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SECURING THIRD PARTY SOFTWARE

Objectives

- Define third party software
  - What it is, why we use it
- Define the risks from third party software
- Identify tools and techniques for addressing the risk
- Connect tools with the right situations
- Explore one possible approach

Software Ecosystem

Also Known As: Software Supply Chain Risk

- Studied by Software Engineering Institute (SEI) and University of Maryland
- Who supplies code?
- Who supplies labour?
- Who operates software?

Kinds of "Third Parties"

1. Staff augmentation — they work on your premises, they follow your orders
2. Integrated Project Teams — they provide a team; you provide management
3. Contractual — You write contracts; they deliver
4. Service Provider — You buy what they sell

The Problem

You can outsource activities, but you cannot outsource liability

- Risk introduced by software
  - How do we identify it?
  - How do we quantify/qualify it?
- Various activities address that risk
  - How do we conduct those activities in someone else's lifecycle?
  - How do we hold the right people accountable?

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Risks from Software

- Brand and reputation damage
- Non-compliance
- Failures in business logic
  - Lost sales
  - Unauthorised disclosure of data
  - Unavailability
- Actual back doors or vulnerabilities

IANAL, But... (I am not a lawyer)

Popular Open Source Licenses

- Apache
- "Artistic" License
- BSD
- GNU General Public License
- GNU "Lesser" GPL

Possible Implications

- Releasing source code
- Permitting derivative works
- Disclosing origin of software

http://www.opensource.org/licenses

Thinking About the Actors

Them

- Do our vendors have a clue?
  - When designing
  - When coding
  - When operating
- Do they do their jobs well?
- Are their products suitable for us?

Us

- Do we have a clue?
  - Requirements
  - Operations
  - Support
- Are we doing our part well?
  - Integration
  - Compliance

Tools for the Problem

- Assessing capabilities
- Deliverable-based security gates
  - Security requirements
  - Security test plan
  - Threat model
  - Code Scan results w/ defect tracking
  - Security test results mapping to requirements
  - Penetration test results
- Contract-based hooks

Build Security In Maturity Model – BSIMM

For Us

- What do we do?
- How mature are we?
- Where might we put more effort?

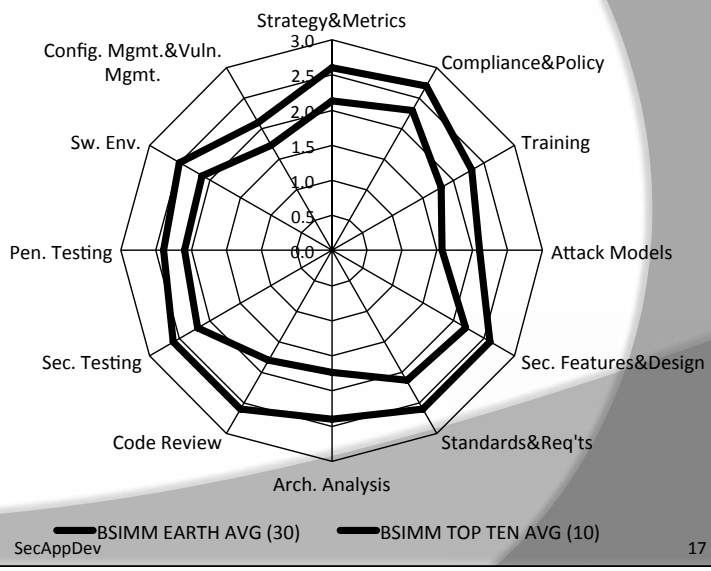
For Vendors: vBSIMM

- Quick / crude measure
- 15 activities
- Very low bar
- Vendors still score poorly

http://www.bsimm.com/

Learning What Others Do

- identify gates
- unify regulations
- know PII obligations
- publish policy
- awareness training
- data classification
- identify features
- security standards
- review security features
- static analysis tool
- QA boundary testing
- external pen testers
- good network security
- incident response
- close ops bugs loop



* ("everybody" = 20 out of 30 firms)

Alternatives to Consider

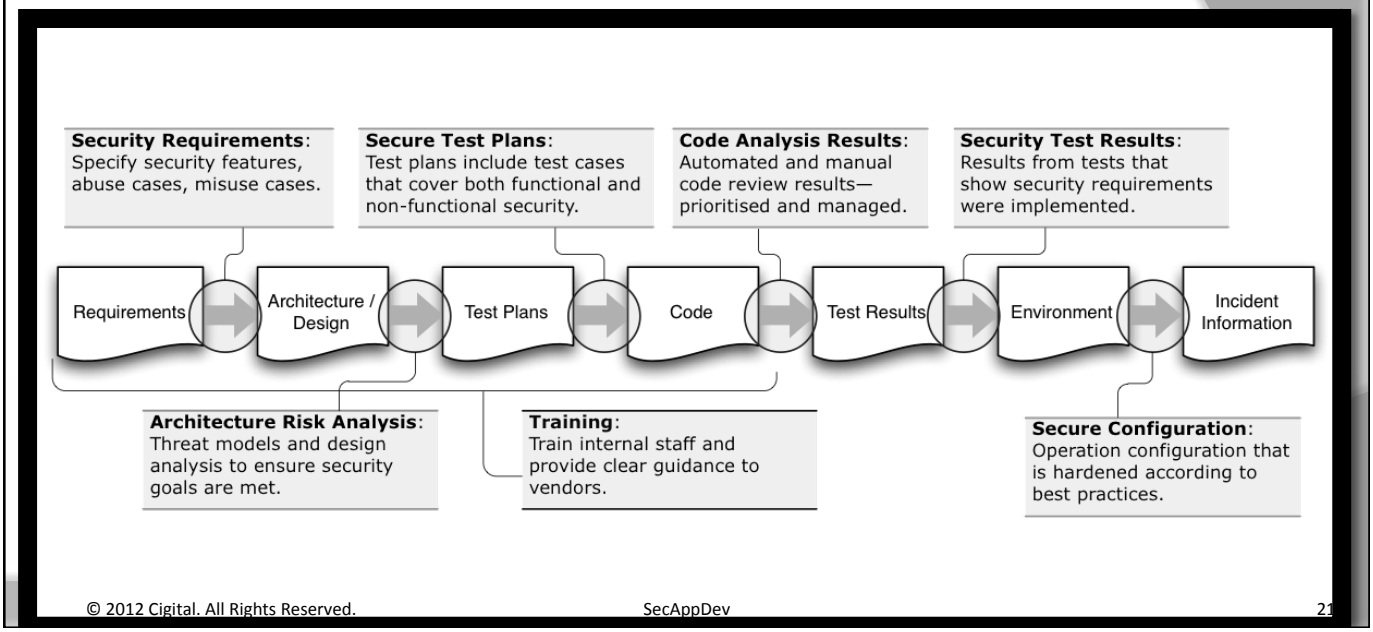
- Microsoft SDL
- OpenSAMM
- CLASP
- Etc.

- Tend to be "prescriptive" not "descriptive"
- Don't help you measure yourself or others

Tools and Situations

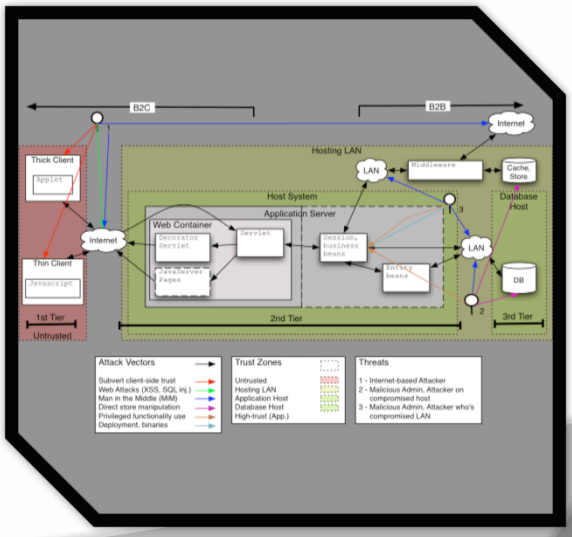
- We can often apply security requirements
  - Very applicable when we specify
  - Harder to enforce in SaaS—limited by vendor's flexibility
- Code scanning is very good evidence
  - Only works when you have code
  - Binary scanning is a poor substitute
- Security testing always possible in UAT
- Pen testing requires cooperation, often limited scope

Touchpoints for Third Party Development



Architecture Deliverables

- Architecture risk analysis
- Threat model
- Test strategy and test plan with security



Use the Source, Luke

- Static analysis
- Defect tracking
- Patch management

- OSS analysis
  - Identify accidental / unknown usage
  - Identify legal obligations

- Static Analysis tools
  - Commercial
    - Fortify
    - Coverity
    - AppScan Source
  - Free
    - CppCheck
    - Findbugs
- OSS Analysis
  - Black Duck
  - Palamida

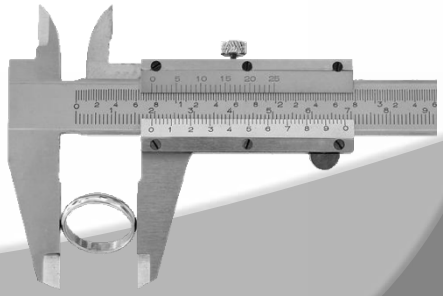
Working with Binaries

- Reverse engineering
  - Good for mobile, embedded, client/ server
  - Not always permitted
- Binary analysis
  - Veracode, etc.
  - Not always successful

- Simulation
  - Run in VM, sandbox, or simulator
- Observation
  - Eavesdropping
  - Proxying,etc.

Security Testing (Not Penetration Testing!)

- Boundary cases
- Negative cases
- Inverted cases off the RBAC matrix
- Identifying undesirable behaviour
- Not "checking"
- Not functional testing
- Exploratory testing is good



Penetration Testing

- Require vendor support
  - access credentials
  - generous time windows
  - etc.
- Require vendor tracking / reporting
  - What will they do?
  - When will they do it?
- Focus on solutions, not problems
  - Not about finding max bugs
  - It's about fixing bugs

Deployment

- Secure configuration
- Change control process
- Coordination with development team
- Upgrades to base platform
- Patch deployment to application

Operations

- Logging, monitoring SIEM
- Incident response
- Vulnerability tracking

Procurement

- Security requirements during RFP / Tender process
- Security questions during vendor selection
- Periodic evaluation of vendor security capabilities
- Security deliverables with functional deliverables

Procurement

- Require source code
- Permit decompiling / reverse engineering
- Permit security testing
- Require significant documentation
- Escrow code if you must

One possible flow

- Figure out which lifecycle stages are out of your control
- Figure out which deliverables are feasible
- Identify mechanisms to enforce deliverables (e.g., UAT, procurement, etc)
- Require deliverables at appropriate stages
- Add to PMO process, if possible

1: Identify Lifecycle Stages

- Which ones are owned by vendors?
- Where do your teams plug in?
  - PMO
  - Project leads
  - Procurement
  - Requirements
  - Integration
  - UAT

2: Identify Practical Deliverables

What?

- What is practical, permissible, measurable?
  - Threat models
  - Code scan reports
  - Pen test reports
  - Defect reports
- Is it objective?
- How much visibility do you get into its creation?

When?

- At major releases?
- At regular intervals?
- On-demand access?
- As it is generated, or after it is reviewed by the vendor?

3: Promote Enforcement

Lifecycle Phases — Promotion

- Create security gates
  - Dev → QA
  - QA → Staging
  - Staging → Production
- Require security deliverables for promotion phase-to-phase
- Enforce security sign-off

Be Pragmatic

- If "security" always says 'no', then "security" becomes a *problem*
- Problems get "fixed"
- Choose battles carefully

4: Institutionalise

Put Security in the PMO

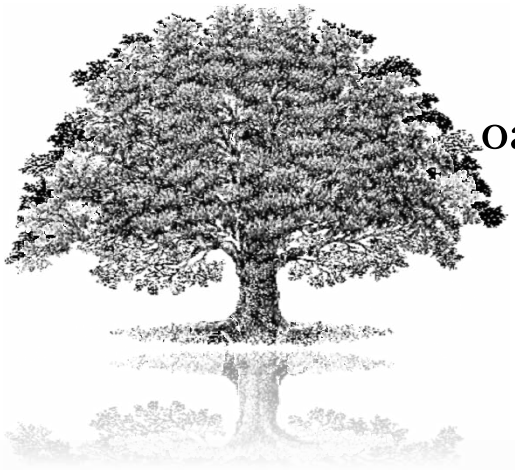
- Make it regular
- Make it understood
- Automate as much as possible
  - Checklists
  - Worksheets
  - Processes

Change Takes Time

- Start small
- Minimise overhead
- Make everything relevant
- Ensure adoption of one small piece before introducing a new piece

Putting it Together

- Identify your vendors and sources of third party software risk
- Understand your competency and theirs
- Determine ownership of lifecycle phases
- Identify security deliverables for each phase
- Gradually work them into your process



The best time to plant an oak tree was twenty years ago.

The next best time is now.

—Ancient Proverb

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