



Naval Open Architecture

DSTO Maritime Defence Technology Symposium

AIR



C4I



SPACE



SUBS



SURFACE



MARINES



28 January 2010

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PEO IWS 7B*



Open Architecture, U.S. Navy, Marine Corp's Approach

- History of U.S. Naval Open Architecture
- Naval Open Architecture Accomplishments
- The Future of Naval Open Architecture



Is Incremental Change Fast Enough?

- Open Business Models
- Open Innovation Models
- Military “Technology”





Naval Leadership Says Implement OA ...

- **5 Aug 2004 OA Policy Statement**
- **OA EXCOMM Action Items**
- **23 Dec 2005 OPNAV Requirements**



Naval Enterprise OA Strategy



OA Requires Commitment At High Levels



Chief of Naval Operations (CNO)

N2/N6 - Information Dominance

N8 - Resources, Requirements & Assessments

Assistant Secretary of Navy (Research, Development & Acquisition) ASN(RD&A)



OA Enterprise Team (OAET)

OA Enterprise Team Lead Council

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ASW

MARINE CORPS

Program Executive Offices (PEOs)

System Commands (SYSCOMS)



What is Naval Open Architecture?

Business Practices

- Government Buys IP**
- All Design Artifacts, In Context**
- Enterprise Collaboration**
- Peer Reviews**
- OA Contracts**
- Transparency**

Technical Practices

- Systems Of Components**
- Publish Interfaces**
- Eliminate Proprietary Elements**
- Choose Standards Over Custom**
- Reuse Components**

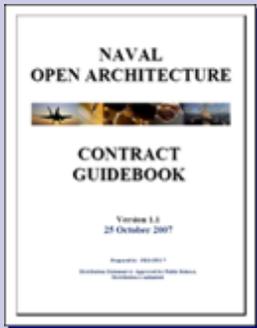


Accomplishments to Date

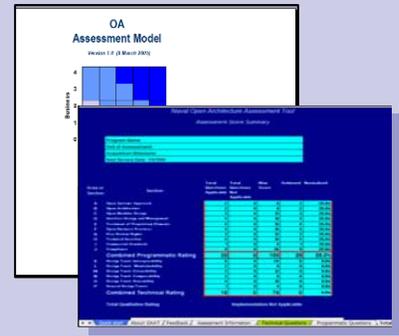


Tools

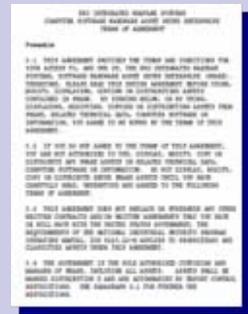
Naval OA Contract Guidebook



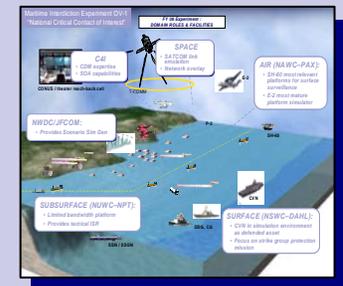
OA Assessment Tool



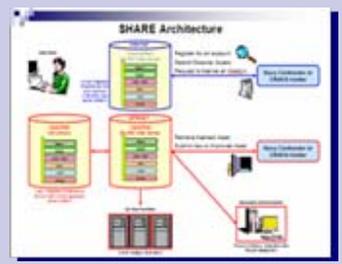
Reuse Licensing Agreement



OA/FORCEnet Experimentation



Asset Reuse Repository (SHARE)



OA Continuous Learning Modules



Industry Days / Symposia



Naval OA Website





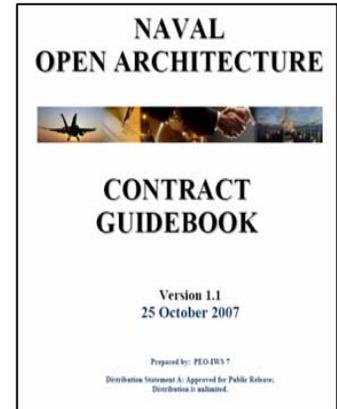
Distinct Benefits by Program/Domain

Domain	Requirement	OA Implementation	Results
 <p>Improve Interoperability</p>	Develop a Naval Integrated Fire Control – Counter Air (NIFC-CA) capability to expand the battlespace	<ul style="list-style-type: none"> ❑ Established peer reviews ❑ Developed modular architecture ❑ Wide use of COTS products ❑ Use of widely-accepted standards 	<ul style="list-style-type: none"> ❑ Integrated capabilities & technologies across multiple platforms from cooperative engagement capability, Aegis, SM-6, and E-2D ❑ Expanded battlespace to max kinematic range of SM-6 missile
 <p>Reduce time to field</p>	Implement enterprise business strategy with technical solutions	<ul style="list-style-type: none"> ❑ Apply open, network-centric architecture w/ services & apps ❑ Eliminate stovepipes, obsolete hardware and software ❑ Coordinate development of tech insertion baselines across SWFTS subsystems and platforms 	<ul style="list-style-type: none"> ❑ ~12-15 platform upgrades/year ❑ Minimized number of configurations requiring support ❑ No maint. actions required at sea ❑ Integrated training approach ❑ Development effort paces threat environment & tech. evolution
 <p>Improve operator performance</p>	Increase bandwidth to ships at sea	<ul style="list-style-type: none"> ❑ Modular architecture / published interfaces ❑ Re-used a DISA-certified Army off-the-shelf component 	<ul style="list-style-type: none"> ❑ Doubled aircraft carrier's SHF capacity to 4 mbps by using enhanced Bandwidth Efficient Modem (EBEM) ❑ FUTURE: Reuse EBEM as part of a Rapid Deployment Capability (RDC) program



New Contract Language

- 24 Current Programs Incorporated
- Mandated Adoption Of OA Practices



- Contract Award Evaluations
- Ground/Air Radar Evaluated For OA
- Eval Used As Award Criteria

- Contract Incentives
- P8-A Contract Includes OA Criteria
- 30% Of \$261M Award For OA Criteria



... to include OA business and technical principles



Asserting The Navy's Intellectual Property Rights

- **Assert and Exercise** intellectual property rights (IPR)
- Under the U.S.'s Federal Acquisition Regulations (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS):
 - **Unlimited Rights** for Exclusive Funding
 - Technical Data (TD)
 - Computer Software (CS)
 - **Government Purpose Rights (GPR)** For Mixed Funding
 - *Right to use, modify, reproduce, or disclose Inside Govt*
 - *Right to release or disclose data outside Govt*
 - **Fail to assert and exercise**
 - Government Loses the IPR
 - Contractor Acquires by default





Controlling IP To Re-use Software And Reduce Costs



- P-8A Re-uses Over 2.5m LOC
- Leveraging Critical Software

- Marine Air Ground Task Force Command And Control (MAGTF C2)
- Incorporates Components From Eight DOD Programs





It also enables programs to disclose designs, which fosters collaboration ...

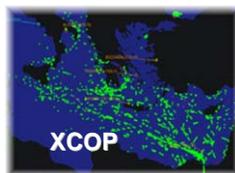
- Design artifacts from AEGIS, LCS, DDG-1000, SSDS, SIAP, and IABM are available to qualified vendors in the IWS repository



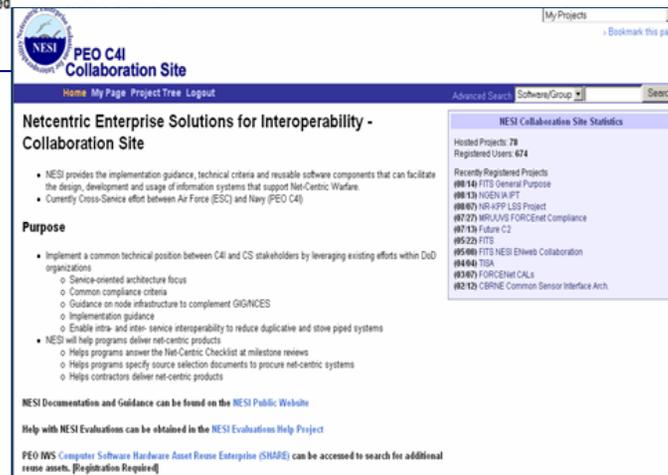
IWS SHARE REPOSITORY



- Project artifacts from CLIP, XCOP, and NITES-Next are available to qualified vendors in the C4I NESI collaboration site



C4I NESI COLLABORATION SITE



... and improves interoperability



While We Have Been at It for 5 Years, There Is Still Work to Do



Top OA Priorities For 2010

- **Implement A Model And Governance Structure**
- **Conduct “Limited Objective Experiments”**
- **Align Architecture Approaches**
- **Implement Accountability Mechanisms**
- **Reward Good OA Behavior**
- **Engage Multiple Stakeholders**
- **Reduce Test & Evaluation (T&E) Costs**



Culture Change is Difficult

- **Failing to Establish Urgency**
- **Paralyzed by risks**
- **Failing to Create a Guiding Coalition**
- **Lacking Vision**
- **Under Communicating the Vision**

Source: "Leading Change: Why Transformation Efforts Fail," by John P. Kotter



More Pitfalls That Derail Change

- ***Failure to Remove Obstacles***
- ***Failure to Create Short-Term Wins***
- ***Declaring Victory Too Soon***
- ***Failing to Anchor Changes in the Culture***

Kotter, J. P. (1995). Leading Change: Why Transformation Efforts Fail. Harvard Business Review OnPoint (March-April), 1-10.



Questions – Discussion – Thank You

Naval Open Architecture [ACC] - Mozilla Firefox: IBM Edition

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dau.mil https://acc.dau.mil/oa

Google

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Where the DoD AT&L Workforce Meets to Share Knowledge

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Done