DENIM GROUP

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Application Portfolio Risk Ranking
Banishing FUD With Structure and Numbers

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Overview

- The Problem
- Information Gathering
- Application Scoring
- Risk Rank & Tradeoff Analysis
- Discussion
- Conclusion, Next Steps, and Q&A

Some Key Questions for Today's Session

- Where do you start?
- What applications represent the biggest risk?
- What attributes make applications more or less risky?
- What are the most cost-effective way to manage the risk of inherited applications?
- What approaches might work for your organization?

Desired Outcomes

- Understand risk-based options for managing the security of inherited applications
- Develop a framework for ranking risks with specific applications
- Understand some of the decision-making factors that come into play when risk-ranking applications
- Apply one tactic from what you learn today next week at your organization

Personal Background

- Denim Group CTO
- Developer by background
  - Java, .NET, etc

Denim Group Background

- *Professional services firm that builds & secures enterprise applications*
- *Secure development services:*
  - Secure .NET and Java application development
  - Post-assessment remediation
  - Secure web services
- *Application security services include:*
  - External application assessments
  - Code reviews
  - Software development lifecycle development (SDLC) consulting
  - Classroom and e-Learning instruction for developers

What you Don't know CAN Hurt You

- Passion: Get security professionals to ask a better set of questions
- Today's presentation focuses on helping you increase your IQ in the arena of software portfolio risk

Background – the Current State of Affairs

- Creating meaningful enterprise-wide software security initiatives is hard
- The vast majority of info regarding software security focuses on testing software writing more secure code or SDLC process improvement
- Most organizations have hundreds or thousands of legacy applications that work!
  - *They represent money already spent – ROI?*
  - *They are viewed "part of the plumbing" by management*
  - *The codebases can be millions of lines of code*
- Industry is focused on web applications
  - *Other software risks must be taken into consideration*
    - Web services, mobile applications, SaaS, certain desktop applications

Key Facts

- 66% have adopted a risk-based approach to remediation of application vulnerabilities
- 71% have an executive or team with primary ownership and accountability for application security
- 66% have defined communications channels between security, operations, and development teams

  – *Source: "Securing Your Applications: Three Ways to Play," Aberdeen Group, August 2010*

Goal for Our Model

- Transparent – Decisions and calculations should be explainable
- Adaptable – Not every organization has the same drivers, goals or resources
- Practical – Get something that works and iterate

Methodology

- Steal steal steal!
  - *Andrew Jacquith's Application Insecurity Index (AII) from his book Security Metrics*
  - *Nick Coblentz's blog posts on the topic*
  - *Other example spreadsheets, etc*
- Simplify simplify simplify!
  - *Great is the enemy of the good enough*
  - *Any information collected should provide value*
  - *Work in progress*
- Test with organizations
- Repeat

Step 1: Develop Initial Criteria

- Business Importance Risk
- Assessment Risk

Step 2 – Information Gathering

- Build a Portfolio of Applications
  - *Public-facing web sites*
  - *Customer-facing web applications*
  - *Partner-facing web applications*
  - *Internal- or partner-facing web services*
  - *Customer Relationship Management (CRM) systems*
  - *Financial applications*
  - *"Green screen" mainframe applications*
  - *Software as a Service (SaaS) applications*

Step 2 – Information Gathering (Continued)

- Collect Background Information
  - *Development Details*
  - *Vendor (if any)*
  - *Audience*
  - *Hosting Details*
- Assess the Data
  - *Type (CCs, PII, ePHI, etc)*
  - *Compliance Requirements*
- Determine the Scale
  - *Lines of Code*
  - *Dynamic Pages*
  - *Concurrent Users*
  - *User Roles*

Step 2 – Information Gathering (Continued)

- Assess the Underlying Technology
  - *Infrastructure (OS, hardware, etc)*
  - *Platform (.NET, Java, PHP, etc)*
  - *Versions*
- Assess the Security State
  - *Assessment Activity (type, date, etc)*
  - *Vulnerabilities (high, medium, low)*
  - *Protection (IDS/IPS, WAF)*

Step 3 – Application Scoring

- Business Importance Risk
  - *Business Function (customer interface, internal but public-facing, departmental use only)*
  - *Access Scope (external, internal)*
  - *Data Sensitivity (customer data, company confidential, public)*
  - *Availability Impact (serious, minor, minimal, or no reputation damage)*

Step 3 – Application Scoring (Continued)

- Technology Risk
  - *Authentication (methods, enforcement)*
  - *Data Classification (formal approach or not)*
  - *Input / Output Validation (structured or not)*
  - *Authorization Controls (resource checks in place or not)*
  - *Security Requirements (explicitly documented or not)*
  - *Sensitive Data Handling (controls in place like encryption or not)*
  - *User Identity Management (procedures in place for account creation, access provisioning, and change control or not)*
  - *Infrastructure Architecture (network segmentation, patching)*

Step 3 – Application Scoring (Continued)

- Assessment Risk
  - *Technical Assessment (assessment activity, vulnerabilities still present)*
  - *Regulatory Exposure (unknown, subject to regulation)*
  - *Third-Party Risks (outsourced development, SaaS hosting, etc)*

Step 4: Determine Assessment Approach

- Currently using OWASP Application Security Verification Standard (ASVS)
- Determine what you consider to be a Critical, High, Medium, Low
- Determine what assessment approach/standard you want to use

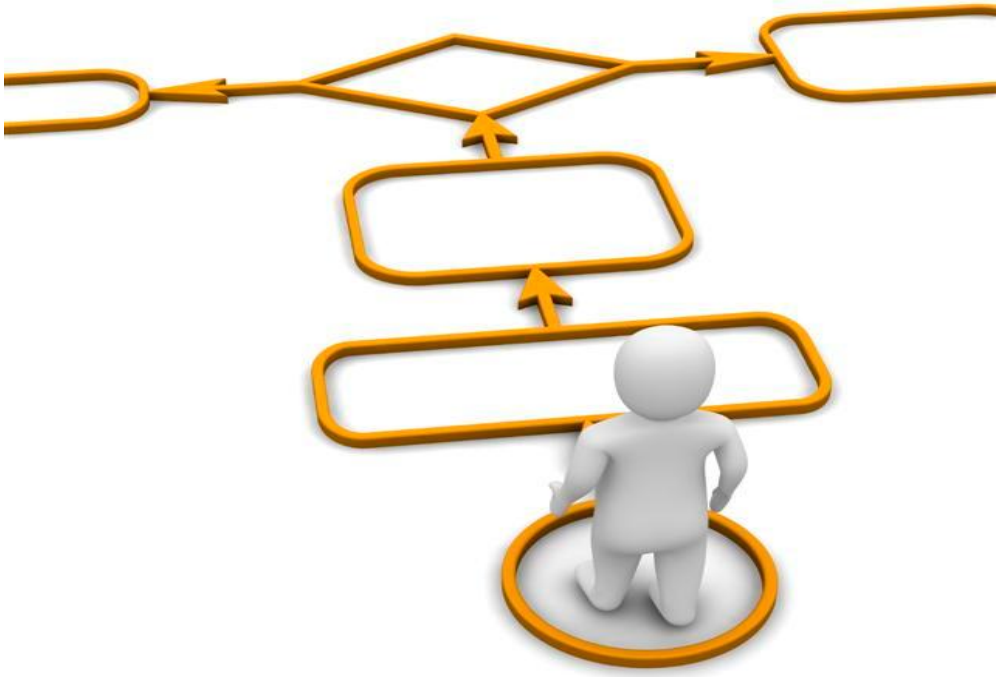
Results Comparison

- Let's analyze our results
- Apply quantitative decision-making analysis concepts
  - *Want to understand what level of effort addresses the highest amount of risk*
- Tradeoff analysis

Evaluation

- Pros
  - *Provides for a structured approach*
  - *Calculations are observable*
  - *Standards can be set for specific organizations*
- Cons
  - *Can seem like a lot of data to collect*
  - *Technology Risk is hard to get at a proper level of granularity*
  - *Excel spreadsheet combines data and code*
  - *Needs work for dealing with "cloud" stuff*

So where do you go from here?



Example Artifacts

- Application Tracking and Risk-Ranking Spreadsheet
  - *What are the applications?*
  - *What are their characteristics?*
  - *How do they rank against one another?*
- Risk-Ranking Planning Spreadsheet
  - *Which applications are critical, high, medium or low?*
  - *How are you going to deal with each application?*

Potential Follow-up Options

- End of Life
- Remediate
- Potential Testing Approaches
  - *Tailoring to Documented Risk*
  - *Work identified list from top to bottom*
- Application Security Verification Standard (ASVS)
  - *Levels of application-level security verification that increase in breadth and depth as one moves up the levels*
  - *Verification requirements that prescribe a unique white-list approach for security controls*
  - *Reporting requirements that ensure reports are sufficiently detailed to make verification repeatable, and to determine if the verification was accurate and complete.*

What you can do now!

- Collect or scrub your initial application inventory
- Develop relationships with 3rd parties who can help you through the identification process
- Find a peer that is conducting the same risk ranking
- Familiarize yourself with OWASP OpenSAMM and OWASP ASVS

Conclusion

- Managing the security of inherited applications can present the most severe headaches for someone building a software security program
- A risk-based approach is really the only economically feasible approach given the size/complexity of the problem
- Understanding certain attributes of inherited applications is critical to applying a risk-based management approach

Resources

- “Web Application Security Portfolios, *ISSA Journal*, May 2009, Coblentz, Nick.
- Open Web Application Security Project Open Software Assurance Maturity Model, www.owasp.org
- Open Web Application Security Project Application Security Verification Standard, www.owasp.org
- “How-to-Guide for Software Security Vulnerability Remediation,” Dan Cornell, Denim Group, October 2010
- Cloud Security Alliance
- “Securing your Applications,” Aberdeen Group, Brink, Derek, August 2010

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Email me for a copy of the example Excel spreadsheet