Automating Security in DevOps Pipelines

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Healthier Lifestyles

• Helping our customers and our community live healthier lifestyles since 1853

• In 1954, Aetna ordered our first computer – an IBM 650

• Acquisitions and affiliates:
  • Medicity in 2011
  • iTriage in 2011
  • Coventry in 2013
  • bswift in 2014
  • Many many others...

• Some affiliates have been practicing DevOps since their inception – without knowing it
What does DevOps Mean for Security?
An Unprecedented Opportunity

- Everyone supports the goals of the Business
- Automation and Tool Adoption
- Creativity, Collaboration and innovation
- Repeatable Processes
- Resiliency/Scalability
- Continual Feedback
- Anyone can commit to production – as fast as possible
- Application as Code / Infrastructure as Code / Security as Code
- Reduction of production operational impacts
- Easily auditable processes
- React Quickly to Software Vulnerabilities and their remediation

DevOps supports the vision of a continuous delivery culture, and the addition of security controls into an automated environment.
success = people * process * tools
# Program Overview

## Investing in People

<table>
<thead>
<tr>
<th>People</th>
<th>Process</th>
<th>Technology</th>
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</thead>
<tbody>
<tr>
<td>Enhance current CBTs</td>
<td>Establish Gates</td>
<td>ARA – Threat Modeling</td>
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<tr>
<td>Engage Security Champions</td>
<td>Defect Management</td>
<td>Static Analysis / Open Source Security</td>
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<td>Cross train Security staff</td>
<td>Risk Management</td>
<td>Dynamic Analysis / Ethical Hacking</td>
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<tr>
<td>Engage APLC / Agile teams</td>
<td>Real time KPI</td>
<td>Container Security</td>
</tr>
<tr>
<td>Invest in QA Maven program</td>
<td>Governance</td>
<td>Run time protection</td>
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...will yield significant benefits

...and will result in an **improved security posture**

### Aetna’s Current State

- **SDLC**
  - APLC, SAFe, SRWs
- **Security findings**
  - Software defect management is separate from Security findings
  - Security findings not part of the SDA data mart

### Aetna’s Future State

- **DevOps**
- **Consistent and real time defect Management**
- **Powerful data and analytics to drive down defect density, improve security posture, and identify threats**
**Value:** Ensuring a trained and motivated security community is critical to successfully implementing security in a DevOps process

- **Attack & Educate**
  - Attack & Educate forums have been very well attended. Continue hosting these sessions
  - Invite DevOps teams to educate the Security maven community on security related initiatives

- **Security Maven**
  - Security Mavens can share information if there are easy ways to collaborate
  - Improve the SSG site on Jive and other enterprise platforms
  - Restart the SSG Newsletter

- **CBT**
  - Re-evaluate all the current CBTs to ensure content is current

- **ILT**
  - Offer a comprehensive instructor led class on security aspects of DevOps
  - Continue supporting the Security Maven Belt program
Building Security into the Process

**Value:** Ensuring a process where security artifacts are built into the SDLC is critical in ensuring the delivery of secure software across the enterprise

- **SDLC gates**
  - Establishing security gates in the DevOps process is critical in ensuring that security tests pass prior to code being promoted to following stages
  - APLC teams must be engaged to ensure that gates are understood and enforced uniformly

- **Defect Management**
  - Transparent defect management ensures timely mitigation of security defects
  - Security defects must be triaged like any other software defect. A common defect management dashboard must be developed

- **Real time KPIs**
  - Generation of real time KPIs gives application teams visibility into the current risk posture of their applications
  - Global security will be able to make immediate judgement on risk decisions

- **Security Architecture**
  - A comprehensive security architecture standard that addresses current acceptable architectures ensures faster decisions
  - Security Architecture will be able to anticipate any upcoming technologies and fund POCs.
**Specialized Security Tools**

**Value:** While the principles of software security is the same, there are significant differences in technology stacks and the tools we must support to secure each stack.

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<th><strong>Open Source</strong></th>
<th><strong>Static Analysis</strong></th>
<th><strong>Dynamic Analysis</strong></th>
<th><strong>Ethical Hacking</strong></th>
<th><strong>Container Security</strong></th>
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<td>• Open Source Software Management Program has been implemented. Javascript, Java and PHP are currently supported. ~200 applications onboarded. • Plugin to Jenkins has been implemented.</td>
<td>• IDE Based tools used effectively throughout the enterprise. • Centralized SAST offers broad language support with more coverage</td>
<td>• Automated triggers when new applications hit staging and production • Continuous nightly scans • Output exported and injected into our WAF</td>
<td>• Ethical hacking is an intentionally manual test that can take ~2 weeks to complete.</td>
<td>• Implemented toolsets to ensure security of the containers • Notarization and cryptographic signatures • Policy Governance</td>
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</table>
Security in the pipeline...
What are our Goals?

• Integrate Security knowledge and Secure coding practices into our DevOps teams

• Expand the traditional cultural mindset of Security Teams and start getting our hands dirty by coding

• To not just ”automate the scan button”

• Ensure that software passes through a well defined and automated set of gateways that assess code security

• Utilize automation to stop or pause the delivery pipeline when critical vulnerabilities are detected or manual intervention is necessary.

• Provide development teams with not just vulnerability information, but with actionable remediation guidance

• To not forget about software after production deployments. You are only as good as your last security assessment

Security pros need to code too! Code your security into the pipeline and go enjoy a cold beer with the #DevOps peeps.

#SecurityAsCode #IaC
Is Agile “agile” enough?

Agile

Cycle Time: Weeks - Months

10 – 20 Releases

Your imagination is the limit...

DevOps

Cycle Time: Minutes - Hours

The faster you can deploy to production, the quicker you can remediate critical vulnerabilities and zero days

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Faster Cycle Times, Increased Flow

Embed controls into the applications/platforms
- Runtime Application Self-Protection (RASP)
- Container Security

Manual Security Testing (out of band)
- Dynamic Assessment
- Ethical Hacking
- App Red Team

Automated Security Testing (in band)
- Automated SAST/DAST, etc.
A *moment* in the life of a feature
...coding **Security** in without *disruption*
Challenges

- **Integration of Security tools in a manner that supports objectives for actionable continuous feedback**
  - Choosing the toolsets that provide as least disruption as possible to DevOps teams.
  - Extracting the proper KPI’s and indicators from the process and making them actionable.
  - Tailoring the People, Process, and Tooling to unique environments
  - Evolving the habits of 3,500+ developers
  - Traditional infrastructure mindsets. There’s a new way of doing things
  - Multiple “flavors” of DevOps in different parts of the organization
Key Takeaways

• Don’t fear deploying rapidly and often into production.
• Always gather information in the form of KPIs and make them ACTIONABLE
• Support the organization with tools, techniques, and best practices
• Automate. EVERYTHING.
• Defects are defects - regardless if they are a code defect or security vulnerability.
• Code your Infrastructure – eliminate access to physical or cloud based machines
• Choose tools that interfere minimally with flow. Manual tasks like penetration testing should be done out of band
• People turn dreams into reality

Use automation to enable traceability of production bound features and deliverables.
Thank you!