Where Our National Security Begins...
NRO Application Service Provider
Industry Advisory Working Group
(NASP IAWG)

Overview & Progress Discussion
Co-Chair/Government Dialog
12/6/2017
Working together to Pioneer “Profound Change”

Why Future Ground Architecture?

“The greatest challenge is going to be on the ground, so I look to the NRO to be the innovators, to plow new ground, to figure out the technology and how to do this, because the rest of us are going to be kind-of catching up, figuring out how to do this because it’s going to be a profound change.”

———Director of National Intelligence, James R. Clapper
Feb 2014, ONI Town Hall

FGA, NASP and NISP Are Evolving the Business Model

Summary

NRO is Transforming the way we do business …
- Developing an architecture to enhance mission performance
- Implementing Enterprise collection optimization, multi-int and ABI/OBP as foundational architecture
- Delivering a unified, modern, resilient commercial-style services platform and interfaces supporting mission applications and information sharing

Industry feedback is key to mission success...

Successful Transformation Demands Ongoing Dialog
The Challenge: Why an Industry Advisory Group?

  - Move from vertically integrated system-based acquisitions to “platform-based”
  - Perception was that industry-wide preference is for vertically integrated systems

- Ground Truth: “to be” business models in ISP-ASP world were ill-defined
  - Projecting future business difficult due to changing government operating models
  - FAR Part 15 services contracts dominating acquisition vs commercial technology FAR Part 12

- How do we “get there from here”? Too many issues to address at one time!
  - Government cannot act unilaterally and expect a positive outcome
  - Industry cannot wait for government guidance and expect a positive outcome
  - Industry partners approaching government one at a time is unproductive
  - RFI’s and Industry Day meetings serve a different purpose

- Who is the “client”? Industry, Government…and anyone who has a stake

Industry self-organizing around specific issues and engage Government with rational, pragmatic perspectives on viable ISP-ASP business models
What is an IAWG?

Industry partners self-organizing to discuss matters of mutual concern and affecting the future business of the national industrial base.

An IAWG is...
- Volunteer-based
- Strategic in nature
- Objective (pros & cons)
- Open to participation
- Company-agnostic
- Problem-centric
- Focused on outcomes

An IAWG is not...
- Sponsored by the government
- Restricted in participation
- Proprietary
- A pursuit/capture venue
- A shaping & positioning opportunity
- A venue to recommend products
- An open ended discussion forum

Future Business Models are of Strategic Importance to the Industry Base
NASP IAWG
Mission, Charter & Objectives

Mission: Help move NRO Ground from vertical systems to mission platforms
- Identify business models that will support government and industry objectives
- Identify potential pitfalls and recommend potential solutions

Charter: Provide expert industry resource and sounding board focused on Business aspects of emerging models to acquire software services
- Ramifications of componentizing software applications,
- Benefits accrued to the government & industry,
- Intended and unintended consequences against the industry base,
- Limitations and viability as a reasonable course of action

Objectives:
- Provide strategic industry input to a changing acquisition landscape
- Provide an objective and neutral venue for discussing approaches to business models
- Foster effective communication between government and industry leadership

Evolving to “NRO” IAWG based on interest from ISP leadership
Guiding Principles & Deliverables

- **Provide Options, not “answers”**
  - Emphasize trade space and alternatives, not defining or recommending “the answer”:
  - Provide feedback (sometimes confidential) and socialize concepts in a trusted-partner venue

- **Constrain the problem set: Step 1 for Action Teams is defining the deliverable**
  - Emphasize speed and pragmatism over exhaustive research and perfect world scenarios
  - Quick hitting analyses, “Magic-Quadrant”-like outputs, roundtable
  - Timely enough to make the dialog relevant in the issue du jour

- **Remain credible**
  - Discussions must be vendor, supplier, and integrator agnostic, not just by product/company, but by architecture as well. Must self-police to ensure objectivity.
  - Recommendations must be realistic
  - Sweet spot is the bridge between policy and execution

- **Establish a functioning & robust Industry – NASP leadership interface**
  - Know when to defer to other groups or venues
  - Be responsive and objective above all
  - Open and collaborative (not duplicative of other efforts, involve as necessary)
# NASP IAWG Progress

## Addressing Business Model Obstacles to Cloud Adoption

<table>
<thead>
<tr>
<th>ISP-ASP Adoption Challenge Area</th>
<th>IAWG Action Teams</th>
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<tbody>
<tr>
<td><strong>✓</strong>-complete</td>
<td>✓ Incentivizing govt/industry behavior</td>
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<tr>
<td><strong>v</strong>-inwork</td>
<td>✓ Requirements: Over-ask and Under-Ask</td>
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<tr>
<td><strong>☐</strong>-future</td>
<td>❏ Cloud business/revenue model forecast</td>
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<tr>
<td>Acquisition processes</td>
<td>✓ Pay-for-Use Licensing &amp; ELA models</td>
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<tr>
<td>- Tech cycles shorter than acq cycles</td>
<td>✓ GOTS/COTS/OSS Business models</td>
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<tr>
<td>- Market research &amp; tech currency gaps</td>
<td>❏ Software Business 101 course</td>
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<td>Procurement Models (“ABC” vs “CBA”)</td>
<td>❏ (NEW) Business/Op Model to attract talent</td>
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<tr>
<td>- Perceived bias against paid licensing</td>
<td>✗ (NEW) Business/Op Model to attract talent</td>
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<td>- Role of OSS misunderstood</td>
<td>✗ (NEW) Business/Op Model to attract talent</td>
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<tr>
<td>- Contracts: S/W vs Services</td>
<td>✗ (NEW) Business/Op Model to attract talent</td>
</tr>
<tr>
<td>Integration Models</td>
<td>✓ FGA Framework segmentation &amp; OCI</td>
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<tr>
<td>- Segmentation &amp; OCI concerns</td>
<td>✓ Software Development vs Integration</td>
</tr>
<tr>
<td>- Integration vs Configuration</td>
<td>❏ Agile &amp; DevOps</td>
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<tr>
<td>- Waterfall vs Agile DevOps</td>
<td>❏ (NEW) DevOps TTO in NSIS waterfall</td>
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## Consistently Strong Participation

Industry buy-in: 45+ volunteers at inception, up to ~75 across 25+ companies
Cross section of companies (large/med/small, H/W, S/W, services, Dev + SETA + FFRDC)
Work-product, deliverable based approach fosters active participation
“Incentives: Motivating Industry/Govt to uptake ASP-ISP”

Industry Perspective on Progress as of the 2016 NRO ICITE Day

March 2015: Industry Defined Challenges

- No clear, 0-3 year architecture or program defined for NISP or NASP
- Government program actions inconsistent with FGA vision
- IC ITE Leadership
  - Lack of programmatic resources & support
  - Actions do not appear to match words
  - Operational One size fits all philosophy
- Confusion on OCI: applied differently for every acquisition

March 2016: Status of Industry Recommendations

- NASP issue “Baseline of Record” & “program segmentation” artifacts
- Senior Leadership demonstrated through program actions and decisions
- Firm actions & direction on ICITE
  - Publish application migration plan & timing
  - Program for application mods to join ICITE
  - Support varying mission workloads
- Evaluate OCI - Consistency across NRO, Directorates, & Programs
NASP IAWG
Action Team Report Excerpts

Complete list of Reports available at
http://usgif.org/community/Committees/NROASPIA?WG
Defining a Government Incentive Approach

**Challenges**

- Early NISP + NASP Programs will be harder and PMO’s will have less control of deliveries
  - Programs are more complex but direct Contract Size reduced
  - Increased GFE
- Govt PM’s worry C/S/T with Infra as a given – not necessarily accurate in the short term
- Long term Cost Risk might be low, but tech risk may rise as NRO learns how to be an ISP

**Recommendations**

- Provide Incentives to “do hard”
  - Credit for reuse, enterprise complexity & total program cost
  - Openly reward & Advertise @ NRO & IC Level Innovation & Cross Org Teamwork
- Execution Incentives
  - Demonstrate & communicate how implementation schedules & risk have been reduced
  - Take advantage of shorter timelines
- Invest in Specialized Training
  - Encourage certifications beyond PM – openly encourage SE + ISP/ASP address “how do I manage in this world”
  - Reinvigorate partnership training with Industry (e.g. the “Business of the NRO”)
- Focused Leadership Selection and Placement:
  - Reward those who “get it”
Alternative Segmentation & Integration Models* and OCI Impact on Business Models

- Segmentation model must precede OCI model
- Key OCI Issues:
  - Who writes requirements?
  - Who makes make-buy decisions?
- Mission-specific OCI ok if consistently applied

Striking a Balance

ASP
Industry: bigger investment
Competitive field: smaller
Prime Contractor Integration

ASP-NASP
Industry: Medium investment
Comp field: broader, by msn
Mostly Industry integration

ASP-Framework-NASP
Industry: Focused investment
Competitive field: broadest
Govt-Industry integration

*For illustrative purposes only.
Not intended to reflect govt architecture
“CME” defined as C2S + Gov Cloud + AUE
Pay-for-Use Licensing & Cross-Agency ELAs

The Licensing Spectrum:
What is a Viable “Pay for Use” Model?

“Pay For Use”
- Based on actual usage
- Metered or Tiered
- No long term commit
- No capital investment
- Support costs embedded
- Services separate
- ELA does not apply

“Term” or “Flex”
- Buyer ‘leases’ licenses for fixed term
- Priced by projected user/usage
- End of term govt owns/owes nothing
- Includes support & in-scope upgrades
- Services separate
- “Lease to Own” is problematic
- ELA may apply (term limited)

“Perpetual”
- Buyer owns & capitalizes
- Priced by projected user/usage
- IT53/300 capitalized investment
- Support & upgrades vary
- License + Support components
- Services separate
- ELA is viable option

“Government Services Model”
- Software provided at no cost or low cost as part of “services” contract
- Government-proposed alternative to licensed software approach

“Unlimited” only applies to term & perpetual; requires named usage
COTS/GOTS/FOSS Software Business Models

Choice of GOTS Dev vs. COTS integration is much more complex than “OSS is free”

COTS/GOTS Open Source Software Business Models

- Business Model Differences
- Terms of Reference
- Drivers: Make-Buy-Integrate Decisions

GOTS?

Integrate/Hybrid?

COTS?

BUSINESS MODEL FACTORS
- Life cycle costs and cost recovery
- Intellectual property rights
- Maintenance and licensing, royalties
- Patent protections and indemnification
- API certification
- Licensing (incl OSS)
- Security certification & patching
- Funding source models

ARCHITECTURAL FACTORS
- Level of componentization
- Degree of API publication
- 80% fit vs 100% fit vs not invented
- Open I/Fs vs Open Source code

OPERATING MODEL FACTORS
- ABC (Adopt, Buy, Create) vs CBA?
- “Speed to Need: Day 1 capability”
- Complexity of NDI Product procurement
- Different pots of money: Dev vs O&M?
## Risk Comparison – COTS/GOTS/Hybrid Models

Is Hybrid the “Best of Both Worlds”?

<table>
<thead>
<tr>
<th>RISK AREA</th>
<th>COTS</th>
<th>GOTS</th>
<th>Hybrid</th>
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<tbody>
<tr>
<td>Development</td>
<td>• Developed in anticipation of market need</td>
<td>• Requirements must be well defined upfront to control risk.</td>
<td>• Lowest baseline risk. Development risk focused on extending COTS with new GOTS functionality.</td>
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<tr>
<td></td>
<td>• Purpose built, custom coding.</td>
<td>• Purpose built, custom coding.</td>
<td></td>
</tr>
<tr>
<td>Integration</td>
<td>• Dependent on API availability</td>
<td>• Purpose built integration</td>
<td>• COTS integration points allow use as open platform</td>
</tr>
<tr>
<td></td>
<td>• May require wrapping</td>
<td>• Code can be modified if req’d</td>
<td>• Minimize custom integration</td>
</tr>
<tr>
<td></td>
<td>• Legacy system complexity</td>
<td>• External Interface complexity</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>• Market driven performance</td>
<td>• Requirements driven testing and performance. “Have it your way.”</td>
<td>• Requirements driven performance &amp; testing PLUS widely available components</td>
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<tr>
<td></td>
<td>• Unique mission configuration or adaption to legacy may be required.</td>
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<tr>
<td>Cost</td>
<td>• Cost amortized over larger expected market.</td>
<td>• Labor throughout lifecycle. Cost from requirements, testing and service rates.</td>
<td>• Minimize direct labor TCO.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Leverage available COTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Maintain OSS</td>
</tr>
<tr>
<td>Schedule</td>
<td>• Available off the shelf with min modification.</td>
<td>• Minimum 6 months to capability. Timeline driven by requirements, testing and available services.</td>
<td>• “Day 1” capability + Requirements, testing and available services driven</td>
</tr>
<tr>
<td></td>
<td>• May require labor to configure or adapt.</td>
<td></td>
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</tr>
<tr>
<td>Maintenance</td>
<td>• Services and version control per licensing parameters.</td>
<td>• Maintenance services. Version Control and promotion to operations.</td>
<td>• GOTS &amp; COTS delineated terms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sustaining outage</td>
<td>• Managed via maintenance model</td>
</tr>
<tr>
<td>Security</td>
<td>• Indemnification, warranties, IA risks/costs carried by supplier.</td>
<td>• Supports unique security needs.</td>
<td>• Indemnifications and protections, w/support to unique security needs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Requires labor to maintain.</td>
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</tr>
</tbody>
</table>
1. Software Industry Myth-Busting
   - Lower total cost is better
   - Profit is greed
   - GOTS is “free” because there aren’t any licensing costs
   - Service and support is the same thing
   - Overhead does not cost the government anything

2. Questions from Government PMs, COs, COTRs
   - Why can’t industry give us their software and let us pay for services?
   - Why can’t all of my existing licenses work effectively on premises AND in the Cloud?
   - How can we teach our Program Managers how to effectively translate mission needs into the correct kind of software license requirements?

3. The COTS software business
   - Is their business model compatible with the needs of the Government?
   - What are the advantages and drawbacks?
   - How do vendors innovate, earn money, and invest in new technologies?
   - Why are these things important?

4. Licensing, Terms & Conditions
   - How to ensure we getting what we think we’re getting when we work with Software Vendors?
   - What sorts of Software Licenses are available for the government to utilize?
   - What are the advantages and drawbacks/limitations of each type?
DevOps is more than the use of tools / services to automate workflows:
- Requires the evolution of an organization's culture and business processes on both sides of the Government / Contractor paradigm
- Emphasis on close collaboration between those who perform development, operations, and security

Organizational culture must evolve to enable DevOps
- Best practice is to start small but significant, learn, grow
- Build firm foundation with growing body of success, not Big Bang
- Overcoming the reluctance to automate the build/test/delivery of software
- Developers must embed security compliance behaviors into their DevOps teams

NRO operating model requires changes for DevOps
- Waterfall based NSIS approach appropriate for systems with well-known requirements and well-known solutions, but not appropriate for software intensive activities with evolving requirements
- “One size fits all” approach for assessing operational readiness, performing A&A, and change management limits the ability to deliver and sustain software services in a more effective manner

Recognize learning component: evolving effectiveness vs designing perfect processes
- Ex: evaluating which infrastructure is appropriate for program operations (Cloud/Virtual/Bare Metal) - One size doesn’t fit all
- Ex: how NRO/Developer community adopts & uses GFE where appropriate

Evolving culture and business processes with respect to software development and sustainment will facilitate NRO benefits from DevOps
Elect a Hybrid Approach: Agile + DevOps AND Waterfall

- Recognizes transition state between legacy system development and emerging framework and services development.
- Combines modes for optimum benefit:
  - DevOps mode can provide capabilities scheduled for waterfall delivery.
  - DevOps contributions to waterfall delivery can have benefits of small batch size.
  - Do not need Big Bang adoption of DevOps to start seeing DevOps value.
  - Recommend starting DevOps with small but significant project:
    - Show value, Learn, grow.
    - Needs to be a real program... “pilot” project should mean “first” not “trial”.
  - Migrate larger Waterfall development to appropriate mix with DevOps.
- Challenges:
  - DevOps delivery speed can overwhelm Waterfall transition processes.
  - Waterfall governance models tend toward “one size fits all.”
NASP IAWG
Industry Observations and
Future Topics for Dialog

2018 Look Ahead
Industry Observations: GED RFPs and Contracts

- RFP language is improving in consistency & clarity (room for more though)
  - Focus on eliminating proprietary interfaces and unpublished APIs is well received
  - “Proprietary Code” in commercially licensed applications allowable with tech data rights

- Misperceptions persist between true cost of GOTS Dev/O&M vs COTS licenses
  - See GOTS vs COTS business model and “make-buy” findings

- FAR Part 15 CPAF Dev contracts may incentivize software “Create” over “Buy”

- Cost reasonableness criteria/scoring: intended and unintended benefits

- OCI: consistency of application remains a concern (intra-SPO vs cross-SPO)
What should government specify ref DevOps implementation?

What standard contract language should be implemented?

Sample concepts for incentives and insight
- Setting a CAIV/Price for procurement to which bidders would respond with how much of the requirements they can meet for that level
- Procuring “story points” as a measure of development capacity and velocity.
- Tell me what your 1, 3, 5 point stories look like?
- Using scrum team velocity as a tracked performance metric that determines viable speed & capacity to deliver a set amount of functionality.
- Incentivize on “delivered velocity” and accurate estimation of story points in the bid (Agile Dev version of the budgetary “closest to the pin”)
- Government assesses realism based on demonstrated velocity and P/P

Discussion on how these approaches affect program funding profiles

What is the business impact of?
- ATO automation
- Continuous delivery
- Multi-Domain DevOps
Government can change the model: shift toward buy vs build
- Identify root cause: proprietary interfaces are the culprit in vendor lock in...not proprietary code!
- Provide training for government, FFRDC, and SETA on COTS Integration vs GOTS Development

Explore concept of an ODC line for licenses in RFPs: level playing field for all and avoids biasing against off the shelf software due to BOM impacts to bid price

Have every contract award include requirement for prime to complete a market survey and make/buy assessment for government approval
- Include life cycle costs and the various factors identified by the IAWG COTS/GOTS/Hybrid matrix
- Market survey...Life Cycle Costs...Risk Factors
- CO/COTR/PM emphasis on Market Research beyond RFI to include industry visits, symposia, etc.

Recognize make-buy tradespace as a requirements trade space...government should include ALL requirements in RFPs.
- Stop allowing programs to cherry pick the requirements in order to justify a “Create” (vs “Adopt”/”Buy”)
- Require programs to determine what portion of the requirements have viable commercial solutions prior to deciding on the acquisition/procurement strategy.

Consider an “outcome based” requirements model (additional dialog needed)

Encourage Programs to consider incremental capability approach
- Stress “Day 1” capability as high value to support “speed to need”
- If there is an incremental approach does it change the make-buy?
Industry Observations: Big Picture

1. Recognize the GOTS vs COTS question is a make/buy decision
   - Both use OSS extensively (why build it if you can grab it?)
   - Different risk models, indemnification, and life cycle cost implications
   - “Hybrid” COTS + GOTS leveraging open APIs may be best of both worlds

   - Investment profiles, architecture decisions, teaming, RFP responses
   - Over-asking can drive industry to game the system or gold-plate
   - Under-asking can turn Best Value into LPTA and leave capability on the table
   - The need for requirements prioritization is underappreciated

3. Technology is evolving faster than requirements:
   - 1-on-1 dialogs with Industry are encouraged prior to RFP release
   - Market research MUST involve more than RFIs
   - Guidance: DoD Vendor Communication Plan, Administrator for Federal Procurement Policy

Do you have ideas on making things better? Participate in the IAWG!
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Please visit us on our USGIF web page:
http://usgif.org/community/Committees/NROASPIAWG