Command Post Computing Environment (CPCE)

Preliminary analysis of the operational test data indicate that the Command Post Computing Environment (CPCE) Increment 1 is operationally effective in supporting commanders and staff with improved situational awareness and mission command, and provides corrections for deficiencies fielded with CPCE Increment 0. CPCE Increment 1 is not operationally suitable, demonstrating problems with reliability, training, and usability. CPCE Increment 1 is survivable, and demonstrated an enhanced defensive posture within a cyber-contested environment. The Army intends to conduct a CPCE Increment 1 full deployment decision in 1QFY22.

System Description

CPCE Increment 1 is a server-based software system that provides server hardware and mission command software to support commanders and staff using general purpose client computers, located within battalion, through corps Tactical Operations Centers. CPCE Increment 1 is the Army's planned evolution of the fielded CPCE Increment 0, and is intended to improve the soldier's user experience, interface with more data sources, and corrected fielded deficiencies. The CPCE Increment 1-supporting server hardware consists of two variants: a Tactical Server Infrastructure (TSI) Large, a full server stack designed to support headquarters at brigade level and above, and the TSI Small, a laptop-based server designed to support battalion headquarters and provide back-up capabilities for higher echelons. The CPCE Increment 1 software provides a common operational picture, a suite of web-based collaboration tools and messaging capabilities to facilitate the commander and staff to plan, prepare, execute, and assess Army operations. The Army designed CPCE Increment 1 to share information with joint and coalition partners utilizing the Multilateral Interoperability Programme standard.

Program

The Army designated the CPCE program as an Acquisition Category II program and delegated Milestone Decision Authority to the Program Executive Officer, Command Control Communications – Tactical. The Army conducted a CPCE Increment 0 IOT&E in November 2018. On June 13, 2019, DOT&E published a CPCE Increment 0 IOT&E report, which assessed the system as not effective, not suitable, and not survivable. The Army conducted a full deployment decision and approved a CPCE Increment 0 software fielding in July of 2019. In accordance with the CPCE Increment 0 Full Deployment Decision Acquisition Decision Memorandum, the Army conducted a developmental test in November 2019 and demonstrated correction of several IOT&E deficiencies.

DOT&E approved the CPCE Increment 1 Test and Evaluation Master Plan in November 2019 and approved the CPCE Increment 1 Operational Test Plan in June 2021. The Army completed a June 2021 CPCE Increment 1 Operational Test in accordance with the DOT&E approved test plan, and intends to conduct a full deployment decision in 1QFY22. DOT&E is completing a CPCE Increment 1 Operational Test report to support this fielding decision.

Major Contractors

Weapons Software Engineering Center – Picatinny Arsenal, New Jersey. Systematic USA/Systematic AS – Centreville, Virginia/Aarhus, Denmark.

Test Adequacy

The Army conducted a CPCE Increment 1 Operational Test, which included an Adversarial Assessment, at Fort Carson, Colorado from June 7-24, 2021, and a Cooperative Vulnerability and Penetration Assessment, at Fort Bragg, North Carolina from April 5-9, 2021. Operational testing, executed by elements of the 4th Infantry Division and allied partners operating within a command post exercise environment, was adequate to evaluate the CPCE Increment 1 operational effectiveness, suitability, and survivability. The Army conducted the operational test in accordance with a DOT&E-approved test plan and intends to use the results to support the planned 1QFY22 CPCE Increment 1 full deployment decision.

Since the discontinuation of Network Integration Evaluations, the Army has shifted operational testing of mission command systems to larger events, vice dedicated operational tests. In this case, the Army combined the CPCE Increment 1 Operational Test with the Joint Warfighter Assessment 21. The operational test included several limitations, mostly related to the command post exercise environment of the test. These limitations included collocated servers for all headquarters, reduced manning of system administrators, and employment of a fiber optic network instead of tactical communications. The full description of adequacy and limitations will be included in the pending CPCE Increment 1 Operational Test report intended to support the Army's 1QFY22 full deployment decision.

The Army completed a partial verification and validation of data instrumentation prior to the CPCE Increment 1 Operational Test due to problems with their data collection, reduction, and assessment process. DOT&E approved the operational test plan with the condition that the Army would complete the verification and validation effort following testing, and that during testing, data instrumentation would collect useful operational test data to support an adequate assessment.

Performance

Effectiveness

Preliminary analyses indicate that CPCE Increment 1 is operationally effective, enabling commanders and staff to share a single common operational picture and common operations data across staff elements, and experience an improved ability to share information with joint and coalition partners. Commanders and staff experienced improved mission execution and situational awareness, but also experienced difficulties in using CPCE Increment 1 to execute the full Army operations process. Soldiers' problems were related to poor collective and individual training, software functions requiring improvements, and troubleshooting. Soldiers were not able to share plans between current and future operations cells, and had difficulty sharing plans between different servers supporting staff elements. When staffs could not employ CPCE Increment 1, they reverted to previous methods, such as collaboration using paper maps, to complete their mission.

Suitability

Preliminary analyses indicate CPCE Increment 1 is not operationally suitable, demonstrating the following problems with reliability, training, and usability:

- CPCE Increment 1 did not meet its derived reliability requirement. CPCE Increment 1's lack of reliability reduces its support of mission command and increases the unit requirements for maintenance support and field service representatives.
- Training afforded to soldiers did not prepare them to make full use of advanced features,

troubleshooting, and employment of CPCE Increment 1 in a collaborative manner. Soldiers recognized CPCE Increment 1 as intuitive for basic features, but struggled to execute advanced capabilities to complete complicated actions, such as troubleshooting and working with CPCE Increment 1 knowledge managers to share information across servers with other staff elements. CPCE Increment 1 new equipment training offered two levels of soldier training, but did not include a collaborative staff exercise as provided during CPCE Increment 0 training.

- Soldier system administrators experienced difficulty using CPCE Increment 1 tools provided to configure and maintain CPCE software and hardware. These maintainers found CPCE Increment 1 difficult to troubleshoot and viewed CPCE Increment 1 as more manpower intensive than their previous version of servers. Soldier system administrators did not receive formal new equipment training, but were provided over-the-shoulder training from contract field service representatives.

Survivability

The CPCE Increment 1 demonstrated enhanced survivability in a cyber-contested environment as compared to CPCE Increment 0. CPCE Increment 1 maintained a strong cybersecurity defense posture when employed with trained Army cyber defense soldiers using integrated cyber defense tools. The full description of CPCE Increment 1 cybersecurity survivability against an operationally realistic cyber threat will be included in a classified annex to the pending CPCE Increment 1 Operational Test report intended to support the Army's 1QFY22 full deployment decision.

Recommendations

The Army should:

1. Correct the deficiencies identified in the CPCE Increment 1 Operational Test.
2. Improve training afforded to soldiers to allow full use of CPCE Increment 1 advanced capabilities and improve the system administrator's ability to install, operate, and maintain CPCE Increment 1 hardware and software. This training should include a capstone staff exercise to reinforce the collaborative use of CPCE Increment 1.
3. Conduct a complete review of instrumented data collection intended to support mission command and network systems. This review should lead to a set of best practices and an enduring set of data instrumentation that provides flexible and responsive support of both developmental and operational test requirements.