# Global Command and Control System – Joint (GCCS-J)

Executive Summary

- Defense Information Systems Agency (DISA) development focused on implementing high priority capability enhancements, software corrections, and infrastructure improvements to both Global Command and Control System – Joint (GCCS-J) Global and Joint Operation Planning and Execution System (JOPES).

GCCS-J Global

- DISA developed GCCS-J Global v4.2.0.9 (Global v4.2.0.9) to provide operational enhancements, remediate security vulnerabilities, and correct Common Operational Picture (COP) and Integrated Imagery and Intelligence (I3) application deficiencies discovered while testing and operating previous Global releases. DISA expended significant effort to ensure Global v4.2.0.9 would be acceptable for fielding into the Air Operations Centers (AOCs) that support the Joint Force Air Component Commanders. Global v4.2.0.9 testing occurred at both the Combatant Command (CCMD) and AOC levels.
- CCMD-level testing:
  - The Joint Interoperability Test Command (JITC) conducted CCMD-level operational testing in December 2011, revealing substantially fewer defects than OT&E conducted during the past two years. However, due to known and encountered test limitations, operational testing was insufficient to determine operational effectiveness and suitability for both the CCMD and higher-echelon environments in which Global v4.2.0.9 will be used.
  - Regression testing of Global v4.2.0.9 Updates 1 and 2 conducted by DISA in 2012 showed the release was acceptable at CCMD and higher echelons. Four Category I deficiencies and 15 Category II deficiencies remain. Testing in the more demanding AOC environment is required to fully evaluate Global v4.2.0.9 corrections.
- AOC-level testing:
  - DOT&E used data collected during AOC-level developmental and operational testing, which implemented Global 4.2.0.9 in a more complex configuration, to assess Global v4.2.0.9 performance at lower echelons.
  - The Air Force conducted developmental testing at Langley AFB, Virginia, of Air Operations Center – Weapon System (AOC-WS) 10.1 Recurring Event (RE)11, which used Global v4.2.0.9 as a significant portion of RE11.
  - The 605th Test and Evaluation Squadron (TES) conducted a Force Development Evaluation (FDE) of RE11 with Global v4.2.0.9 Update 1, which revealed that most critical deficiencies had been fixed, but faster
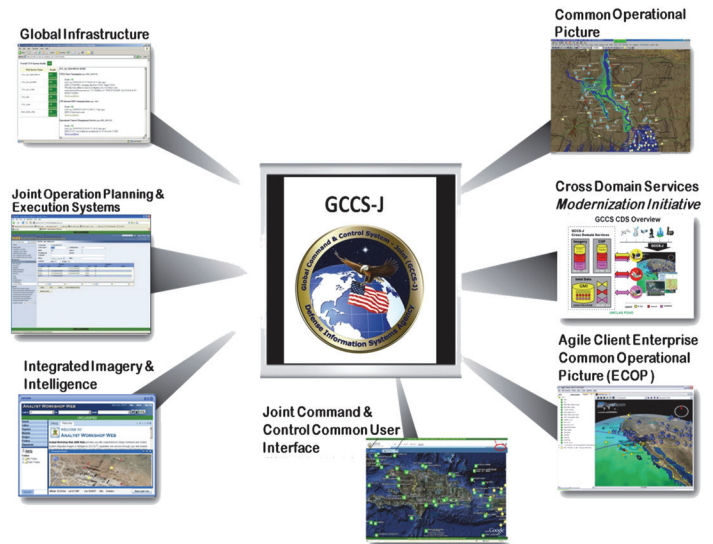
servers would be required to process the data demands of the AOC environment. Global v4.2.0.9 Update 1 testing occurred on upgraded servers, and showed a four-fold improvement in processing speed, satisfying AOC data demands.
  - 605th TES integrated developmental/operational testing of RE12 with Global v4.2.0.9 Update 2 in December 2012 is expected to address the remaining 4 Category I and 15 Category II deficiencies of Global v4.2.0.9 within the AOC environment.

GCCS-J JOPES

- DISA developed GCCS-J JOPES v4.2.0.2 (JOPES v4.2.0.2) to provide the initial framework for the Transportation Tracking Account Number (TTAN), to upgrade JOPES Data Network Services (JDNETS) software to reduce dependency on the Deliberate and Crisis Action Planning and Execution Segment (DCAPES) and support enhanced system monitoring, to resolve existing problem reports, and to upgrade commercial off-the-shelf (COTS) software.
- JITC conducted low-risk operational testing in February and March 2012 of JOPES v4.2.0.2 at five CCMD sites, three Service sites, the Joint Staff Support Center, and at the DISA Headquarters facility laboratories at Fort George G. Meade, Maryland. JOPES operational users validated the JOPES v4.2.0.2 capabilities during the execution of an end-to-end Time-Phased Force Deployment Data scenario.
  - The scenario demonstrated the ability to identify high-level mission requirements, source operational forces and materials, verify force and material availability and mission readiness, and schedule transportation to move those forces and materials.

- Decoupling of database exchanges between DCAPES and JOPES allowed each program to upgrade without affecting the other.
- Enhanced system monitoring allowed JOPES system administrators to better track JOPES system performance, such as transaction queues and query backlogs, across all four enclaves and deployable servers.

System

- GCCS-J is a command and control system utilizing communications, computers, and intelligence capabilities. The system consists of hardware, software (COTS and government off-the-shelf), procedures, standards, and interfaces that provide an integrated near real-time picture of the battlespace necessary to conduct joint and multi-national operations. GCCS-J consists of a client/server architecture using open systems standards, government-developed military planning software, and an increasing use of World Wide Web technology.
- GCCS-J consists of two main components:
  - Global v4.2.0.9 (Force Protection, Situational Awareness, Intelligence applications)
  - JOPES v4.2.0.2 (Force Employment, Projection, Planning, and Deployment/Redeployment applications)

Mission

- Joint Commanders utilize the GCCS-J to accomplish command and control.

  GCCS-J Global
  - Commanders use GCCS-J Global:
    - To link the National Command Authority to the Joint Task Force, Component Commanders, and Service unique systems at lower levels of command

- To process, correlate, and display geographic track information integrated with available intelligence and environmental information to provide the user a fused battlespace picture
- To provide I3 capabilities
- To provide a missile warning and tracking capability
- The AOC uses GCCS-J Global:
  - To build the air picture portion of the COP and maintain its accuracy
  - To correlate or merge raw track data from multiple sources
  - To associate raw Electronics Intelligence data with track data
  - To perform targeting operations

GCCS-J JOPES
- Commanders use GCCS-J JOPES:
  - To translate policy decisions into operation plans (OPLANs) to meet U.S. requirements for the employment of military forces
  - To support force deployment, redeployment, retrograde, and reposturing
  - To conduct contingency and crisis action planning

Major Contractors

- Government Integrator: DISA
- Software Developers:
  - Northrop Grumman – Arlington, Virginia
  - SAIC – Arlington, Virginia
  - Pragmatics – Arlington, Virginia

Activity

  GCCS-J Global
- DISA developed Global v4.2.0.9 to provide operational enhancements, remediate security vulnerabilities, and correct COP and I3 application deficiencies discovered while testing and operating previous Global releases. DISA expended significant effort to ensure Global v4.2.0.9 would be acceptable for fielding into the AOCs that support the Joint Force Air Component Commanders.
- Global 4.2.0.9 is a critical upgrade urgently needed by the AOC-WS program and the operational AOCs. The AOC-WS baseline uses legacy Global v4.0.2 and cannot employ critical I3 capabilities due to outstanding Category I problems when used in the AOC operational environment. Global v4.2.0.9 testing occurred at both the CCMD and AOC levels.
- CCMD-level testing:
  - JITC conducted operational testing of Global v4.2.0.9 at U.S. European Command and U.S. Southern Command

in December 2011 in accordance with a DOT&E-approved test plan.
  - DISA conducted a regression test of Global v4.2.0.9 Update 1 in January and February 2012, after correction of deficiencies.
  - DISA conducted a regression test of Global v4.2.0.9 Update 2 in June 2012 after making corrections to additional deficiencies identified during Update 1 and RE11 testing.
- AOC-level testing:
  - The Air Force performed developmental testing of RE11 in January 2012 at Langley AFB, Virginia. A significant portion of this testing involved additional testing of the Global v4.2.0.9 baseline as it was approved by DISA for fielding within an AOC environment.
  - The 605th TES performed an FDE of RE11, to include the corrections in Global v4.2.0.9 Update 1, at Langley AFB in March 2012. Additional testing of

Global v4.2.0.9 Update 1, modified to work on newer, more powerful servers, occurred at Langley AFB in May 2012. During RE11, the 605th TES implemented Global v4.2.0.9 in a more complex configuration. This configuration has more live interfaces and the ability to load up to 30,000 active tracks into the battlespace picture, which was significantly more demanding than previous operational testing.
- The 605th TES plans to test Global v4.2.0.9 Update 2 in an AOC environment in December 2012.

GCCS-J JOPES
- DISA developed JOPES v4.2.0.2 to provide the initial framework for TTAN, to upgrade JDNETS software to reduce dependency on DCAPES and support enhanced monitoring, to resolve existing problem reports, and to upgrade COTS software.
- JITC, in conjunction with the GCCS-J Program Office, conducted low-risk operational testing of JOPES v4.2.0.2 at five CCMD sites, three Service sites, the Joint Staff Support Center, and at the DISA Headquarters facility laboratories at Fort George G. Meade, Maryland. Testing occurred in February and March 2012.

GCCS-J SORTS
- DISA transitioned the GCCS-J Status of Resources and Training System (SORTS) component to the Defense Readiness Reporting System Implementation Office in late October 2011.

Assessment
GCCS-J Global
- DOT&E approved the JITC plan for operationally testing Global v4.2.0.9 for fielding to CCMD and higher-echelon locations, but not for fielding at lower-echelon sites such as AOCs. DOT&E is using operational test data collected during RE11 to adequately assess Global v4.2.0.9 performance at lower echelons.
- CCMD-level testing:
  - Results of JITC operational testing demonstrated significant improvement relative to past testing. Substantially fewer defects were discovered during the CCMD testing than was the case in nearly every OT&E conducted during the past two years. However, the aggregate of known and encountered test limitations rendered this test insufficient to determine operational effectiveness and suitability for both the CCMD and higher-echelon environments in which Global v4.2.0.9 will be used.
  - Many Global v4.2.0.9 interfaces were not available or tested at the two CCMD test locations, and stress levels for the COP and intelligence portion of GCCS-J are not operationally representative for AOC usage.
  - The CCMD COP loading was well below the 30,000 and 35,000 active tracks, with missile events, expected within the AOC environment.

- Each CCMD location had only three to six intelligence users participating in the test, whereas lower-echelon locations may have over 100 users.
- Regression testing in May 2012 showed that Global v4.2.0.9 Update 1 was acceptable at CCMD and higher echelons, albeit with 4 Category I and 15 Category II deficiencies requiring correction before fielding to AOCs. Regression testing on Update 1 demonstrated the ability of Global v4.2.0.9 Update 1 to handle the more demanding track loads experienced in the AOC environment.
- DISA conducted regression testing of Global v4.2.0.9 Update 2 to validate corrections for 1 of 4 Category I and 10 of 15 Category II AOC deficiencies identified during Update 1 and RE11 testing. However, testing in an AOC environment is required to fully evaluate Global v4.2.0.9 corrections.
- AOC-level testing:
  - DOT&E used data collected at Langley AFB, Virginia, during developmental and operational testing of RE11, which used Global v4.2.0.9 as a significant portion of RE11, to assess Global v4.2.0.9 performance at lower echelons. RE11 offered a test environment more operationally representative of AOC usage and is expected to provide the remaining operational data needed to adequately assess the system once testing is complete.
  - Developmental testing of the RE11 revealed several critical deficiencies with the Global v4.2.0.9 baseline. JITC did not find these deficiencies during the earlier operational testing at the two CCMD sites due to test limitations. AOC users applied more stress to the Global COP and I3 application suite than was experienced at the CCMD test sites.
  - The FDE of RE11 with Global v4.2.0.9 Update 1 revealed that the most critical deficiencies had been fixed, but that faster servers would be required to process the data demands experienced in the AOC environment. Global v4.2.0.9 Update 1 was tested on upgraded servers, showing a four-fold improvement in processing speed and satisfying AOC data demands.
  - 605th TES integrated developmental/operational testing of RE12 with Global v4.2.0.9 Update 2 in December 2012 is expected to address the remaining 4 Category I and 15 Category II deficiencies of Global v4.2.0.9 within the AOC environment.

GCCS-J JOPES
- JOPES operational users validated the JOPES v4.2.0.2 capabilities during the execution of an end-to-end Time-Phased Force Deployment Data scenario. JITC also observed DISA testers perform functional testing of the system to verify that system changes did not introduce new errors to the previously fielded software.

- The supported CCMD identified high-level requirements for forces and materials to accomplish a particular OPLAN.
- CCMD users sourced operational forces and materials to support the OPLAN, along with required timelines and locations.
- CCMD users verified forces and material were available and mission-ready.
- U.S. Transportation Command users scheduled transportation for the operational forces and materials to meet the supported CCMD requirements.
- TTAN implementation added new data fields, providing operational users with an initial capability to track the status of individuals and pieces of equipment for improved situational awareness. Upgrades to JDNETS web services did not adversely affect users' ability to monitor, plan, and execute mobilization, deployment, employment, and sustainment activities associated with joint operations.

The upgrades to JDNETS improved JOPES administrator system-monitoring capabilities with an enhanced dashboard. Users successfully installed COTS software upgrades, following installation procedures, with no discrepancies noted.

Recommendations
- Status of Previous Recommendations. DISA addressed all previous recommendations.
- FY12 Recommendation.
  1. Operational testing of significant Global v4.2.0.9 upgrades will require testing by both CCMD and AOC communities to successfully address the significant test limitations encountered at the CCMD locations. Operational testing needs to include operationally representative stress levels by users, significant COP data processing of dynamically updating tracks, and live data flowing across all critical interfaces.