DON XML

Department of the Navy
Concept of Operations
for an XML Registry

Version 1.0

June 2004

Revision History

Each version of this document that has been issued is tracked in the following table.

Version	Date (yy.mm.dd)	Section affected	Description
0.a	02.07.17	All	First draft of ConOps document format.
0.b	02.07.22	All	DONXML WG, Team 3, Goal #1—submission of draft ConOps document format.
0.1	02.10.18	1–4	DONXML WG, Team 3, Goal #1 starting draft.
0.2	02.12.09	1–5 and Appendix A	DONXML WG, Team 3, Goal #1—minor modifications to wording in Sections 1–5. Added Appendix A to provide details for the operational scenarios identified in Section 5.
0.3	02.12.13	4, 5, and Appendix A	DONXML WG, Team 3, Goal #1—minor modifications to Sections 4, 5, and Appendix A. Made changes to oversight responsibilities (Section 4) and added/edited scenarios (Section 5, Appendix A).
0.4	03.01.24	All	DONXML WG, Team 3, Goal #1—application of Team 3 comments.
0.5	03.11.20	All	Applied information learned from survey of DON on XML and registry requirements and input from Team 2. Also, updated to reflect recent modification to the current environment provided by the DoD XML Registry.
1.0	04.03.31	All	Incorporate comments received from Team 2 and January 2004 F2F review, as well as final edit.

Contents

Section 1
Introduction

1.1 System Overview

An XML registry and repository allows Extensible Markup Language (XML) developers to discover, register, and maintain XML schemas, components, and metadata. Both human and information systems can access the registry to discover, validate, and store XML documents. The concept of an XML registry and repository is referred to as an XML registry or simply a registry.

The structure of this concept of operations (CONOPS) is based upon the Institute of Electrical and Electronics Engineers (IEEE) draft of proposed IEEE Standard 1362-1997, *IEEE Guide for Concept of Operations Document*. The following CONOPS summary is taken from that document:

> The ConOps approach provides an analysis activity and a document that bridges the gap between the users' needs and visions, and the developers' technical specifications. In addition, the ConOps document:
>
> (1) Provides a means of describing user's operational needs without bogging down in detailed technical issues that must be addressed during the systems analysis activity.
>
> (2) Provides a mechanism for documenting a system's characteristics and the users' operational needs in a manner that can be verified by the users without requiring them to have any technical knowledge beyond what is required to perform their normal job functions.
>
> (3) Provides a place for users to state their desires, visions and expectations without requiring them to provide quantified, testable specifications…
>
> (4) Provides a mechanism for users and buyer(s) to express their thoughts and concerns on possible solution strategies….

1.2 Document Purpose

This CONOPS provides an overview of how the Department of the Navy (DON) will use an XML registry. It represents a starting point for discussions of the DON's requirements for an XML registry and how users will interact with the registry.

1.3 Document Organization

The CONOPS addresses a range of topics, including current and proposed registries, operational scenarios, and analysis of the proposed registry. Each section covers a

specific topic; operational scenarios are included as an appendix. The remainder of this CONOPS is organized as follows:

◆ Section 2 describes the current system in the context of the DoD XML Registry.

◆ Section 3 discusses additional registry capabilities that the DON has identified and the reasons it is seeking registry support for the functions.

◆ Section 4 presents a number of registry-related characteristics and solutions to the issues identified in Section 3 and introduced in the requirements document.

◆ Section 5 identifies a series of operational scenarios that provide a high-level view of how the proposed registry is desired to work inclusive of proposed modifications; operational scenarios are developed in use case format.

◆ Section 6 lists the portions of the current system that will be affected by implementing the proposed modifications.

◆ Section 7 examines the effectiveness of the proposed modifications in addressing DON needs and identifies potential alternatives and their trade-offs.

◆ Appendix A shows how the proposed registry works for a set of individual operational scenarios.

◆ Appendix B examines some of the issues associated with operating a registry in ashore and afloat environments.

◆ Appendix C provides a glossary of terms.

1.4 Referenced Documents

Following is a list of documents referred to by letter designation in this CONOPS:

a. *DoD Chief Information Officer Policy for Registration of Extensible Markup Language (XML)*, 22 April 2002.

b. *DON Chief Information Officer Policy on the Use of Extensible Markup Language (XML) for Data Exchange*, 13 December 2002.

c. *DON XML Developer's Guide*, version 1.1, May 2002.

d. "Information Operations Conditions (INFOCONS)," memorandum CM-5 1099, Chairman of the Joint Chiefs of Staff, 10 March 1999, requiring certain actions to increase the readiness posture for information warfare.

e. "Policy Guidance for the use of Mobile Code Technologies in the Department of Defense (DoD) Information Systems," memorandum, Assistant Secretary of Defense, 7 November 2000.

f. 1998 Amendment to Section 508 of the Rehabilitation Act, Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), 7 August 1998.

g. *DON Business Standards Council (BSC) Operating Procedures*, version 1.0, June 2003.

h. *DoD Common Access Card*, memorandum, Office of the Secretary of Defense, 16 January 2001.

Section 2
Current System

2.1 Background

The current system is the DoD XML Registry. This registry facilitates interoperability for developing and implementing XML "vertically within projects and horizontally across organizations."[1]

2.2 Operational Policies and Constraints

DoD XML Registry policy (see Reference a) established the DoD-wide registry to provide guidance in the generation and use of XML among DoD communities of interest (COI) and to be an authoritative source for registered XML data and metadata components.

The DON Chief Information Officer (CIO) issued DON policy for XML (Reference b) to foster the development and implementation of reusable and interoperable XML. That policy identifies the XML family of standards and guidance documents that must be followed and the mechanisms for supporting XML developers and standards groups. Supplementing that policy is the DON XML Developer's Guide (Reference c) that establishes rules for ensuring common approaches to XML implementation for interoperability.

DoD has prescribed standardized steps that information systems coordinators must take in response to threats. Information Conditions (INFOCONS) (Reference d) defines the progression of threat intensity and corresponding action. Similarly, DoD's mobile code policy (Reference e) applies when any executable code needs to be transferred.

The Web user interface is subject to Section 508 of the Rehabilitation Act (Reference f), which establishes minimum accommodations in government computer system interfaces for handicapped individuals.

2.3 Description of the Current System

The DoD XML Registry is organized around a hierarchical central registry. Entries on an unclassified network are replicated to augment entries of a classified nature in a version of the registry on a classified network. Users access the registry over the Internet through a web browser. Users can search for registered objects, and specify metadata criteria to focus their searches.

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[1] DoD XML Registry, "XML Registry Home," accessed on the Internet 5 November 2003 at http://diides.ncr.disa.mil/xmlreg/user/index.cfm.

Users submit new objects in a "package" with supporting information to one of the available namespaces. The submission package includes a manifest schema to facilitate parsing the metadata of submitted components into the registry. The registry provides a manifest creation tool that can create the starting shell of a manifest for registering XSD schemas.[2]

Registry namespaces are overseen by COIs. The DON Enterprise COI was recently approved as an operational COI in the DoD Registry. The DON Enterprise has subnamespaces represented for each of its functional areas. A functional namespace coordinator (FNC) oversees the progression of each submitted object to its DON subnamespace. DON objects may be assigned the following statuses during their life cycle: development, operational, deprecated, and retired.

The registry offers features for users to subscribe to objects. All users have a virtual "briefcase" that allows them to quickly recall objects and create a shell schema from XML components in their briefcase. They can then prepare submission packages to register the resulting schema and identify the reuse of the registered components.

2.4 Modes of Operation for the Current System

As a DoD system, the DON registry must respond to threats consistent with INFOCONS policy. The registry may be unavailable to certain networks if a significant threat is identified,

2.5 User Roles

The following sections define different user roles for DON use cases as applied to the DoD XML Registry. Table 2-1 lists user roles capabilities to execute DoD XML Registry functions.

Table 2-1. DoD XML Registry User Roles

Capability	Developer	FNC	Administrator
Can search the registry to discover registered objects	Yes	Yes	Yes
Can enter objects for review to a namespace coordinator	Yes	Yes	Yes
Can maintain subscriptions to submission packages	Yes	Yes	Yes
Can control the status of objects registered with a namespace	No	Yes	Yes
Can edit other user profiles	No	No	Yes

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[2] XSD schemas are XML schemas written to comply with the W3C XML schema recommendation.

2.5.1 Developer

The role of developer is to search the registry to discover registered objects and enter objects for registration.

2.5.2 Functional Namespace Coordinator

The role of FNCs is to oversee the progression of objects entered into their subnamespace of the DON Enterprise namespace.

2.5.3 Administrator

The role of administrator is to oversee day-to-day registry operations; it is performed by DoD.

2.6 Support Environment

2.6.1 Roles and Responsibilities

The Defense Information Systems Agency (DISA) is the executive agent for the DoD XML Registry. That registry is one of four types of registries that make up the DoD Metadata Registry and Clearinghouse.

2.6.1.1 Community of Interest

A COI oversees one or more namespaces and participates in the DoD Metadata Registry Work Group (MRWG) to coordinate input on the management of the registry. The DON Enterprise namespace COI represents the work of the DON Business Standards Council (BSC), with the DON CIO as the point of contact (POC). DON CIO policy established the BSC, primarily consisting of FNCs, to oversee the registration and harmonization of XML within the DON. The BSC Operating Procedures (Reference g) defines the FNC's process for evaluating XML for DON use. The BSC has authority for mediating registration of items within the DON Enterprise namespace and between the DON subnamespaces.

2.6.1.2 Metadata Registry Work Group

The MRWG brings together registry COIs to evaluate proposals for new communities and to consider other features and procedures for the registry.

2.6.2 Security

User name and password are required to submit objects, search contents, manage subscriptions, and operate administration functions.

2.6.3 Maintenance Activities

DISA and its contractor oversee maintenance. System builds (or upgrades) typically occur twice each year, but three builds in a year are possible.

2.6.4 Backup Plans

Existing capabilities for continuance of operations are not known.

2.7 Configuration Management

2.7.1 Change Procedures

Change requests are recorded by DISA and may be approved by MRWG at regular meetings. Approved changes are added to the requirements for the next build not already in process.

2.7.2 Retirement Procedures

The procedure for retiring registry functionality is not known, but it is assumed to operate similar to change requests.

Section 3
System Change Justification

3.1 Justification for Changes

In a 2002 survey, the DON provided comments to the DoD registry on its perceived shortcomings. Listed below are some of those comments that the DON still desires to address:

- Centralized architecture may pose issues of bandwidth and performance.

- Harmonization of design rules and submissions is insufficient.

- Components do not contain information about authoritative data sources that are their basis.

- Tools to ensure objects are well-formed and valid are not provided.

- Proprietary system is not based on an open registry standard.

- Trading partner profiles and agreements are not supported.

- Registration of web services is not supported.

- Multiple taxonomies are not supported.

In addition to these items, this CONOPS addresses the following issues:

- Selective access to registered objects—Access control policies in an XML registry would ensure content is granted in accordance with DoD and DON security needs.

- Continuity of Operations—Provide support for synchronized backups of critical registries and continuance operations plans for the main registry. (if not already implemented).

3.2 Description of Desired Changes

3.2.1 Architecture

As reflected in the DON's requirements for an XML registry, some commands believe that their operating environment warrants a localized version of the DoD XML Registry. Registry entries and registered objects can be replicated among registry instances as required for connectivity, bandwidth, and performance issues.

Also, to support authoritative sources, the DON requests the use of a standardized application program interface (API) for federated registry interactions. For instance, rather than replicating XML standardized by HR-XML, the registry could point to DON-accepted objects maintained in a HR-XML registry.

3.2.2 Harmonization

Evaluation of submission validity can include assessments against the breadth of DoD registry entries, along with industry registries, to encourage more reusable and interoperable enterprise solutions. Current processes do not require COIs to develop consistent approaches when managing the same data. As a result, if a deviation is justified, registry users are not informed that an entry is an exception to a preferred common solution. Furthermore, requirements for defining the circumstances when use of the exception should be restricted do not exist. The BSC has been charged with harmonizing the XML used throughout DON.

Providing information on XML associations to authoritative data sources would strengthen the contextual purpose of the XML component and make it easier for developers to discover the component for reuse when developing XML based on the authoritative data source. Also, as data sources are changed or deprecated, identifying associated XML components and reflecting the modification become easier.

The DON is also seeking to adopt common design rules. The emerging DON design rules endorse concepts built on those developed by the Universal Business Language (UBL). By closely aligning its design rules with UBL, DON will be better positioned to adopt industry XML based on UBL and improve the acceptance of DON components by UBL-compliant trading partners.

3.2.3 Well-Formed and Valid

The XML registry should consider allowing verifying that an object is well formed and that the content is validated against design rules when the object is submitted to the registry. DoD's REST architecture can facilitate validator calls for schemas in a namespace. But an API facilitation would allow validating objects against multiple validators. Passing or failing a validator tests cannot prevent a submission from being recorded in the registry. Even if a validator cannot be integrated with the registry, a clear indication of XML compliance with World Wide Web Consortium (W3C) specifications and accepted design rules must be discoverable. Capturing sufficient metadata on whether an object has been validated improves the confidence of potential implementers.

3.2.4 Standards Based

DON policy calls for the use of approved industry standards for XML production applications. Use of industry standards helps ensure maximum interoperability between systems, facilitates efficient data exchanges and economical eBusiness practices, reduces duplication of effort and ambiguity of information, and reduces data exchange life-cycle costs.

DON policy further requires that the registry conform to approved industry standards. Since it participates in W3C and OASIS standards bodies, the DON encourages use of the OASIS ebXML Registry Information Model (RIM) and the Registry Services (RS) specification. By following ebXML, RIM and RS, DON would have a common means for implementing many registry functions, such as the federated registries discussed above. The General Services Administration (GSA) is establishing a federated registry to share governmental XML that has ebXML as one of the interfacing requirements.

The standard Collaboration Protocol Profiles and Agreements (CPPA) is also part of the ebXML framework that the DON supports. "A CPP defines one business partner's technical capabilities to engage in electronic business collaborations with other partners by exchanging electronic messages. A CPA documents the technical agreement between two (or more) partners to engage in electronic business collaboration."[3]

Finally, the DON also plans to support the registration of web services through either the OASIS UDDI or ebXML methodologies as a standard way for registering web services.

3.2.5 Taxonomies

To help navigate through the registry, user communities may define taxonomies for organizing registry objects. Registering these taxonomies for discovery will help members of the various communities locate relevant categories of objects.

3.2.6 User Access

The registry matches user logins to profiles to determine user permissions and access rights. The Extensible Access Control Markup Language (XACML), one of the DON's XML standards for defining access control policies using XML, is also being supported by the upcoming ebXML registry specification.

Encrypting connections after login provides for confidentiality. There is the potential that some activities will require Public Key Infrastructure (PKI) support for a higher degree of authorization and non-repudiation (i.e., recording activities related to partnering agreements). Wherever PKI is implemented, it must conform to DoD policy.[4]

3.2.7 Disaster Recovery and Continuance of Operations

As stated in Section 2, the particulars of the DoD registry plans for backup systems are not known. However, before it can be accepted as a dependable 24/7 resource for developers and systems, the registry will need to offer hot-site backups. The registry

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[3] http://www.oasis-open.org/committees/ebxml-cppa/.

[4] U.S. Department of Defense, "X.509 Certificate Policy for the United States Department of Defense", Version 5.0, 13 December 1999.

should also be capable of performing regular backups to a long-term storage mechanism. One possible scenario would be to use multiple servers that act as a recovery system replicating and synchronizing the registry alternate sites.

3.3 Changes Considered (Not Included)

The DON is developing a vision document for collaborative development. A registry can play a role in making that work available to other interested parties. The extent to which the registry should be the environment for managing the collaboration is questionable. Other environments may be better for capturing developer comments and drafting materials.

In September 2003, a focus group of the MRWG suggested that DoD's registry add metadata for defining the quality of an object, particularly when it was in development or a legacy product. The metadata may be able to identify products that are being proposed as well. An interested developer could then contact a listed POC for information on how to participate in development.

Section 4
Concepts for the Proposed System

4.1 Objectives and Scope

The objective is to explain the consensus developed for the operational characteristics of an XML registry to support the DON. The concepts complement items listed in the DON XML Registry Requirements document and the steps relating to the operating procedures of the BSC.

4.2 Operational Policies and Constraints

In addition to the policies and constraints discussed in Section 2.2, the DON is updating Secretary of Navy Instruction 5000.36 to clarify the roles and responsibilities of Functional Area Managers, Functional Data Managers, and Functional Namespace Coordinators. The updated instruction will supersede aspects of the DON XML policy establishing the FNCs. However, a Secretary of Navy policy specific to XML is expected to augment the new SECNAV 5000.36.

DON recommendations to use PKI for some authentications would be subject to the PKI requirements of the DoD Common Access Card (Reference h).

4.3 Description of the Proposed System

4.3.1 Architecture

The DON envisions a federated registry architecture that provides connectivity in geographically disparate locations, including those afloat. The registries would operate as peer-to-peer connections, allowing replication and association as necessary.

The DON supports an ebXML methodology for interfacing registries that make it easier to link to federated external ebXML registries.

4.3.2 User Access

The registry will support both human and automated users. Registry interfaces for humans will be provided through web browsers. The look and feel of the interfaces for the distributed registries will be coordinated and Section 508 compliant. At a minimum, human users will continue to login with a user ID and password. Registries operating on systems requiring the PKI authentication will implement a Common Access Card type authentication.

The DoD's Representation State Transfer (REST) interface, which supports retrievals of specific registry entries, will be requested to support ebXML Registry Services as

well. Additionally, DON will consider use of PKI certificates for authentication. Each registry server will use a certificate to authenticate the registry to trading partners. Trading partners will implement their own server certificate to authenticate their system to the registry.

4.3.3 Submissions

Identifying an object that is not well-formed at the point of submission helps with quality assurance. A registry service that uses available free-ware validator tools to check that submissions are well-formed is one possible solution. Another is to implement an API for more robust tools such as XMLSpy and TurboXML. Because these tools have been shown to introduce errors, developers will validate their XML against more than one product. However, recording pertinent data relating to well-formed checks will help re-users of the entry.

Validity checking against naming and design rules (NDRs) at submission time is also needed for quality assurance. NDRs, following the Backus-Naur Form, support the use of rules as automated checking routines. A standard API call to an NDR validator is the preferred mechanism, so that the validation tool can be updated as needed to account for changes to the NDRs with minimal disruption to the registry.

In a distributed registry environment, the DON requires the ability to reference XML objects residing in external registries and repositories. Interoperability with the referenced registry would keep the DON XML registry metadata updated and provide links to the repository where the object resides. The ebXML registry specifications define a mechanism for linking to external registry objects. Additional policies would need to be developed for managing references for updates and identifying broken links.

4.4 Modes of Operation

The following sections define the conditions the registry may use to differentiate operational interactions.

4.4.1 INFOCONS

As in the current system, all distributed registries will be subject to INFOCONS. Because each system assesses and responds to threats individually, one or more registries could be unavailable when experiencing a high-threat condition.

Each system that depends on the registry will identify its contingency needs if a registry becomes unavailable. Quality of service metrics will help planners identify backup system connections and tolerance levels for system response times before initiating alternative courses of action.

4.4.2 Geographic Conditions

Registries are expected to be deployed on afloat systems. These systems will be synchronized replicas of specified ashore registries. When at sea, the systems will be isolated registries that contain the full set of needed objects, rather than allowing routine linkages to external taxonomies. Extended periods without registry synchronization could introduce problems in some information systems afloat. If a ship cannot initiate synchronization because of operational constraints, the ashore registry could "push" updates to these activities. Regardless of the method of synchronization, the communications capability of a particular unit will be a factor in synchronization with the registry. See Appendix B for more information on the expectations of ashore vs. afloat environments.

4.5 User Roles

With a few exceptions, the roles for the proposed registry will be similar to those in the current system. The user roles are defined in the following sections. Table 4-1 summarizes the capabilities of the various users to execute registry functions.

Table 4-1. User Roles

Capability	Developer	FNC	Administrator	Automated system
Can search through the registry to discover registered objects	Yes	Yes	Yes	Yes
Can submit objects for review to a namespace coordinator.	Yes	Yes	Yes	No
Can maintain subscriptions to submission packages	Yes	Yes	Yes	Yes
Can submit content for discovery by other users	Yes	Yes	Yes	No
Can control the status of objects registered with a namespace	Yes	Yes	Yes	No
Can edit other user profiles	No	No	Yes	No

4.5.1 Developer

The developer, a primary registry user, searches the registry to discover registered objects for development or content and can, in turn, submit its own development packages and content.

4.5.2 Functional Namespace Coordinator

An FNC oversees the progression of registry-submitted objects through their life cycle. FNCs will reconcile XML components within their functional area and harmonize those components across functional areas to existing standards. They will ensure the reuse of existing international, national, federal, and DoD standards. FNCs

will also promote DON standards where international, national, federal DoD standards do not exist. To ensure XML solutions are implemented from an enterprise perspective, FNCs coordinate with other FNCs.

4.5.3   Administrator

The role of administrator oversees day-to-day operations of the registry.

4.5.4   Automated Information System

The role of an automated information system (trading partner system) is to automatically access the registry to validate XML and to retrieve updates of registered objects.

4.6 Support Environment

4.6.1   Roles and Responsibilities

This section addresses the elements of the DON XML governance structure that will be involved in managing the XML registry and its contents.

4.6.1.1 Community of Interest

The BSC will manage a COI for the DON Enterprise and the FNCs will have developmental subnamespaces. The DON has developed mappings between the FNCs and the proposed business domains of the Global Information Grid, and plans to develop similar mappings with the weapon and intelligence domains when they are solidified. The DON proposes that mappings exist between the FNCs to joint DoD COIs. A mapping will help FNCs track joint standards and facilitate feeding COIs DON Enterprise standards.

The BSC will also facilitate DON requests to operate local registries within the main registry. As an application, DON implementation of a registry will conform to DON Functional Area Manager-approved implementations.

4.6.2   Facilities

In addition to the main registry overseen by DISA, the DON will support synchronized subordinate registries based on demonstrated performance needs. It is expected that registries will reside at multiple ashore locations and full or partial versions of the registry will reside afloat.

4.6.3   Security

Use of DoD PKI mechanisms as prescribed in the policy of the Common Access Card will be used for registry security.

4.6.4   Maintenance Activities

Updated releases of registries will continue to be coordinated with the DoD registry governance structure as a means of implementing consistent and interoperable functionalities.

4.6.5   Backup Plans

A primary registry administrator will issue guidance on disaster recovery and continuance of operations. Distributed registries must prepare contingency plans and provide them to the primary registry administrator.

4.7 Configuration Management

4.7.1   Change Procedures

Change requests for functionality to support DON activities will be directed to the BSC. Before the review, change requests will be posted for comments by registry administrators and other interested parties. If approved, the functionality will be designated as either a required or optional modification and forwarded to the DoD Metadata Registry Work Group for consideration by the DON Enterprise COI representative.

Mandatory changes approved by the DoD registry governance structure will be replicated by all federated defense registries. Optional functionality already approved by the DoD registry governance structure for implementation by federated defense registries will be implemented at the discretion of the local registry administrator (or the local registry's change control board, if required).

FNCs (through the BSC) will be responsible for coordinating input into externally managed registries.

4.7.2   Retirement Procedures

The BSC will authorize all DON requests for retiring a mandatory registry functionality. Approved requests will be forwarded to the DoD MRWG for consideration. Adequate time must be given for users to make necessary adjustments before retirement of system functionality or an entire registry.

Section 5
Operational Scenarios

This section identifies a series of DON XML registry operational scenarios—a high-level view of registry operation—developed in business use case format. A use case describes an actor's interaction with the system to achieve a desired outcome.

The individual operational scenarios, provided in Appendix A, are as follows:

◆ *5.1 Register User.* This use case describes the actions for potential registry users to create user profiles that will establish their roles in the registry.

◆ *5.2 Authenticate User.* This use case describes the actions for authenticating a user of the registry.

◆ *5.3 Edit User Details.* This use case describes the actions for users to change their registry profiles or subscription information.

◆ *5.4 Enter Object.* This use case describes the actions for entering an object to the registry.

◆ *5.4.1 Register Object Manually.* This use case describes the actions for manually entering a new object to the registry.

◆ *5.4.2 Register Annotated Object.* This use case describes the actions for entering a new object in the registry by submission of an annotated object.

◆ *5.5 Modify Object Entry.* This use case describes the actions to modify a registry entry.

◆ *5.6 Validate Object.* This use case describes the actions for invoking the validation of objects to verify an object is well-formed and a valid implementation of appropriate NDRs for the object type.

◆ *5.7 Record Registry Status Change.* This use case describes the actions associated with recording a status change for an object in the registry.

◆ *5.8 Search Contents.* This use case describes the actions for a user to search the registry to discover an object's registry entry.

◆ *5.8.1 Search Federated Registry.* This use case describes the actions for a user to extend a search to include one or more federated registries through a single registry portal.

- *5.9 Subscribe to Object.* This use case describes the actions to subscribe a user to a registry object for notifications of any changes entered for the object.

- *5.10 Synchronize Entries.* This use case describes the actions for a mirrored registry to synchronize entries and verify links automatically.

- *5.11 Manage Metadata Slots.* This use case describes the actions for managing the capability to add and remove metadata slots in the registry after approval by the registry Change Control Board.

- *5.12 Generate Schema.* This use case describes the actions to generate a schema by reusing objects in the registry.

Section 6
Summary of Impacts

6.1 Operational Impacts

Coordination between the DoD XML Registry and distributed local registries will be very important. Considerations for some new functionalities may be complicated if they are optional and not consistently implemented.

6.2 Organizational Impacts

DON FNCs need to formalize their relationships to DoD's COIs.

6.3 Impacts During Development

Development work on implementing this CONOPS should not negatively impact current users of the registry. Some phasing in of operations may be necessary to allow users to plan for adjustments.

Timing for DoD to support federated registries will determine the ability of users to begin incorporating other governmental registry items without manually replicating and managing entries.

Section 7
Analysis of the Proposed System

7.1 Summary of Improvements

Mechanisms that support harmonization strengthen developer reuse, which is important for achieving interoperability. The registry alone cannot achieve interoperability. For example, associating XML with authoritative data sources is one of the proposed mechanisms that can aid in reducing duplicative XML. However, such an association is only meaningful if an organization has rationalized its information data sources down to an effective set of authoritative data, provides design rules to ensure that XML reflect the authoritative source, and enforces compliance with the approved XML representation.

Plans for synchronized copies of the DoD XML Registry will improve usage in areas that demonstrate performance problems when dependent on a single registry. The same capability would be beneficial for ensuring continuity of operations.

7.2 Disadvantages and Limitations

The effort to manage registry content will be considerable, particularly in the beginning. The history of electronic business offerings show that organizations must inevitably harmonize their internal and external communications to make long-term maintenance cost effective. Efforts by organizations that have helped evolve EDI through similar steps are attempting to apply much of their experience to reduce the amount of time required to develop cross-industry interoperable XML.

7.3 Alternatives and Tradeoffs

None at this time.

Appendix A
Business Use Cases

This appendix provides detailed representations of business use cases identified in Section 5 of this document. The detailed use cases included in this appendix are as follows:

5.1—Register User

5.2—Authenticate User

5.3—Edit User Details

5.4—Enter New Object

5.4.1—Register Object Manually

5.4.2—Register Annotated Object

5.5—Modify Object Entry

5.6—Validate Object

5.7—Record Registry Status Change

5.8—Search Contents

5.8.1—Search Federated Registry

5.9—Subscribe to Object

5.10—Synchronize Entries

5.11—Manage Metadata Slots

5.12—Generate Schema.

5.1—Register User

1. Purpose

This use case describes the actions for a potential registry user to create a user profile with pertinent information for establishing their role in the registry.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

Automated information system.

4. Pre-Conditions

(At this time, there are no identified assumptions or conditions to meet before a registry registration attempt is made).

5. Post-Conditions

A user can access other registry functions according to the registration profile.

6. Main Flow

6.1   User selects to register.

6.2   User completes the user profile that is required for the desired role.

6.3   Registry administrator validates user's information.

    6.3.1   Identity of user.

    6.3.2   Level of access to be allowed.

    6.3.3   DoD sponsorship of non-DoD users.

6.4   Registry administrator activates account for requested role and permissions.

6.5   Registry notifies user that account has been activated.

7. Exceptions

7.1 <Sponsor does not validate non-DoD user>

A sponsor does not register a non-DoD user at any level based on a negative decision by the identified sponsor or non-response within an established timeframe.

7.2 <User is not validated for level of access requested>

A user is registered for the lowest level of access and provided notification regarding how to follow up on the request.

7.3 <Insufficient information on registration request>

The system identifies necessary information required to complete the registry registration request.

8. Non-Functional Requirements

None.

9. References

None.

10. Issues/Questions

Are there any policy documents relating to registry registration that need to be referenced or addressed?

5.2—Authenticate User

1. Purpose

This use case describes the actions for authenticating a user of the registry.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

Automated information system.

4. Pre-Conditions

User must be a registered user of the registry.

User must have a DoD Common Access Card (CAC) or software PKI certificate to login without needing to enter an account ID and password.

An automated information system must have a digital server certificate in accordance with DoD PKI requirements.

5. Post-Conditions

User can interact with the registry according to their user profile.

6. Main Flow

6.1   User requests action requiring authentication (e.g. login).

6.2   Registry checks if a Registry session key has been assigned to the user's client

    6.2.1   If Yes, proceed to step 6.8.

    6.2.2   Otherwise, continue to next step.

6.3   Registry asks user for type of authentication.

6.4   User selects either ID/Password, DoD CAC, or software PKI certificate.

6.5   User enters an account ID/Password, or they provide a PKI certificate from their CAC or a software PKI certificate.

6.6   Registry authenticates the ID/Password pair or the PKI certificate.

6.7   Registry assigns a session key to the user's client system for later quick authentication.

6.8   Registry checks with the user's profile to verify user's permissions to the requested function.

7. Exceptions

7.1   <Non-authentication>

If the registry cannot authenticate an ID/password pair or a PKI certificate, then the registry rejects the request. Failure of three consecutive authentication attempts to the same account will lock the account until it is reset by a registry administrator.

7.2   <Lost session>

If the user does not maintain the session with the registry either by ending the session, or due to inactivity for a defined period of time, the registry will require re-authentication of the user.

7.3   <Lack required permissions>

If the user is authenticated, but does not have the required permission to perform the requested action, the registry will inform the user that the requested action is not available.

8. Non-Functional Requirements

None.

9. References

DoD PKI directive.

10. Issues/Questions

None.

5.3—Edit User Details

1. Purpose

This use case describes the actions for users to change their registry profiles or subscription information.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

Automated information system.

4. Pre-Conditions

User must be a registered user of the registry.

5. Post-Conditions

Profile-dependent activities change.

6. Main Flow

6.1   User accesses their registry profile.

6.2   User modifies their profile information.

     6.2.1   Change contact information.

     6.2.2   Unsubscribe from objects.

     6.2.3   Manage authentication options.

6.3   User commits changes to the registry.

6.4   Registry saves changes.

6.5   Registry sends notification to user indicating success or failure to record changes.

7. Exceptions

    7.1   <Profile not found>

If user has not submitted a profile, the registry will respond that no profile exists for the user.

    7.2   <Insufficient information>

If user does not complete the required entries to proceed with a change, the registry will inform the user that the request to make changes could not be executed.

    7.3   <Changes not committed>

If user does not select to commit the changes to the registry, the changes will not be recorded.

8. Non-Functional Requirements

A registry administrator may reset another user's authentication options. A notification must be provided to the user.

A registry administrator may unsubscribe another user from an object. A notification must be provided to the user.

9. References

None.

10. Issues/Questions

Outside of the registry administrator, can other registry users discover information from the profile of other users? If so, how much?

5.4—Enter New Object

1. Purpose

This use case describes the actions for entering a new object to the registry. (NOTE: All new objects are entered into the registry as draft status).

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

4. Pre-Conditions

The submitter must be a registered registry user.

5. Post-Conditions

The object is available to other users as a developmental object.

6. Main Flow

6.1   User selects to provide a new object to the registry.

6.2   User selects method of registration.

    6.2.1   User selects option to manually register object (Use case: "Register Object Manually").

    6.2.2   User selects option to auto-register object (Use case: "Register Annotated Object").

6.3   Registry validated the object as well-formed and in compliance with NDRs. (Use case: "Validate Object.").

6.4   Registry versions the object (See "DON XML Naming and Design Rules, v2.0").

6.5   Registry notifies the FNC of an object being entered in their developmental namespace.

6.6   If the submission affects an existing registered object, the registry notifies subscribers to the effected object of the proposed change submission.

7. Exceptions

7.1   <Object does not pass validation>

The system provides the identified errors to the submitter to make corrections/modifications to the object. Though object is still entered in the registry with indicators that it did not pass registry validation.

7.2   <Object bypasses validation>

The submitter elects to bypass validation and have the object assigned to the FNC. The object is sent to the FNC with the notification that it was not validated by the registry.

8. Non-Functional Requirements

When a user is submitting to the registry the system should make clear to the user that the object is being registered at a specific classification for that section of the registry.

Developmental objects can be included in other submissions.

Production systems cannot use developmental objects for validation.

9. References

None.

10. Issues/Questions

What happens when an object has cross-functional jurisdiction?

What degree of FNC consensus is required for objects with cross-functional jurisdiction?

5.4.1—Register Object Manually

1. **Purpose**

   This use case describes the actions for manually entering a new object to the registry.

2. **Diagram**

   None.

3. **Actors**

   Developer.

   Functional namespace coordinator.

   Registry administrator.

4. **Pre-Conditions**

   The submitter must be a registered registry user.

5. **Post-Conditions**

   The object's registry entry has been committed, ready for validation.

6. **Main Flow**

   6.1   User enters the object's name, type, description, and security classification.

   6.2   User may also enter additional user defined metadata supported by the registry.

   6.3   User identifies the functional area's developmental namespace that the object is requesting to be associated with.

   6.4   User selects all existing registry objects that are to be associated with the new object and defines the relationship. (e.g. selects modular ABIE schemas to make a particular business schema that is being registered.)

   6.5   User selects to have the new object committed to the registry.

7. **Exceptions**

   7.1   <Registry entry is not committed>

   If the submitter does not actively select to commit the entry to the registry, the entry is not saved in the registry.

7.2   <Error during commitment of object entry to the registry>

If during the process of saving the entry to the registry an error prevents the record from being saved, the registry is to notify the submitter that the entry was not saved and provide an indication of the type of error encountered.

8. Non-Functional Requirements

None.

9. References

None.

10. Issues/Questions

None.

5.4.2—Register Annotated Object

1. Purpose

This use case describes the actions for entering a new object in the registry by submission of an annotated object.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

4. Pre-Conditions

The submitter must be a registered registry user.

5. Post-Conditions

The object's registry entry has been committed, ready for validation.

6. Main Flow

6.1   User uploads an object to the registry.

6.2   Registry scans the annotations of the object to collect metadata required for registering the object, including the functional area's developmental namespace for the object.

6.3   Registry identifies the reuse of existing objects that are components of the new object and generates associations between the objects.

6.4   Registry commits the object entry.

7. Exceptions

7.1   <Error during commitment of object entry to the registry>

If during the process of saving the entry to the registry an error prevents the record from being saved, the registry is to notify the submitter that the entry was not saved and provide an indication of the type of error encountered.

8. Non-Functional Requirements

None.

9. References

None.

10. Issues/Questions

None.

5.5—Modify Object Entry

1. Purpose

This use case describes the actions to modify a registry entry.

2. Diagram

None.

3. Actors

Developer.

Functional Namespace Coordinator.

Registry Administrator.

4. Pre-Conditions

The object has been successfully entered in the registry and assigned to a namespace.

5. Post-Conditions

The modifications to a registry object are reflected in the registry.

6. Main Flow

6.1   User selects object to be modified.

6.2   Registry authenticates the user's permissions to modify the object. (Use case: "User Authentication").

6.3   Registry presents object entry with editable fields.

6.4   User makes edits and submits them to the registry.

6.5   Registry verifies edits do not violate registry entry requirements and do not conflict with other entries.

6.6   Registry asks user to confirm edits.

6.7   User confirms edits.

6.8   Registry records the modified entry and increments version reflective of the type of change. (See "DON XML Naming and Design Rules, v2.0").

6.9 Registry "bubbles up" the change to associated objects of the DON namespaces and generates new developmental versions of the effected objects.

6.10 Registry distributes notifications to subscribers of the object.

7. Exceptions

7.1 <User lacks required permissions>

When authenticating a user, if the system determines that the user lacks the permissions to make the desired change the system will generate an error message back to the user reflecting that the user does not have the requisite permissions.

7.2 <Edits incorrect or incomplete>

If the edits fail to conform to entry requirements, the registry will not record the edits and will prompt the user to complete required registration data.

7.3 <User declines to confirm edits>

If the registry does not receive confirmation of the edits from a owning developer, the edits are lost.

8. Non-Functional Requirements

A FNC may only change the namespace assignment for an object in their namespace.

A registry administrator may modify any registry entry as if they were the owning developer, but the owning developer must be notified of the change.

A registry administrator may change the registry entry owner. The registry must notify the original and new entry owner.

A registry administrator may delete a registry entry in its entirety. This should be used in extremely rare instances where the entry was not intended to be entered in the first place. The registry administrator is to consult with the namespace manager for concurrence. The registry must notify the entry owner and namespace manager when an entry is deleted.

A registry administrator may change the incremented version number for an entry.

9. References

None.

10. Issues/Questions

If components of an object are stored in their respective security classification areas, a potential issue arises regarding subsequent changes that could be submitted to individual components and the overall effect on the original object.

If a registered schema has a higher-level security section than a specific function, and

another user wants to perform the same process from an unclassified perspective, how can the possible conflict between the old and new projects be addressed?

5.6—Validate Object

1. **Purpose**

   This use case describes the actions for invoking the validation of objects to verify an object is well-formed and a valid implementation of appropriate NDRs for the object type.

2. **Diagram**

   None.

3. **Actors**

   Developer.

   Functional namespace coordinator.

   Registry administrator.

   Automated information system.

4. **Pre-Conditions**

   User must be a registered registry user.

5. **Post-Conditions**

   Returns confirmation on the validity of the object's conformance to being well-formed and compliant with NDRs.

6. **Main Flow**

   6.1   User identifies object and requests validation.

   6.2   Registry accesses validation tool(s) to process the object.

        6.2.1   Validate object is well-formed.

        6.2.2   Validate object against NDRs.

   6.3   Registry returns the result of the validation.

7. **Exceptions**

   7.1   <Object cannot be processed>

   If an object cannot be read/accessed by the validation tool, the registry will notify the user of the problem.

8.   Non-Functional Requirements

Validations of production schemas cannot include objects that are not either "approved" or "deprecated" (within a transition period).

9.   References

None.

10.   Issues/Questions

None.

5.7—Record Registry Status Change

1. Purpose

This use case describes the actions associated with recording a status change for an object in the registry.

2. Diagram

None.

3. Actors

Functional namespace coordinator.

Registry administrator.

4. Pre-Conditions

An object is entered in the registry.

5. Post-Conditions

The status associated with an object has changed.

6. Main Flow

6.1   User accesses the desired object.

6.2   User selects the status to be applied to the object.

6.3   Registry authenticates user permission to make the requested status change (Use case: "User Authentication").

6.4   Registry distributes a status change notification to the object's owner and subscribers.

7. Exceptions

7.1   <User lacks required permissions>

When authenticating a user, if the system determines that the user lacks the permissions to make the desired change the system will generate an error message reflecting that the user does not have the requisite permissions.

7.2   <Object does not exist>

If a user attempts to access an object that does not match an existing object, or if the user attempts to change the status of an object that does not exist, the registry will reject the request.

8. Non-Functional Requirements

Only the FNC that oversees the developmental namespace for the entered object can declare an object as under review.

Only the DON Enterprise namespace manager can declare an object as approved, rejected, deprecated, or legacy.

If an object is a component of multiple objects, then a rejection of the parent object does not automatically reject the child component.

If an object is a component of multiple objects, then a rejection of the child component should result in the automatic rejection of a version of a parent object that is dependent on the version of the child component that was rejected.

A registry administrator may change the status for an entry as if they were the owning developer or the owning FNC.

9. References

DON FNC Operating Procedures.

DON BSC Operating Procedures.

10. Issues/Questions

For scenarios using a remote version of the repository, a time lag may occur between the time an object is recorded in the master registry and when the remote registry synchronizes with the master registry and the remote business application can use the revised object. An initial example is the afloat scenario, where the ship maintains either a copy or parts of the registry.

5.8—Search Contents

1. Purpose

This use case describes the actions for a user to search the registry to discover an object's registry entry.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

4. Pre-Conditions

User must be a registered registry user.

5. Post-Conditions

The results matching the search criteria are returned by the registry.

6. Main Flow

6.1   User enter search criteria.

6.2   Registry returns results in some clearly rational manner that enables the user to easily identify the desired object and metadata.

7. Exceptions

7.1   <No related records found>

A search result may indicate no records related to the search request are found. Then the user can refine the search criteria and attempt additional searches.

8. Non-Functional Requirements

Returning results at particular security levels. Searches are conducted mindful of a user's profile. For example, a user operating at the unclassified level will not see anything listed at a higher level.

Searches results must clearly indicate the status of the entries.

Users should be offered the option of extending their searches to include the content of

cooperating registries.

The search routine will be capable of processing Boolean operands to define a relationship between keywords in a string.

The search routine should spell check submitted key words and suggest possible replacements where there is not a match.

The search routine should be capable of identifying synonyms for keyword search entries.

9. References

None.

10. Issues/Questions

When an object is registered, how is the security classification of the object handled? For example, can unclassified objects be registered at the highest classification level of the user registering the object and then flow down to lower security classifications of the particular object? Alternatively, will a user be required to register the object at a specific section of the repository for the security level of the particular object?

5.8.1—Search Federated Registry

1. Purpose

This use case describes the actions for a user to extend a search to include one or more federated registries through a single registry portal.

2. Diagram

None.

3. Actors

Developer.

Functional namespace coordinator.

Registry administrator.

4. Pre-Conditions

User must be a registered user of the DoD registry.

DoD must have established connectivity to additional registries.

5. Post-Conditions

The results matching the search criteria provided by the user are returned by the cooperating registry.

6. Main Flow

6.1   User identifies one or more cooperating registries that can be searched from the DoD registry.

6.2   Registry either passes parameters to the external registries to conduct a real time search, or to a local mirror of the target registries.

7. Exceptions

7.1   <Registry could not be accessed>

If an attempt at a real time search of a cooperating registry fails to complete the DoD registry should notify the user that it was unable to access the cooperating registry.

8. Non-Functional Requirements

None.

9. References

None.

10. Issues/Questions

Recommend support for ebXML Registry Information Model and Registry Services to support and facilitate the incorporation of a standardized means federated registry interactions.

5.9—Subscribe to Object

1.   Purpose

This use case describes the actions to subscribe a user to a registry object for notifications of any changes entered for the object.

2.   Diagram

None.

3.   Actors

Developer.

Functional namespace coordinator.

Registry administrator.

Automated information system.

4.   Pre-Conditions

User must be a registered registry user.

5.   Post-Conditions

Users will receive notifications as updates are made to subscribed objects.

The AIS may synchronize with the objects subscribed to.

6.   Main Flow

6.1   User requests subscription to object.

6.2   Registry adds object subscription to profile.

6.3   Registry acknowledges subscription successfully recorded.

7.   Exceptions

7.1   <Duplicate subscription>

If a user attempts to subscribe to an object already in their profile, the registry will provide notification that subscription request is a duplicate and no changes were recorded.

8.   Non-Functional Requirements

A registry administrator may subscribe another user to an object.

9.   References

None.

10.   Issues/Questions

None.

5.10—Synchronize Entries

1. **Purpose**

   This use case describes the actions for a automatically synchronizing entries and verifying links.

2. **Diagram**

   None.

3. **Actors**

   Automated information systems.

4. **Pre-Conditions**

   The registry must have the means to authenticate the automated information system seeking to synchronize entries.

5. **Post-Conditions**

   The automated information system and the registry will have the most up-to-date entries available for their users.

6. **Main Flow**

   6.1   AIS connects to the registry.

   6.2   Registry authenticates the AIS.

   6.3   AIS identifies the scope of objects to be synchronized (e.g. entire registry or contents of a specific namespace).

   6.4   Registry identifies new and modified objects since the last successful synchronization, then pushes the updates to the AIS.

   6.5   AIS confirms the successful synchronization with the registry.

   6.6   AIS identifies new and modified objects since the last successful synchronization, then push the updates to the registry.

   6.7   Registry logs the synchronization with the AIS.

7. Exceptions

7.1 <Synchronization is incomplete>

If the transmission of synchronization data is interrupted, the registry logs the event as an unsuccessful synchronization. Any transmitted data up to the point of interruption is not committed, so that the registry state is rolled back to how the registry would be had the synchronization not been attempted.

7.2 <Conflicting updates>

If the registry and the AIS have updates to the same object that do not match, the conflicting entries are not exchanged. The registry administrator and AIS are notified of conflicts not exchanged.

8. Non-Functional Requirements

For registries distributed afloat, rollout of registry components should be timed to coincide with applications that depend on those components.

Synchronizations between registries of different security classification levels will filter objects to synchronize only those objects that qualify for the lower of the two security classification levels. Alternatively, synchronizations should only occur in a single direction between registries of different classifications.

9. References

Department of Defense PKI directives.

10. Issues/Questions

It is expected that there will be differences between ashore and afloat mechanisms and timeframes for synchronization.

5.11—Manage Metadata Slots

1. **Purpose**

   This use case describes the actions for managing the capability to add and remove metadata slots in the registry after approval by the registry Change Control Board.

2. **Diagram**

   None.

3. **Actors**

   Registry administrator.

4. **Pre-Conditions**

   User must be a registered registry user.

5. **Post-Conditions**

   Added metadata slot will be reflected in the registry data entry requirements.

   Removed metadata slots will purge existing metadata and be unavailable for future entries.

6. **Main Flow**

   6.1   Registry administrator requests to modify metadata slots.

   6.2   Registry authenticates registry administrator.

   6.3   Registry provides registry administrator with current registry metadata slots.

       6.3.1 Registry administrator defines new metadata slots.

       6.3.2 Registry administrator identifies slots to be removed.

   6.4   Registry requests confirmation of changes.

   6.5   Registry administrator confirms changes.

   6.6   Registry processes the changes.

   6.7   Registry notifies registry administrator of the success or failure to implement the changes.

7. Exceptions

7.1   <Insufficient data>

If the user does not provide sufficient information to process the request, the registry will inform the user.

7.2   <Metadata slot already exists>

If the user attempts to add a metadata slot that matches an existing metadata slot, the registry will reject the request.

7.3   <Metadata slot does not exist>

If the user attempts to remove a metadata slot that does not match an existing metadata slot, the registry will reject the request.

8. Non-Functional Requirements

The registry UUID metadata slot cannot be removed.

The registry must warn the registry administrator about removing slots that are populated with data in registry entries, so as to avoid inadvertent loss of data.

9. References

ebXML RS 2.0.

10. Issues/Questions

Policy needs to be established to identify circumstances under which the registry administrator is authorized to add and remove metadata slots.

5.12—Generate Schema

1.   Purpose

This use case describes the actions to generate a schema by reusing objects in the registry.

2.   Diagram

None.

3.   Actors

Developer.

Functional namespace coordinator.

Registry Administrator.

4.   Pre-Conditions

At least two objects have been successfully entered in the registry and assigned to a namespace.

The developmental URN for the schema has been registered.

5.   Post-Conditions

The user has a well-formed XML schema from registry objects.

6.   Main Flow

6.1   User identifies XML objects for reuse.

6.2   User requests XML objects be combined into a schema.

6.3   User provides a name for the schema.

6.4   Registry generates schema.

7.   Exceptions

None.

8.   Non-Functional Requirements

None.

9.   References

None.

10.   Issues/Questions

None.

Appendix B
Ashore vs. Afloat Considerations

When considering the requirements for an XML registry, the DON XML Work Group looked at the various uses and environments where registry support may be desired. A major consideration was the military's unique need to operate self-sustaining XML environments. Specifically, the ability to develop, maintain, and interact with data from an XML registry in afloat environments produces challenges.

The current thinking within the DONXML WG is that it will become necessary for afloat environments to maintain a version of the DON Enterprise registry. It is envisioned that an XML registry will be of use to afloat systems for

◆ facilitating shipboard development of interoperable XML system capabilities, and
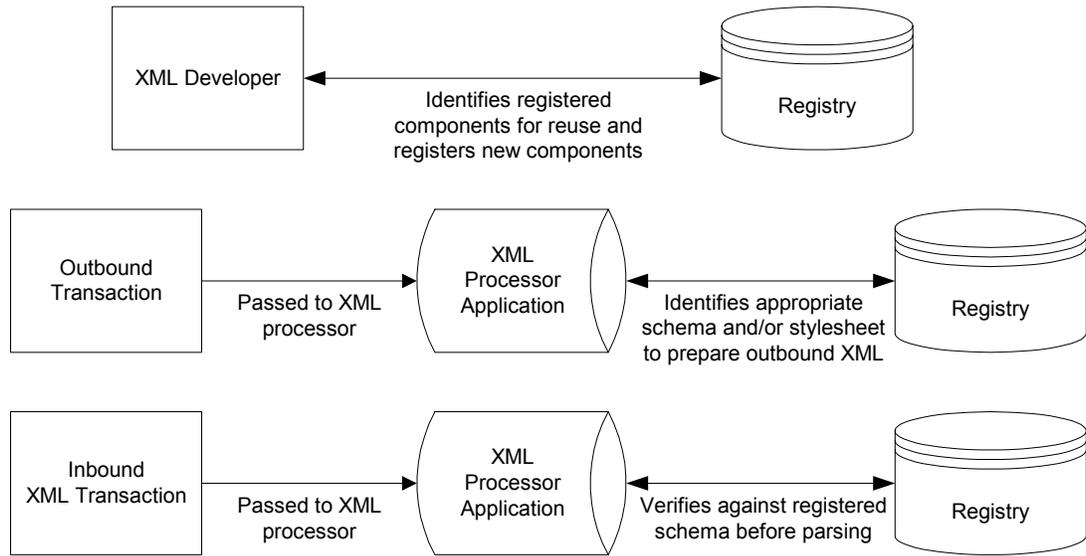
◆ supporting XML transaction validation by XML parsers.

The DON, through a number of efforts, has been aggressively pursing a manageable and interoperable collection of system implementations.[1] An XML registry is a crucial part of the DON objective for maintaining authoritative XML schemas, DTDs, and other standards that DON applications can use with assurances that those XML objects will be compatible with other implementations. The registry would provide a resource of XML for developers to implement in applications or for constructing new XML structures that build upon existing structures.

To ensure that XML transactions are properly formed, an XML parser may communicate with an XML registry to compare against schemas and DTDs. Problems with an improperly constructed XML transaction can be better trouble-shot at the parser, rather than at each application that receives XML.

Figure B-1 depicts the activities of XML development and XML processing that an XML registry would support.

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[1] Please see directives establishing FAMs, TFW, DADMS, and similar initiatives.

Figure B-1. Typical Interactions for Afloat Users with the XML Registry

XML Developer	◄— Identifies registered components for reuse and registers new components —►	**Registry**
Outbound Transaction	—Passed to XML processor→ **XML Processor Application** ◄— Identifies appropriate schema and/or stylesheet to prepare outbound XML —►	**Registry**
Inbound XML Transaction	—Passed to XML processor→ **XML Processor Application** ◄— Verifies against registered schema before parsing —►	**Registry**

Given the example uses of XML registries above, there are two primary reasons why the DON XML Work Group believes that each afloat unit will have to maintain a copy of all or part of the DON Enterprise registry. First, current bandwidth technology can produce bottlenecks. Second, EMission CONtrol (EMCON) requirements would limit communications. The scenarios below depict the three operating scenarios believed to be necessary for synchronizing registries to the DON Enterprise registry.

Regularly Connectivity

Ashore environments would be evaluated for their need to maintain a local version of the XML registry. These locations may support heavy throughput of XML transactions, provide linking points to afloat environments, or considered of a critical nature that they cannot be put at risk from potential disruptions of connectivity to the Enterprise registry. Operations would include regular connections to the DON Enterprise registry to synchronize the registries.

Occasional Connectivity

Many afloat units will have varying opportunities to connect to an ashore registry when necessary, if not at home port. Generally, needed XML registry updates would roll out with the applications that depend on those registered constructs. However, the desire for an afloat unit to connect to an ashore node for updates should be facilitated within policy guidelines for ship-to-shore communications.

Restricted Connectivity

Mission requirements will dictate extended deployments that restrict connectivity for extended periods. These units would rely on the XML registry that they left port with for the duration of their mission. Since roll-outs and updates to related XML applications would be under a similar stasis, the impact would be limited to latency of any ship board XML development to be sorted out after the next synchronization.

Appendix C
Glossary

Community of Interest (COI)	Inclusive term used to describe collaborative groups of users who must exchange information in pursuit of their shared goals, interests, missions, or business processes and who therefore must have shared vocabulary for the information they exchange.[1]
Enterprise Standards	Standards selected or developed by an enterprise to promote interoperability in all functional areas. Enterprise standards usually are formally promulgated (e.g., DoD joint technical architecture).
Functional Area	A functional area encompasses the scope (the boundaries) of a set of related functions and data as defined by SECNAVINST 5000.36 and the Functional Area Manager designation memo. To date, the DON has defined 23 functional areas.
Functional Area Manager (FAM)	An organization designated by the Under Secretary of the Navy to manage a functional area.
Functional Data Manager	Organizations designated by the respective resource and program sponsors to produce and control structuring of data in functional activities, information systems, and computing and communications infrastructures. Examples include Naval Meteorology and Oceanography Command (for meteorological and oceanographic data), Office of Naval Intelligence (for characteristics and performance data of non-U.S. equipment and merchant ships), Naval Security Group (for cryptologic information and data), and DC/S Installations and Logistics (for Marine Corps logistics).
Functional Namespace Coordinator (FNC)	Organizations responsible for advocating, supporting, and ensuring the development, maintenance, registration, discovery, and reuse of standard XML within their functional area. Examples include Naval Meteorology and Oceanography Command (for meteorological and oceanographic data), Office of Naval Intelligence (for characteristics and performance data of non-U.S. equipment and merchant ships), Naval Security Group (for cryptologic information and data), DC/S Installations and Logistics (for Marine Corps logistics).

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[1] U.S. DoD Chief Information Office, "DoD Net-Centric Data Strategy," 30 April 2003.

Governance Structure	Organizational structure necessary to make and administer policy to ensure that a specific mission is fulfilled or vision achieved. Governance structures can be formal (e.g., an organization) or matrixed (e.g., participants from different organizations).
Interoperability	Ability of systems, units, or forces to provide services to, and accept services from, other systems, units, or forces, and to use the services so exchanged to enable them to operate effectively together. (See CJCS Pub 1-02.)
Registry	Mechanism where relevant repository items and metadata about them can be stored so a pointer to their location and all their metadata can be retrieved through a query.
XML	Open standard for describing data from the W3C. It is used for defining data elements on a web page and business-to-business documents. XML uses a tag structure similar to that for SGML and HTML; however, whereas HTML defines how elements are displayed, XML defines what those elements contain. HTML uses predefined tags, but XML enables the developer of the page to define the tags. Thus, virtually any data items, such as product, sales rep, and amount due, can be identified, so web pages can function like database records. By providing a common method for identifying data, XML supports business-to-business transactions and is expected to become the dominant format for electronic data interchange.