

TTA #14: Software Assurance MarketPlace (SWAMP)

Cyber Security Division 2012 Principal Investigators' Meeting

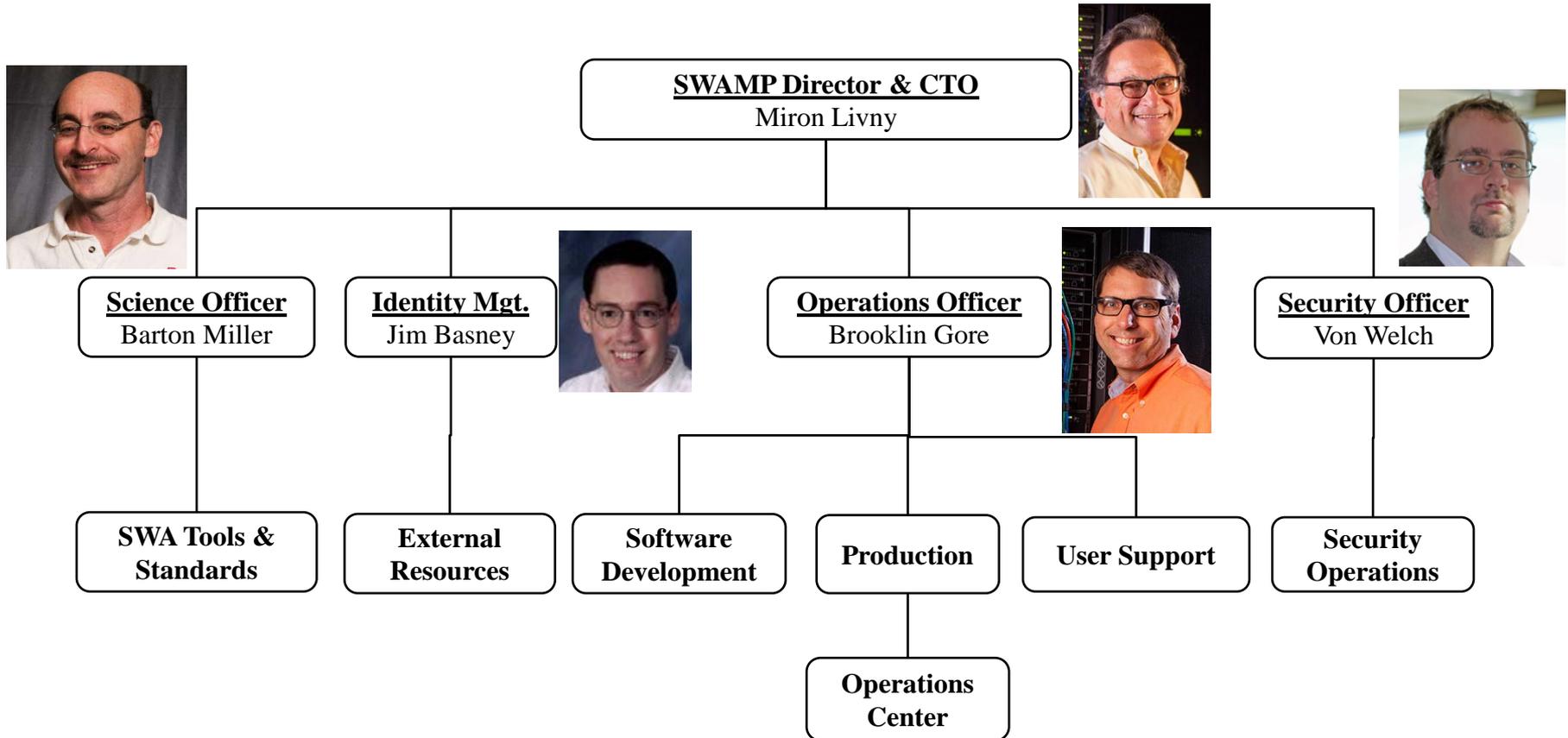
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The SWAMP Team

- Morgridge Institute for Research (lead)
 - **Miron Livny**, *Director and Technology Officer*
 - **Brooklin Gore**, *Operations Officer*
- Indiana University Pervasive Technology Institute
 - **Von Welch**, *Security Officer*
- University of Illinois at Urbana-Champaign NCSA Cybersecurity Directorate
 - **Jim Basney**, *Identity Management Lead*
- University of Wisconsin–Madison Middleware Security and testing group
 - **Barton Miller**, *Science Officer*

Organization



Need for an Infrastructure

Specifically, TTA#1 solicits **ideas** for research and development of new tools and methods for software analysis, and for applying new and existing capabilities in test and evaluation activities. This TTA (#14) focuses on the **research infrastructure** necessary to enable these software quality assurance and related activities.

Our Vision (from proposal)

The success of a market depends on the quality of goods offered by **producers** *and* the ability and willingness of **consumers** to use these goods. When producers and consumers **meet** at the marketplace, they form a complex web of interactions that drive supply and demand. For the market to thrive, this web of interactions needs to sustain growth in supply *and* demand.

All about Sharing (from the proposal)

Researchers who develop new SWA tools and methodologies will use the repositories and cyberinfrastructure offered by the SWAMP to improve their technologies and tools, while **software developers** and adopters will use the same services to hunt for vulnerabilities in their software. **Educators** will use these services to offer hands-on experience in SWA techniques to their students. By facilitating the **sharing** of tools, techniques, information, experiences, and resources, **the SWAMP will: 1) help advance the quality and adoption rate of SWA tools, 2) lower the threshold for using them, and 3) make it easier to interpret and use their output.**

You are the key!

- **We need your guidance** – which tools, which packages, which policies, which topics, which platforms, how much capacity?
- **We need your involvement** – help with tools, software packages, standards, technical literature, seminars, training.
- **We need your feedback** – the good, the bad, and the ugly

Contact us at info@cosalab.org

Research Infrastructure

User Communities

SWA Tool
Developers

SWA
Researchers

Software
Developers

Educators
& Students

Infrastructure
Operators

SOFTWARE **ASSURANCE** MARKETPLACE

Software Packages

Assessment Tools

Assessment
Reference Data Sets
(ARDS)

Analysis
Results

Continuous Software Assurance Lab (CoSALab)
powered by Metronome

Supporting Services:
User Support, security, training, best practices, etc.

Leverage

- **Four repositories** – SWA Tools, Software Packages, Analysis Results, and Vulnerability Datasets – will be built around a **continuous SWA laboratory** (CoSALab) that will provide the resources and automation needed to analyze 275 million lines of code per day.
- CoSALab will **leverage** over 6 years of software development and experience gained from building and operating an NSF funded, continuous software integration facility.
- The SWAMP will **build** on the design, software, and experience of the Build and Test Facility (BaTLab) at the University of Wisconsin-Madison.
- The CoSALab will be hosted at a **state-of-the-art data center** to meet the security, privacy, and confidentiality needs of the SWA community.

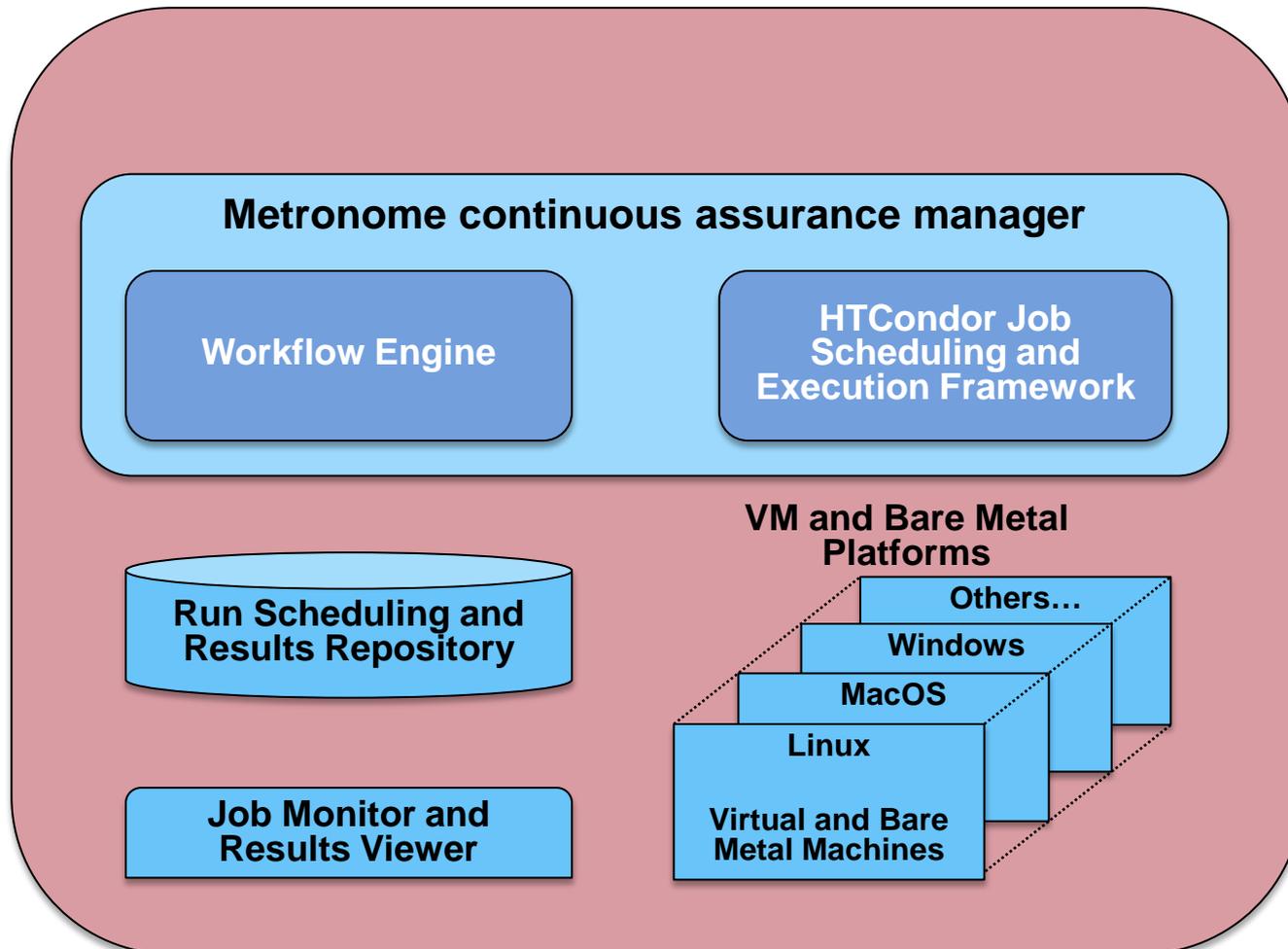
100+ Packages

Initially the SWAMP will provide tool developers a suite of 100 open source packages that they can test against, as well as allowing them to bring their own packages to accommodate special needs. In Year 3 we will augment, in close collaboration with the SAMATE effort, these packages with Verified Analysis Reference Datasets (VARDS), which are software packages with verified, documented vulnerabilities that provide clear measuring sticks against which developers can evaluate their progress.

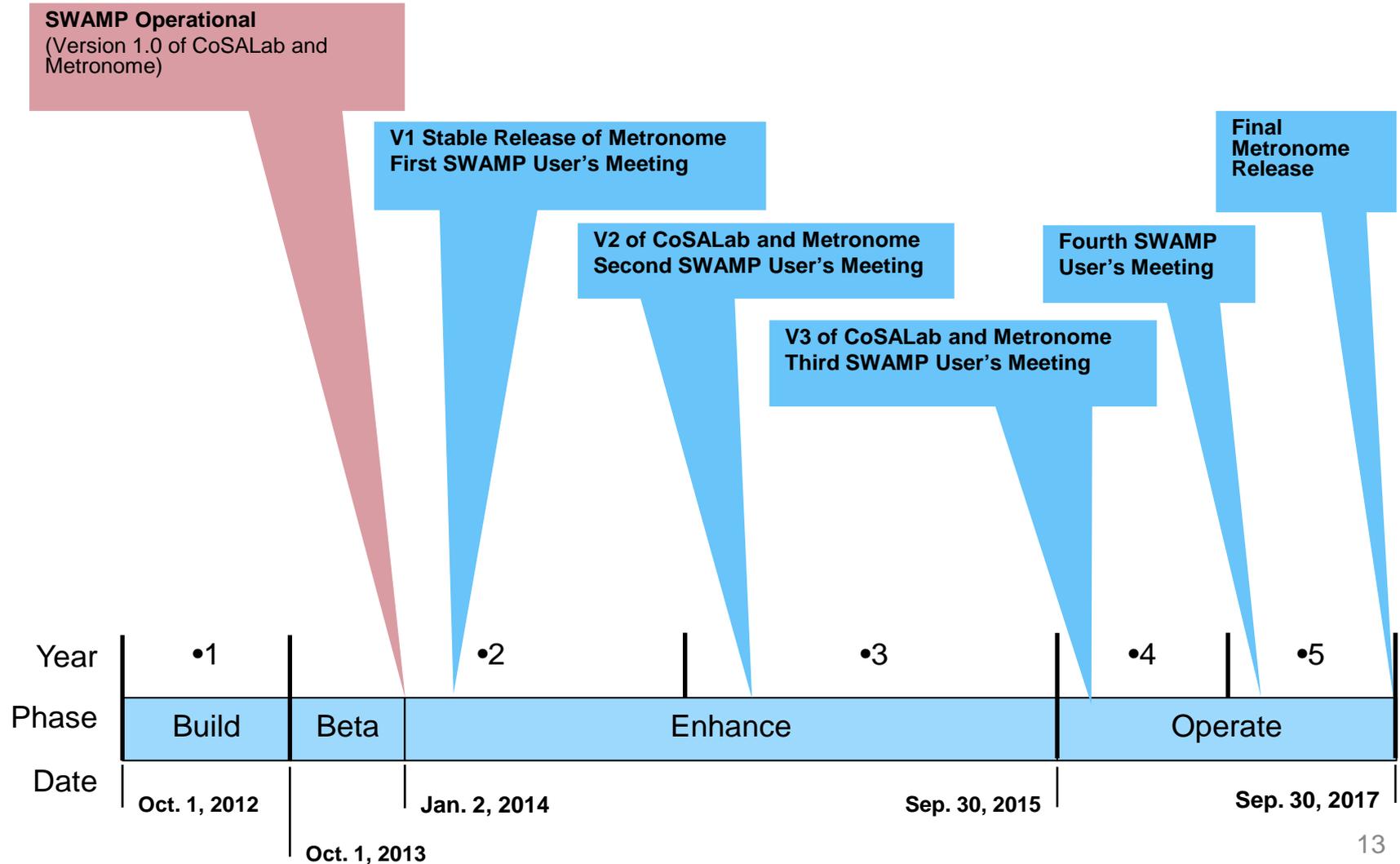
Continuous Assurance

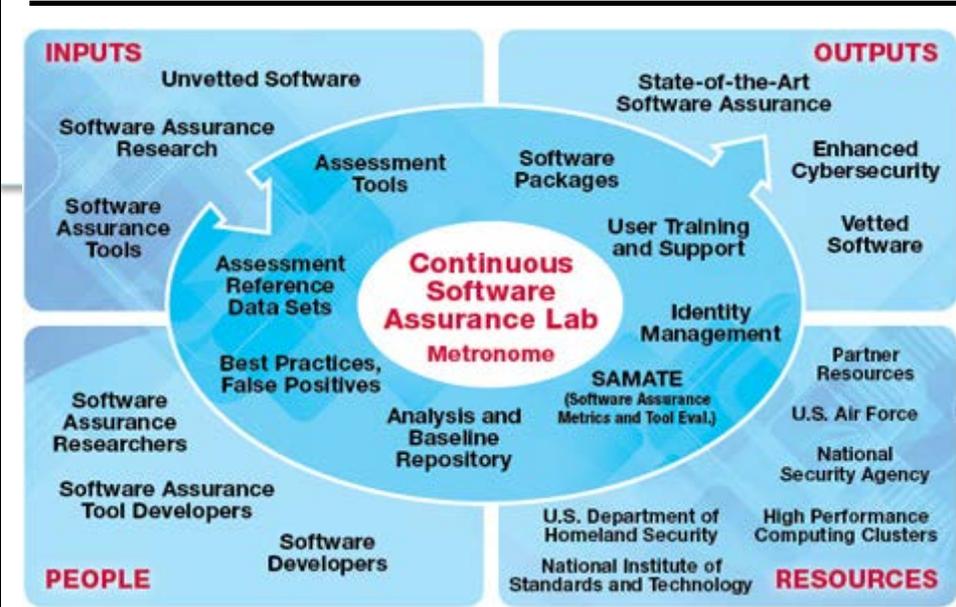
Provide the ability to create workflows, which apply one or more tools to one or more software packages. These workflows can be run repeatedly (e.g., nightly using the latest tools or packages from the head of a source code repository), with the results automatically shipped through secure channels to the developers, or compared at the SWAMP against historical results, results of other workflows, or known vulnerabilities of reference cases.

Extensible and Flexible



Milestones and Schedule





Operational Capability:

- Performance Metrics and targets:

Metric (Lines of Code/Day)	Build Package	Test Package	Static Analysis of Package
Target	>45M	>45M	>275M

Key BAA goals addressed by proposal:

- Provides a multi-platform facility to run multiple vulnerability assessment tools against multiple SW packages in parallel
- Provides a secure, web-based workflow management & execution system integrated with available inputs and normalized outputs.
- Provides a managed, integrated service coordinated with DHS S&Ts HOST initiative and appropriate staffing to maintain and enhance services to meet evolving customer requirements.

Proposed Technical Approach:

- **How meets and/or exceeds the BAA requirements/goals:**

•Morgridge host facility perfectly aligned with Market Place mission. Team brings extensive public/private experience. Leveraging broad, proven software and operational infrastructure.

- **Tasks to be performed for base period:**

•Enhance Metronome, build knowledge base schemas and results repositories. Deploy infrastructure. Stand up identity management services, web interfaces and databases. Populate baseline repositories. Deliver training and activate operation center.

- **Current status of the proposed technology:**

•Condor, Metronome, CILogon, initial analysis tool set and software packages are in broad use and available to project.

- **Related ongoing effort by Morgridge Institute for Research:**

•Pursuing “Discovery to Delivery” mission since 12/2010 with cyberinfrastructure focus. Data center is ready to host SWAMP.

Schedule:

Year	1	2	3	4	5
What	Ramp	IOC:11/1/12	Update	Run	Run

Deliverables (at IOC):

- 5 SWA tools running against 100 SW packages on 16 platforms
- Authenticated web access with training materials and 24/7 NOC
- 528 CPU cores, 150TB storage, redundant network connectivity

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Success (from the proposal)

The success of the marketplace will be measured by its ability to attract and sustain SWA tool researchers and developers, software developers and users, and facilitate the improvement of SWA tools and the assurance of software packages.

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