

ONR BAA Announcement Number 10-018
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BROAD AGENCY ANNOUNCEMENT (BAA)

Dynamic Command and Control (C2) 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
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 10-018

5. Response Date

White Papers: 21 June 2010 - 2:00 PM Eastern Daylight Time

Oral Presentations: 19 July 2010 - Exact date, time, and location to be determined

Full Proposals: 16 September 2010 - 2:00 PM Eastern Daylight Time

6. Research Opportunities Description

6.1 Synopsis

6.1.0 Scope

The Office of Naval Research (ONR) is seeking innovative solutions to address information sharing challenges between tactical-level combat systems networks and command, control, communications, computers and intelligence (C4I) networks. Offerors will be asked to develop software products that address specific challenges in service oriented architecture (SOA) implementations across ashore, afloat, and airborne environments.

Combat systems (CS) networks operate in “real-time” [utilize time-deterministic protocols], and include Weapons Systems and Sensor Systems that are constrained by

unique hardware systems and characteristics. Future surface ship combat systems are moving to a product line architecture, as described in the Architecture Description Document (ADD)¹. The product line architecture will provide software commonality across multiple ship classes, and enable maximum software reuse.

C4I networks address “non real-time” or “near real-time” [non-deterministic] computing requirements. Multiple C4I networks currently are implemented aboard ship to address various information classification needs, although the Navy is working to integrate these networks into a single multi-level security network over time. The future shipboard C2 information system architecture is evolving, under the direction of the Program Executive Office for Command, Control, Communications, Computers, Intelligence (PEO C4I), to have a common computing environment and a service oriented infrastructure. Both CS and C4I have to deal with cyber threats and maintenance of a secure Information Assurance (IA) boundary.

This solicitation addresses needed advances in integration between combat systems networks and C4I network aboard ship, as well as between C4I shipboard networks and other ships, shore sites and naval aircraft. Figure 1 provides a high level depiction of key shipboard components and interfaces. It illustrates the relationship between the combat system and the systems that connect the combat system to other shipboard systems and to external communications systems. This solicitation deals with the development of technologies to support the creation of Domain Bridge Services and Domain Edge Services.

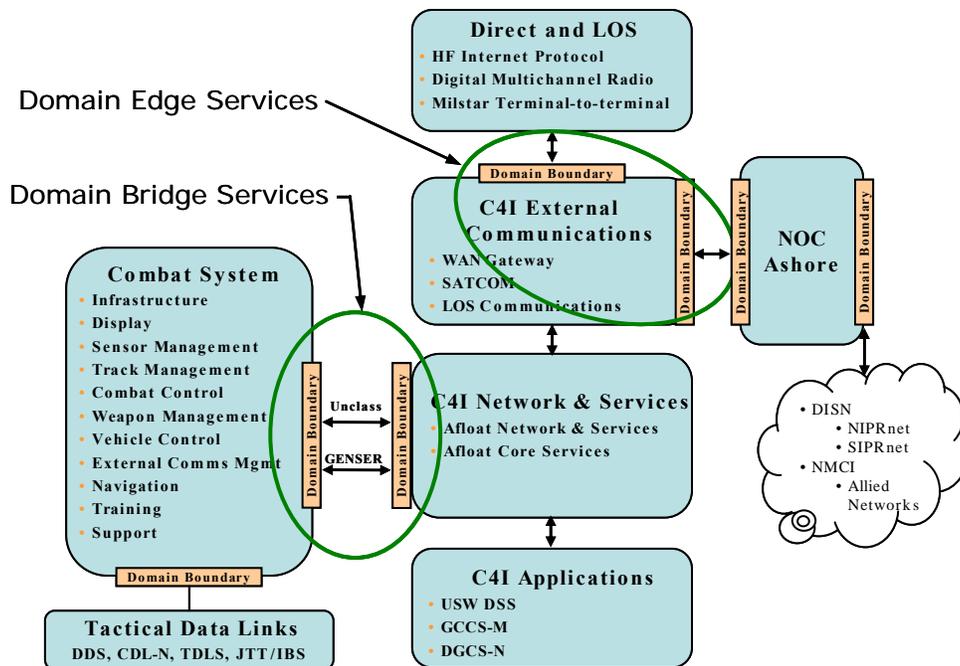


Figure 1. Combat System, C4I Network and Services, and Communications Interfaces

¹ Surface Navy Combat Systems Software Product Line Architecture, Architecture Description Document, Version 1.0, PEO IWS, 31 July 2009

For the purpose of this solicitation Domain Bridge Services address application-level facilitation of information transfer between the combat systems and C4I networks and services aboard ship using internet protocol (IP) protocols. This is a high speed local area network (LAN) interface that is primarily concerned with protocol conversion, format mediation, information assurance, quality of service, and data characterization for information shared across the interface. For data exchanged at the Secret-high security level, there is no encryption boundary involved.

Domain Edge Services address the sharing of information off-ship using IP protocols, primarily from the C4I network and services operated at the secret level. These services must facilitate information transfers through an encryption boundary and across naval radio frequency (RF) networks. These services are primarily concerned with providing network transparency and optimizing information exchange performance across networks of limited performance. Domain Edge Services do not include sharing of data or information across the interface with tactical data links.

Both future combat systems and future C4I information systems architectures are evolving toward SOA implementations. While not asked to propose tactical SOA development, offerors will be asked to propose solutions that generically use a tactical SOA for sharing information among operational and tactical-edge users, while specifically focusing on challenges in sharing information between emerging combat systems and C4I architectures. These solutions will be combined with other research in progress that is addressing optimization of information sharing between afloat nodes and Maritime Operations Center (MOC) nodes, as well as collaborative planning solutions, management of sensor information, pedigree information, and automation of mission readiness management across the Naval and Joint enterprises.

6.1.1 High Level Objectives

This program will develop science and technology (S&T) products, primarily in the form of software products, with supporting analyses and laboratory experimentation, for delivery at a technology readiness level (TRL) of 6 or 7 to acquisition sponsors for integration into Programs of Record (PoRs). Offerors are asked to develop innovative technology solutions while simultaneously delivering robust products to acquisition programs.

The key objectives of this solicitation are to develop technologies to:

- a. Maximize information transparency between combat systems networks and C4I networks aboard U.S. Navy combatant ships, and
- b. Maximize information transparency between U.S. Navy combatant ships, and between ships and shore sites, while
- c. Minimizing the level of design complexity imposed on individual applications developers for both combat systems and C4I applications

The ultimate objective of this suite of capabilities is to provide operational and tactical commanders with a coherent information space in support of shared awareness and collaborative decision making. In addition, these capabilities will enable any tactical user to access any relevant data that is available from combat systems, C2 systems, and operational-level C2 systems in a timely manner and in a form that he/she can utilize most efficiently. These solutions will be combined with other research in progress that is addressing optimization of information sharing between afloat nodes and Maritime Operations Center (MOC) nodes, as well as collaborative planning solutions, management of sensor information, pedigree information, and automation of mission readiness management across the Naval and Joint enterprises.

6.1.2 Technology Challenges

Specific challenges to be addressed in this solicitation fall into three focus areas:

1. Domain Bridge Services – application level services that enable information exchange between combat systems networks and C2 networks within a ship or aircraft over its internal LAN.
2. Domain Edge Services – application level services that optimize information exchange between ships, aircraft, and shore sites over naval radio frequency (RF) communications networks.
3. Common Information Functions – commonly used, critical services or standards that enable software re-use or services consistency. These critical items are:

Data Quality Attributes – Concise and accurate metadata and error representation to provide context and determine usability of shared data (e.g., spatial and temporal properties of accuracy, precision, resolution, stability).

- Service Level Agreements / Quality of service (QoS) – characterization of the performance of application-level services, so that aggregate enterprise performance can be specified
- Information assurance (IA) – management of risks related to the use, processing, storage, and transmission of data and protection of the systems and processes used for those purposes
- User facing services (UFS) – visualization of critical performance indicators spanning CS and C2 system performance

The distinction between domain bridge services and domain edge services is the need for edge services to accommodate the inherent disconnected, intermittent, and limited (DIL) nature of naval RF communications networks. Domain bridge services and domain edge services each provide a form of federation between different capability domains. However, bridge services will operate on shipboard networks with connections that are high speed and have high reliability. Edge services will operate on IP networks over naval RF networks that are often characterized by DIL communications. Disconnected

operations include periods of no communications between platforms, due to tactical action (e.g., emissions control (EMCON)), or conditions of the environment (e.g., antenna blockage, atmospheric effects). After such outages networks must catch up to synchronize all platforms to the current operational state. Intermittent operations recognize the warfighting reality that individual communications links are often lost or degraded for short periods of time due to natural or man-made causes. Limited operations recognize that communications over all RF links are bandwidth constrained, and that demand always exceeds supply.

The functions identified as common information functions are believed to be necessary enablers for important aspects of information sharing, interpretation, usage, or protection. These functions are called out separately as they are likely to be common to a number of application level services. As such, the approach to implementing each function should be in accord with common standards (syntax) for re-use as needed once populated with application specific or mission relevant parameters or data.

Note that this solicitation addresses application level solutions, not communications and routing systems or software. However, relevant applications mostly exist within cipher-text black core encrypted networks. Visibility of the inter-platform network communications state to applications within the combat systems and C4I networks is a significant concern.

6.1.3 Design Standards & Guidelines

Technologies for providing end-to-end interoperability and reliable performance are essential across the range of business, intelligence, and warfighting functions. With the Global Information Grid (GIG) being a globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, and managing information on demand to warfighters, defense policy makers, and support personnel, the challenges being addressed by emerging SOA related technologies are indeed great.

- Domain Edge Services must support the range of information capabilities required by the GIG. These capabilities include transport, Web-based services, information assurance technologies, applications, data, architectures, and standards. All must be carefully factored into the development of candidate Domain Edge Services capabilities and technologies, along with supporting analyses and trade-offs. Current categories of technologies addressed as part of GIG capability development include but aren't limited to Service-oriented Design Principles
- Message formats and standards
- Service Description Mechanisms
- Service Discovery Mechanisms-Enabling Software and Protocols
- Middleware Frameworks

All software products developed under this solicitation must be consistent with emerging combat system and C4I system architectures, and will comply with Net-Centric Enterprise Solutions for Interoperability (NESI)² guidance. Further, all developments under this solicitation will be consistent with emerging Navy and Joint common data architectures and definitions and data modeling practices. It is important to note that this BAA does not solicit SOA infrastructure development. Proposals for SOA infrastructure, apart from identified shortfalls in capability, will be considered non-compliant.

6.1.4 Execution Guidelines

This program will develop S&T products, software products and experimentation articles, and deliver these products at a technology readiness level (TRL) of 6 or 7 to acquisition sponsors for integration into Programs of Record. The challenge is to develop innovative technology solutions while simultaneously delivering robust products to acquisition programs and operational experimentation.

A government-coordinated experimentation process will be used to ensure that the S&T products are well aligned with Fleet and Program of Record needs, and that they are sufficiently mature when delivered. Offerors should assume they will participate in a progression of experimentation venues, including laboratory based technical validation, limited technology experiments (LTEs) in cooperation with other performers and their technology articles, limited objective experiments (LOEs) to validate operational utility, and fleet exercises to demonstrate operational capability.

6.2 Operational Requirements

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 and information content that support C2 to be rapidly adaptable and responsive to the needs of the decision-maker in real time. The SOA tactical services that support combat systems and 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.

This BAA seeks to provide a commander with timely access to decision-quality information by facilitating management of sensor information and information sharing between combat systems and C4I shipboard network domains. By leveraging other products this effort will also enable tactical forces afloat to seamlessly interface with the operational-level Maritime Operations Center (MOC).

During the early stages of program development, use cases that illustrate one or more mission profiles, including the interaction of ships, aircraft and shore sites, and the data exchange required to meet mission goals and decision timelines will be formulated. The integration of the new multi-mission helicopter MH-60R into the surface ship combat systems provides an example use case. Technology focus is placed on the management

² NESI information can be found at: <http://nesipublic.spawar.Navy.mil>

and distribution of anti-submarine warfare (ASW) sensor data, contact/track data, and air platform readiness and mission status data to the combat systems, C4I systems and ultimately to the MOC.

Figure 2 shows the primary aircraft carrier shipboard systems involved. The Ship Self Defense System (SSDS) is the aircraft carrier self defense combat system. It receives input from a variety of sensor systems, targets incoming threats and coordinates weapons response. For the purpose of this use case SSDS will handle air platform readiness and mission status information from the helicopter.

The Aircraft Carrier Tactical Support Center (CV-TSC) is the primary antisubmarine warfare (ASW) sensor data processing system aboard the carrier. It receives wideband sensor information from ASW aircraft and fuses that information with sensor and contact information from other aircraft to create a local ASW tactical picture.

The Undersea Warfare Decision Support System (USW DSS) is a C2 system for ASW mission planning and mission execution support. It forms an integrated ASW Common Tactical Picture (CTP) combining relevant ASW tracks from CV-TSC with Global Command and Control System Maritime (GCCS-M) track data, and contact/track data from radar, Automated Identification System (AIS), Link-16, as well as with undersea acoustic tracks from battle group cruiser and destroyer (CRUDES) assets.

Data from the MH-60R is received by the SSDS and CV-TSC using the existing SAU 7000 interface. Data in SSDS and CV-TSC is made available for use by other combat systems components over a combat systems local area network (CS-LAN). Data exchange on the SAU-7000 interface and among CS components and the CS-LAN is not within the scope of this BAA. Data exchange between CS and C4I systems, in particular the networks that support data from those systems, will be shared via new Domain Bridge Services. Once in the C4I computing environment that data will be made available to other platforms and sites via Domain Edge Services. This BAA is concerned with the development of such domain bridge services, and domain edge services, and related common information functions. Other use cases may be identified to support and guide S&T development. The operational objective is to ensure that any data available to any combat systems or C4I component (regardless of platform type) is available to all components in a usable

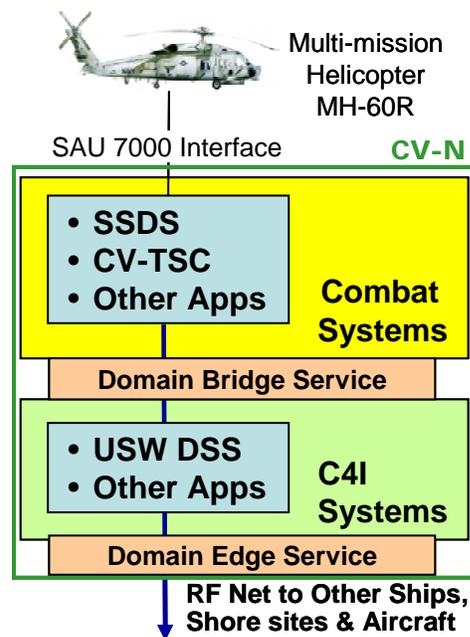


Figure 2, MH-60R Data Flow

form. The potential extensibility of proposed solutions will be a significant consideration.

6.3 Detailed Description of Capabilities

6.3.1 Domain Bridge Services

Current interfaces between combat systems components and to non-combat systems components are largely custom point-to-point implementations. This approach greatly limits distribution of available information within the shipboard enterprise and requires custom engineering each time an interface is changed.

PEO C4I and PEO integrated warfare systems (IWS) are proceeding on a complimentary strategy to facilitate architectural coordination between the two organizations and, specifically to enable efficient information sharing between CS and C4I networks. Architectural differences between these networks create bridging challenges.

Future combat systems and C4I systems will use a variety of technology approaches for information sharing. These include web service mechanisms such as Enterprise Service Bus (ESB), the dynamic distributed services (DDS) messaging on the combat systems network, Java Message Service (JMS) or Advanced Messaging Queuing Protocol (AMQP) messaging on the C4I network, and others as identified to meet functional and performance requirements.

A mechanism is needed for applications hosted on C4I networks to be able to subscribe to CS data that is currently transmitted in the CS by use of DDS messages. This mechanism would enable information to be published and subscribed to across the CS network to the C4I network connection. A DDS-to-JMS bridge is currently under development to address this requirement, but advanced techniques for bridging of generic message types will continue to be of interest for some time. The Navy will use the current bridge capability to replace an existing one-way, point-to-point custom interface between an combat systems component and a C4I component with a publish/subscribe interface. This exercise will provide insight to developers into Navy implementation issues.

Additional capabilities to support Domain Bridge Services implementation are discussed in section 6.3.3.

6.3.2 Domain Edge Services

The vast scope of the Navy's mission requires the optimal use of distributed sensors and weapons requiring the ability to seamlessly discover, task and expose data on tactical networks. To do this the tactical edge and enterprise networks must be linked and work "across the seams" (between ships and to shore sites, aircraft, etc.). To facilitate flawless "across the seams" operations, Domain Edge Services must be developed.

Domain Edge Services are defined, for the purpose of this solicitation, as application level services that optimize information exchange between ships and other naval ships, shore sites and aircraft over naval RF communications networks. An application level service is one that exists within the encryption boundary of a local area network (LAN) and does not include direct access to encryption, routing or communications equipment used to connect the LAN to a wide area networks (WAN). The fundamental difference between domain bridge services and domain edge services is the need for edge services to accommodate the inherent DIL nature of naval RF communications networks. As a result, Focus Area 2 Domain Edge Services should exhibit the following characteristics:

- Support distributed decision makers with the means to collaborate using shared information space.
- Allow individual nodes (of a distributed enterprise) to function while temporarily disconnected from internal and external domain services.
- Automatically and adaptively monitor and manage the functioning of the domain edge services to diagnose problems and make repairs as needed.
- Provide information to the applications to enable the applications to be network aware and respond accordingly.

Domain Edge Services will query, transport, translate, transform, aggregate, compress, filter, and cache information (possibly proactively seeking unrequested data, in order to provide seamless availability to information when reach-back networks are down) to move it from the source to the destination while insulating each domain from interference from the other. These objectives lead to the following technical concerns for C4I to Tactical Networks Domain Edge Services:

Network Aware Services

Domain Edge Services must provide services to the applications that enable the applications to be aware of the network status and respond accordingly. Applications that subscribe to the Domain Edge Service should receive the underlying information of state of the network that then enables the application to optimize its behavior based on the information provided by the Domain Edge Service. Quantification of network state through the very limited mechanisms available in a cipher-text black core encrypted domain is a particular challenge. However, ultimately such Domain Edge Services would tend to be mostly transparent to the consumers and producers of services in these different domains. In summary, technologies are required to provide information to the applications to enable the applications to be network aware and respond accordingly.

Edge Caching

One of the challenges in the tactical edge environment is access to information even when disconnected from the network. The fundamental question is where and how to persist perishable data in the tactical environment while ensuring that applications receive the most timely and accurate response available to each query.

Content Discovery, Delivery and Management

Technologies are required to facilitate content discovery, delivery and management over tactical networks. Many commercial standards breakdown in the tactical edge environment with disconnected, intermittent and low bandwidth networks. For example, UDDI for discovery may not be an enabling technology for federating discovery between tactical edge networks (e.g., ship to ship or ship to aircraft networks).

Technologies should also ensure continuous metadata updates across the SOA federation do not degrade across existing networks. Of particular concern is the ability to optimize communications of applications data across DIL networks using both content-aware and content-independent means. While the Navy has some application specific algorithms that perform this function, there is a strong need to host such algorithms as edge services that are standardized, documented, available to all applications on the SOA, and are extensible to accommodate new content as it becomes available.

Additional capabilities to support Domain Edge Services implementation are discussed in section 6.3.3.

6.3.3 Common Information Functions

This focus area addresses critical services or standards needed to support effective data and information sharing, usage, interpretation, and protection. These functions are:

Data Quality Attributes – Concise and accurate metadata and error representation to provide context and determine usability of shared data (e.g., spatial and temporal properties of accuracy, precision, resolution, stability).

The Navy is changing its systems implementation approach from a paradigm of vertical integration to one of shared information resources. The ability of a system to utilize data generated by a remote source will depend on its ability to characterize that data with respect to its appropriate use. Information consumers need to have the ability to specify their requirements for both information content and data delivery parameters. Note that data quality attributes are often addressed as quality of service attributes; However, data quality attributes are discussed separately here to distinguish them from data delivery characteristics.

The Navy has robust abilities to collect sensor data and produce processed information within the CS and C2 systems domains. In order to use such data in a consistent manner, there is a complementary need to represent the accuracy of those sensors. As a matter of practice, accuracy is usually defined in terms of the errors associated with those sensors and processes. Error models that support such representation are unique to the sensors/processes used in formulating the information product, and can be available (although sometimes with difficulty). The challenge is routine availability and disciplined treatment of the error representation associated with the resulting

sensor/processor data product. For example, target track estimates are seldom accompanied by the covariance estimate that is calculated by the track algorithm, nor is use or interpretation of the covariance matrix commonly understood.

The goal of this work is to identify standards and best practices that can be used by both PEO IWS and PEO C4I to address employment of data quality attributes in qualifying sensor/processor information products and the representation of uncertainty associated with such information products in a way that aids user understanding. The performer is expected to develop the appropriate form and function for efficient enterprise sharing of data models and data representation, including standards and guidance for developers to achieve standardized data quality usage in machines, along with effective methods for visual representation to aid understanding by humans.

This function addresses data quality representation for the purpose of adequately describing shared information. It is not a request for data fusion analysis capabilities or methods. Proposals that offer data fusion solutions will be considered non-compliant.

Service Level Agreements (SLA) / Quality of Service (QoS) – characterization of the performance of application-level services, so that aggregate enterprise performance can be specified.

CS and C2 applications will require that Service Level Agreements (SLAs) be established to support dependable use of shared network services. The CS network services and C2 network services will need to be able to support these SLAs and the applications will need to be able to monitor the SLA performance metrics to ensure compliance.

The future surface ship combat systems architecture description document (ADD) describes the intended implementation of four Quality of Service levels for future combat systems internal communications.

- Best Effort Communications will be used when it is acceptable to not retransmit lost or garbled messages
- Reliable Communications will be available in both a broadcast and a multicast mode where the middleware will detect the need to retransmit a message if it has not been received within a certain interval
- Reliable Processing provides an acknowledgement to a sending mode that a message has both been received and that message processing has been initiated
- Reliable Command Compliance enables a sending node to monitor the state of a receiving node to ensure that it reaches the correct ordered state or report the failure to a higher level control process or operator

Shipboard C2 networks currently do not enforce SLA/QoS protocols. However, as we develop automated interfaces between combat systems and C2 networks, and from there

transfer combat systems data across naval RF networks, it will become imperative to define and support consistent SLA/QoS protocols across this distributed enterprise. This solicitation is concerned with the development of standards, patterns, practices, and software tools for managing SLA/QoS handling between shipboard CS and C2 networks, and between shipboard C2 networks and off-board networks (ship, shore, aircraft). The intent is to deliver standardized models and utilities for capturing SLA/QoS properties and for negotiating and maintaining services between dissimilar networks and across RF WAN environments.

For CS-C2 interaction the notion of quality of service (QoS) may be:

- Description and performance related metrics relevant to an application-level service to characterize that component's data/information product.
- The ability to provide different priority to different applications, data flows, or users or to guarantee a certain level of performance to a data flow.

Combat systems and C4I applications will require that service level agreements (SLAs) be established to support dependable use of shared network services, especially the more deterministic CS data exchange requirements. The combat systems network services and C4I network services will need to be able to support these SLAs and the applications will need to be able to monitor the SLA performance metrics to ensure compliance.

Offerors will be asked to work directly with transitioning PEO organizations to ensure that interfaces and requirements are well defined. Supporting tasks to be worked with the PEOs include:

- Evaluate the extent to which the SLAs described in the ADD can be implemented across the CS/C2 Domain Bridge (PEO IWS Lead, with PEO C4I and ONR participation)
- Define SLA capability extensions to address the unique operating characteristics of C2 networks for the purpose of maximizing the quality of data provided to the combat system (PEO C4I Lead, with PEO IWS and ONR participation)
- Define SLA capability extensions for the Advanced Digital Network System (ADNS) to manage quality of service across Naval RF communications for the purpose of maximizing the quality of data provided to the combat system and C2 network (PEO C4I lead, with PEO IWS and ONR participation)

Ultimately, the goal of this effort is to define a flexible SLA/QoS implementation that can be employed across combat systems and C2 domains, including over naval RF networks, and that enables applications in all domains to maximize their ability to utilize data from diverse sources.

Information Assurance (IA) – management of risks related to the use, processing, storage, and transmission of data, and protection of the systems and processes used for those purposes

Information for use by C2 and CS assets may originate from sources that are not organic to the tactical platforms involved, the C2 systems, or the shore nodes. As a result there is a strong need to authenticate the source and provenance of all data to minimize the likelihood of deception or contamination. In addition the implementation of network-based publish-subscribe interfaces between CS and C2 components requires assurance that messages received through subscriptions are reliably prepared by a trusted originating system and delivered over transmission paths that have not been compromised. Therefore there is a need for efficient but effective information assurance mechanisms both within and between SOA environments. This BAA is concerned with cyber threats and maintenance of a secure information assurance (IA) boundary at the interfaces of CS and C2 networks.

Four key aspects of information assurance are of concern for the Domain Bridge Service - Loading, Access, Pedigree, and Accuracy. Loading addresses the ability of the bridge to isolate the combat system from excessive data calls that would impact performance. Access addresses the need to control visibility of combat systems components to external intrusion, as well as the ability to control what information is allowed to enter the combat system. Pedigree refers to documenting the sources and processing that has been done on data provided to the combat system. Accuracy addresses the traceable error calculation for data provided to the combat system, and may involve other data quality attributes as discussed above.

Domain Edge Services do not directly interface with the combat system, and so CS loading is less of an issue than for the domain bridge services. Otherwise IA issues for these service components are similar.

User Facing Services (UFS) – visualization of critical network performance indicators

Visualization of critical performance indicators spanning CS, C2 and ADNS network performance is required. This will provide User Facing Service (UFS) for tailored, role relevant presentation of status, performance and summary “dashboard” information to support monitoring, tuning and mission alignment of the network capabilities. UFS will support remote WAN/LAN access to this information. UFS will provide access to the following information, minimally: utilization of the data stores, timing of data exchange operations, density of operations (parallel and overlaying operations), size of data exchanges, timing of repeat data store access, and time to complete operations. The UFS will provide function to set up Conditions-of-Interest alerting and monitoring on any of the data exchange parameters. UFS will provide statistical measures and graphic display of information spanning historical and current performance.

PEO C4I and PEO IWS use both industry standard and custom visualization technology. The focus of visualization work by both PEOs has been on the visual presentation of objects (such as tracks, land masses, and areas in which special weapon engagement doctrine applies). Presenting information clearly and minimizing clutter has been a consistent area of emphasis for both PEOs. Less emphasis has been given to the visual representation of distributed system and network performance. The goal of this work is to

identify standards and best practices that can be used by both PEOs, specifically to provide awareness of the near-real-time performance of the Navy's distributed warfighting network.

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. Funds to support this development are from ONR's Future Naval Capabilities, budget category 6.2/6.3. Offerors selected to perform research will be expected to work with other technology developers and also as members of government-led 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 Employment (CONEMP) 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 CONEMP that will be ultimately delivered to the acquisition transition partner. The government will integrate all performer inputs and produce the final CONEMP document. Performers will be asked to contribute to the CONEMP in areas corresponding to the technology products that they developed.

Performers will also actively participate in the experimentation process. The complexity and operational relevance of the experimentation venue will increase over the course of the contract. The Navy will supply relevant SOA architectural components and network simulation capability to facilitate an initial demonstration of technology performance at the performer's facility 9-12 months from date of award. The Performer will also have the opportunity to observe planning and execution of ongoing Navy experimentation to inform Performer technical execution.

As the technology matures, performers will be expected to participate in follow-on Navy distributed experiments between government facilities and, as appropriate, will participate in fleet exercises such as Trident Warrior, or Joint Expeditionary Force Exercise (JEFX). The goals of experimentation in this program are to: (a) support early evaluation of technology product performance and capability in laboratory and operational settings, and (b) validate and refine CONEMP, tactics, techniques, and procedures (TTP), and doctrine. Laboratory based experiments, known as Limited

Technology Experiments (LTEs), are conducted in cooperation with other performers and their technology articles to explore interoperability and system-like capabilities. Fleet operational experiments, known as Limited Objective Experiments (LOEs), are designed to validate TTP and operational utility. Experimentation will be coordinated with appropriate naval acquisitions commands (e.g., PEO IWS, PEO C4I).

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 and defines key analytic questions, metrics, and data collection methodologies. 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.

Work funded under a BAA may include basic research, applied research and some advanced technology development (ATD). With regard to any restrictions on the conduct or outcome of work funded under this BAA, ONR will follow the guidance on and definition of "contracted fundamental research" as provided in the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum of 26 June 2008. As defined therein, the definition of "contracted fundamental research", in a DoD contractual context, includes grants and contracts that are (a) funded by Research, Development, Test, and Evaluation Budget Activity 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Activity 2 (Applied Research) and performed on campus at a university. ATD is funded through Budget Activity 3. In conformance with the USD(AT&L) guidance and National Security Decision Directive 189, ONR will place no restriction on the conduct or reporting of unclassified fundamental research, except as otherwise required by statute, regulation or Executive Order. Normally, fundamental research is awarded under grants with universities and under contracts with industry. ATD is normally awarded under contracts and may require restrictions during the conduct of the research and DoD pre-publication review of research results due to subject matter sensitivity. As regards to the present BAA, the Research and Development efforts to be funded consist of applied research and advanced technology development. The funds available to support awards are Budget Activities 2 and 3.

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.

Primary:
Mr. Gary Toth
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Secondary:
Richard Coupland
Naval Undersea Warfare Center, Division Newport
Combat Systems Department, Code 25E
1176 Howell Street
Newport, RI 02841-1708
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Questions of a business nature shall be directed to:

Primary:
Silvia Molinillo
Contract Specialist, ONR BD251
Office of Naval Research
875 North Randolph Street – Suite W1272D
Arlington, VA 22203-1995
Telephone Number: (703) 696-2972
Facsimile Number: (703) 696-0066
E-mail Address: silvia.molinillol@navy.mil

Secondary
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Contracting Officer, ONR BD251
Office of Naval Research
875 North Randolph Street – Suite 1279
Arlington, VA 22203-1995
Telephone Number: (703) 696-2610
Facsimile Number: (703) 696-0066
E-mail Address: vera.carroll@navy.mil

Any questions regarding this solicitation must be provided to the Technical Point of Contact and 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. Questions submitted within two (2) weeks prior to a deadline may not be answered, and the due date for submission of the white paper and/or full proposal will not be extended. Responses are not binding unless the specific question and answer 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.

If invited to present an oral presentation, questions regarding oral presentations must be submitted by 2:00 p.m. Eastern Daylight Time one (1) 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.

Answers to questions submitted in response to this BAA will be addressed in the form of an Amendment and will be posted to one or more of the following webpages:

- Federal Business Opportunities (FEDBIZOPPS) Webpage - <https://www.fbo.gov/>
- ONR Broad Agency Announcement (BAA) Webpage - <http://www.onr.Navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>

Questions of a security nature should be submitted to:

Diana Pacheco
Information Security Specialist
Office of Naval Research
Security Department, Code 43
One Liberty Center
875 N. Randolph Street
Arlington, VA 22203-1995
Email Address: diana.pacheco@navy.mil

Any CLASSIFIED questions shall be handled through the ONR Security POC. Specifically, any entity wanting to ask a CLASSIFIED question shall send an email to the ONR Security POC with copy to both the Technical POC and the Business POC stating that the entity would like to ask a CLASSIFIED question. DO NOT EMAIL ANY CLASSIFIED QUESTIONS. The Security POC will contact the entity and arrange for the CLASSIFIED question to be asked through a secure method of communication.

8. Instrument Type

Awards will be issued as Contracts. ONR reserves the right to award a different instrument type if deemed to be in the best interest of the Government.

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 \$1,000,000 – \$1,500,000 per year for three (3) years, although lower and higher proposals will be considered. Proposed work should be structured for a one (1) to three (3) 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 14 January 2011. Contract awards are subject to the availability of FY 2011 funds.

ONR has funded related information technology development under numerous programs. Proposals that build on current or previous Department of Defense (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 10-018:

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. 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 Primary and Secondary 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. 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. 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.

e. Full Proposals

Submission: The due date for receipt of full proposals is no later than 2:00 p.m. (Eastern Daylight Time) on 16 September 2010.

Notification: As soon as the final proposal evaluation process is completed, each Offeror will be notified via email 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.

White Papers should include those items identified in the paragraph below entitled “White Paper Content” and should not exceed the allowed page total. White papers exceeding any of the page restrictions may not be reviewed. The preferred method of White papers submission is .PDF by e-mail; however, ONR is not responsible for content being stripped due to Navy Marine Corps Intranet (NMCI) restrictions. Offerors who opt not to e-mail their submissions, shall ensure that a CD-Rom copy in **PDF format** is provided to ONR no later than the due date and time set forth on this BAA. No .zip files will be accepted or password protected files. Submissions sent by fax 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.

a. White Paper Format

- .PDF file
- 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 eleven (11) pages in length, as described below in the “White Paper Content” section (including the cover page).

b. White Paper Content

All sections shall start on a new page.

- **Cover Page:** The Cover Page shall be labeled “WHITE PAPER” and shall include BAA Number 10-018, 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, 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 Section 6.2 of the BAA. It should also explain how the concept would be integrated into relevant PEO IWS and PEO C4I Service Oriented Architectures

- Offeror’s Capabilities: Describe the technical capabilities of the offering company, including prior technical work and published papers relevant to this solicitation that establish technical credibility as the basis for the white paper. This shall be one (1) page only.
- Management Approach: Describe the organizational components, internal and external teaming arrangements and other management factors to be employed in the execution of this tasking, if awarded. This shall be one (1) page only.
- 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) 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 specifications and 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:

FY11	FY12	FY13	Total
\$xxxK	\$xxxK	\$xxxK	\$yyyK

c. 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, proposal checklist, current and pending project and proposal submission and resumes are excluded from the page limitations.

- 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).

d. 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 10-018;
 - 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)
 - 7) Signature of the Authorized Representative
- **Proposal Checklist:** To assist Offerors in the development and submission of their proposals in response to this BAA, a Proposal Checklist for Contracts, Grants, Cooperative Agreements and Other Transactions has been uploaded as an attachment. Offerors should print and complete the checklist to ensure that all required actions have been taken and information included prior to proposal submission. Inclusion of the completed checklist as the first page of your Volume I, Technical Proposal will assist in proposal evaluation and may shorten the time it takes to make an award.
- **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/VDFDARA.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 (e.g., hardware, software or prototype) to be delivered inclusive of the timeframe in which they will be delivered.

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

- Technical and Financial Progress Reports
- Presentation Materials
- Final Report

- **Current and Pending Project and Proposal Submissions:** Offerors are required to provide information on all current and pending support for ongoing projects and proposals, including subsequent funding in the case of continuing contracts, grants, and other assistance agreements. Offerors shall provide the following information of any related proposal submissions from whatever sources (e.g., ONR, Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations).

- 1) Title of Proposal and Summary;
 - 2) Source and amount of funding (annual direct costs; provide contract and/or grant numbers for current contracts/grants);
 - 3) Percentage effort devoted to each project;
 - 4) Identity of prime Offeror and complete list of subcontractors, if applicable;
 - 5) Technical contact (name, address, phone/fax, electronic mail address)
 - 6) Administrative/business contact (name, address, phone/fax, electronic mail address);
 - 7) Duration of effort (differentiate basic effort);
 - 8) The proposed project and all other projects or activities requiring a portion of time of the Principal Investigator and other senior personnel must be included, even if they receive no salary support from the project(s);
 - 9) The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months or labor hours per year to be devoted to the project, regardless of source of support; and
 - 10) State how projects are related to the proposed effort and indicate degree of overlap.
- **Qualifications:** A discussion of the qualifications of the proposed Principal Investigator and any other key personnel. Include resumes for the Principal Investigator and other key personnel and full curricula vitae for Principal Investigators and consultants. The resumes and curricula vitae shall be attached to the proposal and will not count toward the page limitations.
 - **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.

Volume 2: Cost Proposal

All sections shall start on a new page.

The following information is provided to assist contractors in preparing and submitting an adequate and compliant cost proposal. The purpose of the submission of other than cost or pricing data is to enable Government personnel to perform cost or price analysis and ultimately negotiate a fair and reasonable cost. Offerors are reminded that the responsibility for providing adequate supporting data and attachments lies solely with the

offeror. Further, the offeror must also bear the burden of proof in establishing reasonableness of proposed costs; therefore, it is in the contractor's best interest to submit a fully supportable and well-prepared cost proposal. The basis and rationale for all proposed costs should be provided as part of the proposal so that Government personnel can place reliance on the information as current, complete and accurate. Further, FAR 15.403-4 sets forth those circumstances in which offerors are required to submit certified cost or pricing data.

Although not required and provided for informational purposes only, using the cost proposal format spreadsheet (spreadsheet.xls) that is an attachment to this document and the accompanying instructions (spreadsheetinstructions.doc) as the basis of the cost proposal may **significantly decrease** the time required to review and award proposals submitted in response to this announcement.

Options: Any proposed options that are identified in either Volume 1 or 2 but are not fully priced out, will not be included in any resulting contract or other transaction. If proposing options, they must be separately priced and separate spreadsheets should be provided for the base period and each option period.

For pricing purposes, assume that performance will start no earlier than six (6) months after submission of the cost proposal.

The proposal should include a statement that the company has (or has not) done business with the Government before. If the company has done business with the Government before, the statement should include the date that the accounting system was determined to be adequate. If this will be the company's first Government contract, please download the Defense Contract Audit Agency's (DCAA) "Information for Contractors" pamphlet, which can be found at www.dcaa.mil and become familiar with the Federal Acquisition Regulation (FAR) Part 31.205 to ensure that a successful accounting system review can be completed prior to contract award.

DoD's Procurement Technical Assistance Centers (PTACs) provide a wide range of services including assistance with developing a cost-accounting system as well as preparing for an audit. The Defense Logistics Agency (DLA) administers the DoD Procurement Technical Assistance Program (PTAP). Procurement Technical Assistance Centers are located in basically every state of the union and provide assistance to businesses seeking to successfully compete in federal, state and local government contracting. A listing of PTACs by state may be accessed at: <http://www.dla.mil/db/procurem.htm>.

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 Contractor fiscal year, and Part 2 will provide a cost breakdown by Government fiscal year and task/sub-task corresponding to the task numbers in the proposed Statement of Work.

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 10-018
- 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
- Proposed period of performance (identity both the base period and any options, if included).

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. Provide escalation rates for out years.
- Indirect Costs - Fringe Benefits, Overhead, G&A, COM, etc. and their applicable allocation bases. If composite rates are used, provide the calculations used in deriving the composite rates.
- Travel - The proposed travel cost should include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip must be justified based on the organizations historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant costs claimed must conform to the applicable Federal cost principals.
- Subcontracts/Interorganizational Transfers - A cost proposal as detailed as the Offeror’s cost proposal will be required to be submitted by all proposed subcontractors and for all interorganizational transfers. For subcontracts or interorganizational transfers over \$100,000, the subcontract proposal, along with supporting documentation, must be provided either in a sealed envelope with the prime’s proposal or via e-mail directly to both the Program Officer and the Business Point of Contact at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract, and should include a description of the effort to be performed by the subcontractor. A proposal and supporting documentation must be received and reviewed before the Government can complete its cost analysis of the proposal and enter negotiations. The prime contractor should perform and provide a cost/price analysis of each subcontractor’s cost proposal.* Offerors are required to obtain competition to the maximum extent practicable when selecting subcontractors or interorganizational transfers; if the offeror has obtained competitive quotes, copies should be provided. If the Offeror has selected other than the low bid for inclusion in their proposal or intends to award the

- Consultants - Provide a breakdown of the consultant's hours, the hourly rate proposed, any other proposed consultant costs, a copy of the signed Consulting Agreement or other documentation supporting the proposed consultant rate/cost, and a copy of the consultant's proposed statement of work if it is not already separately identified in the prime contractor's proposal.
- Materials & Supplies - Provide an itemized list of all proposed materials and supplies for each year including quantities, unit prices, proposed vendors (if known), and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). If the total cost for materials and supplies exceeds \$100,000 per year, then select a sample of the items proposed and provide catalog price lists/quotes/prior purchase orders to support the price for the items in the sample. All items with a unit price over \$10,000, regardless of the total cost for materials and supplies, must be supported with a copy of catalog price lists/quotes/prior purchase orders.
- Contractor Acquired Equipment or Facilities - Equipment and/or facilities are normally furnished by the Contractor. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items must be provided including: 1) a very specific description of any equipment/hardware that it needs to acquire to perform the work, 2) whether or not each particular piece of equipment/hardware will be included as part of a deliverable item under the resulting award, and 3) the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). The 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 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.
- Other Directs Costs - Provide an itemized list of all other proposed other direct costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
- Options - The Base Period of Performance and Option Periods must be priced at the submission of the proposal. Unpriced options will not be included in any resulting contract or agreement.
- Fee/profit ("CONTRACT PROPOSALS ONLY") - Profit or fee is not allowed on direct costs for facilities or in cost-sharing contracts.

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

<u>EVENT</u>	<u>DATE*</u>	<u>TIME</u>
Industry Day	05/21/2010	To Be Determined
White Paper Due Date	06/21/2010	2:00 PM Eastern Daylight Time
Notification of White Paper Evaluation*	07/09/2010	
Oral Presentations*	07/19/2010	
Notification of Oral Presentation Evaluation*	08/05/2010	
Full Proposal Due Date	09/16/2010	2:00 PM Eastern Daylight Time
Notification of Selection: Full Proposals*	10/14/2010	
Awards*	01/14/2011	

* 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.

NOTE: 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. Materials submitted through the U.S. Postal Service, for example, may take seven days or more to be received, even when sent by Express Mail. Thus any hard-copy proposal should be submitted long enough before the deadline established in the solicitation so that it will not be received late and thus be 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 of Full Proposals for Contracts.

Hard copies of 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 significantly 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 1 through 5 are listed in descending order of importance. The sub-criteria, i.e., the “lettered” items within each of the “numbered” paragraphs, are of equal importance.

1. Overall scientific and technical merits of the proposal
 - a) The degree of innovation and ability to deliver technology that will improve warfighting capabilities.
 - b) The soundness of the technical concept.
 - c) 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.
 - d) 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.
2. Naval relevance, anticipated contributions of the proposed technology and transition potential. 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 of this BAA.
3. Offeror’s capabilities, related experience, and past performance, including the qualifications, capabilities and experience of the proposed principal personnel.
 - a) The quality of technical personnel proposed to perform the described work.
 - b) The Offeror’s past experience in relevant efforts with similar resources.
4. 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:

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

- b) Relationship between cost and milestone achievement is defined.
 - c) Estimate of technical, schedule and cost risk with risk management addressed.
5. The Realism of the Proposed Cost.
- a) Total cost relative to benefit.
 - b) Realism of cost levels for facilities and staffing.

For proposed awards to be made as contracts to other than small businesses, the socio-economic merits of each proposal will be evaluated based on the extent of the Offeror's commitment in providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, HUBZone small businesses, veteran-owned small businesses, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions.

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

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>.
- Subcontracting Plans - Successful contract proposals that exceed \$550,000, submitted by **all** but small business concerns, will be required to submit prior to award a Small Business Subcontracting Plan in accordance with FAR 52.219-9.

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.

VII. OTHER INFORMATION

1. Information Sharing

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

- Comply with Naval and Department of Defense (DoD) data strategies.
- Operate with Naval and DoD security mechanisms and protocols.
- 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.

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

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.

3. 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.

Normally, work under a grant does not require access to classified material.

4. Department of Defense High Performance Computing Program

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S & T and RDT & E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and other assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at <http://www.hpcmo.hpc.mil/>.

5. Organizational Conflicts of Interest

All Offerors and proposed subcontractors must affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any ONR technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports and identify the prime contract numbers. Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure shall include a description of the action the offeror has taken or proposes to take to avoid, neutralize, or mitigate such conflict. In accordance with FAR 9.503 and without prior approval, a contractor cannot simultaneously be a SETA and a research and development performer. Proposals that fail to fully disclose potential conflicts of interests or do not have acceptable plans to mitigate identified conflicts will be rejected without technical evaluation and withdrawn from further consideration for award. If a prospective offeror believes that any conflict of interest exists or may exist (whether organizational or otherwise), the offeror should promptly raise the issue with ONR by sending his/her contact information and a summary of the potential conflict by e-mail to the Business Point of Contact in Section I, item 7 above, before time and effort are expended in preparing a proposal and mitigation plan. If, in the sole opinion of the Government after full consideration of the circumstances, any conflict situation cannot be effectively avoided or mitigated, the proposal may be rejected without technical evaluation and withdrawn from further consideration for award under this BAA.

5. 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.