NET-CENTRIC ENTERPRISE SERVICES (NCES) INDUSTRY BEST PRACTICES AND DOD LOGISTICS

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ABSTRACT

The Global Combat Support System (GCSS) was the U.S. Department of Defense (DoD) first step to implementing Net-Centric Enterprise Services (NCES) in the DoD supply chain. A public key infrastructure-enabled service and portal environment, provided feeds from a variety of logistics systems. US Central Command (USCENTCOM) directed that all materiel resources flowing to the theater be monitored through the In-Transit Visibility (ITV) system. This paper looks at a service-oriented architecture (SOA) as the design blueprint for seamless connectivity between business processes and IT infrastructure, enabling innovation and improving productivity. NCES provide the most efficient standard way to dynamically interoperate with any customer, supplier, product or other business object.

NCES AND GLOBAL INFORMATION GRID

Net-Centric Enterprise Services (NCES) has been identified by the Assistant Secretary of Defense for Networks and Information Integration (ASD-NII) as a key U.S. Department of Defense (DoD) Global Information Grid (GIG) supporting infrastructure. As network-centric operations take pre-eminence over platform centric solutions within the Defense Department, the Global Information Grid, aimed at improving interoperability across the organization. GIG has been in development for several years and replaces the inadequate and outdated Defense Information Infrastructure (DII), created in the early 1990s. GIG is designed to provide DOD with a working framework for moving to network-centric operations. The GIG architecture will provide data to military forces around the world, from regional commanders to soldiers on the front lines. NCES is a key component of the department's strategy for meeting its transformation goals. NCES provides a common set of interoperable information capabilities which will (1) support posting of data to shared spaces; (2) provide users with the capability to pull whatever data they need, whenever they need it, from wherever they are; and (3) provide information assurance measures. NCES increases warfighter flexibility, improves the quality and timeliness of Department decision cycles, and enhances business operations. Stove-piped department and/or service-specific enterprise level legacy programs will be replaced by the consolidated infrastructure built upon NCES capabilities. The end result will be the enterprise level integration of IT systems, in both the warfighting and business domains, in an interoperable, net-centric operating environment. Net-Centric Enterprise Services supports the Department's transformation goals to achieve rapid decision superiority, streamline business processes, conduct effective and discriminate information operations, and provide a joint force operational picture. NCES transforms legacy planning and execution capabilities into protected, web-based, real-time collaborative business processes, including Joint and Coalition information exchanges across organizational boundaries. It supports real-time battle management and operations by providing a user-defined operational view of the battle space via a web browser. NCES meets the military requirement to provide dramatically improved situational awareness, robust alerting, shortened decision cycles, and shared understanding. NCES capabilities, deployed on Defense networks, will provide a consolidated, services-based IT infrastructure which reduces overall costs to deploy and

maintain IT systems supporting day-to-day business and warfighter operations. The NCES services-based architecture eliminates costly legacy interfaces between disjointed, disparate, and stove-piped systems by providing a comprehensive set of core enterprise services.

NCES ENABLING SENSE-AND-RESPOND LOGISITCS

Logistics, is moving to the forefront of military planning. The Defense Department is now developing new logistics practices and making technology upgrades that will move wartime logistics into the 21st century. In the 1991 Gulf War, the military relied on a "mass-based" logistics system that built up mountains of supplies to make sure the troops did not run out. Over a decade later, in Operation Iraqi Freedom, the military used computer and tracking systems such as those used by Wal-Mart and other retailers to order supplies "just in time." For future wars, the military will go a step further with a "sense-and-respond" system that will use networks and sensors to create an agile, real-time supply chain. The sense-and-respond logistics concept relies on battlefield sensors, communications networks, and information databases as the basis for deciding when and how supplies should be delivered to troops and from where they should come. A field commander needing more ammunition would query an automated system connected to all other units and supply databases. The system would recommend how best to field that order. It would make that decision on the basis of where the supplies were located, what was in stock, and which units had priority call on them. A unit not in the heat of battle might end up giving its ammunition to one engaged in a fight. Sense-and-respond logistics is not just about transporting stuff but to give a commander more options. The service needs logistics systems that can keep up with the pace of military operations. Before Gulf War II began, the Army in Kuwait was ordering as many as 18,000 parts and supply items per day, using standard logistics systems. However, as the troops moved into Iraq and raced toward Baghdad, logisticians received no orders because the force was moving too fast to connect to the supply chain. Eventually, computer disks were used to track supply shortages. Those disks were shipped back to logisticians for use in filling orders. Army troops probably received only one-third of the equipment needed, and it usually took two to three days to fill a request.[1].

NCES INDUSTRY BEST PRACTICES

Rainer Alt, Dimitrios Gizanis, and Hubert Österle from the University of St. Gallen, Switzerland in their current discussion on web services distinguishes between two perspectives [2], [3], [4] and [5], (1) web services from a technical perspective, which includes the standardization of transport protocols, service descriptions, message syntax, and directory structures; (2) web services from a business perspective, which emphasizes the out-tasking of process elements to a web service provider. The following focuses on the business view and considers web services as external services which are integrated into the COM process. They perform clearly delimited and highly standardized tasks which are charged on a time and/or transaction basis, and can be integrated into company information systems such as e.g. ERP, CRM, electronic product catalogs, APS or portal systems. There are four basic types of web services [6, p.43]:

- *Business process web services* perform tasks in specific processes such as procurement, production, distribution, marketing, sales and customer service.
- *Content and transaction web services* provide IT application functions and support the collection of information and interaction by means of virtual rooms or instant messaging. They provide content, evaluate, syndicate and store it, and supply application functions for transactions, such as news or research reports, stock exchange prices, product catalogs or community functions, etc. They are not process-specific and can be used various processes.

- *Integration web services* provide uniform access to network-based applications. They support the exchange of information and coordination between different organizations. This involves secure transportation and protocoling of messages (messaging, routing), converting messages into different formats (EDI, XML, fax, mail or paper), helping to find and identify market players (directory and subscriber registration services), etc.
- *IT operation web services* offer modular basic services as a basis for other web services. They support the transportation of information at the data level with tasks ranging from pure network operation and internet service providing to the backup of entire IT systems.

NCES FUTURE RESEARCH

Net-Centric Enterprise Services (NCES) for Logistics will take pre-eminence over platform centric solutions, both in the military and civilian sector. While the Global Information Grid and Net-Centric Warfare advanced the technical perspective of web services, the DoD is looking for industry best practices to develop the DoD logistics model of the future incorporating web-based Enterprise Supply System. These systems need to be secure and scaleable with a special focus on global deployment and incorporation of international standards and technology. RFID will one of the key input devices for the DoD Supply Chain of the 21st century. COTS items will be able to enter the DoD supply chain without any changes to the tracking system either commercial or DoD – this will provide the soldiers and commanders in the field total asset visibility.

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