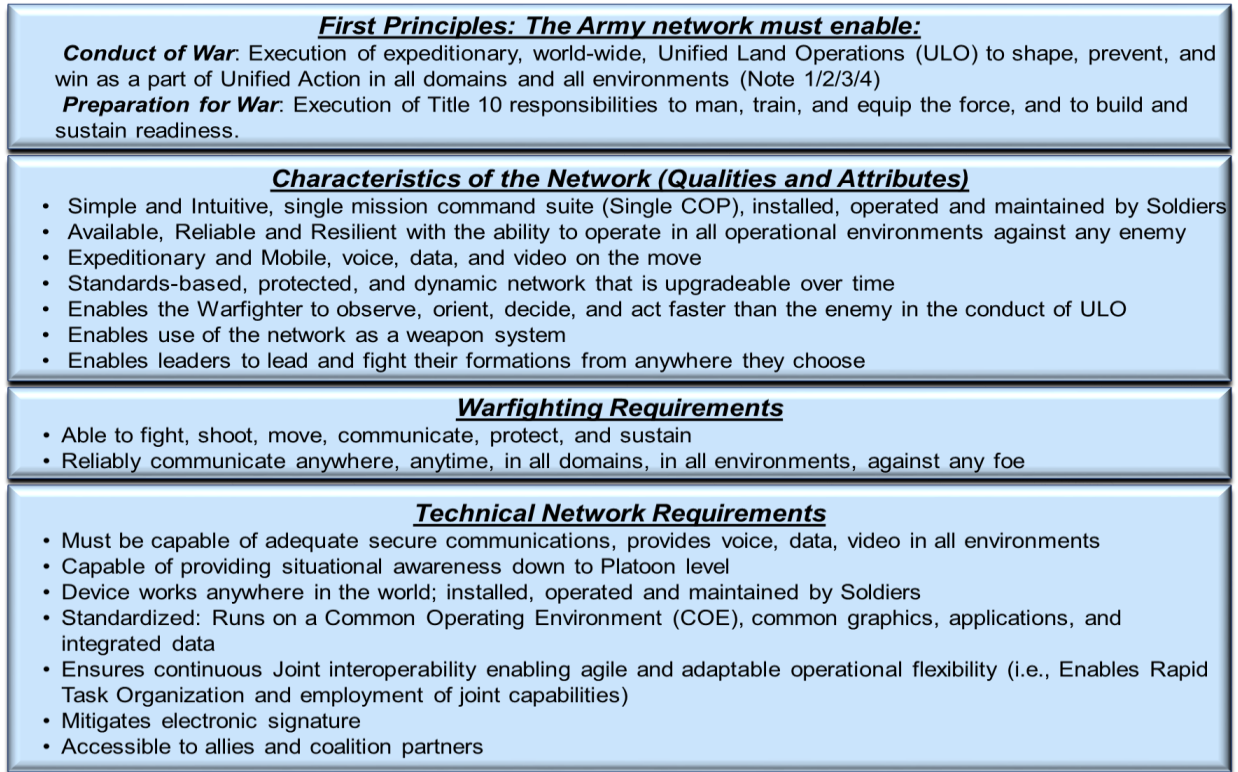
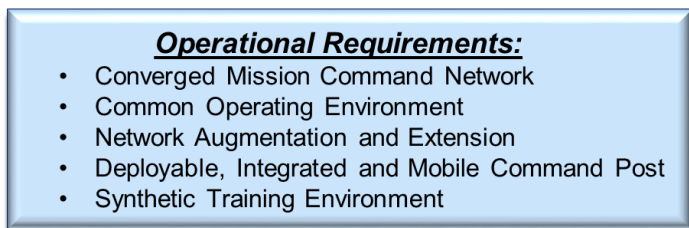


Figure 1: First Principles, Characteristics and Requirements

Operational Requirements

The warfighting requirements are described at the highest level, and deserve amplification. In order to be “able to fight, shoot, move, communicate, protect, and sustain”, and “reliably communicate anywhere, anytime, in all domains, in all environments, against any foe” an array of MC Network capabilities are needed.

A Table Top Exercise (TTX) executed by the Mission Command Center of Excellence in November 2016, analyzed network requirements to achieve mission success within realistic scenarios against anticipated threats. The TTX vignettes spanned Forces Command (FORSCOM), Central Command (CENTCOM), European Command (EUCOM), and Pacific Command (PACOM) areas of responsibility and addressed joint operational phases 0-3. The results of the TTX identified the following five areas as key operational requirements for MC Network modernization: Converged Mission Command Network; Common Operating



Environment; Network Augmentation and Extension; Deployable, Integrated and Mobile Command Post; and Synthetic Training Environment.

Converged Mission Command Network

The first operational requirement identified is *Converged Mission Command Network*. This enables the convergence of current, disparate networks into a single network that operates seamlessly worldwide in any environment. Areas of emphasis required to support the converged network include *integrated transport* which provides connectivity and network access for forces in an area of operation, especially command posts and mission command on the move (MCOTM), from tactical to strategic. To support integrated transport, a focus on *cyber and electronic warfare (EW) resiliency* is needed in order to mitigate an enemy threat utilizing Cyber Electronic Magnetic Activity (CEMA) and EW tools.

Features that must apply to each modernization effort include the *flexibility* to allow the network to work in any environment with single identity access by the users at home station, enroute, and in deployed conditions. Additionally, *electromagnetic signature management* provides the capability to modify the signature of network components which facilitates the security of emissions, communications and operations.

Common Operating Environment

The second operational requirement is a *Common Operating Environment (COE)* with emphasis on Unified Action Partner (UAP) interoperability. This is a fully integrated and interoperable environment that enables the joint operation in both the *Joint Information Environment (JIE)* and the *Mission Partner Environment (MPE)*. This also applies to mission command applications in support of commanders and leaders across echelons, and enables all warfighting functions. Situational understanding for commanders and staffs will be achieved through the common operating picture (COP) and enabled by a consolidation of applications and system interoperability while including CEMA and electromagnetic data. Episodic extension of MPE to the tactical network, tactical voice interoperability solutions and accessible situational understanding with UAPs are included in this requirement.

Network Augmentation and Extension

The third operational requirement identified is *Network Augmentation and Extension* which are capabilities that thicken and extend the network to overcome space and terrestrial shortfalls.

An area of emphasis needed to support this requirement includes *improving a commander's ability to 'maneuver' the network*. This can be accomplished by providing additional communication pathways and/or increasing the bandwidth capacity and connectivity at the time and place of operations, including *capabilities that facilitate* ISR and long range precision fires. This operational requirement drives a range of terrestrial, aerial, and near-space capabilities to thicken and extend the network.

Deployable, Mobile, Agile, Integrated Command Posts

The fourth operational requirement identified is *Deployable, Mobile, Agile, and Integrated Command Posts (CPs)*. This is an integrated CP design with inherent expeditionary communications package from Army Service Component Command (ASCC) to BN in support of immediate deployability/mobility. An integrated design is tailored to echelon and formation and will feature an expeditionary communications package. This package allows expeditionary maneuver by CP elements tailored for a wide range of operations from small unit early entry through full combat operations in support of a major campaign. This meets the requirements for formation agility, mobility and protection. Modular and interchangeable components facilitate task reorganization and allows CPs to be employed in multiple locations with low profile signatures (cyber, electromagnetic, physical).

Synthetic Training Environment

The fifth operational requirement is the Synthetic Training Environment (STE). STE is education and training delivered over the network to the point of need and will include Combat Training Centers (CTCs), mission training complexes and institutional training centers. The STE will provide access to training support enablers and a repository of digitized learning content that portrays operational and mission variables in order to support on-demand training across the operational, institutional, and self-development training domains. The Army's intent is to ultimately push STE down to company/battery/troop level.

The Strategy

The Mission Statement

The Army's mission statement for the implementation plan is "The Army will field a network that is easy to use, works in all environments, in order to prepare for war, and to fight and win wars."

Vision, Ends, Ways and Means

The Vision for the Mission Command Network Modernization Strategy is to operate with an integrated and unified, end-to-end warfighting network, that is flat, fast, mobile and protected. As stated in the Principles, Characteristics and Requirements, this network will enable leaders to lead and fight their formation from anywhere.

The Ends to achieve this vision are a cascading set of successive future states achieved through four lines of effort: 1) Unified Network that supports all theaters of operation, 2) Common Operating Environment providing a unified suite of mission command applications, 3) Interoperability among all Army, Joint, and Coalition partners and 4) Command Posts that are deployable, mobile, and survivable.

The Ways in which the strategy will be achieved is the implementation of the pillars of "halt", "fix", and "pivot" across the four lines of effort. Objectives established over time allow the Army to develop and apply the means to achieve successive future states.

The Means to support the Ends and Ways are the reinvestment of funds from halted programs to fix our fight tonight capability and improve readiness while shifting focused investments in Research, Development, Technology and Experimentation. This will also include investments in proven industry, Joint and Special Operations Forces solutions, in order to pivot to the next-generation network.

The Army's Implementation Guidance

In 2017, the Chief of Staff of the Army's guidance to Army leaders was to move away from the current network modernization path which falls short of the operational Warfighter requirements of survivability, effectiveness, interoperability and suitability for an expeditionary Army in all environments against all enemies. Based on this guidance, the Army pivoted to a new network modernization approach.

The new approach codified in September 2017 (shown in Figure 2) describes the Army's targeted "halt, fix and pivot" acquisition and modernization approach. Near-term fixes focus on readiness in order to fight tonight and buys down risk on fixable components of the network. This ensures the Army's ability to support the most pressing OPLANs, while simultaneously pivoting to a new adapt-and-buy acquisition and modernization approach.

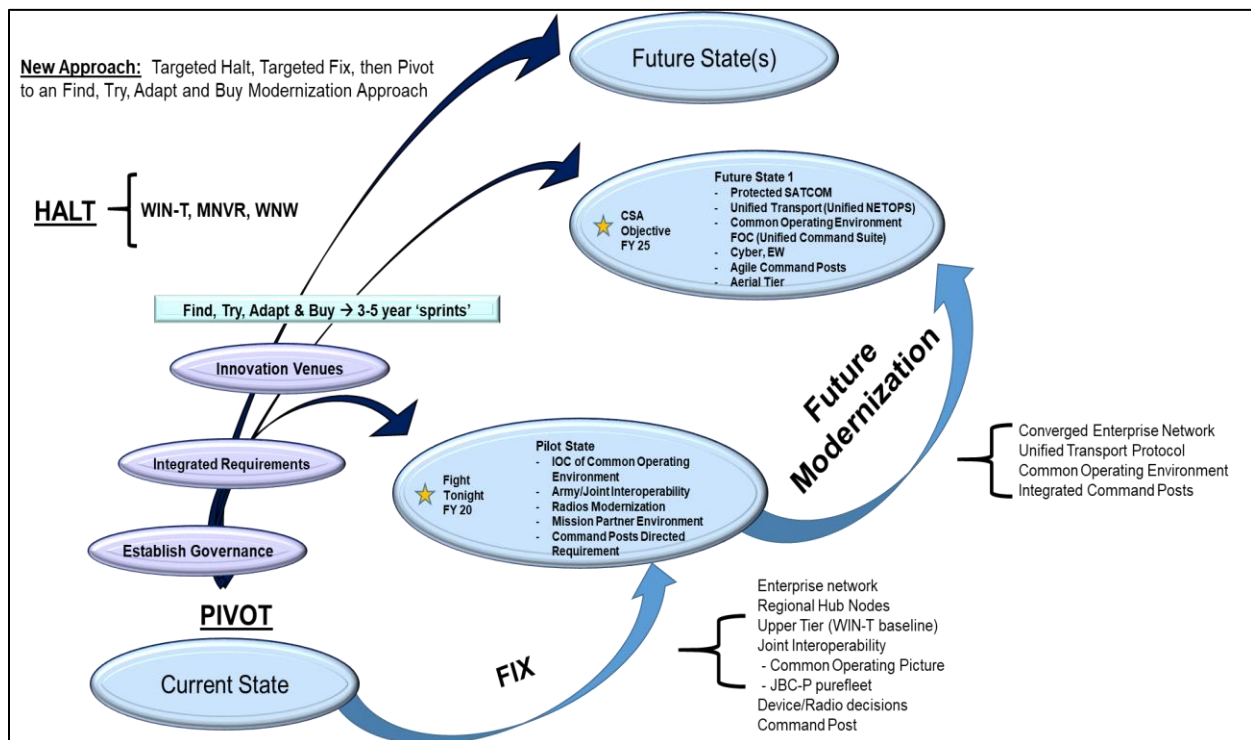


Figure 2: Mission Command Network Modernization Strategic Sketch

This approach provides greater predictability for our forces and better facilitates collaboration with industry. This approach began in FY 18, occurs in 3-5 year sprints and reach incremental future states as described in the Strategy Framework (Figure 3).

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The initial “halt, fix and pivot” to “adapt and buy” approach supports the Framework utilizing the timeline below:

- **Targeted Halt (Near-Term):** Halt all programs that are not needed for the future state, or do not meet operational requirements for today.
- **Targeted Fix (Near-Term):** Fix those programs necessary for acceptable Army baseline, Joint interoperability and buy down risk against a peer adversary. This includes fixing individual systems and the tactical network as a whole.
- **Pivot to Adapt and Buy (Near-term):** Utilizing the “adapt and buy” method allows continuous evaluation of available, commercial solutions for military application using operational units to test potential technologies in the field. The Army will then “adapt and buy” the best-tested solution to meet unique military challenges and modify its tactics, techniques, and procedures to enable it to best leverage new and existing technologies.

This approach requires a complete review and update of our governance processes, from how we draft requirements, to the acquisition process, to how the Army fiscally manages this portfolio, and better hold ourselves and industry accountable to deliver the requirements our Soldiers deserve and need. It also affords the Army an opportunity to pivot to an “adapt and buy” acquisition process, partnering with industry, utilizing the following solutions:

- **Find existing and emerging solutions versus develop solutions:** Given the rate of industry R&D and the rate of change in technology, it is futile for the Army to spend millions of dollars on development. It is our belief that the most effective and efficient path forward is to find available solutions that meet our needs, rapidly adapt those solutions with funding dedicated to integration and a more rapid test and evaluation process – this puts relevant capabilities in the hands of Soldiers faster.
- **Team Approach:** The Army created cross-functional teams consisting of a core team of experts in Requirements, Acquisition, Science and Technology, Capability Development, Communications, Spectrum, Cyber Security, Intelligence, Operations, Test and Evaluation, Resourcing, Contracting, Costing, Acquisition Logisticians, and U.S. Army Forces Command as well as Army Service Component Commands. Focused on improving the precision, speed, capability, and cost of materiel solutions for the Army’s tactical and enterprise network, they will narrow an existing capability gap by developing capability documents, informed in appropriate cases by experimentation and technical demonstrations, and rapidly transition leader-approved capability requirements to the Army Acquisition System. The future network must be built by bringing Warfighters, developers, and testers to the center of the process. The hub of these efforts will be with operational units so innovation and improvements are made more rapidly. These CFTs address network disconnects and misalignments by horizontally and vertically integrating requirements. Concurrently, they will seek available solutions for experimentation, demonstration, and evaluation by Soldiers and leaders in the field.

- **Soldier-Centric Design:** Fundamentally we need to change how we design every aspect of our network so we take into account the one constant – our Soldier. This is no different than in the commercial sector, which is designed around consumers. We will adapt leading design-theory fundamentals that turn upside down the current government acquisition process. Innovation around and with Soldiers is key.

Army Mission Command Network Modernization Framework

In order to implement the Modernization Network Strategy, the Army will focus on four modernization lines of effort (LOE), oriented on operational requirements, and will occur in 3-5 year increments. These Future States will continue in 3-5 year sprints as current efforts are assessed and advances in technology emerge. While in support of the overall Army strategy documents, smaller sprints will enable iterative modernization over time and beyond current timeline horizons. The Pilot State is projected for 2020 and the first Future State is projected in the following 3-5 years (approximately 2025). A key aspect supporting the execution of each of these lines of effort are a delivery of an integrated body of requirements and architectures. These requirements and architectures are codified in the Mission Command Network Requirements and Architecture Summary and inform the design of network and architecture through integrated requirements.

The strategy framework is intended to pivot the Army to a new and faster modernization path. The strategy achieves this by focusing lines of effort on operational needs, then synchronizing modernization efforts to deliver capability in successive future states, which offer repetitive opportunities to adapt to threats and ingest available capabilities. The tempo of future states is anticipated to be every 3-5 years, the exact pace determined by opportunities to incorporate emerging, operationally significant technologies. The strategy enables this pivot by insisting on integrated requirements and architecture that realize each line of effort, and also tie the contributions of each line of effort into a holistic capability (i.e. a future state). In addition, programs, funding, research & development, and science & technology efforts must be aligned to support each line of effort.

The foundation for the pivot is achieved by (1) development of an integrated body of requirements (primarily based on the “IT Box” model which allows for continual adaption), (2) continual demonstration and assessment of available capabilities, (3) integrated, standards-based architecture that allows ‘plug and play’ of new capabilities.

The overall Strategy Framework, depicted in Figure 3, highlights key actions underway within each Line of Effort that moves the Army to a seamless, standards-based, secure, and globally accessible network. These actions unify the enterprise and tactical network, establish a Common Operating Environment, integrate joint and mission partner accessibility, and deliver integrated and agile command posts.

Modernization Strategy Framework

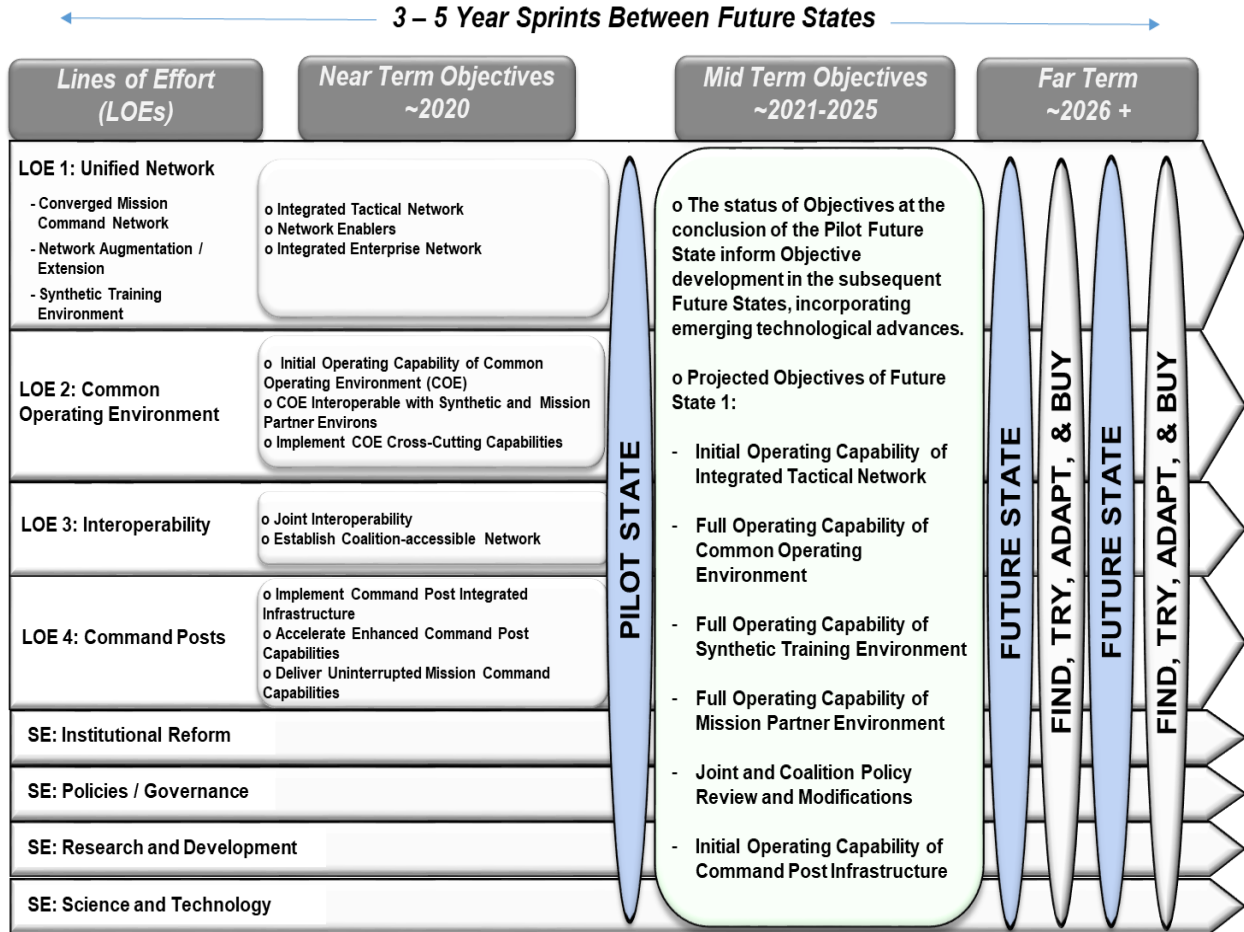


Figure 3: Mission Command Network Modernization Strategy Framework

Lines of Effort and Future Network States

The MC Network Implementation Plan enables operational requirements through the LOEs and future states of the network as discussed above. The following sections will take a closer look at the LOEs and how each supports the network future states. Figure 4 below indicates objectives in Pilot State, initial projections of objectives in Future State 1 and identifies characteristics of subsequent Future States:

	Objectives Pilot State (~2020)	Initial Projection of Objectives Future State 1 (~2025)	Characteristics of New Future States
LOE 1	<ul style="list-style-type: none"> o Integrated Tactical Network o Network Enablers o Integrated Enterprise Network 	<ul style="list-style-type: none"> o IOC of Integrated Tactical Network o IOC of Cloud Services o Formation & Platform Integration o Operationalize Cybersecurity o Achieve World Wide Spectrum Supportability o FOC of STE o Achieve Network Survivability 	<ul style="list-style-type: none"> o Internet of 'battle things' o Global mesh network of military and commercial assets o Intuitive and seamlessly integrated (aided by AI and advanced interfaces) o Balanced access vs. protection o Capabilities to support Multi-Domain Operations * Characteristics will inform Future State 2 objectives as technology advances and previous Future State objectives are achieved
LOE 2	<ul style="list-style-type: none"> o IOC of COE o IOC of COE-based STE Solution o Establish COE Institutional & Operational Fielding Model 	<ul style="list-style-type: none"> o Fully-functioning COE o Initial divestiture of legacy PoRs o Fully-functional COE-based STE solution 	
LOE 3	<ul style="list-style-type: none"> o Joint Interoperability o Establish Coalition-accessible Network 	<ul style="list-style-type: none"> o FOC of MPE o Joint and Coalition Policy Review and Mod o IOC of UAP Secure Voice Interop Solutions o Incorporate COE within MPE 	
LOE 4	<ul style="list-style-type: none"> o Implement Command Post Integrated Infrastructure o Accelerate Enhanced Command Post Capabilities o Deliver Uninterrupted Mission Command Capabilities 	<ul style="list-style-type: none"> o IOC of CPI2 CP Infrastructure o IOC of Joint and Multi-Natl MC Nodes o IOC of Decision Aids 	

Figure 4: Objectives for Future States

Line of Effort 1: Unified Network

Objective State - Assured network transport in a contested environment against a peer adversary. Dominate Cyber Electromagnetic Activities (CEMA).

Line of Effort 1, Unified Network, enables a converged Mission Command Network that operates seamlessly worldwide and in any environment. This effort has three components: Integrated Tactical Network, Integrated Enterprise Network and Network Enabling Capabilities. It includes the development of a standards-based network architecture that unifies enterprise and deployed network capabilities and features a unified transport layer, network operations, and other enabling functions that allow integration of disparate networks. The Army requires the network to provide resiliency through path diversity and dynamic routing to ensure tactical units can communicate in hostile environments. It fully incorporates cyber and electronic warfare capabilities that support the employment of the network as a weapon system.

This LOE addresses current issues such as fragmented organizational and functional networks, cyber vulnerabilities, complexity, fragility, and lack of interoperability with joint and coalition mission partners. This requires the creation of a standards-based network architecture that effectively integrates enterprise and deployed network capabilities across domains and environments, and features a unified transport layer that permits “plug and play” for specific network capabilities. LOE 1 addresses the following operational requirements: Converged Mission Command Network, Network Augmentation/Extension, and Synthetic Training Environment.

A vital support element to achieve key actions in LOE 1 are the Assured Position, Navigation and Timing (APNT), Network, and Synthetic Training Environment (STE) Cross Functional Teams (CFTs). These CFTs will be leveraged to innovate and inform requirements and solutions. Key actions in the near-term include a Secure but Unclassified network, air-ground integration, and next generation tactical radios. In the

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near term, key objectives include a standardized tactical network transport baseline, the standards-based network architecture described above, initial network, provisioning, and transport convergence, joint & coalition gateways, adaptation of available, interoperable radios and implementation of Expeditionary Signal Battalion – Enhanced (ESB-E). These actions help create the first future state of the network.

In the mid-term, key actions are completion of network, provisioning, and transport convergence, incorporating cyber and electronic warfare capabilities, (3) dynamic spectrum allocation, (4) dynamic network adaptation, next generation blue force tracker, initial protected satellite capabilities and commercial Low Earth Orbit (LEO), Mid Earth Orbit (MEO) and Geosynchronous Earth Orbit (GEO) satellite integration. Key Research & Development (R&D) and Science & Technology (S&T) efforts for successive future states include improved waveforms and network augmentation/extension capabilities.

Line of Effort 2: Common Operating Environment (COE)

Objective State - Distributed mission command and rapid decision making (Observe, Orient, Decide, Act).

Line of Effort 2, Common Operating Environment (COE) creates an approved set of standards, computing technologies, integrated data and databases, common graphics, and a unified set of mission command applications. The COE is a common implementation of computing technologies and standards that enable secure and interoperable applications. These standards form a common foundation allowing the Army to deliver warfighting capabilities as software applications. The COE will operate in both Joint and Mission Partner Environments which will include, but not be limited to, MC applications that support commanders and leaders across six Computing Environments.

This LOE provides solutions for current issues with stove-piped mission command systems that function well individually, but do not integrate easily with each other, and/or don't provide an accurate common operating picture. It will also support collaboration using a common picture with joint and coalition mission partners. This LOE delivers an integrated body of requirements that meet operational needs. The decisive action within this LOE is fielding of the initial version of COE in FY19.

This LOE leverages the APNT-, Network-, and STE-Cross Functional Teams to innovate and inform requirements and solutions. Key CFT-supported actions in the near-term are bridging solutions for a joint common operational picture focused on software baseline reduction; JBC-P pure fleeting (with an initial operational capability in FY19); initial Distributed Mission Command/Cloud computing capability; and integrated Command and Control situational awareness across command post, mobile and hand held computing environments.

Key mid-term objectives are instituting COE across the Army, maturing COE with additional capabilities, and transitioning legacy mission command systems to COE-based applications. R&D and S&T initiatives that help create successive future states include automated planning and high-tempo data-driven decision tools. Operational Requirements met in LOE 2 are Common Operating Environment and Interoperability.

Line of Effort 3: Interoperability

Objective State - Joint interoperability/coalition accessibility with all Unified Action Partners

Line of Effort 3, Interoperability, includes joint interoperability and coalition accessibility and enables collaboration through a Common Operating Environment, the JIE, and the MPE. Interoperability is the ability to routinely act together coherently, effectively, and efficiently in order to achieve tactical, operational, and strategic objectives. It is critical that the Army implements applications, common standards and technologies that are inherently joint. This is in alignment with DoD JIE and MPE efforts and is achieved through the development of an architecture and mission command systems that are rapidly adaptable to common operational standards.

Going forward, the Army will procure solutions that incorporates the ability to leverage common commercial standards and/or widely recognized military interoperability standards.

In the near-term, this LOE focuses on the development of a Secure but Unclassified network, and interoperable gateways and radios in order to achieve initial operational capability (IOC) for the MPE. Key mid-term objectives include: MPE full operational capability (FOC); a deployed Army solution to extend episodic MPEs into the tactical network; and implementing solutions to UAP information exchange gaps (data, message and waveform interoperability).

Long-term key actions are R&D and S&T initiatives that focus on interoperability in the areas of communication, information systems and information management; intelligence, surveillance and reconnaissance (ISR); intelligence fusion; digital fires; and sustainment. Similar to LOE 2, this effort establishes an interoperable network environment and addresses the operational requirements of Common Operating Environment & interoperability.

Line of Effort 4: Command Posts

Objective State - Mobile/ survivable CPs in a dynamic, lethal combat environment.

Line of Effort 4, Command Posts (CPs) establishes capabilities that enable the ability to employ CPs for operations from early entry to major combat operations and resolves current issues with set-up and tear-down, survivability, mobility, suitability, and footprint. This LOE focuses on developing and obtaining approval of requirements for integrated command posts, then delivering these integrated command post designs to Army units. LOE 4 addresses the operational requirement of Deployable, Integrated, and Mobile Command Post and integrates Knowledge Management.

Key near-term objectives are the delivery of initial phases of the Command Post Integrated Infrastructure (CPI2) Directed Requirement (including containers and vans to high priority units, reprioritization of interim CP enhancements to Brigade Combat Teams (e.g. secure Wi-Fi), and improved platform integration). Key mid-term objectives include the ongoing program development and delivery of Integrated CP Designs that

provide agility, mobility, and protection. Key R&D and S&T initiatives include signature management and advanced mobility solutions for CPs. The Network CFT efforts will inform these future requirements.

Supporting Efforts

In order to achieve the future states of each line of effort listed in the previous section, a holistic approach to each line is necessary. In the past, the Army has observed disconnects across the requirements definition, testing, and acquisition communities and lacked intimate interaction with warfighting units. These disconnects led to the misalignment of delivered capabilities versus operational needs. Therefore, supporting lines of effort must be executed for success of Mission Command Network Modernization. There are four supporting efforts: *Institutional Reform*, *Policy and Governance*, *Research and Development (R&D)*, and *Science and Technology (S&T)*.

Institutional reform will modify the methods by which the Army acquires, tests, trains and lifecycles materiel solutions. *Policy and Governance* will leverage elements of each that are necessary, while modifying practices and regulations that inhibit rapid and effective network modernization. R&D will drive modernization via Army-internal organization and leverage technological developments from industry. Finally, S&T will enable incremental changes to the future Army networks and interoperability as new developments are matured and operationalized via the CFT's efforts to focus on a modernized and interoperable network. These supporting LOEs and key actions within them are listed in Figure 5 below:

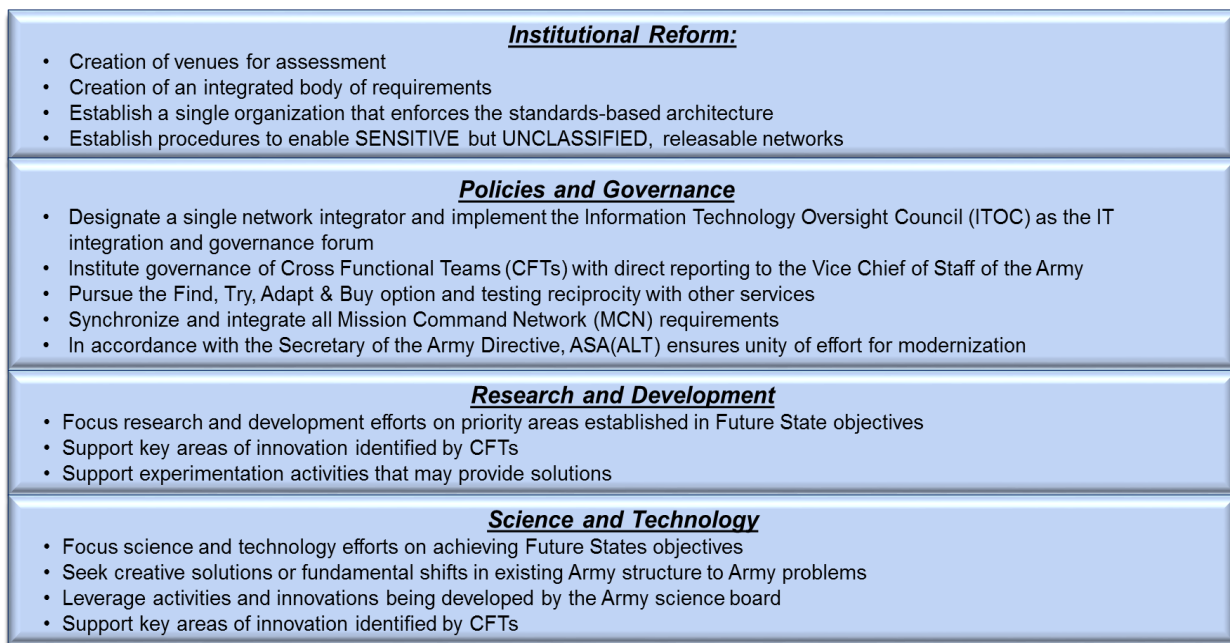


Figure 5: Mission Command Network Modernization Supporting Efforts

Conclusion

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The MC Network Implementation Plan supports the Army Campaign Plan and the Army's Network Strategy and fulfills the ideas and design principles outlined in the Mission Command Network Vision and Narrative. It integrates and synchronizes the ends, ways, and means to enable mission command throughout the Army and in collaboration with Joint and multinational partners. The implementation plan integrates efforts from the HQDA staff, Army Futures Command, the Cross Functional Teams, ASA(ALT), ARCYBER and TRADOC while addressing the five operational requirements: Converged Mission Command Network; Common Operating Environment; Network Augmentation and Extension; Deployable, Integrated, Mobile Command Post; and Synthetic Training Environment. Each are aligned to the four lines of effort outlined in the document and will be executed, evaluated, and assessed over near-, mid-, and far-terms in order to achieve future states. This plan achieves unity of effort to develop and deliver capabilities across all DOTMLPF-P domains in support of overall Army network modernization.

Appendices

1. Abbreviations, Acronyms, And Initialisms

Appendix 1: Abbreviations, Acronyms, and Initialisms

ASCC	army service component command
BYOD	bring your own device
CE	computing environment
CFT	Cross Functional Team
COMSEC	communications security
CONOPS	concept of operations
CP	command post
DIL	disrupted, intermittent, limited
EMS	electromagnetic spectrum
FOC	full operational capability
FUE	first unit equipped
ICD	initial capabilities document
IOC	initial operational capability
IEN	integrated enterprise network
ITE	integrated training environment
ITN	integrated tactical network
JIE	joint information environment
JTF	joint task force
JFLCC	joint force land component commander
MC	mission command
MCE	mounted computing environment
MC Network	mission command network
MC System	mission command system
OPSEC	operational security
PED	processing, exploitation, and dissemination
RAF	regionally aligned forces
STE	Synthetic Training Environment
SWaP	size, weight, and power
TTP	tactics, techniques, and procedures
UAS	unmanned aircraft system