



# FVAP Update

Technical Guidelines Development Committee

NIST-EAC

Dec 15<sup>th</sup> 2011



# Demonstration and Pilot Projects

- **DoD required by law to conduct electronic absentee voting demonstration project**
  - 42 USC 1073ff note; 2002 and 2005 NDAA's
  - Mandates
    - Cast Ballots through electronic voting system
    - Only Uniformed services voters specified
    - States must agree to participate
    - Report afterwards
    - Statistically significant number of participants
- **DoD allowed to wait for EAC certified guidelines**
  - EAC establishes guidelines
    - EAC also certifies it will assist in project
    - Different requirement than MOVE Act
  - DoD may further delay implementation



## 2011 Research Efforts

Research Initiative	Status
Wounded Warrior-Disability Analysis	<b>Complete</b>
Wounded Warrior-Voting Assistance	<b>Complete</b>
Wounded Warrior-Operation VOTE	<b>Complete</b>
VSTL Testing-UPPTR	<b>Complete</b>
Penetration Testing	<b>Complete</b>
2012 Grant Programs-Pilot programs	<u>Ongoing</u>
Cyber Security Review Group-FED only	<u>Ongoing</u>
UOCAVA Solutions Summit-Public	<u>Ongoing</u>



# Wounded Warrior Research Initiative-Disability Analysis

**Purpose:** To analyze voting assistance requirements for wounded and injured military voters

- **Individual Interviews:**
  - Wounded Warrior
  - Voting Assistance Officers
  - Coordinated with EAC and Heroes Grant recipient
  
- **1<sup>st</sup> Phase:**
  - Over 100 interviews
  - Assess current level of accessibility and engagement with Voting Assistance Program
  
- **2<sup>nd</sup> Phase:**
  - Execution of Operation VOTE
  - Validate research findings
  - Observe usability challenges with existing fvap.gov tools and EVSW implementation



# Wounded Warrior Research Initiative-Disability Analysis

Results	Recommendations
<p>Both IVS and EBDS platforms were highly rated for usability</p>	<p>Conduct additional testing of IVS and EBDS systems in both VSTL and operational testing environments</p>
<p>Some users had problems with complex log-in procedures, changing display features, instructions and warnings, navigation, and scrolling</p>	<p>Share recommended changes with system vendors:</p> <ul style="list-style-type: none"> <li>• Simplify log-in procedures</li> <li>• Clarify instructions/warnings</li> <li>• Minimize scrolling</li> <li>• Label icons for navigation</li> <li>• Create links to return to particular races from the verification screen</li> <li>• Create built-in audio ballots and touch screen functionality</li> </ul>
<p>The UPPTR had inconsistent organization, redundant and vague requirements, and a lack of requirements related to cognitive disabilities</p>	<ul style="list-style-type: none"> <li>• Encourage EAC/NIST to adopt consistent Requirements numbering</li> <li>• Condense redundant requirements</li> <li>• Separate distinct requirements</li> <li>• Add requirements for cognitive disabilities for systems designed for disability access</li> </ul>



# VSTL Testing

**Purpose:** Establish System Security Baseline

- Evaluate the quality of testing across VSTLs
- Evaluate the sufficiency of the UOCAVA Pilot Program Testing Requirements
- Identify common gaps across vendors
- Establish a baseline on how well vendors are complying
- Limitations
  - No source code or Technical Data Package Review
  - No remediation or retesting

**Execution:**

- FVAP Funded Testing at Wyle Laboratories, Inc. and SLI Global Solutions

<u>EVSU Systems</u>	<u>Voting Systems</u>
Credence	Dominion Voting
Democracy Live	ES&S
Everyone Counts	Scytl
Konnech	



# VSTL Testing Results

Results	Recommendations
No systemic issues noted	
The VSTLs interpreted some of the requirements differently and used differing definitions for “Not Tested” and “Not Applicable”	Better define “Not Tested” and “Not Applicable” – reiterates need for central authority
Labs reported pass/fail at different levels (i.e., overall test vs. individual test elements)	Standardize VSTL reporting to ensure consistency across products and labs
Portions of the UPPTR can be applicable to web based solutions, but may need adjustment	Section 5 of the UPPTR can be used as a foundation for web based voting systems with modifications
VSTLs reports were widely different in formats	Standardize VSTL reporting to ensure consistency across products and labs



# Penetration Testing

**Purpose:** Evaluate the sufficiency of the UOCAVA Pilot Program Testing Requirement, identify common vulnerabilities across vendors and evaluate methods of penetration testing

**Methodology:** Active Penetration Testing

- Conducted during “mock” election with votes being cast online
- Dominion Voting, Everyone Counts, and Scytel systems
- Two Red Teams:
  - Air Force Institute of Technology Center for Cyber Space Research
  - RedPhone, LLC
- 72-hour testing period
- Limitations
  - No Denial of Service Attacks
  - No social engineering
  - No attacking of business systems on the same network



# Penetration Testing Results

Testing Objective	Results
Identity common vulnerabilities across vendors	No successful penetrations
	Intrusion attempts were quickly identified
	Disable non-essential services & ports
	Isolate voting systems from other support and business systems
Evaluate methods of penetration testing	Future tests need to be > 72 hours
	Future efforts need to reflect actual threat environments



# EASE Grants

## Electronic Absentee Systems for Elections (EASE) Grants

- Multiple competitive awards totaling \$16,200,000
- State and local governments
- Full Grant **notice available from [www.Grants.gov](http://www.Grants.gov)**
  - Announcement Number BAA HQ0034-FVAP-11-BAA-0001
  - Or go to Grants.gov and search under “FVAP” keyword search
- **Applications closed 13 July**

## Technical Criteria

- **Significance:** Addresses key problems
- **Sustainability:** Available beyond term of grant
- **Impact:** Number of UOCAVA voters served
- **Strategic Approach:** Well-defined hypothesis and plan to test validity of hypothesis
- **Innovation:** Discovery or implementation of new technologies
- **Scalability:** application across jurisdictions
- **Collaboration:** Involvement of other election jurisdictions/partners
- **Cost Benefit Analysis:** Anticipated ROI (Return on Investment)



## EASE Grants Status

- 8 Grants Awarded
  - NY, OH, MD, NJ, VA,
  - King Co, Okaloosa Co, Santa Cruz Co
- 17 Grants in Process, possibility of more
- Emphasis was on technical innovation, enduring solutions, and population of voters affected
- No funding of voted ballots electronically in live elections



# Cyber Security Analysis Group

- Government-only Review Group
  - Provides independent review and advice on FVAP efforts
  - Reviews cyber security efforts in support of the remote electronic voting demonstration project

NIST	EAC
FVAP	FBI
Air Force Institute of Technology	Defense Information Systems Agency
Defense Intelligence Agency	Defense Technical Information Center
National Security Agency	Naval Research Laboratory
DoD Chief Information Officer	Under Secretary of Defense (Personnel & Readiness)

- Expect validation for FVAP-Demo Project CONOPS in early 2012



# UOCAVA Solutions Summit

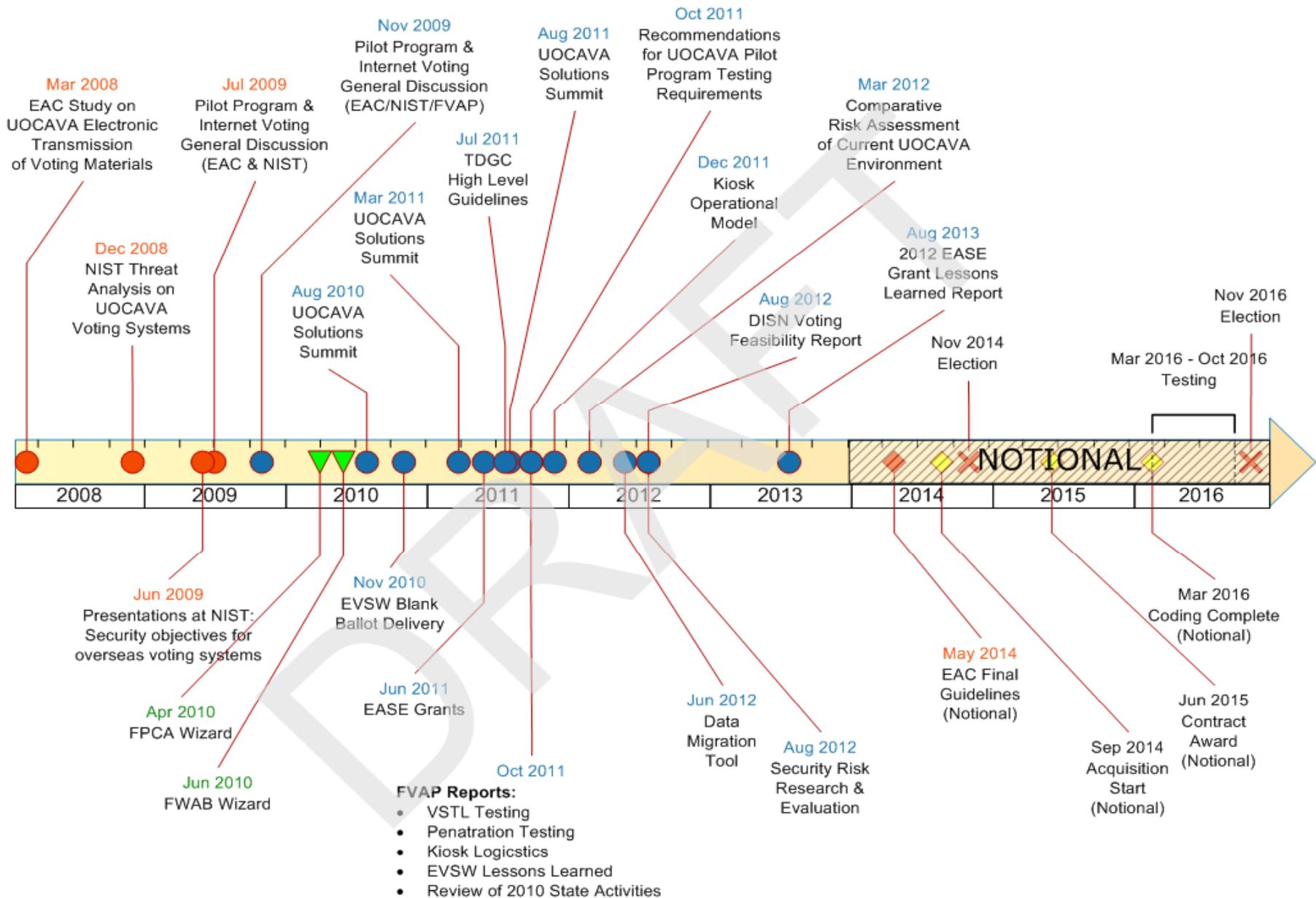
**Purpose:** Provides for an open dialogue and exchange of ideas on electronic voting properties and build out of risk matrix for current UOCAVA absentee voting environment

**Invitees:**

- Public advocates and critics
- Advocacy groups
- Service providers
- Government agencies

**What's New:**

- Last meeting - San Francisco, 6-7 AUG 2011
  - Good discussion. Idea to create an open competition (similar to AES/SHA-3) could provide workable solutions at lower cost, with greater transparency and participation.
  - FVAP is investigation potential partnership with the Defense Advanced Research Projects Agency (DARPA) to conduct competition.
- Meeting Aug 4-5, 2012 in Bellevue, WA (Prior to EVT/WOTE and USENIX)



**Timeline for discussion only – not approved by DoD, EAC, or NIST**

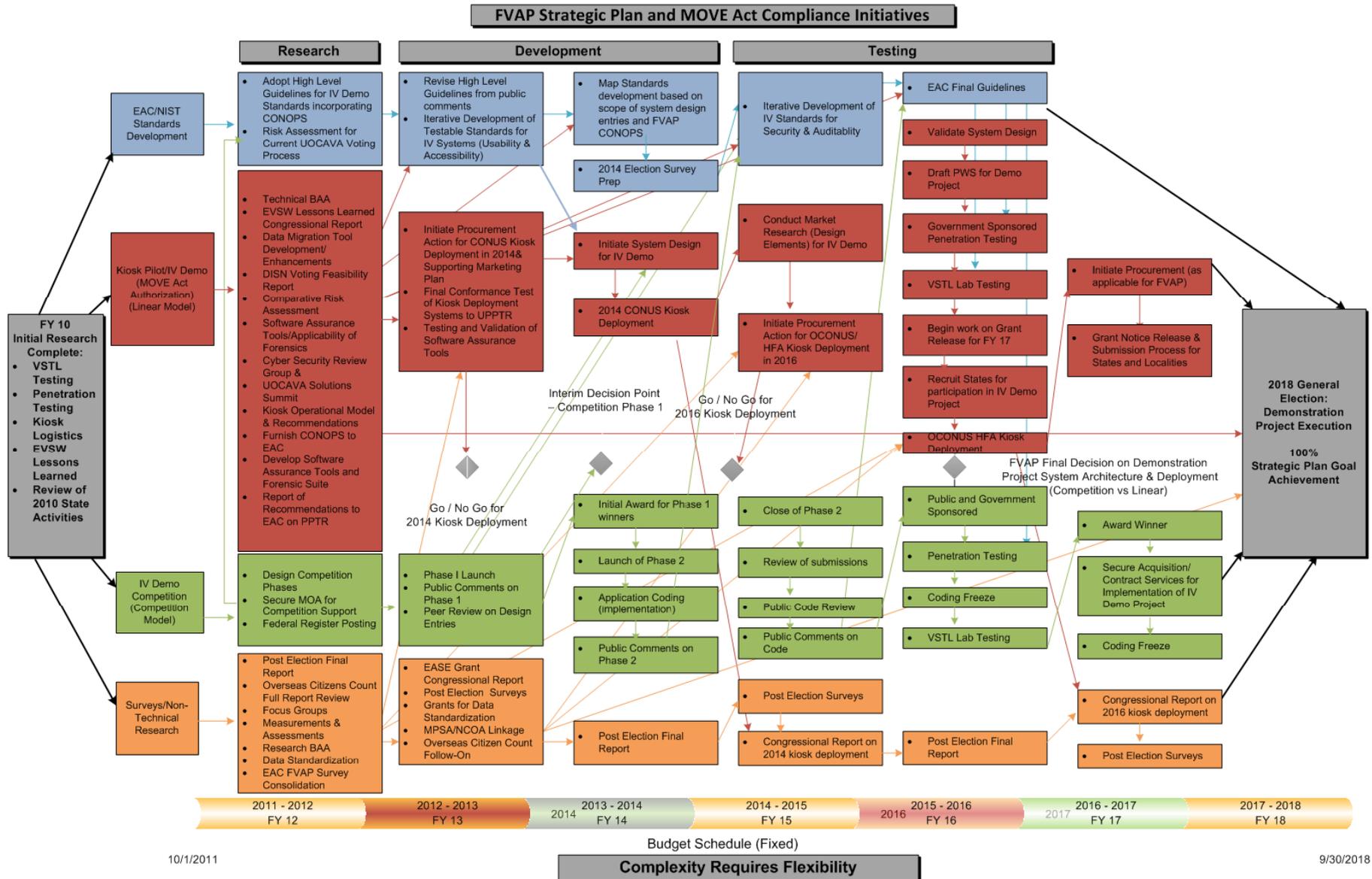


# Public Competition Concept

## Fully open competition

- **Concepts and architectures are submitted**
  - Full public review and comment
  - Source code disclosed
  - Government review and selection to next phase
- **Competition Phases**
  - 1<sup>st</sup> phase (NOTIONAL): CONOPS/HLG serve as guidance
  - 2<sup>nd</sup> phase (NOTIONAL): Usability standards applied
  - 3<sup>rd</sup> phase (NOTIONAL): Demonstration Project Execution
- **Multi-phase over 5 years**
  - Concept / architecture
  - Implementation
  - Demonstration

# Notional FVAP Roadmap





## Research Plans for 2012

Activity	Status
<b>Technical/Non-Technical Broad Agency Announcement (BAA)</b>	Research based acquisition strategies
<b>Data Migration Tool</b>	Currently revising and reviewing approach
<b>NIPRNet Voting Feasibility Study</b>	Requirements for kiosk & IV Demo implementation using DoD PKI/CAC
<b>Comparative Risk Assessment</b>	Quantify level of risk between existing and IV system
<b>Software Assurance Tools and Forensic Suite Development</b>	Define mitigation strategy and scope positive assurance mechanisms
<b>Kiosk Operational Model</b>	Review 2014 and 2016 models for final "Go/No-Go"
<b>Data Standardization for Candidate/FVAP Survey</b>	



# Comparative Risk Assessment

- **FVAP plans to conduct a Comparative Risk Analysis**
  - EAC Risk Assessment Tool and NIST Risk Management Framework
  - Initial Risk Assessment by MAR 2012 (?)
  - Comparative Risk Assessment by AUG 2012 (?)
  - Contingent upon contract support
- **Assess risks associated with the current UOCAVA Voting Environment**
- **Compare to risks associated with remote electronic voting**
- **TGDC Support Needed**
  - Review methodologies
  - Comment on preliminary results
  - Incorporate results into High Level Guidelines



## FVAP Next Steps

1. Complete the comparative risk assessment-incorporate TGDC/EAC assessments
2. Incorporate and Coordinate FVAP findings from FY 10 and FY 11 research into standards development
3. Formally revise Joint EAC-NIST-FVAP Roadmap to reflect 2018 implementation and synchronization



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