ABSTRACT

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Composeable FORCEnet Command and Control: The Key to Energizing the
Global Information Grid to Enable Superior Decision Making

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or

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Composeable FORCEnet Command and Control:
The Key to Energizing the Global Information Grid
To Enable Superior Decision Making

The major institutions of American National Security were designed in a different era to meet different requirements. All of them must be transformed.
President George W. Bush
National Security Strategy of the United States
September 20, 2002

When asked what single event was most helpful in developing the theory of relativity, Albert Einstein is reported to have answered, “Figuring out how to think about the problem.”

Men, Women, Messages and Media:
Understanding Human Communication

This paper will examine one of the most critical aspects of transforming information age concepts and technologies – how do we “think about the problem” of Joint and coalition command and control. Our research has shown that coalition warfighters operating in a Global Information Grid (GIG) and FORCEnet-enabled environment must be able to compose the command and control elements at their disposal to ensure superior decision-making to enable the Joint Force Commander to achieve the Joint Vision 2020 goal of Full Spectrum Dominance.

The key word in this construct it composeable and our thesis is that commanders must have the ability to compose a command and control architecture that meets their warfighting requirements from a broad array of multi-tiered networked sensors, dynamic bandwidth capabilities and tailorable visualization. This paper will show that in the naval context, this requires that we engineer FORCEnet, from the keel up, not as a set-piece bundle of fixed capabilities, but as a fungible toolbox of capabilities that the Joint and coalition commander selects based on the operational mission he must accomplish – as well as a set of capabilities that fits seamlessly into the GIG. Composeable FORCEnet enables warfighters to make the superior decisions necessary to win in battle.

We will describe how Composeable FORCEnet unlocks the power of the GIG to fundamentally alter the way in which military decision makers view, manage and understand the information environment in a Joint and combined warfighting context. We will show how Composeable FORCEnet supports shared situational awareness across strategic, operational and tactical levels to enable superior decision-making.

We assert that Composeable FORCEnet has two primary goals. One goal is to deliver a “composeable” framework that enables the discovery and utilization of web-based services as
well as to “plug-and-play” new hardware and software. Composing hardware, software and services, including sensors and weapons, communications, computing, applications, collaboration and human-computer interaction components, permits the creation of new functional capabilities that meet emergent warfighting requirements. With Composable FORCEnet, because the framework is based on open, publicly distributed web services, specifications and standards, these new functional capabilities lead to the inherent ability to create new organizational structures and even permit the development of new and innovative tactics and doctrine without re-engineering the supporting systems.

The second Composable FORCEnet goal is to provide mechanisms to transform information into knowledge in a manner that directly supports decision making at all levels of command in a Joint and coalition warfighting environment. This is accomplished by providing customizable (composeable) geospatial, functional, and temporal views of an operational situation so that the full spectrum of warfighting plans, issues, concerns, and status can be tailored, assimilated, and understood by the commanders and their battle watch staffs.

Composeable FORCEnet provides an information representation interface to the composeable framework that is based on a geo-spatial (i.e. map) metaphor and which can be collaboratively viewed and manipulated over a network. Composable FORCEnet will permit a user to migrate seamlessly across geo-spatial, functional and temporal dimensions. To facilitate and guarantee web based military Command and Control, Composable FORCEnet also includes a variety of tools and mechanisms to allow a commander to compose his communications and computing environment and fully exploit the power of the GIG.

Technically, Composable FORCEnet represents a transformation away from building turnkey systems that require large investments in integration toward providing seamless, open, object-based architectures that permit “composeable” services, hardware, and applications. Composable FORCEnet is technically aligned with the Network Centric Warfare (NCW) initiatives being undertaken by the United States Navy for SEAPOWER 21 - FORCEnet and Task Force Web - that will provide a new conceptual framework for distributing and sharing information, and eliminating information stovepipes. The design of Composable FORCEnet ensures compatibility with the emerging Global Information Grid.

Our research to date has shown that Composable FORCEnet dramatically changes C4ISR operations by providing the means to achieve shared awareness through an intuitive, map-based operational picture where information from any source may be geo-referenced, and where all users can participate in collaborative sessions. Composable FORCEnet provides tailorble human-centric interfaces as the FORCEnet construct and the GIG demands. The goal of Composable FORCEnet is to make possible command and control constructs that are limited only by the operational and tactical imagination of the military commander.