Where Our National Security Begins...
NRO
Industry Advisory Working Group

Working Session
March 31, 2020
Welcome & Introductions

“Snapshots” (COVID-19 response, USGIF Update)

Action Team Engagement updates: GEOINT 2020 fallback

Action Team Discussions
  - Agile + Waterfall
  - Hybrid Cloud Adoption & Business Model
  - System Level Integration & TTO

Government Perspective (as applicable)

Open Dialog
Snapshots: COVID-19 Response
Industry Inputs & Ideas

- Specific challenges created by structures, process, or contract
- Facility capacity challenges
- Any pleasant surprises?
- Learning by doing: building future resiliency practices
Addressing Unique COVID-19 Challenges Facing Customers and Contractors in IC


SEC. 3610. FEDERAL CONTRACTOR AUTHORITY.

Notwithstanding any other provision of law, and subject to the availability of appropriations, funds made available to an agency by this Act or any other Act may be used by such agency to modify the terms and conditions of a contract, or other agreement, without consideration, to reimburse at the minimum applicable contract billing rates not to exceed an average of 40 hours per week any paid leave, including sick leave, a contractor provides to keep its employees or subcontractors in a ready state, including to protect the life and safety of Government and contractor personnel, but in no event beyond September 30, 2020. Such authority shall apply only to a contractor whose employees or subcontractors cannot perform work on a site that has been approved by the Federal Government, including a federally-owned or leased facility or site, due to facility closures or other restrictions, and who cannot telework because their job duties cannot be performed remotely during the public health emergency declared on January 31, 2020 for COVID–19: Provided, That the maximum reimbursement authorized by this section shall be reduced by the amount of credit a contractor is allowed pursuant to division G of Public Law 116–127 and any applicable credits a contractor is allowed under this Act.
PROPOSAL

In Lieu of GEOINT 2020...
Joint NRO-NGA Working Group
Virtual Session on 4/28/20
GEOINT Theme: New Decade, New Challenges, New Strategies

1. Achieving Success with Agile
   - Agile Acquisition isn’t the same as Acquisition of Agile
   - Terms of Reference reuse for NGA

2. Reducing Industry Base Barriers to Entry
   - Attracting Talent: Latest Observations & Ideas
   - Security Clearances & Facilities access to broaden industry base

3. Improving Software Acquisition:
   - Business models & licensing
   - Architecture & requirements impact on make-buy decisions

Session Theme: Increasing Speed, Industry Capacity, and Performance
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Agile & DevSecOps Action Team

From February 2018 Report:
Agile & DevSecOps Adoption in NROs Waterfall Centric Enterprise
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
“Bimodal IT”* - the practice of managing two separate but coherent styles of work

Mode 1 (Waterfall)
- Single sequential progression from requirements to development to test to deployment
  - Typically requires long timelines (e.g. years) from problem to delivered solution
  - Concentrates on development of many (possibly diverse) capabilities to be delivered at the same time (or as a small number of drops)
- Baseline for Government programs with which any other approach must likely combine and coordinate

Mode 2 (DevOps)
- Evolving requirements prioritized as backlog
- Multiple cycles (e.g. sprints) to develop, test, and deploy additional capability as capability becomes available
  - More frequent delivery of more focused capability
  - Delivery of small batches, fully tested and avoiding accumulation of issues that harder to isolate in larger batches
- Goal is rapid delivery of value to stakeholders
- Numerous methodologies, e.g. Agile Scrum, SAFe

* Source: Gartner
Recommendation: Elect a Hybrid Approach
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”
What does NRO need to do to make DevOps work?

**Leadership Commitment to Changing Culture**
- Must take place at the Director level and include all echelons
- Recognize conflict between Waterfall & Agile/DevOps approaches
- Ensure MOD, Security, and SED share in **accountability** to accelerate speed to operations. There is a mission opportunity cost to delay.

Adoption requires ongoing collaboration between:
- Acquisition
- Program Management
- Developers
- Infrastructure Providers (NISP)
- Software Service Provider (NASP)
- Security

Start with Program Development environments, labs, & factories
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Hybrid Cloud Adoption & Business Model
Action Team

Chris Arroyo, Keith Barber, John Farrell, Scott Lawler,
Tim Stewart, Romano Romani, Al Stewart, Ron Alford, Marc Kriz
Hybrid Cloud Adoption & Business Model Action Team Charter & Overview

• Objectives:
  1. Build a *decision framework* to guide government/industry on path to hybrid cloud
  2. Characterize “as a Service” business and acquisition models
  3. Identify alternatives for deciding which cloud and how (centralized vs distributed decisions)

• Approach & Ground Rules
  • Unbiased, research-driven best-practice recommendations
  • We may NOT recommend virtues of one cloud over another!
  • Different agencies identify decision criteria levels based on own mission requirements

• Aspects to Consider:
  • Operating Models – who makes the decisions? At agency level or program by program?
  • Business Models- cost (i/o performance, data storage and compute) and data rights
  • Acquisition Models- [need to explore]
Notional Work Plan

1. Decision Framework
   - Brainstorm criteria list
   - Group / consolidate criteria into “like things” (Business, Performance, etc)
   - Vett against an industry standard of like scale (highly regulated industry)

1. As-a-Service Business & Acquisition Models
   - Crowd source existing industry and government alternatives
   - Crosswalk vs NRO operating model and mission types
   - Develop pros and cons, intended and unintended consequences of each

1. Decision Operating Models:
   - Brainstorm options for decision authority, e.g. agency level vs. PM level vs. Prime contractor
   - Flesh out a “Day in the Life” of each option, what it would take, what it would mean
   - Develop pros and cons, intended and unintended consequences of each
Focus Area 1: Terms of Reference & Taxonomy

- Commercial definitions: “private” = on-prem, “public” = external
- Government definitions to coordinate: Public, Private, Hybrid
- Variations to consider
  - “Public cloud provider on-prem” vs Government IaaS/PaaS: are both “Private”?  
- Does fielding to a commercial data center = on-prem or public?
- Multi-Cloud:
  - Single-Cloud services available from multiple vendors  
  - “I have multiple cloud infrastructures to choose from”  
  - “I want the cloud that matches my mission and business objectives”
- Hybrid-Cloud:
  - Mix of cloud services provided by different vendors and/or on-premise.  
  - “Some of my workloads exceed cloud provider offering so I need on-premise IaaS”  
  - “I use cloud for intermediate processing but store my finished data in IC Gov Cloud”
Focus Area 2: Public/Private Sector Models & Trades

- Define what costs exist in hybrid cloud architecture
  - What is the cost of exfiltrating your data?
  - How much is compute?

- Story from the Public Sector: Capitalization – Usage cost trade
  - NGA - NCL proposed move to C2S. Customer deemed more cost effective to use the stay in place.
  - NRO AUE/MUE

- Story from the Private Sector (Goldman Sachs): performance & security trade
  - Private Cloud (on-prem):
    - Applications that create and store sensitive information
    - Low latency, mission critical analytics (time = money)
    - Sensitive, or proprietary data sets
    - Sensitive app development
  - Public Cloud (Commercial Cloud Offerings)
    - Important, but less critical back-office applications
    - General app development
    - Web based applications such as marketing campaigns (surge, less sensitive data)

- Crosswalk: Look for intersections & incompatibilities
Focus Area 3: Mission/Enterprise Data as a Decision Driver

Driver: Data conops
- Data - What is the end goal?
- Raw vs intermediate vs finished data bear different cost profiles

What is most important to the mission?
- Raw data – does government need to “see” every data point before it’s fed into an algorithm?
- Finished data & Results - Is it more valuable to see the end result of that data?
- Mechanisms - what levels of service are expected wrt data storage and handling?
Joint NGA-NRO WG Action Team

Accelerating System-Level Integration & Transition to Operations (TTO)

Jason Dever  Marlu Oswald
Jeff Goerges  Renard Paulin
John Hays  Sonny Sarkar
Matt Madigan  Steve Sharp
Mike Manning  John Sutton
Nick Miller  Fred Turman
Curt Nare  Eric Viglione
Seth Wambold
Challenge:
System Level Integration, Test, and TTO Timelines

Current Agile implementation has improved the development cycle but not the integration, test, and TTO cycles.
## GED Agile Development Day 2019

### (U) Functional Equivalency

<table>
<thead>
<tr>
<th>Process</th>
<th>GED Waterfall Events</th>
<th>Agile Ceremonies</th>
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<tbody>
<tr>
<td>Requirements and Design</td>
<td>SRR, PDR, CDR</td>
<td>Solution and Program Increment Planning Events</td>
</tr>
<tr>
<td>Configuration Management</td>
<td>GED Level Request for Change (RFC)</td>
<td>Pre-Planning Phase, Solution and Program Increment Planning Events, Deployment Checklists (after Initial Installation RFCs)</td>
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<tr>
<td>Test and Evaluation (T&amp;E)</td>
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<td>Sprint, Program and Solution Level demonstrations</td>
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(U) There is not a one-to-one mapping between Agile ceremonies and method and Waterfall events. The risk mitigation that drives the traditional Waterfall Readiness Events is still accomplished in Agile, however; the mitigation is done iteratively instead of in “big bang” events.
GED Agile Development Day 2019: Agile Integration with Traditional Milestones

<table>
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<tr>
<th>Enterprise</th>
<th>Architecture</th>
<th>Launch Readiness</th>
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<tbody>
<tr>
<td><strong>System</strong></td>
<td><strong>Launch</strong></td>
<td>Launch Base</td>
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<tr>
<td><strong>Collection / Space Relay (Space &amp; Ground Elements)</strong></td>
<td><strong>Operational Readiness</strong></td>
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<tr>
<td><strong>Ground Acquisition</strong></td>
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<td>Mission</td>
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<td><strong>Shared Service Acquisition (TBD 002)</strong></td>
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- **Launch Readiness**: LCR, MCR, MRR
- **Operational Readiness**: MORR, VCC, IOC, FOC, DDR, ORR, FCR, DDR

**Acquisition Readiness**:
- SRR, SFR, SSR, SCR, IARR, ERR, CRR, PSR, CR, GRR, CDR, GCR, SRRs, SDRs, PDRs, CDR/EDR, PSR, GRR, SRRs, PSR

**Acquisition Segments**
- Solution Planning/Demo
- Increment Planning/Demo

**Launch**
- LCR, MCR, MRR

**Launch Readiness**
- Launch Base

**Operational Readiness**
- Mission (MORR, VCC, IOC, FOC, DDR)
- ORR, FCR, DDR

**Acquisition Readiness**
- SRR, SFR, SSR, SCR, IARR, ERR, CRR, PSR, CR, GRR, CDR, GCR, SRRs, SDRs, PDRs, CDR/EDR, PSR, GRR, SRRs, PSR
*(U) Solution Epics are not decomposed from Function Level requirements. The Solution Epics will be mapped to the Function Level requirements they cover to provided a trace to the allocated baseline.*
(U) Program Increment Demos

- Pre-Planning Increment for Release Train X
- Pre-Planning Increment for Release Train Y

Release 1
- Integrate, Test and Demonstrate
- Simulators or Early Releases

Release 2
- Integrate, Test and Demonstrate

SRR - PDR - CDR

Waterfall Delivery A

Graphic is Unclassified
GED Agile Development Day 2019

(U) Solution Demonstrations
The CI/CD Panacea … but does this make sense?

• Proposed Objectives for SI and TTO Team
  1. Root cause analysis WRT problems in the SI and TTO phases in an Agile/DevSecOps world
  2. Barriers to adopting changes in the SI and TTO phases and how to overcome
  3. What makes sense in terms of SI/TTO phases, DevSecOps, and Critical systems?
     • How are commercial critical systems treated? (pacemaker, high-speed financial transactions, others)

• Discussion Topics
  • Concepts of Roll-back/forward for error and problem recovery
  • Agreeing on the level of (automated) test that is sufficient to reach ops
  • What level of human interaction is right?
  • Are there multiple approaches that make sense depending on the nature of the system?
Parallelization across all phases enables new capabilities to reach operations faster … but still has imposed limits from SI, test, and TTO

- Also requires that changes are identified at “byte-sized chunks” vs. the large knife-switch style cutover events that predominate govt programs

Progression takes into account current scope of national programs and differing organizational requirements/limitations involved in delivering new capabilities to an operations group
Open Dialog

Additional Topics for Consideration

Actions & Next Steps

No-Host Social
2020 NRO IAWG Objectives & Goals

- **Objective 1: communicate existing material across Community**
  - Goal 1: Community engagement: 1 per quarter per team
  - Goal 2: Major conference/event beyond GEOINT
  - Goal 3: NRO Government attendance at GEOINT 2020 Joint Session
  - Goal 4: obtain GED feedback on Agile Dev Guide comments

- **Objective 2: broaden our collective voice**
  - Goal 1: increase engagement across IAWG membership
  - Goal 2: increase & enhance interactions with USGIF Board and leadership

- **Objective 3: Refresh Charter**

- **Objective 4: Establish Joint NAWG/NIAWG Action Team**
NRO IAWG Contact Information

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