Deploy the Marine Corps Enterprise Network

An information environment that best supports *EF 21*

by LtCol Leonard J. LeVine

I n February 2015, planners from across the Operating Forces, Supporting Establishment, and Headquarters Marine Corps convened an Operational Planning Group (OPG) at Headquarters, Marine Corps Forces Pacific at Camp H.M. Smith, Hawaii. The main focus of the OPG was to define the requirements for an information environment that best supports *Expeditionary Force 21* (*EF 21*) operations and fulfills the tenants of the Joint Information Environment. The overarching goal was to develop a simplified user experience that enables operating forces to utilize and maintain access to the Marine Corps Enterprise Network (MCEN) in a deployed environment and diminish the need to establish separate and distinct tactical networks. This would provide for continuity of critical information during planning and through operations that extend from garrison to remote locations. Most importantly, it would provide a single network environment that is easily echeloned forward and redeployed without loss of critical information and without the need to utilize various email addresses in different domains to accomplish the mission. This would occur without interruption or having to change how the network is accessed or the way information is retrieved. There would also be an improvement to the cybersecurity posture of our tactical networking systems by enabling near real time mitigation of vulnerabilities and assured security compliance. The changing cyberspace landscape presents

MCTSSA conducted a limited objective experiment at Camp Pendleton to prove we could merge garrison and tactical networks. (Official USMC Photo.)

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opportunities for achieving enhanced mission effectiveness, improving cybersecurity, and gaining overall efficiencies.

The OPG generated a Deliberate-Universal Needs Statement, which led to the first in a series of limited objective experiments (LOE) to guide the development of a standardized method for extending the MCEN to the tactical edge. The first LOE was executed from

The MCEN system would obviate the need for separate garrison and deployed databases and email. (Official USMC Photo.)

May to July 2015 and was led by the Marine Corps Tactical Systems Support Activity (MCTSSA) with support from the Marine Corps Network Operations and Security Center (MCNOSC) and Marine Corps Installations Command. The primary goals of this LOE were to develop and demonstrate the capabilities of an MCEN Tactical Processing Node (TPN) and to identify changes required in existing capabilities, policy, and procedures.

Col Ben Stinson, the Commanding Officer, MCTSSA, states, "The Limited Objective Experiments support efforts to merge tactical and garrison networks within the Marine Corps. Our Operating Forces require the ability to rapidly deploy forces while ensuring that Marines have a singular user identity which would provide them seamless access to individual and organizational data from anywhere in the world." The MCEN would be engineered to support operations that employ mission-tailored forces in various sizes that rapidly deploy from a static information environment. A key characteristic would be for the MCEN TPN to provide prompt and reliable access to persistently used information and enable the rapid assumption of operations with no loss in the flow of information to higher, adjacent, and lower echelon units. The end state

is an MCEN that enables our forces to operate within a range of mission environments. These operations would be supported by command, control, communications, and computers (C^4) capabilities that assure flexibility, rapid deployment, and scalable solutions to support MAGTF command and control in a Joint, interagency, multi-national, and mission partner environment.

As a crisis unfolds, planning would commence.

The targeted beneficiaries are mission-tailored forces requiring rapid transition from a garrison setting (static information environment) to a deployed environment in order to conduct short duration, crisis response-type missions as described in *EF 21*. The emphasis on scalability and the ability to transition to more robust, locally hosted network services will ensure that should a contingency become prolonged, the supporting C^4 infrastructure can grow along with the mission.

Employing the MCEN as an integrated capability would begin in the garrison environment during steady-

state operations where a staged environment of MCEN TPNs are maintained in a "ready-state" status with up-to-date security and software compliance. The MCEN TPNs would be properly configured, compliant with security measures, and rapidly "un-dockable" for portability to any area of operations. The staged environment of MCEN TPNs could reside either physically or logically alongside garrison resources until ready to be deployed.

As a crisis unfolds, planning would commence. Based on factors such as expected user density, operational environment, and personnel and lift constraints, planners would identify which technical resources would be physically deployed forward from the "ready-state" and which would be accessed remotely from the persistent environment. This would be a risk decision that offers flexibility balanced with mission requirements. Technical resources include fundamental network services such as domain name system, dynamic host control protocol, authentication, etc. Other technical resources include real time and near real time services such as chat, telephony, enterprise voice and video teleconferencing, and some command and control applications. The use of standardized and scalable capability sets in the form of MCEN TPNs would simplify planning and employment and also serve to improve training and readiness as the systems would remain online and available for Marines to operate and maintain. Connectivity back to a static environment would be transmission agnostic and primarily through consolidated base stations providing access into an MCEN entry point. Additionally, connections would be possible through satellite or terrestrial means via standardized tactical entry points or through commercial service providers.

Today, there are limited options that provide deployed forces with reach back access into the MCEN. However, in the event of isolation, these options pose an unacceptable risk to the mission. The ability to employ MCEN TPNs would ensure our operating forces retain the ability to employ organic tactical networking capabilities that ensure sur-

vivability in the event of disconnected, intermittent, or low-bandwidth conditions. Local administrators within the operating forces would possess an appropriate level of permissions and capabilities as an imperative to ensure autonomy and responsiveness to dynamically changing network requirements and operational environments. Likewise, deployed operating forces would have the support needed from the larger enterprise such as the MC-NOSC, MCTSSA and other supporting organizations.

The first LOE specifically focused on MCEN non-secure Internet protocol router network services that were loaded onto a tactical networking suite, the distributed data system–modular. This LOE was conducted in a simulated tactical environment representing a deployed battalion-level combat operations center connected via satellite communications. Each of the objectives were successfully met for the first LOE which were to: 1) Develop an MCEN TPN using currently available tactical networking equipment and the current garrison MCEN network architecture; 2)

Identify and recommend solutions for equipment and policy gaps that prevent the development of MCEN TPNs for the operating forces in order to guide future development of this capability; 3) Demonstrate cyber readiness of the MCEN TPN in a ready-state status; 4) Demonstrate the capability of the MCEN TPN to extend MCEN services to operate in a tactical environment; and 5) Demonstrate the survivability of locally hosted MCEN services in a disconnected or intermittent/low-bandwidth network environment. The first LOE generated a number of technical and procedural changes needed to implement this concept. Many of the technical challenges are associated with data transfer, processing, and storage. Modernization of our existing tactical data systems will better leverage the use of virtualization, optimize performance, and reduce size, weight, and power requirements in a deployed environment. The significant work—some of which has already been initiated—will be in updating policy, developing standardized implementation guides, and repeatable tactics, techniques, and procedures.

According to Col Stinson, future LOEs will target MCEN secure Internet protocol router network, other command and control applications and systems for integration, and MAGTF afloat nodes. Although there will be a multitude of technical, procedural, and policy changes required before this capability is ready to be employed, the series of LOEs that will be executed over the next year are designed to refine the concept necessary to build a unified MCEN that extends toward the tactical edge. The recommendations and findings of the LOEs are nested with other long-term efforts and will inform the Marine Corps Cyber Task Force that is working to improve the Marine Corps' capability and capacity to operate within the cyberspace domain.

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With the MCEN, we can deploy from garrison to an expeditionary environment with enhanced cybersecurity. (Official USMC Photo.)