

Marine Corps Tactical System Support Activity



Information Brief

Marine Corps Enterprise Network (MCEN) Planning Yard

February 2019

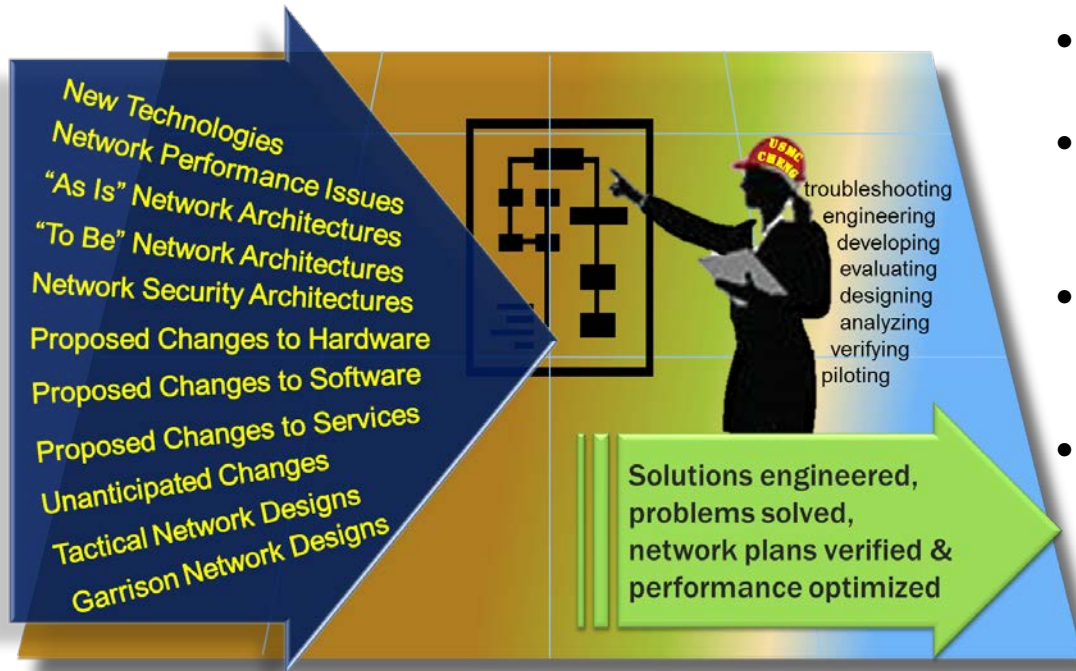
Purpose: Provide Overview of the MCEN Planning Yard



MCEN Planning Yard (MPY)

Mission

The mission of the MCEN Planning Yard is to provide engineering services to integrate changes to the MCEN to reduce risk and meet or exceed all force requirements, maximize cybersecurity, minimize down time, and reduce total cost of ownership. Support services include:



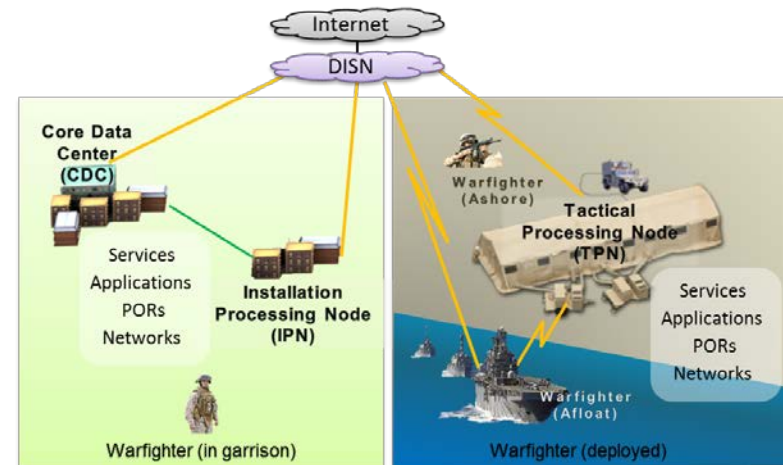
- Complete life cycle and configuration control support
- Concept development through design resolution, integration, and installation
- Testing and proofing in order to ensure secure and reliable networks and services for the force
- Advance design/engineering for planning and execution of technology insertion, refresh, and upgrades

The MPY provides an enabling capability to implement Technical Authority over the MCEN by establishing a rigorous and repeatable engineering process to evaluate proposed changes and cyber vulnerabilities



Background

- **What is the Marine Corps Enterprise Network (MCEN)?**
 - Marine Corps Worldwide Network of Networks
 - Physical and logical information systems, PORs, applications, and networks that connect from the USMC Tier 2 boundary to the DISA Tier 1 Internet Access Point.
 - Both Tactical and Garrison, NIPR & SIPR, afloat and ashore
 - Data Centers (i.e. MCEITS)
 - Enterprise Services (i.e. email, domain controllers, etc.)
 - Local Marine networks (i.e. MAGTF Regional Area Network)
 - Deployed MCEN/DSTB extensions



- **Engineering the MCEN is a complex effort involving multiple stakeholders with loosely defined roles and responsibilities:**
 - DC I, MARFORCYBER, MCNOSC, MCSC, HQMC C4, HQMC I&L, MITSCs, and Operating Forces



Background (Cont.)

- **The MCEN Planning Yard initiative was established on 20 Jan 2016 to address the “Dynamic” nature of the MCEN**
 - **Marine Corps Systems Command initiative, coordinated with MCEN stakeholders and led by MCTSSA**
 - **Initial Operating Capability achieved in October 2018**
- **Goal; Technically evaluate proposed changes to the MCEN**
- **Scope: Configuration & Change Management, Testing, Experimentation, Optimization Engineering, and Decision Support**
- **Current focus: Tactical systems; seams and interfaces between the MCEN Deploying environment (tactical) and the MCEN persistent environment (garrison)**



Why “Planning Yard”

Ship vs. MCEN Planning Yard

Ship Class Planning Yard

- Maintain the physical configuration of the ship class for the lifecycle;
- H/W (Equipment) focused; Does not address S/W modifications;
- Most/All Ship Planning Yard work is “calculable”;

Maintain the integrity of the ship

MCEN Planning Yard

- There is no comprehensive configuration for the MCEN; The MCEN is difficult to define/bound;
- Software will be a critical component for MCEN Planning Yard considerations;
- MCEN change impacts are not “calculable” – some testing will be required.

Maintain the integrity of the MCEN



MCEN Planning Yard Advantages

- **Holistically evaluates changes to the MCEN**
 - New to the enterprise
- **Promulgates enterprise awareness of MCEN changes**
 - Proactive, deliberate configuration decisions
- **MCEN Cyber/IT standards**
 - Enforces common implementation across the MCEN
- **A more secure, better performing MCEN**
 - Risk is better understood and mitigated



MCEN Planning Yard FY18 Accomplishments

MCEN Planning Yard Functional Decomposition

1.0 Configuration & Change Management

- Evaluated ATOs expiring 12 months out
- Added “new” ATOs to assessment approach
- Completed 140 Triage Assessments

2.0 Testing

- Test Events
 - 17-2 SoS Test Event (NDAA 1647 Effort)
 - 18-1 SoS Test Event (ACE Focus)
 - 18-2 SoS Test Event (USS Secure)
- Deep Dive Assessments
 - JBC-P
 - MCTIMS
 - MEMS
 - AN/117G
 - GCSS-MC (in progress)
 - GCCS/TCO
 - MCHH (in progress)
 - DNS, DHCP, IPAM (DDI) (in progress)

3.0 Conduct Experimentation & Proof of Concept Events

- Engineering Assessment of the Army’s Command Post Computing Environment (CPCE) within the Marine Corps’ Combat Operations Center C2 systems architecture
- Engineering Assessment of Microsoft Office 365 and an on premise cloud solution for the deployed environment (Planning)

4.0 Optimization Engineering

- GCSS-MC R11 performance assessment (11 environments, afloat and ashore)
- GCSS-MC R12 engagement
- MCFMIS Point of Sale system analysis and resolution
- DMCEN TIG Update

5.0 Decision Support & Lessons Learned

- 11 Governance Board Decision Memorandums
- 17-2 and 18-1 Test Reports
- JBC-P and MCTIMS Technical Reports



Current MCEN Planning Yard Efforts

- **Engineering Assessment of Microsoft Office 365 and an on premise cloud solution for the deployed environment**
- **Engineering Assessment of the Army's Command Post Computing Environment (CPCE) within the MAGTF Afloat C2 systems architecture**
- **Deployed MCEN Limited Objective Experiment 3**
- **Test of the Electronic Maintenance Support System (EMSS) to determine performance and cyber security impact on the MCEN as it transitions to a wireless transport solution**
- **Engineering Assessment / Testing of multiple other programs of record in both development and sustainment phase of the acquisition process**



Key Facilitating Attributes

- **Federated Approach**
 - Distributed Engineering and T&E
 - Connectivity with federation partners engineering labs and test facilities
- **Engineering and T&E facility that leverages;**
 - Virtualization Technologies
 - Modeling and Simulation Software



Federated Approach

The MCEN Planning Yard Federation:

- Includes organizations that provide support to the acquisition and sustainment of the Programs of Record (PORs) that make up the MCEN.
- Leverages expertise, systems and laboratories at both mission funded and Navy working capital funded sites.
 - These geographically separated sites may work autonomously or as a connected federation to provide robust engineering, test, and cyber evaluation capability.



Engineering and T&E Environment

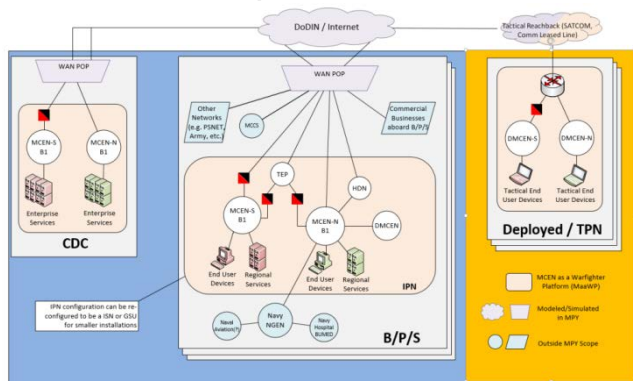
- Distributed approach to leverage existing lab infrastructure and capabilities to address test and engineering needs of a Unified MCEN
- Enables effective use of virtualization and Modeling and Simulation (M&S) where practicable to improve efficiency and reduce risk
 - Virtualization leverages vRealize Automation, VSAN and NSX technologies
 - M&S leverages Scalable Networks EXata Modeling and Simulation Software
- Enables technical evaluation of cyber vulnerabilities from an enterprise vice individual system perspective



MCEN Planning Yard

Distributed Test & Engineering Environment

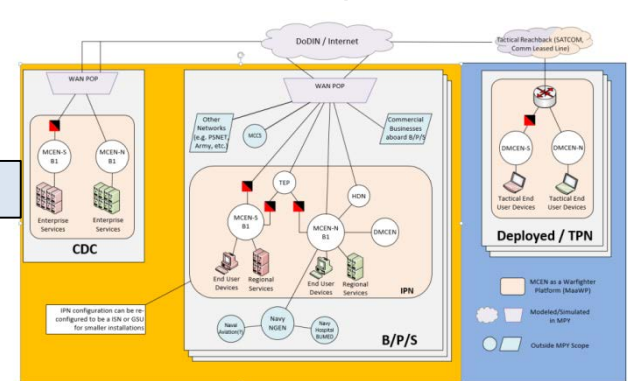
PfM Supporting Establishment Systems SIL Environment Implementation



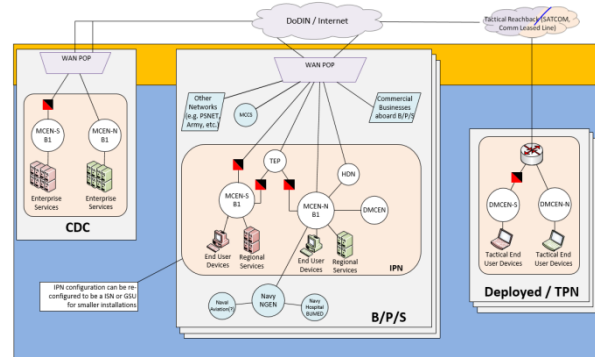
Quantico VA

Distributed Test & Engineering Environment connected via DREN / SDREN / Leased Line or Tactical SatCom

MCTSSA MPY SIL Environment Implementation



Camp Pendleton CA



Who:
MCTSSA and PfM SES
Other MPY Federation Partners TBD

Why:
To provide an engineering and testing environment that accurately represents the MCEN from the fighting hole to the flag pole in support of:

What:
Establish a high fidelity "digital twin" of the MCEN by establishing a persistent or "near persistent" connection between the PfM SES SIL and MCTSSA MPY SIL environments

Base, Post, Station Topology NGEN, SONIC, MCEITS, BTS	High Fidelity High Fidelity
DISA Topology	Low Fidelity
Tactical Transmission Systems Tactical End User	High Fidelity High Fidelity

- Testing of enterprise level engineering change proposals
- Technology evaluations
- SoS Adversarial Cybersecurity assessments



MPY Modeling & Simulation

Description

EXata is a network emulator that provides the capability to evaluate static and mobile network topologies

It can digitally represent the entire network, the various protocol layers, antennas, and devices

The system can interoperate, at one or more protocol layers, with live devices to provide hardware-in-the-loop capabilities

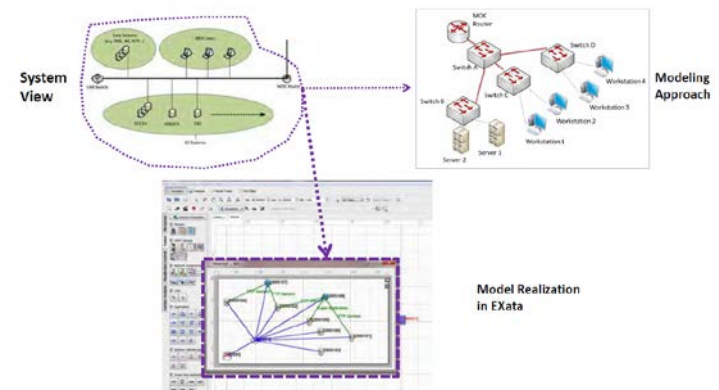
Capabilities

- Topology conversion from Visio XML files to EXata scenarios
- Import device configuration data (router config files) into EXata
- Includes libraries for Military Radios, Cybersecurity, Sensor Networks and Urban Propagation (terrain data required)
- RF propagation with Digital Elevation Model (DEM), Digital Terrain Elevation Data (DTED) and Urban Terrain Data
- On-the-move (mobility) networking modeling

Benefit

- Employ large numbers of networks in small space with minimum manpower while providing realistic effects caused by latency and bit error rate
- Reduce risk in fielding frequently changing network devices and programs

As-is Scenario Realization in EXata





Opportunities

- **Modeling and Simulation Subject Matter Expertise:**
 - Scalable Networks EXata Software user expertise
- **Data Center Management**
 - Network Management (Cisco, McAfee, F5, Pulse)
 - Virtualization Technology Subject Matter Expertise (vRealize Automation, VSAN and NSX technologies)
 - System Administration Expertise (Microsoft Exchange 2016 and Microsoft Server 2016)
- **Program Administrative Support**
 - Schedule management (Microsoft Project)
 - Meeting / Conference coordination and support