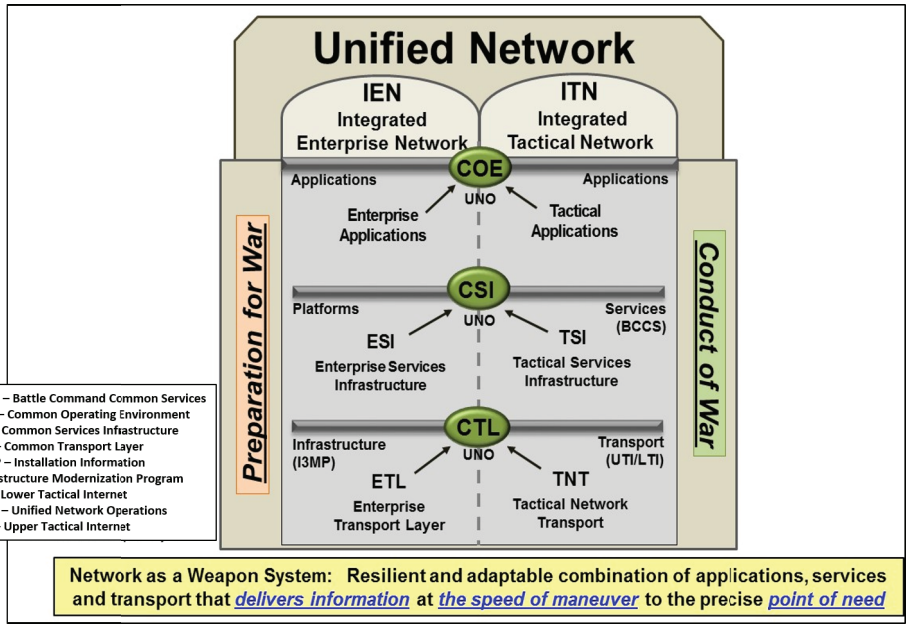
Army Network Modernization

Network Modernization

The 2018 National Defense Authorization Act directed the Army to submit to the congressional defense committees a report on the Army strategy for "modernizing air-land ad-hoc, mobile tactical communications and data networks." The Chief of Staff of the Army developed a strategy intended to enable the Army to "fight tonight" while seeking technical solutions in order to modernize the Army's communications. The Army's strategy recognized that its network had not evolved to enable decisive action against a peer threat in a highly mobile and contested environment. To correct this, the Army seeks to pivot away from traditional acquisition by including non-developmental items and commercial off-the-shelf technologies with programs of record to build its tactical network.



The Army's plan has four tenets: institute cohesive governance, halt select programs of record, fix existing critical programs, and pivot to a new acquisition approach. The Army strategy intends to create a new process by which it will experiment and learn about a broad array of technologies. The Army created the Network Cross Functional Team (N-CFT) to augment traditional acquisition through rapid prototyping and experimentation. The N-CFT is a subordinate organization to the Army Futures Command, a new four-star Army Command, combining people, responsibilities, and funding from the requirements, research and development, and systems analysis communities. The N-CFT will design and execute experimentation to inform requirements and design for future acquisition programs. The Army has identified four primary lines of effort to modernize its tactical network:

- **Unified Network** – This effort has three components: integrated tactical network, integrated enterprise network, and unified 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 allows integration of disparate networks. A unified network could provide resiliency through path diversity and dynamic routing to ensure tactical units can communicate in hostile environments. Allied partners have successfully implemented a similar approach.
- **Common Operating Environment (COE)** – When complete, the Army intends for the COE to include a set of computing technologies, integrated data and databases, common graphics, and a unified set of mission command applications. It will rely on data standards and virtualization to provide browser-based access to mission command capabilities for at-the-halt and on-the-move leaders.
- **Interoperability** – This effort includes joint interoperability and coalition accessibility through a network that enables appropriate collaboration with all unified action partners.
- **Command Posts** – The Army wants to improve the mobility and signature (visual, acoustic, thermal, and electromagnetic) of expeditionary command posts.

The Director, Cost Assessment and Program Evaluation (CAPE) and DOT&E reviewed the Army's strategy in response to the Explanatory Statement for the Department of Defense Appropriations Bill, 2018. CAPE and DOT&E concluded:

- The strategy was a work in progress and was premature to assess the suitability of programs and technologies that the Army was investigating.
- The Army strategy of using experimentation to inform requirements is suitable and the Army should continue to refine the process of how technologies were chosen for inclusion in the experimentation.
- Each experiment should be conducted against the appropriate threat scenario to include cybersecurity and electronic warfare capabilities.
- A standards-based network strategy is suitable and could allow for rapid insertion of new technology over time. The Army should prioritize completion of the standards and architectures for the COE and unified network in order to create a cohesive effort of building the Army's network.
- The success of this strategy is directly tied to adequately funding experimentation by the N-CFT.

Network Cross Functional Team (N-CFT)

The N-CFT is working on several lines of effort in order to continue the Army's network modernization strategy.

The N-CFT is in the middle of developing requirements and systems to create a unified network for the Army to use. This includes efforts to develop and implement an architecture that will unify the tactical network; finding, developing, and demonstrating technologies to create this network; and the creation of requirements. The N-CFT defined a working term, the Integrated Tactical Network (ITN). The ITN is the suite of communications and networking hardware and software that provides voice and data communication capabilities to tactical units. It is the infrastructure necessary to support the current and future voice and data needs (namely mission command software). The ITN is not rigidly defined and will continue to evolve over time as the Army identifies new technologies.

The ITN Information System Initial Capabilities is under development with a planned approval during 1QFY19. The N-CFT has lines of effort for the COE, interoperability, and command post mobility and survivability.

The N-CFT has conducted ITN-based experiments in FY18 to include major training events in the United States and Europe. The Army Test and Evaluation Command (ATEC) led a team that observed the experimentation and published a Capabilities and Limitations Report for the ITN in May 2018. This report recommended several possible ways to refine the configuration, evaluation, and deployment of the ITN in the future. This included recommendations to reduce or eliminate wired connections, create less resource intensive range extension, and use conformal wearable batteries. The report also recommended that future testing of the ITN should include cybersecurity, human factors, and waveform characterizations.

Directed Requirement to Experiment, Demonstrate, and Assess an Integrated Tactical Network (ITN)

In June 2018, the Vice Chief of Staff of the Army used the Army's Tactical Network Modernization Strategy and the ATEC Capabilities and Limitations Report for the ITN as references for the Directed Requirement to Experiment, Demonstrate, and Assess an ITN. This document created the requirement to procure equipment necessary to field the ITN to an Infantry Brigade Combat Team (IBCT), Stryker Brigade Combat Team (SBCT), Armored Brigade Combat Team (ABCT), and associated units. The document gave responsibility of the architecture of the network to the Army Capabilities Integration Center (now part of Army Futures Command) in coordination with the Chief Information Officer of the G6 and the Assistant Secretary of the Army for Acquisition Logistics and Technology's System of Systems Engineering and Integration.

The Directed Requirement included guidance to the N-CFT to conduct assessments and characterizations of the ITN with an IBCT, an SBCT battalion, and an ABCT battalion. The Vice Chief of Staff of the Army directed the N-CFT assessments of the ITN to focus on the networking capabilities of the ITN to include: alternate networks, advanced waveforms, network gateways, satellite terminals, mission command system integration, and range extension. The experimentation is expected to include scenarios and equipment that will help inform future requirements, capability sets, and procurement recommendations. DOT&E is concerned about the level of test rigor planned for these assessments. In the absence of a detailed experimentation and evaluation strategy, it is unlikely that the Army will be able to collect the data required to support development of requirements.

The Directed Requirement seems to have implemented the network modernization plan to use experimentation to develop requirements and define ITN equipment. The Vice Chief of Staff of the Army has included some of the ATEC suggestions for additional testing and made them a part of the requirements. The development of the evaluation strategy is undefined at this point. The Army intends to do the assessment with a unit during a combat training center rotation. The development of this assessment strategy is crucial to how the equipment fielded to the designated units will function in an operational setting, but also how future requirements will be written and implemented.

Network Integration Evaluation (NIE) 18.2

The NIE 18.2, scheduled for October and November of 2018, will serve as the final NIE. ATEC will conduct three operational tests as a part of the NIE 18.2: Command Post Computing Environment (CPCE) IOT&E, Distributed Common Ground System – Army (DCGS-A) Capability Drop 1 IOT&E, and the Mounted Computing Environment (Mounted CE) Customer Test. The NIE 18.2 will include risk reductions of the air-ground network integration and demonstrations of the ITN and various tactical radios.

The NIE events were a useful tool for the Army to conduct comprehensive evaluations of an integrated mission command network than was possible through evaluations of individual components. This benefit was predicated on aligning multiple operational tests with a single, annual, schedule-based event. This schedule alignment limited the flexibility of programs to adapt to schedule delays, and delays could be amplified when a program needed to wait for the next scheduled NIE.

The ITN is a capability comprised of many different systems. The N-CFT would benefit from conducting an integrated experiment, with a dedicated test unit, against an appropriately sized opposing force, in challenging terrain, which will be necessary to evaluate that overarching capability. This will necessarily align the systems being tested together and could prevent the schedule driven nature of the NIE. The Army should consider using the lessons learned from the execution of 8 years of NIEs to develop a plan for the assessment and evaluation of the ITN. Using test and evaluation best practices will enable the Army to gather objective, defensible data to inform future requirements.