ONR BAA Announcement Number 08-015
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BROAD AGENCY ANNOUNCEMENT (BAA)

Dynamic Command and Control for Tactical Forces and Maritime Operations Center (MOC) FORCEnet Enabling Capability

INTRODUCTION

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2). A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued.

The Office of Naval Research (ONR) will not issue paper copies of this announcement. ONR reserves the right to select for award all, some or none of the proposals in response to this announcement. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

It should also be noted in accordance with Section III, that proposals under this BAA will only be considered from those Offerors that have a Secret facility clearance with SECRET safeguarding since any ensuing contract will require access and storage of classified information.

I. GENERAL INFORMATION

1. Agency Name

Office of Naval Research
Contract and Grant Awards Management Division
875 North Randolph Street – Suite 1279
Arlington, VA 22203-1995

2. Research Opportunity Title

Technology for FORCEnet Science and Technology (S&T) – Dynamic Command and Control for Tactical Forces and Maritime Operations Center (MOC)

3. Program Name

Technology for FORCEnet Science and Technology (S&T) – Dynamic Command and Control for Tactical Forces and Maritime Operations Center (MOC)

4. Research Opportunity Number

BAA 08-015

5. Response Date

White Papers: 16 June 2008 no later than 2:00 PM

Oral Presentations: 14-18 June 2008 – exact date, time and location TBD

Full Proposals: 07 August 2008 no later than 2:00 PM ET

6. Research Opportunities Description

6.1 Synopsis

The Office of Naval Research (ONR) is seeking innovative solutions for enhanced capabilities for tactical-level command and control (C2). Offerors will be asked to develop software products that address tactical-level Command and Control (C2) challenges in a service oriented architecture (SOA) environment afloat. Offerors will be asked to propose solutions that generically use a tactical SOA for sharing information seamlessly among operational and tactical-edge users, while specifically focusing on challenges in selected Programs of Record (PoR)[1]. Proposed innovative solutions will enable the necessary information to be passed between the operational-level Maritime Operations Center (MOC) and tactical level nodes, to give tactical commanders awareness-of and access-to enterprise information that is relevant to assigned missions. These information support services must be designed under the constraint that (a) many of the physical networks supporting USW are limited in bandwidth and intermittent in nature, and (b) the technical solutions will utilize a Consolidated Afloat Networks and Enterprise Services (CANES) environment based on NESI compliance2. Solutions offered should address one or more of the following broad thrust areas:

1 One PoR under discussion for transition is delivering tactical ASW capabilities.
2 NESI is described at the following site: http://nesipublic.spawar.navy.mil/

1. increased access and shared awareness of relevant data, activities, and enterprise status among tactical forces and the MOC,
2. automated support for synchronized planning, coordination, and execution of network enterprise resources to meet evolving mission demands, and
3. visualization of critical performance indicators of force capabilities needed to manage complex problem spaces

Thrust 1 - *Increased access and shared awareness of relevant data, activities, and enterprise status among tactical forces and the MOC.* This thrust seeks technical solutions that allow a tactical commander[3] the timely access and awareness of enterprise information that is relevant to assigned missions while maintaining the necessary quality of information. Capabilities sought include (a) access and awareness of relevant enterprise data, activities and status across the enterprise[4] to maintain the quality of information necessary to meet mission goals, (b) the timely sharing of information about objects, events, tracks, and relevant context across the enterprise, and (c) the management of combined, distributed, and unambiguous tracks, targets, and situation-relevant information among all participants.

The solutions offered may include new processing algorithms or the augmentation of available algorithms, but the primary focus must be on development of information services that provide the C2 capabilities outlined in this document and operate in net-centric environment and under the constraints highlighted in the first paragraph of this synopsis. Such information services must be adaptive to changing mission priorities, and designed in a manner that enables aspects of: (a) understanding what data (content and quantity) might be passed over communication paths that may be disconnected, intermittent, or limited (DIL) for a given enterprise condition, (b) awareness or rapid discovery of information content that is available in the enterprise and relevant to each local tactical node, and (c) maintaining continuous awareness of the condition of the enterprise, along with an understanding of the relative importance and priority of information to mission goals in order to support adjudication of competing demands for enterprise resources including communications, processing, database and other resources.

Thrust 2 - The *automated support for synchronized planning, coordination, and execution of network enterprise resources to meet evolving mission demands* thrust seeks to develop automated capability for development of multiple alternative course of action (COA) recommendations to the commander. Functions sought under this thrust include:

- automated development of force plans and allocation of related resources (e.g., sensors, platforms, weapons) and processes;
- dynamic management and re-planning of tactical force goals, activities and resources.

3 In this document a tactical commander is envisioned as, for example, the Sea Combat Commander (SCC) of a Carrier Task Group. Unit commanders such as submarine and ship commanding officers and Maritime Patrol and Reconnaissance Aircraft mission commanders are also included in this definition of tactical commanders.

4 For the tactical ASW domain, the enterprise would be the Undersea Warfare (USW) enterprise.

This thrust seeks to automate functions which are currently performed manually - or not at all – due to the lack of time available to a decision-maker, or due to a lack of necessary information, or due to the complexity of the decision trade-off space. Operational- and tactical-level commanders (e.g. the Theater ASW Commander and or the Sea Combat Commander) must have sufficient automation support (in addition to common situation awareness available for instance from Thrust 1 products) distributed in accordance with roles and responsibilities across the geographic area of operations (AO) to properly assess their COAs or to re-plan as appropriate. Multiple commanders must be able to communicate to synchronize actions and be able to collaborate in order to re-plan rapidly as the operational and tactical situation changes. Support of coordinated COA development and selection by operational and tactical-level commanders has implications for sharing across the enterprise of: (a) mission critical information needs, (b) health and readiness of enterprise (from Thrust 3) and status of mission critical resources including sensors, platforms, weapons and processes, (c) resource allocation solutions for collection resources, movement of assets, and assignment of roles / responsibilities. The solutions offered may be completely new, or innovative modifications of existing designs, but the offering must indicate unique approaches that enable operation in net-centric environments under the constraints highlighted in the first paragraph of this synopsis.

Thrust 3 - V*isualization of critical performance indicators of force capability needed to manage complex problem spaces.* This thrust seeks to expose, organize, and visualize critical and relevant information from across the enterprise in a manner that supports both: (a) operational planning by a commander, and (b) the monitoring and control of net-centric resources consistent with mission goals. The underlying goal for both of these is to make tactical-edge operations utilizing SOA core services understandable and manageable by human users, respectively. The underlying information processes will likely require machine based monitoring of process quality indices and their consistency with mission goals. The nature of a complex enterprise requires that key parameters be monitored and presented in an intuitive fashion so that military decision makers can rapidly assess the state of the enterprise and its readiness for mission execution. Key elements in achieving this goal include: (a) derivation of relevant operational metrics to monitor performance of infrastructure and application components, (b) metadata to characterize the behavior of all information sources (e.g., platforms and sensors) within the enterprise and external sources feeding data to the enterprise, (c) pedigree to maintain traceability of all processing actions over time. Pedigree represents a key component in that it enables drill down to understand how all information products were developed. This explanatory power of pedigree provides a basis (among other metrics) for imparting confidence to decision makers, and essential contextual data in support of operational and tactical collaboration. Pedigree sufficiency would allow the local tactical C2 node to accept and trust related information sources. Other elements may be equally important to the goals of this thrust, which is to devise a methodology for providing an optimally minimal (sufficient) amount of background data (e.g., metrics, metadata, pedigree) to enable monitoring and control of enterprise information flow and performance in a readily understandable manner. Visualization attributes must enable diverse, standards-compliant visualization software to present data in a consistent and easily understood

manner to minimize the need for human interaction (such as voice, chat, e-mail, or naval message exchanges).

Capabilities sought by this research opportunity will provide greatly enhanced C2 information sharing from the operational to the tactical echelon of command. Capabilities proposed must be simple and intuitive for the user, and meet timing deadlines in a tactical edge communications environment. In addition, these capabilities should not increase the workload of a decision-maker. This BAA does not desire proposals for development of an SOA infrastructure or for specific communications technologies. Rather, capabilities are sought that will enable information technologies to operate efficiently within an SOA infrastructure and under a variety of DIL communications conditions. The BAA is interested in developing these technologies consistent with evolving MHQ with MOC guidance.

This is an applied research program. The innovative solutions will be software products and experimentation articles that include methodologies or solutions for information process flow, information management, development or use of pedigree and context, or other functions necessary to provide tactical forces with shared situation awareness and collaborative planning. The solutions will be delivered at maturity level suitable for transition to acquisition Program of Record at a technology readiness level (TRL) of 6 or 7. These will be delivered to Navy Programs of Record (POR) – including Navy C2 and Combat System PoRs – and to Navy-Joint experimentation venues.

It is assumed that the Navy will be incrementally migrating toward the Program Executive Office for Command, Control, Communications, Computers, Intelligence (PEO C4I) Consolidated Afloat Networks and Enterprise Services (CANES) SOA environment. Consequently, all software products developed under this Program must be generally consistent with the Navy's planned migration and adhere to NESI compliance. It is also assumed that Navy and Department of Defense (DoD) will be migrating toward use of common data architectures and definitions in support of data sharing. Note, however, that this BAA does not solicit SOA infrastructure development. Proposals for SOA infrastructure will be considered non-compliant.

This program will develop S&T products that significantly enhance tactical-level C2 for decision-makers and deliver these products to acquisition sponsors for integration into Programs of Record via a fleet-lead government-coordinated experimentation process. The obvious challenge here is to develop innovative technology solutions while simultaneously delivering robust products to acquisition and experimentation.

6.1.1 Dynamic C2

The term ***Dynamic C2*** refers to the time-compressed and unanticipated nature of the factors that press upon a commander during major operations and conflicts, and the need for the information systems that support C2 communications to be rapidly adaptable and responsive to the needs of the decision-maker in real time. The SOA tactical services that support C2 must be capable of providing decision-quality information to the commander

much more rapidly than in the past, and in response to unanticipated changes in operational requirements.

6.2 Operational Requirements

This BAA seeks to provide a commander with timely access to decision-quality information utilizing CANES core services, consistent with the Navy Common Net-centric Data Environment (CNDE) and NESI compliant and allowing tactical forces afloat to seamlessly interface with the operational-level Maritime Operations Center (MOC). Unclassified examples of desired ASW C2 capabilities are as follows:

- A submarine, ship, or Maritime Patrol and Reconnaissance Aircraft (MPRA) aircraft mission commander will, for example, have shared tracks derived from data held by sensors on other platforms and with sufficient granularity, information detail and pedigree to enable the commander to fire weapons even though the target is not held by sensors organic to the local platform.
- The Sea Combat Commander within a Carrier Strike Group or Amphibious Strike Group will have shared track and sensor data and tactical engagement data from a variety of sources that will enable the Sea Combat Commander to direct the use of a weapon by a unit under his or her Tactical Command.
- The Commander will have shared track, sensor, and tactical engagement data at a level of granularity that will enable him or her to direct assets to attack or avoid areas of conflict, in accordance with appropriate guidance for water space management.

The desired capabilities (listed above) exist today in a very limited way, and fragmented among many C2, combat direction and weapon systems which were not designed to share data and information. This lack of integration is compounded by severe limitations in communications and underlying network infrastructure, particularly for forces afloat. There are many research programs attacking elements of the problem to create the possibility of enterprise wide solutions. The focus of this BAA is to provide dynamic C2 capabilities that address information content and sharing, planning and decision aids, and visualization tools and services that will interface seamlessly with aircraft, ship, and submarine Combat Systems so that sensor data, track data, and force orders and any other relevant data and information are consistently available and understandable to the C2 and Combat Systems and the decision-makers they support. Section VII of this BAA provides potential Offerors additional guidance including representative information sharing requirements and a table that illustrates restrictions and constraints of the multi-echelon information environment likely to be encountered in an operational setting.

6.2.1 Relevancy

Of particular interest are approaches that deal with notions of *relevance* and *priority* of information as it applies to the commander's decision making needs. Central to a commander's ability to prioritize C2 activities is the underlying information system's ability to provide information that is of decision quality and relevant to the commander's decision process. During operations, a commander must make decisions with the

information available – and often with data and information which is incomplete, ambiguous, or even contradictory. In many military operations and conflicts the decision time window is shorter than the time required to gain the desired amount of information. In practice, the determination of relevance is performed manually by the commander and staff. While human beings do this very well, it is a difficult and complex task and increasingly too slow in a dynamic operational environment. The goal is to make advancements in identifying the information and automating the processes that are relevant to a commander's decision-making. Solutions and tools Offerors propose as services should support the development and maintenance of situational awareness from the MOC to the tactical commander and the converse. It is critical to the success of assigned missions that the commander and his subordinates have the ability to prioritize their C2 requirements and activities at any time; commensurate with the authority of assigned roles, and supported by the information systems across the enterprise. The information systems that support the commander must allow for a flexible, efficient and effective support that will allow for the rapid and real-time (i.e., dynamic) reconfiguration necessary to accommodate unanticipated requests and priorities, providing the commander with the needed decision-quality information. Consequently, the more that the information systems supporting C2 can understand and adapt dynamically to the needs of a decision-maker without requiring additional attention or becoming a distraction, the more likely they will be to provide the decision-maker with relevant information.

6.2.2 Extending or Replacing Existing Paradigms for Shared Awareness

This BAA seeks proposals that will address the challenges attendant to extending and / or replacing current paradigms for achieving shared awareness. The manual entry of data, "chat", and voice communications are examples of communications methodologies that will persist in the foreseeable future. These methods of providing information are prone to human error, inaccuracy due to dissimilar data fields between systems, time-lateness, and are typically void of the context needed to support cross-platform fusion.

A critical capability desired under this BAA is the ability for tactical commanders to have awareness of relevant mission information that is shared not only among tactical forces but also with higher echelons at the operational and even strategic level. This shared awareness is more than just a common picture, although that is sometimes a key element. Shared awareness information needs will differ in granularity and content depending on the specifics of the mission and position in the chain of command. For example the MPRA in the above example will require a very high update rate to develop a fire control solution on the targeted submarine in order to make the decision to release a weapon. Other tactical level forces and higher echelons need only periodic updates of the track at much lower data rates to maintain their awareness of the situation. In current practice, however, tactical commanders often receive overwhelming amounts of data much of which is often raw or barely processed and a great deal of C2 information may be provided through undisciplined processes such as Instant Message interfaces (known as "Chat"), manually entered data (slow and prone to error) and/or voice transmissions (prone to error and misunderstanding). For example, past fleet experimentation has

revealed that a proliferation of Chat rooms alone can lead to confusion on the part of watch standers and operators, resulting in a loss of key information for decision-makers.

6.3 Detailed Description of Capabilities

Sections 6.3.1 through 6.3.3 provides additional details regarding the capabilities desired in the three thrusts identified above. While the discussions below are grouped into thrust areas, ONR recognizes that some of the capabilities described support multiple thrust areas. While Offerors are free to propose solutions across thrust areas, they will be asked to summarize their cost and product deliverables into each individual or multiple thrust areas.

6.3.1 Increased Access and Shared Awareness of Relevant Data, Activities, and Enterprise Status

Four technology areas have been identified as critical to success in this thrust. Offerors are free to provide and explain alternative technology areas that support their proposed solution.

The first is *data management in a service oriented environment operating with disconnected, intermittent, or limited (DIL) communications paths.* The goal here is to determine how data delivery and currency of information can best be managed considering the dynamics of communications constraints and mission goals. Such solutions are essential enablers for timely sharing of information about objects, events, tracks, and context. The data and information delivery must be timely and consistent in accordance with mission needs. Unlike terrestrial SOA enterprise environments where physical networks tend to be stable and servers are designed to accommodate near real-time data replication and anticipated storage requirements, the maritime afloat SOA will be constantly challenged by constraints in bandwidth, storage space, network reliability, and data quality. A coherent strategy for data management across the enterprise with unified and well-understood policies for quality of information service (QoS) is required. In addition, data management implies control of data/information flow from processes that may exist at separate nodes which may drop off or enter the enterprise at varying times, depending on tactical conditions. Tactical data management services must understand how to operate with and support such enterprise dynamics. Innovative solutions are required for an adaptive and scalable approach that builds on the base SOA capability available in CANES and allows unanticipated data and policies from across the enterprise to be accessed and managed appropriately over its life cycle.

The second technology area is *management of tracks and contextual information from distributed enterprise nodes.* The goal of this technology area is to provide rapid discovery and shared awareness of track data, and access to relevant supporting contextual information. The problem is driven by the need for unambiguous track solutions with rational association and assignment of observations, reports and tracks to individual objects or events. Current methods for arbitrating among multiple (often ambiguous) reports are unable to manage the expected volume of surface and undersea

objects. In USW, for example, part of the challenge in achieving satisfactory track fusion is the difficulty in associating and correlating data from multiple distributed sensors observing a single contact. Equivalent challenges exists in identifying and associating relevant contextual data for use in refining object identification, interpreting track behavior, establishing relationships to other tracks or activities, and possibly inferring intent.

The third technology area is *awareness and adaptation to network conditions*. This technology area has the goal of providing awareness of network conditions (e.g. communications interruption, bandwidth limitations, nodal availability) and incorporating application features or new information services that adapt the data or information product to meet minimum essential mission requirements consistent with assigned priorities and availability of other enterprise resources (e.g. computing, databases). These goals call for technologies that provide enterprise self-awareness (to monitor status of not just communications but also nodal health and readiness), and resource management tools (responsive to mission goals) for direction or advisory alerts to guide the use of a broad range of physical and logical enterprise assets. This capability to be aware-of and adapt to the underlying unreliability of the maritime communications environment is underlined by the representative network parameters and conditions provided in Section VII, Table 1. The key issue here is that tactical enterprise services must have the ability to respond to network disruptions with sufficient awareness of mission goals and the state of enterprise resources to provide recommendations for reassignment of enterprise assets, including reprioritizing sensing and processing tasks. Other ONR programs are exploring disruptive tolerant network technologies. Such solutions are not invited under this solicitation.

The fourth technology area is the *composition of enterprise services*. Specifically, the automated and real-time composition of existing tactical enterprise services to accomplish a new C2 function. This area is important to achieving dynamic C2. The commercial and business marketplaces consider this area to be an area where SOAs have the great promise for future payoff. Commercial SOAs are typically designed for stable, well-understood, business processes that describe the management and control of data and information. The goals and scope of these SOAs are defined before system development commences. When operational, commercial SOAs limit service interactions to those complying with the previously established business processes. In contrast, the Navy seeks maritime afloat solutions which may require dynamic reconfiguration of tactical enterprise services in ways that are defined in real-time, and use core enterprise services such as discovery, orchestration or messaging to facilitate the reconfiguration. Since the Navy aspires to migrate to a Service Oriented Environment, enterprise services must be able to discover and interoperate in real time without the time-intensive *a priori* planning that has historically been required and is still in use today. Methodologies are needed that support the specification and design of new service composition, as well as in the decomposition and conversion of legacy applications into tactical edge enterprise services. Recent Navy and Joint experimentation employing SOAs in realistic vignettes provided evidence that no known methodology yet exists to compose services in real-time in response to unanticipated operational events.

Technologies, tools, and methods that support the effective, flexible, reliable and simple composition of services distributed across the enterprise are needed. Services must understand and be able to adapt to each other's policies, performance levels, security requirements and, for example, service-level agreement negotiations. While there are standards available today to facilitate service composition, the automation of this capability remains embryonic and the need for innovation is clear and pressing. Innovation in the area of automated composition is needed.

6.3.2 Automated Support for Synchronized Planning, Coordination, and Execution of Network Enterprise Resources to Meet Evolving Mission Demands

Products produced under this thrust will be largely concerned with (1) developing automated techniques for force planning and allocation of resources based on information as it is passed from the Operational Level MOC to the local-tactical level and from local-tactical centers to adjacent local-tactical centers; (2) dynamic management and replanning of localized force activity (platforms, sensors, weapons); and (3) integration of resources and processes that include: weapons, platforms, sensors and processing for target selection and engagement. The products developed will contribute to the recommendation of alternative courses of action (COAs) for the commander. Key to achieving meaningful advances in this thrust area will be innovations in algorithms and techniques that understand warfighter contextual and prioritized information, while maintaining an awareness of the status and capabilities of resources in the enterprise and continuously update multiple courses of action.

Factors impacting COA recommendations include, but are not limited to, the nature of the mission(s), the commander's assigned responsibilities, the commander's professional judgment, geographic considerations, time considerations, weather, and rules-of-engagement (ROE). COA services must be interoperable with the Maritime Operations Center. With this capability, the decision-maker will be provided with COA recommendations based on force information from across the enterprise and including inputs by the decision-maker.

Products developed must be capable of operating as enterprise services that demonstrate dynamic management and re-planning of localized force activities. Often it is an urgent, unanticipated, and time-critical event that creates the need for the reallocation of resources. When this occurs, the decision-maker typically has little time to analyze and deliberate the consequences of various options. For example, if a given Sea Combat Commander is better resourced to engage a target than another geographically adjacent SCC who is currently prosecuting that target, then all decision-makers involved must be able to collaborate and share the information necessary to arrive at this decision, and the capability to align this new tasking with other ongoing missions. Achieving this will require significant improvements in enterprise-wide automated track management and the need for globally unique identifiers. In addition, and very importantly, fleet concepts of operation, TTP and doctrine will need to be refined and co-evolved to allow for the effective use of the capabilities provided by these tactical services.

Producing recommended COAs will require that resource management enterprise services collaborate between and across the enterprise; including the MHQ / MOC. Currently there is a lack of efficient tools in the fleet to access and share the information necessary to collaborate on certain decisions. Moreover, multiple modes of Fleet C2-related communications – e.g. tactical radio networks, VOIP phone, email, Naval Messages, Chat, and face to face discussions – can fragment and confuse discussion threads. Approaches will need to consider information flow across a wide range of communications channels.

6.3.3 Visualization of Critical Performance Indicators of Networked Force Capabilities Needed to Manage Complex Problem Spaces

There are two dimensions to this thrust area. The first is operational in nature. The second concerns the status of the information enterprise system, and provides the Commander with the latest health and readiness of the sensor network.

With respect to the operational dimension, enterprise services developed under this thrust will provide the commander with critical information that is relevant to the situation at hand, or of a potential situation for which the commander is greatly interested but currently unaware. The commander or decision-maker is presented with an awareness of the key factors necessary to make timely informed decisions[5]. These key factors may be the same used in the formulation of recommended alternative courses of action. The commander might be informed using predetermined criteria or in response to a standing or recent request by the commander. Alternatively, the commander might be alerted by a system that inferred the key information from unfolding situational events. The tactical level information presented for visualization can range from submarine sonar lines-of-bearing to an AOI-wide visualization of shooter engagement-zones.

With regard to the second dimension, tactical enterprise services will provide the commander with critical indicators regarding the status of the information systems and networks upon which C2 is dependent. Indicators will require techniques that provide a sufficient degree of pedigree information to allow the local tactical C2 node to accept and trust related information sources. An important concept of this thrust will be to devise a methodology for providing an optimally minimal (sufficient) amount of background pedigree data on relevant information sources. Two conditions that impact the degree of pedigree background information involve highly complex problem spaces and disadvantaged communications channels. As the problem space grows more complex, local nodes are severely taxed in processing target assignments, requiring a higher amount of pedigree to separate complex target spaces. Pedigree sufficiency is also critical within disadvantaged communications channels with constrained bandwidth (and in some cases severely limiting conditions). Limited capability of providing corroborating data forces the local nodes to make command decisions on limited datasets. Sending the right amount of acceptable pedigree without overtaxing the channel capacity allows local command decision to act at the right time with a minimal set of data.

5 While Offerors are free to consider efficient and effective methods of presenting this information to the decision-maker, the focus in this program is not on display presentation.

6.4 Transition

This program seeks to develop innovative technology solutions ***while simultaneously*** delivering robust products to acquisition and experimentation. Transition consists of delivering mature S&T products to acquisition in an agreed upon manner. Offerors selected to perform research will be expected to work with other technology developers and also as members of government-lead teams that will coordinate the delivery of products to acquisition programs in a way that meets the schedule and performance requirements of the acquisition sponsor. Offerors should expect that the prototypes they develop will require interface modifications in order to properly integrate into the acquisition program or experimentation venue. The government will provide the guidance and coordination for interfacing and integrating products into acquisition programs and experimentation. The government may choose to provide the infrastructure to host selected Performer technology prototypes for transition testing and experimentation. Full government rights to technology products - including intellectual property - is a necessary and important factor in the selection process.

6.5 Concept of Operations (CONOPS) Development and Experimentation

Performers selected to participate in the *Dynamic C2 for Tactical Forces and Maritime Operations Center* program are expected to contribute to the development of a concept of operations (CONOPS) that will be ultimately delivered to the acquisition transition partner. The government will integrate all performer inputs and produce the final CONOPS document. Performers will be asked to contribute to the CONOPS in areas corresponding to the technology products that they developed.

Performers will also actively participate in the experimentation process. This may include fleet experiments such as Valiant Shield, Annulex, and JEFX. The goals of experimentation in this Program are to: (a) support early evaluation of technology product capabilities in both laboratory and operational settings, and (b) validate and refine CONOPS, TTP and doctrine. Laboratory based experiments are known as Limited Technology Experiments (LTEs). Fleet operational experiments are known as Limited Objective Experiments (LOEs). Experimentation will take place under the direction of a Fleet command, and coordinated by the Navy Warfare Development Command, (NWDC) as part of Navy Sea Trial.

Government facilities will provide the experimentation infrastructure to assess Offerors enterprise services. These facilities can be configured to operate in a distributed environment via networks such as DREN, S-DREN, and SIPRNET, providing operationally realistic environments to conduct both limited technical experiments (LTEs) and limited objective experiments (LOEs).

Offerors will be expected to support and work with an independent experimentation and analysis team that sets objectives, defines of key analytic questions, metrics, and data collection methodologies. The independent analysis team is typically aligned with

NWDC and executing the approved Sea Trial analysis process. The experimentation and analysis team will develop a Data Collection and Analysis Plan (DCAP) and Control Plans to guide the experimentation and execution and analysis. An analysis report will be developed by this team following rigorous analysis and assessment of the collected data sets with recommended courses of action. Typically, a capability subjected to a fleet experiment or exercise will also undergo a military utility assessment (MUA) conducted by a numbered fleet.

7. Point(s) of Contact

Questions of a technical nature shall be directed to the cognizant Science and Technical Point of Contact, as specified below.

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Questions of a business nature shall be directed to:

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8. Instrument Type

Awards will take the form of contracts.

9. Catalog of Federal Domestic Assistance (CFDA) Numbers

Not Applicable.

10. Catalog of Federal Domestic Assistance (CFDA) Titles

Not Applicable.

II. AWARD INFORMATION

The Office of Naval Research plans to award multiple technology development efforts that represent the best value to the Government in accordance with the evaluation criteria set forth in this announcement. The Office of Naval Research is seeking participants for this Program that are capable of supporting the goals described in this announcement. Offerors have the opportunity to be creative in the selection of the technical processes and approaches to addressing the thrust areas.

The Office of Naval Research plans to fund development contracts with a combination of Applied Research and Advanced Technology Development funds (Budget Category 6.2/6.3). It is anticipated that the average award will typically be in the range of $600,000-1,000,000 per year, although lower and higher proposals will be considered. Proposed work should be structured for a one to three year period. Multi-year proposals shall include a base performance period of twelve months with one or two 12-month options. The estimated date for award is on or about 31 October 2008. Contract awards are subject to the availability of FY 2009 funds.

ONR has funded related information technology development under numerous programs. Proposals that build on current or previous DoD work are encouraged. Offerors enhancing work performed under other ONR or DoD projects must clearly identify the

point of departure, what existing work will be brought forward, and what new work will be performed under this BAA.

III. ELIGIBILITY INFORMATION

Proposals under this BAA will only be considered from those Offerors that have a SECRET facility clearance with SECRET safeguarding, since any ensuing contract will require access to and storage of classified information.

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation

Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal bidders are allowed so long as they are permitted under the sponsoring agreement between the Government and the specific FFRDC.

Navy laboratories and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR POC to discuss its area of interest. The various scientific divisions of ONR are identified at http://www.onr.navy.mil/. As with FFRDCs, these types of federal organizations may team with other responsible sources from academia and industry that are submitting proposals under this BAA.

Teams are encouraged to submit proposals in any or all areas. However, Offerors must be willing to cooperate and exchange software, data, and other information in an integrated program with other contractors as well as with system integrators selected by ONR.

Some topics cover export controlled technologies. Research in these areas is limited to "U.S. persons" as defined in the International Traffic in Arms Regulations (ITAR) - 22 CFR § 1201.1 et seq.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process

The Application and Submission Process consists of white papers, oral presentations and full proposals. If an Offeror does not submit a white paper before the due date and time, they are not eligible to participate in the rest of the process.

a. Website for ONR BAA Announcement 08-015:

The ***Dynamic C2 for Tactical Forces and Maritime Operations Center*** website (http://www.onr.navy.mil/02/baa/08_015/) is dedicated to this BAA and will be the primary means of publicizing all relevant information that is specific to this BAA. All interested parties are encouraged to visit this website regularly.

b. Industry Day Briefing:

ONR will conduct an Industry Day Briefing for potential Offerors. The purpose of the briefing is to provide potential Offerors with a better understanding of the program. It will be held at the SECRET level.

Interested Offerors must register for Industry Day. Registration instructions may be found at the ***Dynamic C2 for Tactical Forces and Maritime Operations Center*** website. For security reasons, anyone who has not registered will not be allowed to attend. No substitutions in the attendee list are allowed after the registration deadline. For the location and time, refer to the '***Dynamic C2 for Tactical Forces and Maritime Operations Center***' website. http://www.onr.navy.mil/02/baa/08_015/. All expenses for attendance must be borne by the potential Offeror. Those not able to attend this briefing should consult the ***Dynamic C2 for Tactical Forces and Maritime Operations Center***' website to see unclassified briefing slides and answers to written questions submitted during the event. Please continuously view the ***Dynamic C2 for Tactical Forces and Maritime Operations Center***' website for updated information.

c. White Papers

White Papers are required prior to submitting a full proposal. The due date for white papers is 2:00 p.m. (Eastern Daylight Time) on Thursday, 8 May 2008. Each unclassified white paper should state that it is submitted in response to this announcement and identify the thrust to which the response is applicable. White Papers shall be submitted directly to the Technical Point of Contract (TPOC). White papers will be evaluated by the government to determine whether an Offeror is to be selected to make an oral presentation of its white paper to a panel of government evaluators. The submitters of White Papers determined to not be of "particular value" to the Navy will not be permitted to give an Oral Presentation or submit a Full Proposal.

Notes:

- White papers exceeding the page limitation may not be evaluated.
- Should an Offeror's email address change after submission, it is the responsibility of the Offeror to notify the program manager of the change to ensure receipt of critical process emails.

d. Oral Presentations

The purpose of the oral presentation is to better acquaint the Government with the Offeror's proposal, especially its understanding of how the proposed technology will affect military applications.

Invitation Process: Offerors whose white papers are selected for oral presentations will be invited by e-mail not less than five (5) working days prior to the commencement of the unclassified oral presentation event. This event is tentatively planned for the week of 9 June 2008. A detailed format for the presentation will be provided in the e-mail invitation, as well as the day, time and location of the presentations. Each presentation will be no longer than thirty (30) minutes in duration. An additional ten (10) minutes will be allowed for questions (if any) from the panel of government reviewers. Offerors will be required to submit their oral presentation materials to the government PRIOR to the presentation as specified in the invitation email.

Those Offerors whose technology is still considered as having "particular value" to the Navy will be encouraged to submit detailed technical and cost proposals. Notice of encouragement to submit full proposals will be issued on or about 17 June 2008. If the Offeror receives notification that its technology was not considered as having "particular value" to the Navy, it cannot submit a full proposal. Full proposals will not be considered under this BAA unless both a white paper was received by the due date specified above and a presentation was made during the Oral Presentation and both are rated as being of "particular value" to the Navy.

Policy Towards Reimbursement of Oral Presentation Costs: The Office of Naval Research will not reimburse travel costs and time for potential bidders to brief their proposals.

Notes:

- Offerors may not be allowed to participate in the oral presentations if materials are received late (as described in the invitation email), and the project will not be considered further.

- Should an Offeror's email address change after submission, it is the responsibility of the Offeror to notify the program manager of the change to ensure receipt of critical process emails.

f. Full Proposals

Submission**:** The due date for receipt of full proposals is 2:00 p.m. (Eastern Daylight Time) on Thursday, 07 August 2008.

Notification: It is anticipated that final selections will be made on or about Friday, 29 August 2008. As soon as the final proposal evaluation process is completed, each Offeror will be notified via e-mail of its selection or non-selection for an award. Proposals exceeding the page limit may not be evaluated.

2. Content and Format of White Papers/Full Proposals

The white papers, oral presentations, and full proposals submitted under this solicitation must be unclassified. However, performance under the awarded contracts may require access to classified data.

The proposal submissions will be protected from unauthorized disclosure in accordance with FAR 15.207, applicable law, and DoD/DON regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information. The proposal shall include a severable, self-standing Statement of Work which contains only unclassified information, and does not include any propriety restrictions.

White Paper submission should include those items identified in the paragraph below entitled "White Paper Content" and should not exceed ten (10) pages total. White papers exceeding any of the page restrictions may not be reviewed. White papers sent by fax or e-mail will not be considered.

Note about Project Title: Titles given to the White Papers / Full Proposals should be descriptive of the work they cover and not be merely a copy of the title of this solicitation.

White Paper Format

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double-spaced
- Font – Times New Roman, 12 point
- White papers are limited to ten (10) pages in length, as described below in the "White Paper Content" section.
- Copies – one (1) original, three (3) hard copies, and one electronic copy on CD-ROM (in Microsoft® Office Word or Excel or Adobe Acrobat .pdf format).

White Paper Content

All sections shall start on a new page.

- **Cover Page:** The Cover Page shall be labeled "WHITE PAPER" and shall include the BAA number, proposed title, technology interest areas addressed, technical points of contact, with telephone number, facsimile number, and e-mail address. This shall be one (1) page only.

• **Abstract:** A very brief description of the technology including goals and objectives, and technology areas to be addressed. This section shall be no more than one (1) page.

• **Technical Concept:** A description of the technology innovation, the Program thrusts addressed (described in Section I paragraph 6.1), and technical risk areas. This section may be five (5) pages or fewer. Include a detailed listing of the technical tasks/subtasks organized by year. Relate the product that results from the task/subtask, and briefly state metrics that will be met as a result of the task/subtask. In presenting the technical concept, the paper should explain how the technology proposed is relevant to the operational context described in the unclassified paper described in Section 6.2 of the BAA. It should also explain how the concept for integrating technology into the NESI service oriented architecture using standards posted at http://nesipublic.spawar.navy.mil/.

• **Deliverables:** Deliverables to be available for experimentation and final project deliverables shall be specifically described, including a description of proprietary components and an assertion of data rights applicable to the deliverable. This section shall be no more than one (1) page in length.

• **Costs:** A one (1) to two (2) page summary of costs segregated by both task and year. The task breakout should enable the Government to determine which portion of the technology development costs are attributed to (1) the costs related to attaining the goals of this BAA through development of the proposed technology deliverable, (2) the S&T project costs for technology integration into a Program of Record using the NESI service oriented architecture standards posted at http://nesipublic.spawar.navy.mil/, and (3) the costs related to experimentation activities. Within the task summary there should be a top-level segregation of the loaded costs attributed to labor, material, and facilities (if applicable) for each task. A statement should also be made under each task in which the use of government facilities is proposed. This section shall include a table with all costs summarized in thousands of dollars as shown in the following example:

FY09	**FY10**	**FY11**	**FY12**	**FY13**	**Total**
$xxxK	$xxxK	$xxxK	$xxxK	$xxxK	$yyyK

Full Proposal Format – Volume 1 - Technical and Volume 2 - Cost Proposal

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double-spaced
- Font – Times New Roman, 12 point

• Enclosures -- Each copy and the original should be free of any notebook or other enclosing material.
• Number of Pages
- Volume 1 is limited to no more than twenty (20) pages. The cover page, table of contents, and resumes are excluded from the page limitations. Offerors are free to allocate as many pages to each section as they wish, provided the overall twenty page limit is not exceeded. Volume 1 submissions exceeding the page limit may not be evaluated.
- There is no page limit for Volume 2.

• Copies – one (1) original, three (3) hard copies, and one electronic copy on CD-ROM (in Microsoft® Office Word or Excel or Adobe Acrobat .pdf format).

Full Proposal Content

Volume 1: Technical Proposal

All sections shall start on a new page.

• **Cover Page:** This should include the words "Technical Proposal" and the following:

1) BAA number;
2) Title of Proposal;
3) Identity of prime Offeror and complete list of subcontractors, if applicable;
4) Technical contact (name, address, phone/fax, electronic mail address)
5) Administrative/business contact (name, address, phone/fax, electronic mail address) and;
6) Duration of effort (differentiate basic effort and any proposed options)

• **Table of Contents:** An alphabetical/numerical listing of the sections within the proposal, including corresponding page numbers.

• **Statement of Work:** A Statement of Work (SOW) clearly detailing the scope and objectives of the effort and the technical approach. It is anticipated that the proposed SOW will be incorporated as an attachment to the resultant award instrument. To this end, the proposals must include a severable, self-standing SOW, without any proprietary restrictions, which can be attached to the contract award. Include a detailed listing of the technical tasks/subtasks organized by year.

Technical Approach: The offeror shall provide a detailed plan that coherently describes the technical approach proposed for contract performance which demonstrates a technical understanding of the proposed Statement of Work (SOW). The technical approach should address each of the numbered task areas delineated in the SOW providing specific or unique techniques to be employed and anything else the offeror considers relevant in performing the SOW. The technical approach should indicate how the work will be

performed, including the capabilities and resources which will be applied, what problem areas exist, the proposed solutions and a full explanation of the proposed disciplines, procedures and techniques to be followed. Emphasis should be placed upon the extent that the Offeror's technical approach ensures timely delivery and successful completion of the tasks outlined by the SOW submission.

• **Project Schedule and Milestones:** A summary of the schedule of events and milestones:

• **Assertion of Data Rights and/or Rights in Computer Software:** For a contract award an Offeror may provide with its proposal assertions to restrict use, release or disclosure of data and/or computer software that will be provided in the course of contract performance. The rules governing these assertions are prescribed in Defense Federal Acquisition Regulation Supplement (DFARS) clauses 252.227-7013, -7014 and -7017. These clauses may be accessed at the following web address:

http://farsite.hill.af.mil/VFDFARA.HTM

The Government may challenge assertions that are provided in improper format or that do not properly acknowledge earlier federal funding of related research by the Offeror.

• **Deliverables:** A detailed description of the results and products to be delivered inclusive of the timeframe in which they will be delivered.

• **Management Approach:** A discussion of the overall approach to the management of this effort, including brief discussions of the total organization; use of personnel; project/function/subcontractor/ relationships; government research interfaces; and planning, scheduling and control practice. Identify which personnel and subcontractors (if any) will be involved. Include a description of the facilities that are required for the proposed effort with a description of any Government Furnished Equipment/Hardware/Software/Information required, by version and/or configuration.

• **Other Agencies:** Include the name(s) of any other agencies to which the proposal has also been submitted.

Volume 2: Cost Proposal

All sections shall start on a new page.

The Cost Proposal shall consist of a cover page and two parts. Part 1 will provide a detailed cost breakdown of all costs by cost category by calendar or Government fiscal year, and Part 2 will provide a cost breakdown by task/sub-task corresponding to the task numbers in the proposed Statement of Work. Options must be separately priced.

Although not required and provided for informational purposes only, detailed

instructions, entitled "Instructions for Preparing Cost Proposals for Contracts and Agreements", including a sample template for preparing costs proposals for contracts and agreements, may be found at ONR's website listed under the 'Acquisition Department – Contracts & Grants Submitting a Proposal' link at: http://www.onr.navy.mil/02/how_to.asp

Cover Page: The use of the SF 1411 is optional. The words "Cost Proposal" should appear on the cover page in addition to the following information:

- BAA number
- Title of Proposal
- Identity of prime Offeror and complete list of subcontractors, if applicable
- Technical contact (name, address, phone/fax, electronic mail address)
- Administrative/business contact (name, address, phone/fax, electronic mail address) and
- Duration of effort (separately identify basic effort and any proposed options)

Part 1 – Contract Costs: Detailed breakdown of all costs by cost category by calendar or Government fiscal year:

- Direct Labor – Individual labor categories or persons, with associated labor hours and unburdened direct labor rates;
- Indirect Costs – Fringe Benefits, Overhead, G&A, COM, etc. (Must show base amount and rate);
- Proposed Contractor-Acquired Equipment - such as computer hardware for proposed research projects should be specifically itemized with costs or estimated costs. An explanation of any estimating factors, including their derivation and application, shall be provided. Where possible, indicate purchasing method (competition, price comparison, market review, etc.);
- Travel – Number of trips, destination, duration, etc.;
- Subcontracts – A cost proposal as detailed as the Offeror's cost proposal will be required to be submitted by the subcontractor. The subcontractor's or subrecipient's cost proposal can be provided in a sealed envelope with the Offeror's cost proposal or will be obtained from the subcontractor prior to award[6];
- Consultant – Provide consultant agreement or other document which verifies the proposed loaded daily/hourly rate;
- Materials - Should be specifically itemized with costs or estimated costs. An explanation of any estimating factors, including their derivation and

6 Note: DoD Federal Acquisition Regulation provision 252.215-7003 (48 CFR 252.215-7003) is incorporated into this solicitation by reference. The Offeror is to exclude excessive pass-through charges from subcontractors. The Offeror must identify in its proposal the percentage of effort it intends to perform and the percentage to be performed by each of its proposed subcontractors. If more than 70 percent of the total effort will be performed through subcontracts, the offeror must include the additional information required by the above-cited clause.

application, shall be provided. Include a brief description of the Offeror's procurement method to be used (competition, engineering estimate, market survey, etc.);

- Other Directs Costs - particularly any proposed items of equipment or facilities. Equipment and facilities generally must be furnished by the contractor/recipient. (Justifications must be provided when Government funding for such items is sought). Include a brief description of the Offeror's procurement method to be used (Competition, engineering estimate, market survey, etc.);
- Options – the Base Period of Performance and Option Periods must be priced at the submission of the proposal. Any proposal containing unpriced options will not be included in the contract;
- Fee/Profit

Part 2: Cost breakdown by task/sub-task corresponding to the same task breakdown in the proposed Statement of Work. When options are contemplated, options must be separately identified and priced by task/subtask.

3. Significant Dates and Times

Schedule of Events

EVENT	DATE	TIME (EASTERN DAYLIGHT TIME)
Pre-Proposal Conference / Industry Day	**19 May 2008**	**TBD**
White Papers Due Date	**16 June 2008**	**2:00 pm**
Notification of Initial Navy Evaluations of White Papers	**30 June 2008**	**N/A**
Oral Presentation of White Papers	**14-18 July 2008***	**TBD**
Notification of Navy Evaluations of Oral Presentations	**23 July 2008***	**N/A**
Full Proposal Due Date	**07 August 2008**	**2:00 pm**
Notification of Selection for Award	**29 August 2008***	**N/A**
Contract Awards	**24 November 2008***	**N/A**

***** These dates are estimates as of the date of this announcement. Please refer to the *Dynamic C2 for Tactical Forces and Maritime Operations Center* website for official dates. **Due to changes in security procedures since September 11, 2001, the time required for hard-copy written materials to be received at the Office of Naval Research has increased. Thus it is recommended that any hard-copy proposal be mailed several days before the deadline established in the solicitation so that it will not be received late and thus ineligible for award consideration.**

4. Submission of Late Proposals

In accordance with FAR 15.208, any proposal, modification, or revision, that is received at the designated Government office after the exact time specified for receipt of proposals is "late" and will not be considered unless it is received before award is made, the contracting officer determines that accepting the late proposal would not unduly delay the acquisition and:

(a) If it was transmitted through an electronic commerce method authorized by the announcement, it was received at the initial point of entry to the Government infrastructure not later than 5:00 P.M. one working day prior to the date specified for receipt of proposals; or

(b) There is acceptable evidence to establish that it was received at the Government installation designed for receipt of proposals and was under the Government's control prior to the time set for receipt of proposals; or

(c) It was the only proposal received.

However, a late modification of an otherwise timely and successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

Acceptable evidence to establish the time or receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the Government office designated for receipt of proposals by the exact time specified in the announcement, and urgent Government requirements preclude amendment of the announcement closing date, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the announcement on the first work day on which normal Government processes resume.

The contracting officer must promptly notify any offeror if its proposal, modifications, or revision was received late and must inform the offeror whether its proposal will be considered.

5. Address for the Submission of Hard Copy White Papers and Full Proposals for Contracts.

Hard copies of white papers and full proposals for Contracts should be sent to the Office of Naval Research at the following address:

Office of Naval Research
Attn: Mr. Gary Toth
ONR Department Code: 311
875 North Randolph Street – Suite 1181
Arlington, VA 22203-1995

V. EVALUATION INFORMATION

1. Evaluation Criteria –

The Office of Naval Research plans to make multiple awards depending on their value to the Government in accordance with the evaluation criteria listed below. The following evaluation criteria apply to the White Papers, Oral Presentations and the Full Proposals. Proposals will be selected through a technical/scientific/business decision process with technical and scientific considerations being more important than cost. Even though cost is of less importance than the technical factors combined, it will not be ignored. The degree of its importance will increase with the degree of equality of the proposals in relation to the other factors on which selection is to be based, or when the cost is so significantly high as to diminish the value of the technical superiority to the Government. The technical factors A through D are listed in descending order of importance. The sub-criteria, i.e., the "numbered" items within each of the lettered paragraphs, are of equal importance.

A. Overall scientific and technical merits of the proposal

1. The degree of innovation and ability to deliver technology that will improve warfighting capabilities.

2. The soundness of the technical concept.

3. The Offeror's awareness of the state of the art and understanding of the scope of the problem and the technical effort needed to address it.

4. The extent to which the government will have full intellectual property rights, or at least unlimited government purpose intellectual property rights, to the deliverables received. If the proposal includes proprietary restrictions on government use of intellectual property, the proposal shall show how components with restricted intellectual property rights may be integrated into a Service Oriented Architecture.

B. Naval relevance, anticipated contributions of the proposed technology and transition potential

1. The degree to which the proposal shows the connection between the proposed technology development and.how the technology proposed is

relevant to the operational context described in Section 6.2 through 6.2.2 of this BAA. It should also explain how the concept for integrating technology into the NESI service oriented architecture using standards posted at http://nesipublic.spawar.navy.mil/.

C. Offeror's capabilities, related experience, and past performance, including the qualifications, capabilities and experience of the proposed principal personnel.

1. The quality of technical personnel proposed to perform the described work.

2. The Offeror's past experience in relevant efforts with similar resources.

D. Management Approach

The Management Approach is not required in the White Paper or for the Oral Presentations. However, the Management Approach is required for the Full Proposal and will be evaluated in accordance with the following criteria:

1. The Approach is in milestone format with succinct factual description of how achievement of milestones will be managed.

2. Relationship between cost and milestone achievement is defined.

3. Estimate of technical, schedule and cost risk with risk management addressed.

E. The Realism of the Proposed Cost.

1. Total cost relative to benefit.

2. Realism of cost levels for facilities and staffing.

Evaluation of Options: The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. The evaluation of options will not obligate the Government to exercise the option(s).

The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. Evaluation of options will not obligate the Government to exercise the options during contract performance.

2. Evaluation Panel

White papers, oral presentation materials, and full proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-5 and 15.207. Potential Offerors should understand that government technical experts drawn

from the Office of Naval Research, the Naval systems commands, Navy warfare centers, the Naval Research Laboratory (NRL), and other Naval and Defense activities/agencies will evaluate the white papers, oral presentations, and full proposals.

The Government may use selected support personnel as subject matter expert technical consultants to assist in providing both technical expertise and administrative support regarding white papers, oral presentation materials, and full proposals resulting from this announcement. Similarly, support contractors may be utilized as subject matter experts in the evaluation of cost proposals. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to the submissions in response to this BAA will be required to sign a non-disclosure agreement prior to receipt of any proprietary and source-selection information.

VI. AWARD ADMINISTRATION INFORMATION

1. Administrative Requirements

• The North American Industry Classification System (NAICS) code – The North American Industry Classification System (NAICS) code for this announcement is 541710 with a small business size standard of 500 employees.

• Central Contractor Registry (CCR) - Successful Offerors not already registered in the CCR will be required to register in CCR prior to award of any grant, contract, cooperative agreement, or other transaction agreement. Information on CCR registration is available at http://www.onr.navy.mil/02/ccr.htm.

• Certifications – Proposals for contracts should be accompanied by a completed certification package which can be accessed on the ONR Home Page at Contracts & Grants located at http://www.onr.navy.mil/02/rep_cert.asp.

Contracts:
For contracts, in accordance with FAR 4.1201, prospective contractors shall complete and submit electronic annual representations and certifications at http://orca.bpn.gov. In addition to completing the Online Representations and Certifications Application (ORCA), proposals must be accompanied with a completed DFARS and contract specific representations and certifications. These "DFARS and Contract Specific Representations and Certifications", i.e., Section K, may be accessed under the Contracts and Grants Section of the ONR Home Page at http://www.onr.navy.mil/02/rep_cert.asp.

2. Reporting

The following are samples of data deliverables that are typically required under a research effort:

*Technical and Financial Progress Reports

*Presentation Materials
*Final Report

Additional data deliverables may be proposed and finalized during negotiations. Research performed under contracts may also include the delivery of software, prototypes, and other hardware deliverables.

VII. OTHER INFORMATION

The following are representative of the type of requirements that the capability developed in response to this research opportunity should provide.

- The research opportunity described in this Broad Agency Announcement does not seek proposals for improved communication protocols, waveforms, antenna technology, propagation prediction techniques, or other communication technology. Proposals that offer communication technology development will be rejected as non-compliant with the BAA. The research opportunity does seek innovative proposals for information processing and sharing mechanisms that will use available communication connectivity and capacity in the best possible way.
- Information sharing capability must:
  - Comply with Naval and Department of Defense (DoD) data strategies. Navy's Common Net-Centric Data Environment is relevant to this research opportunity.
  - Operate with Naval and DoD security mechanisms and protocols: the Navy Common Afloat Network and Enterprise Services (CANES) initiative is relevant.
  - Include use of meta-data that provides pedigree information about data such as the source of sensor data, track data, and command control orders. Navy Combat System Open Architecture and Navy Anti-Submarine Warfare Data Strategy initiative are relevant.
  - Adapt to changes in the computing infrastructure so that processing capability can be shared as a resource across the entire platform (air, surface, subsurface, and shore). Priorities in computational tasking must be expressed in a common format, and the integrity of data must be preserved.
  - Dynamically adapt to rapid and frequent changes in the communication network environment. The table immediately below shows the type of network parameters that solutions are to be expected to perform under, and provides a rough indication of the range of network conditions to be considered. CANES is responsible for network management, and capability provided in connection with this research opportunity should interact with CANES network management for exchange of information about priority information sharing data in queue and network condition information.

Representative Network Parameters and Range of Conditions
(Note: this information is presented as hypothetical but reasonably realistic guidance concerning the availability and connectivity of ASW nodes.)

Characteristic	Good conditions	Poor conditions	Note
Connectivity (Sea Combat Commander)	99% to shore and surface ships	80% to shore and surface ships	
Connectivity (surface ships)	95% to shore and surface ships	70% to shore and surface ships	
Connectivity (submarine)	95% during communication periods7	70% during communication periods	Note 1
Bandwidth (Sea Combat Commander)	16 kilobits per second to shore and surface ships	2.4 kilobits per second to shore and surface ships	
Bandwidth (surface ships)	8 kilobits per second to shore and surface ships	600 bits per second to shore and surface ships	
Bandwidth (submarine)	8 kilobits per second	75 bits per second	Note 2
Two-way capability (Sea Combat Commander)	Full duplex	1.2 kilobits per second receive, 1.2 kilobits per second send	
Two-way capability (surface ship)	Full duplex	300 bits per second receive, 75 bits per second send	
Two-way capability (submarine)	Full-duplex	Receive only	
Bit error rate	One error in 10^6 bits	One error in 10^4 bits	
Burst error rate	One error in 10^4 bits for periods as long as 10 minutes, each hour	One error in 10^4 bits for periods as long as 10 minutes, three times each hour	
Lost connectivity	As much as one hour per day	As much as three periods per day of one hour duration	
Latency	2-10 seconds	1 – 3 minutes	NOTE 3
Information error rate	1 error in 10^9 bits	One error in 10^6 bits	NOTE 4

.

Note 1: Submarine communication periods may occur as often as four times a day for 20 minutes each time under good conditions, as little as once every other day for 10 minutes each time under poor conditions

Note 2: Submarine bandwidth varies considerably, depending on the mechanism used for communication. The values in Table 6-1 provide a notional example of the range of submarine communication bandwidth.

NOTE 3: Latency should be measured only with "Good" communication conditions.

NOTE 4: Information error rate should be measured only with "Good" communication conditions.

1. Government Property/Government Furnished Equipment (GFE) and Facilities

Each Offeror must provide a very specific description of any equipment/hardware that it needs to acquire to perform the work. This description should indicate whether or not each particular piece of equipment/hardware will be included as part of a deliverable item under the resulting award. Also, this description should identify the component, nomenclature, and configuration of the equipment/hardware that it proposes to purchase for this effort. The purchase on a direct reimbursement basis of special test equipment or other equipment that is not included in a deliverable item will be evaluated for allowability on a case-by-case basis. Maximum use of Government integration, test, and experiment facilities is encouraged in each of the Offeror's proposals.

Government research facilities and operational military units are available and should be considered as potential government-furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for any one specific program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should explain as part of their proposals which of these facilities are critical for the project's success.

2. Security Classification

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the Offeror must clearly identify such need prominently in its proposal.

3. Protection of Proprietary and Sensitive Information

The parties acknowledge that, during performance of the contract or grant agreement

resulting from this BAA, the recipient may require access to certain proprietary and confidential information (whether in its original or derived form) submitted to or produced by the Government. Such information includes, but is not limited to, business practices, proposals, designs, mission or operation concepts, sketches, management policies, cost and operating expense, technical data and trade secrets, proposed Navy budgetary information, and acquisition planning or acquisition actions, obtained either directly or indirectly as a result of the effort performed on behalf of ONR. The recipient shall take appropriate steps not only to safeguard such information, but also to prevent disclosure of such information to any party other than the Government. The recipient agrees to indoctrinate company personnel who will have access to or custody of the information concerning the nature of the confidential terms under which the Government received such information and shall stress that the information shall not be disclosed to any other party or to recipient personnel who do not need to know the contents thereof for the performance of the contract/agreement. Recipient personnel shall also be informed that they shall not engage in any other action, venture, or employment wherein this information will be used for any purpose by any other party.

4. Project Meetings and Reviews

Individual program reviews between the ONR sponsor and the performer may be held as necessary. Program status reviews may also be held to provide a forum for reviews of the latest results from experiments and any other incremental progress towards the major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, Offerors should assume that 40% of these meetings will be at or near ONR, Arlington VA and 60% at other contractor or government facilities. Interim meetings are likely, but these will be accomplished via video telephone conferences, telephone conferences, or via web-based collaboration tools.

5. Submission of Questions

Any questions regarding this solicitation must be provided to the Science and Technology Point of Contact and/or Business Point of Contact listed in this solicitation. All questions shall be submitted in writing by electronic mail. Questions presented by telephone call, fax message, or other means will not be accepted. Responses are not binding unless the specific Q&A is posted on the ONR website. There will be no meetings between potential Offerors and the Science and Technology Point of Contact prior to the Industry Day briefing described in paragraph IV.1.b.

Questions regarding **white papers** must be submitted by 2:00 P.M. Eastern Daylight Time on 09 June 2008. Questions after this date and time may not be answered, and the due date for submission of the white papers will not be extended.

If invited to present an oral presentation, questions regarding **oral presentations** must be submitted by 2:00 p.m. Eastern Daylight Time one week prior to the scheduled

presentation. Questions after this date and time may not be answered and the scheduled date and/or time of the oral presentation will not be changed.

Questions regarding **full proposals** must be submitted by 2:00 P.M. Eastern Daylight Time on 07 August 2008. Questions after this date and time may not be answered, and the due date for submission of the proposals will not be extended.