

GLOBAL INFORMATION GRID NETOPS TASKING ORDERS (GNTO) WHITE PAPER

Introduction

This White Paper advocates United States Strategic Command's (USSTRATCOM) Joint Task Force – Global Network Operations (JTF-GNO) and/or AF Network Operations (AFNETOPS) conduct concept and prototype development with Global Information Grid (GIG)¹ NetOps Tasking Orders (GNTO) for command and control of the GIG. We believe Joint Expeditionary Force Experiment 2008 (JEFX 08) may provide a near-term venue for this concept and prototype development. The Command's NetOps global mission area is perpetual and not only supports National Military Command Authority, Combatant Commands and Services, but also non-Department of Defense (DoD) Agencies and Allies; as a result, the command may benefit from a set of universally understood and accepted USTRATCOM NetOps Orders for command and control (i.e. monitor, assess, plan, execute) of their global 24 hour a day 365 day a year mission. This paper will provide background information on USSTRATCOM's Command Relationships, NetOps Community of Interest (COI) and Mission, NetOps Effects, NetOps Essential Tasks, Commander, JTF-GNO Assigned NetOps Tasks, Assigned NetOps Tasks and NetOps Planning. The paper concludes with a discussion, challenges, and possible way-ahead recommendations.

Military Command Relationships

The Unified Command Plan, dated March 2005, assigned CDRUSSTRATCOM as the Combatant Commander for Information Operations and Global C4ISR.² The SECDEF, at USSTRATCOM's request, assigned the Director, DISA as the Deputy Commander for Global Network Operations and Defense and Commander of Joint Task Force-Global Network Operations.³ The Commander, JTF-GNO has Operational Control (OPCON) of the GIG for Global NetOps and will issue the orders and directives necessary to maintain the assured service of the GIG.⁴ When USSTRATCOM is the supported commander for Global NetOps Events, they will issue orders and direction through the JTF-GNO to the Combatant Commands, Services, and Agencies. Their supported commander OPCON includes the following command centers: JTF-GNO's Global NetOps Center, Service NetOps Components, Global NetOps Support Center, Global Infrastructure Enterprise Services Center and Theater NetOps Centers.

The Geographic Combatant Commander (GCC), on the other hand, exercises OPCON over the GIG assets in their theater. The GCC also exercises TACON over the Theater Network Center for Theater NetOps matters. As a result, all GCCs will establish a Theater Network Control Center through which they will maintain GIG situational awareness and exercise OPCON and/or TACON of their apportioned, allocated, or assigned network assets. The GCCs have the authority to direct efforts and actions that affect the portions of the GIG in their area of operations.

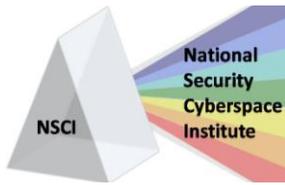
USSTRATCOM will use the NetOps COI as the primary process for building GIG management teamwork and building the trust and confidence needed to seamlessly integrate global and theater GIG operations. The use of the NetOps COI to accomplish the command and control monitor, assess, plan, and execute

¹ The 10 Aug 2005 Joint Concept of Operations for Global Information Grid NetOps states that the GIG includes all owned and leased communications and computing systems and services, software (including applications), data security services, and other associated services necessary to achieve Information Superiority. GIG also provides capabilities from all operating locations (bases, posts, camps, stations, facilities, mobile platforms, and deployed sites). As a result, it is inclusive of nearly all DOD air, surface, and space command and control, communications, computers, networks, and software activities.

² Joint Concept of Operations for Global Information Grid NetOps, 10 Aug 2005, Executive Summary, p iii

³ IBID, p 17

⁴ IBID, p 17



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functions in the above command relationship environment will be a challenge. The next section of this paper provides background on the NetOps COI and Mission.

NetOps Community of Interest and Mission

The USSTRATCOM Joint Concept for Global Information Grid NetOps states, "Under the authority vested in the Commander, USSTRATCOM, the NetOps community of interest (COI) consists of organizations from the Office of the Secretary of Defense, Joint Chiefs of Staff, Combatant Commands, Military Services, Defense Agencies, Other US Government Agencies, Intelligence Community, coalition partners and Non-Government Organizations (NGO) that must interact to accomplish NetOps in support of the DOD mission."⁵ The Joint Concept for Global Information Grid NetOps also states, "NetOps C2 must be a joint decision-making process that is dynamic, decentralized, distributed, and highly adaptive. Enabled by a robust, secure, integrated network, and through the employment of Collaborative Information Environments (CIEs), the NetOps COI will possess a seamless C2 capability. Supported by skilled personnel trained in joint NetOps and standardized NetOps Tactics, Techniques, and Procedures (TTPs), the NetOps COI will be able to create desired GIG effects at the right time and place to accomplish the mission."⁶ USSTRATCOM's ability to achieve the above mission responsibilities will be dependent on NetOps COI-wide universal understanding of the desired NetOps Effects. The next section of this paper provides a summary of the USSTRATCOM's NetOps Effects for achieving their GIG mission and management end state.

NetOps Effects

USSTRATCOM has identified three NetOps desired Effects to achieve their global mission⁷:

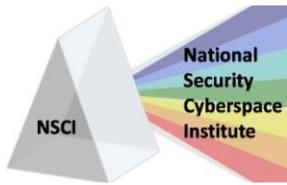
- 1) **Assured System and Network Availability:** Provide visibility and control over the system and network resources. Resources are effectively managed and problems are anticipated and mitigated. Proactive actions are taken to ensure the uninterrupted availability and protection of the system and network resources. This includes providing for graceful degradation, self-healing, fail over, diversity, and elimination of critical failure points.
- 2) **Assured Information Protection:** Provide protection for the information passing over networks from the time it is stored and catalogued until it is distributed to the users, operators and decision makers.
- 3) **Assured Information Delivery:** Provide information to users, operators, and decision makers in a timely manner. The networks are continuously monitored to ensure the information is transferred with the correct response time, throughput, availability, and performance that meet user needs.

Achieving Assured System and Network Availability, Assured Information Protection and Assured Information Delivery will not only require global collaboration of the NetOps COI to develop the NetOps Strategy for achieving the above effects, but also a COI-wide in depth understanding of the NetOps Essential Tasks that must be successfully accomplished to achieve this strategy. The next sections of this paper present a brief summation of NetOps Essential Tasks and Command JTF-GNO Assigned Tasks.

⁵ Joint Concept of Operations for Global Information Grid NetOps, 10 Aug 2005, p 16

⁶ IBID, p 44

⁷ IBID, p 3-4



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NetOps Essential Tasks

USSTRATCOM has identified three NetOps Essential Tasks for achieving the above NetOps desired Effects⁸:

- 1) **GIG Enterprise Management (GEM):** GEM is defined as the technology, processes, and policy necessary to effectively operate the systems and networks that comprise the GIG.
- 2) **GIG Network Defense (GND):** GND encompass USSTRATCOM's operational responsibilities for Information Assurance (IA), Computer Network Defense (CND) and Critical Infrastructure Protection (CIP).
- 3) **Information Dissemination Management/Content Staging (IMD/CS):** IDM/CS is defined as the technology, processes, and policy necessary to provide awareness of relevant, accurate information; automated access to newly discovered or recurring information; and timely, efficient and assured delivery of information in a usable format.

In order to successfully complete the above NetOps Essential Tasks, USSTRATCOM has assigned NetOps Tasks to its subordinate Commands and Command Centers.⁹ The next section of this paper identifies only those tasks that involve command and control activities of "directing" NetOps forces or the command and control planning activity of developing and coordinating a course of action.

Commander, JTF-GNO Assigned NetOps Tasks

The CDR USSTRATCOM assigned seventeen tasks to the Commander, JTF-GNO. Three of the seventeen tasks¹⁰ are directly related to the C2 of the GIG and issuance of orders:

- 1) Direct Operations and Defense of the GIG
- 2) Direct and oversee network defense and information services
- 3) Develop, coordinate, integrate, direct and oversee specific network defense course of action support of GIG network operations and defense.¹¹

The Global NetOps Center (GNC) is the JTF-GNO's Command Center for executing the GIG daily operations and defense. One of fourteen GNC responsibilities are directly related to the issuance of orders: Direct the operation and defense of the GIG. None of the other GNCs subordinate command centers¹² have GIG responsibilities that can be directly linked to the issuance of orders. Successfully accomplishing the above NetOps Tasks and achieving the NetOps Desired Effects will require detailed planning and accurate and timely communication of the resulting tasks, resource allocation decisions, objectives and end states. The next section provides a brief overview of USSTRATCOM's three NetOps Planning Areas.

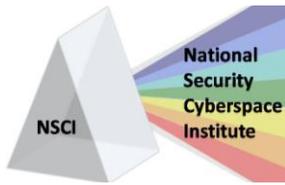
⁸ Joint Concept of Operations for Global Information Grid NetOps, 10 Aug 2005, p 5-10

⁹ IBID, p 17-19, 21-28

¹⁰ IBID, p 18-19

¹¹ Apportionment, allocation and tasking of air assets is facilitated by an air Friendly Order of Battle (FrOB) database. Establishing / maintaining a GIG FrOB will be a critical enabler to C2 of the GIG and a likely "first step" toward the GIG Network Tasking Orders discussed in this paper.

¹² Joint Concept of Operations for Global Information Grid NetOps, 10 Aug 2005, p 17-19, 21-28



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NetOps Planning

The Joint CONOPS for GIG NetOps¹³ states that NetOps Planning is done in three primary areas:

- 1) **Information Technology Services:** allocating circuits, calculating loads, ensuring spectrum non-interference, backup resources, restoration resources and establishing applications for use in the operation.
- 2) **Network Defense:** establish defense-in-depth configurations, assigning monitoring responsibilities, anticipating contingency operation for a given set of cyber attacks/failures and coordinating NetOps Priority Information Requirements with COCOM Priority Information Requirements.
- 3) **Information Dissemination Management/Content Staging:** establish prioritized information requirements, sources responsible for providing that information and staging of information content throughout the GIG in support of a given operation.

The above three planning areas present a difficult technology and process challenge. Again, it will be very important for USSTRATCOM to have a reliable command and control process to accurately communicate the above planning information in a consistent, user-friendly format to members of the NetOps COI.

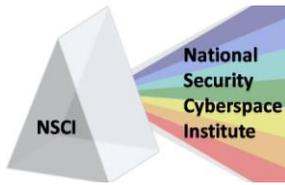
Observation

USSTRATCOM's command and control operating principle is based on the concept of Net-Centric Operations and Warfare (NCOW). NCOW is the application of net-centricity to the activities of the DOD during both day-to-day business processes and warfighting. Net-Centricity is "the realization of a robust, globally networked environment (interconnecting infrastructure, systems, processes, and people) within which data is shared seamlessly and in a timely manner among users, applications, and platforms. It is the desired end state for Net-Centric Operations; however, the DOD community at large has not achieved this level of "net-centricity," as a result, additional command and control "structure" will be needed to provide persistent command and control "direction" for the entire NetOps COI. GIG NetOps Orders could be used to communicate not only what to do and who does it with what assets; but also what to monitor and assess. The next section will provide recommendations for GIG NetOps Orders that could provide this needed structure. It also argues that the effectiveness of the NetOps COI could be improved if three types of orders were added to the USSTRATCOM GIG command and control processes.

Discussion and Recommendations

The above sections on NetOps Mission, Desired Effects, Essential Tasks, Assigned Tasks, and Planning were provided in order to help the reader understand not only the scope of the USSTRATCOM's GIG Mission responsibilities; but also the important management concepts that the Command was implementing to achieve its challenging Global NetOps Mission. Earlier in this paper we stated that the USSTRATCOM's NetOps Mission was perpetual and, as a result, required continual support to be successful. USSTRATCOM's concept for building a Global NetOps COI is an excellent environment for building trust and confidence among NetOps COI members. It will also be an excellent environment for the NetOps COI to not only handle day to day monitor, plan, execute and assess command and control activities; but also the near real time GIG NetOps security issues. However, there are currently many organizational, people, process and technical issues that will need to be resolved in USSTRATCOM's

¹³ IBID, p 6, 8, 10



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quest for the above “net centrality” nirvana where the NetOps COI achieves the realization of a robust, globally networked environment (interconnecting infrastructure, systems, processes, and people) within which data is shared seamlessly and in a timely manner among users, applications, and platforms. As a result, USSTRATCOM could augment their evolving NetOps COI with a set of orders allowing the command to not only communicate NetOps Planning resource allocation decisions among COI members; but also “direct” GIG operations and defense. These GNTOs could be divided into three categories:

- 1) **NetOps “standing orders.”** intended for routine day-to-day operations, provide NetOps COI members persistent, easily communicated and accessible direction on the operations and defense of the GIG.
- 2) **NetOps “cyclical” orders** that communicate planning and resource allocation informant for specific periods of time. These orders would be very similar to a Joint Air Tasking Order.
- 3) **NetOps “dynamic” orders** where USSTRATCOM communicates near real time direction for resolving GIG security and/or resource allocation issues. These dynamic orders will also provide needed agility and flexibility to handle pop-up opportunities.

These three orders should be viewed as structured “augmentation” for the NetOps COI collaborative net-centric environment.

The USSTRATCOM Global 24 hour a day 365 day a year mission responsibilities will involve a large number of individuals and organizations within the NetOps COI. Using this set of orders will allow USSTRATCOM to augment their collaborative COI command and control environment with an effective set of Global NetOps Tasking Orders. These GNTOs should accurately provide consistent direction and should be easily communicated to a widely distributed GIG community.

This paper is an initial attempt in capturing NetOps command and control challenges that may benefit from further concept and prototype development via venues such as JEFX 08. This white paper is designed to provide “food for thought” in crafting a USSTRATCOM NetOps experimentation program and in developing a GIG command and control way ahead. Today we have a limited ability to monitor measure and assess the NetOps Desired Effects. In order to achieve these effects the DoD will need to have a global strategy, apportion and allocate GIG resources (i.e. physical resources = circuits, spectrum, bandwidth, etc; cognitive resources = personnel) to achieve the strategy, develop a plan, task units to support the plan, and produce a common GIG operational picture to monitor mission execution. While done from a global perspective, this process must include and support the missions of Geographic Combatant Commanders also. This is no small task, but it is similar to and may benefit from approaches to command and control of other DoD missions. We plan to further develop this White Paper to include addressing apportionment, tasking, monitoring execution and assessing GIG assets in future papers.