Wild, Wild West

How to Corral All Your Developers into Creating Secure Code

Jonathan Beck

Original State

- Static and Dynamic programs are great at finding vulnerabilities.
- Penetration Test performed to deeply inspect applications.
- Provided generic security requirements to all development efforts.
- Correcting found issues was the responsibility of the development team.

Original State Issues

- Defects are discovered at the stage in the development lifecycle in which it costs the most to fix.
- The Developers are expected to halt their current development effort to address vulnerabilities.
- Developers are not given proper support to fix the issues quickly and competently.

Buy the Book

- Best practice sets you in the correct direction but it is not a map
  - Develop Application Security Expertise
  - Application Security Training and Awareness
  - Risk Analysis
  - Threat Modeling
  - SDLC Integration
  - Security Requirements
  - Requirements Validation

Application Security Coaches

International Teams of Mystery

- Over 1,500 Developers
- Located in several countries
- Coding in Java, JavaScript, JSP, C, #, ++, PHP COBOL, Perl, .net
- Using jQuery, Spring, Dojo, Struts
- Lifescycle HP ALM, M. Team Foundation, IBM Rational, Eclipse

International Teams of Mystery

- Supporting 7 major Lines of Business (LOBs)
- 1,000’s of applications
- 1,000’s of financial instruments
- Servicing millions of customers in 19 states
- Like piña coladas and getting caught in the rain
- Organized by LOBs, very little centralized representation

How we sometimes envision “Silos”

Darwin’s Developers

Application Security Coaches

Application Security Coaches

VS

- Background in education
- Focus on building code, not tearing apart
- Working knowledge of all major languages
- Expertise in remediating security vulnerabilities
- There only job is to assist developers

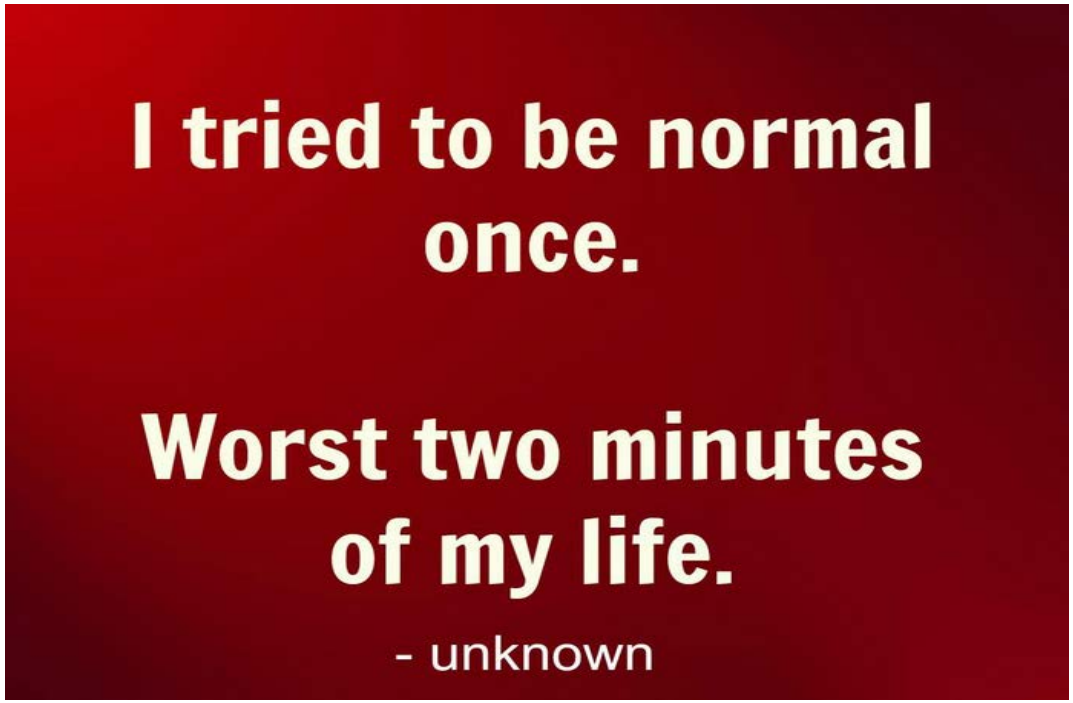
Application Security Training and Awareness

App Security Training and Awareness

- Audience
  - Developers
  - Developing Tech Leads
  - Managers
  - Quality Assurance
  - Business System Analysts
- Initial goal of 5 hours a year
- Training Effectiveness?
  - Live instructor-leb training
  - Virtual classroom with instructor
  - Self-paced computer based training (CBT)
  - Non-electronic courses

The New Normal

- People's preference varied greatly
- Instructor led usually deemed the most effective



- Reoccurring theme was concern over not having enough time to complete training and being forced to take training in a format they do not like

Taking a “Campaign” Approach

- Embracing the reality that one awareness solution is not going to get us to our desired state. Rather we need to create a tapestry of techniques, lining up the best qualities of each to meet the needs of all audiences.
- Nudging not nagging
- Example campaign elements
  - Community Portal
    - An interactive forum administered by Security Coaches to discuss new threats and vulnerabilities,
    - Awareness articles and security refreshers.
  - Communications celebrating team successes

Taking a “Campaign” Approach

- Presentations in senior management meetings
- Executive Support
- Training Program
  - Customized for each role
  - Combination of mandatory and optional
  - Combination of CBT and instructor
  - CBT
    - » Navigation, Voice Acting, Presentation, Coverage, Technical, Interactive, Testing, Service
  - Instructor Led
    - » Topics that have has been identified as best delivered in-person to affect the greatest behavior-change in participants. This will be decided through patterns that appear across development teams, survey results, online feedback, test results, and gaps in CBT

Risk Analysis

Risky Business

- Drives the nature and strength of required security controls
- This is very personal to an organization
  - Risk definition needs to align with other cyber, audit, technology, and enterprise risk designations
- Risk frameworks that can assist
  - Octave Allegro
  - Factor Analysis of Information Risk (FAIR)
  - Dread

Threat Risk Modeling

Threat Risk Modeling

- Process using design documents and usage scenarios to drive analysis from an attacker's perspective
- Goes way past code, past architecture, out to include operational and business practices.
- Identify Trust Boundaries and assess their ability to withstand attack
- Can be very challenging for complex systems
- Requires expertise to facilitate the discussion
- Only perform on systems with high potential impact

SDLC Integration

SDLC Integration

- Create Security Requirements
- Requirements are integrated into design
- Testing is completed on Security Requirements
- Quality Gates in place to ensure completion
- SDLC adherence can range greatly between teams

Security Application Requirements and Validation

Secure Application Requirements

- OWASP Top 10 is great, but…
  - Not cover custom or architectural control
- Move to language and functionality driven requirements
  - Means will need to understand the application a bit more than before
- Requirements need to be maintained as threat environment changes
- Vulnerability scan results need to be folded back into our requirements

Control Validation

- Each security requirement needs to be tested just the same as business requirements
- Failures need appropriate risk signoff

In Conclusion

- Best practice is the start of your journey not the end.
- Go in with eyes open, studying and understanding evolutionary differences. Steamrolling over them trying to get to process nirvana will likely end in ruin.
- The engagement of all the roles we discussed is critical to our continuing battle for the delivery high quality and secure applications.

Thank You

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