



Getting to GIG: Enterprise-Wide Systems Engineering

Defense Information Systems Agency

The Defense Information Systems Agency (DISA) has recently taken on a new initiative to perform Enterprise-Wide Systems Engineering (EWSE), expanding upon the work currently performed by the Assistant Secretary of Defense for Networks, Information, and Integration (ASD[NII]) staff. DISA is leveraging their vast technical resources to perform end-to-end systems engineering across the Global Information Grid (GIG) to jump start this effort.

The goals of EWSE include providing continuous oversight of the GIG's evolution, maintaining a GIG enterprise-wide technical baseline, establishing enterprise-wide analysis capabilities, establishing a GIG compliance management program, and overseeing enterprise-wide experiments.

DISA's GIG engineering directorate is leading this effort and recently stood up the new EWSE Management Office to coordinate activities across DISA sub-units and to provide interfaces to ASD (NII) and other organizations outside DISA, including the National Security Agency (NSA), Naval Research Laboratory, Coordinating Committee for Multilateral Export Controls, Services, and other Department of Defense (DoD) agencies. The EWSE office will also prioritize workload and develop annual work plans. A major focus of the effort will be to resolve GIG EWSE issues for end-to-end interoperability including incrementally developing a common set of requirements for capabilities that span the GIG, establishing a GIG end-to-end reference architecture, developing technical guidance to facilitate end-to-end interoperability and performance, and developing a minimum set of interoperability and performance requirements (i.e. Net-Centric Interface Documents [NCIDs]) for GIG programs and systems.

Specific technical issues to be resolved by the new EWSE team include:

Black Internet Protocol (IP) Core Architecture. The EWSE team will develop a flexible and affordable black IP core architecture that provides external encryption to the tactical edge of the GIG. This architecture extends the black core to bases, posts, camps, and stations and to service delivery points for tactical (mobile, deployable, transportable) networks and will provide critical insight in supporting the fiscal year (FY) 2010 program office memorandum build. This effort will define a solution for GIG gateways, service delivery points and defense integration systems network interfaces.

Voice-over IP (VoIP). The EWSE team will define a GIG end-to-end VoIP architecture. It will develop associated VoIP requirements, standards, interface specifications, and performance criteria for all DoD enter-

prise component systems. This initiative will provide a standards-based documented architecture and guidance that will enable multi-vendor implementations.

Operationalizing GIG Quality of Service (QoS). The EWSE team's objective is to demonstrate the feasibility of a proposed QoS approach. It will define a QoS service class definition for DoD needs and define service level objectives and performance metrics for QoS service classes. It will leverage modeling and simulation efforts to validate QoS performance requirements and architecture decisions.

GIG Services. The EWSE team will develop an interoperable architecture for GIG services and address core enterprise services issues for study as a result of Program Decision Memorandum III (PDM III). The EWSE team will provide a liaison and coordinate with the various core enterprise services working groups chartered under PDM III. They will identify key issues to be addressed, document results of the studies in NCIDs, and ensure that proposed solutions trace to and are consistent with the rest of the GIG technical guidance.

Information Assurance (IA). Working with NSA, this effort builds on the current GIG IA Architecture. This work will expand in FY 2007 to focus on IA enterprise system engineering and the development of an IA implementation plan and guidance. The task will also develop an acceptable High Assurance IP Encryptor discovery solution and develop implementation guidance for cross-domain solutions to manage and control information.

Tactical Edge Issues. The EWSE team's goal is to address tactical edge issues articulated by the joint net-centric operations portfolio manager focusing on tactical ground and tactical ground-to-air scenarios. This effort will involve developing solutions for issues such as address allocation, mobile domain routing, tactical QoS for voice and data, and tactical network management.

The EWSE effort also involves maintaining and ensuring compliance with the GIG Technical Baseline by working with programs to define requirements. This close working relationship with program offices

throughout the DoD was established through DISA's role as the DoD Executive Agent for Information Technology (IT) Standards. Within this context, the Enterprise Documentation Framework working group was set up to streamline technical baseline documentation and perform configuration management. The DoD IT Standards Registry (DISR) is evolving to fit the new tech baseline. Program office technical staffs will be able to access the latest standards and GIG technical guidance published to the DISR with just a few mouse clicks.

Applying an EWSE approach to next-generation GIG capabilities will improve DoD acquisition decisions based on solid technical advice. The effort will instantiate department-wide, detailed, technical analysis by defining fundamental GIG interoperability and performance requirements for both warfighting and business capabilities. The analysis is targeted at addressing risk and synchronization across programs, and the improved decision process will enable the deployment of new or improved capabilities quicker or at lower cost. GIG EWSE is critical to ensure acquisition and interoperation of GIG components that will result in end-to-end capabilities enabling warfighters to better conduct agile net-centric operations. ♦

About DISA

This article was the collaborative effort of several individuals from DISA. DISA is a DoD combat support agency under the direction of ASD (NII). It is responsible for planning, engineering, acquiring, fielding and supporting global net-centric solutions and operating the Defense Information System Network to serve the needs of the President, Vice President, Secretary of Defense, Joint Chiefs of Staff, Combatant Commanders, and other DoD components under all conditions of peace and war. More information on DISA and the GIG can be found at www.disa.mil/index.html.