Making the Future Secure with Java

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About Me

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- **Role** – Java platform strategy, vision, features, internal, external communications
- **Background** – 20+ years of programming and specializing in security
- **Former Employer** – Yahoo! Lead security for the User Data Analytics property. Run enterprise triage program.

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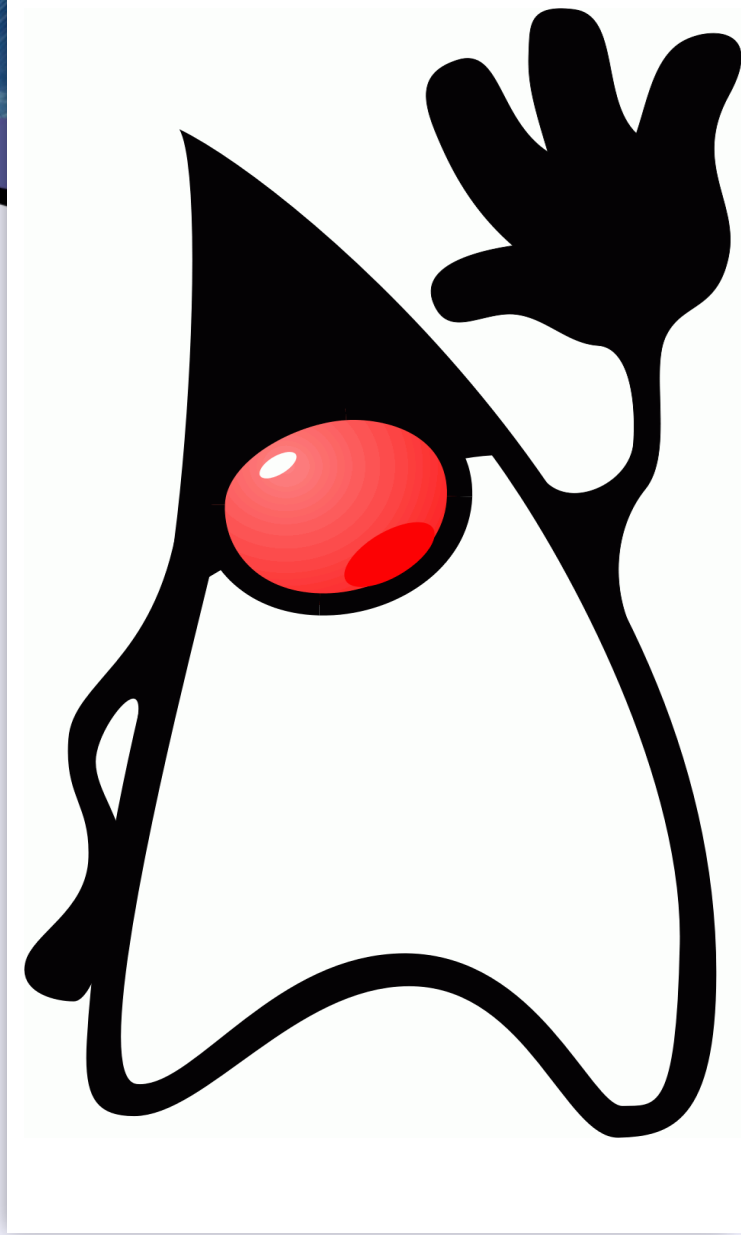
Program Agenda

- Brief Java Primer
- Security Policies & Program
- Platform Remediation Progress
- Security Features Delivered
- Call to Action

Brief Java Primer

Java is useful in many different ways…



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What is Java?

An application platform, but what does that mean?

- **Specifications** – Java Community Process (JCP) drives rules defining Java
- **Implementations** – Transforming Java specifications into code like Java.exe, Javac.exe, utility libraries, etc.
- **Community Driven** – OpenJDK to drive open source implementation

Java SE

Java Card

Java FX

Java

Embedded

…and more

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Where is Java?

The Java ecosystem…

	Facts
Desktops	▪ Java deployed on 97 Percent desktops
Devices	▪ Java deployed on 80 percent of mobile platforms ▪ Java deployed on 125 million television sets
Community	▪ 1 billion Java downloads per year ▪ 9 million developers worldwide

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How Serious is Java Security?

Security is a top organization priority

Java 8: Secure the train (Apr 18, 2013) – Mark Reinhold, Java Chief Architect

"...As a consequence of this renewed focus on security the Java 8 schedule, with a GA release in early September, is no longer achievable."

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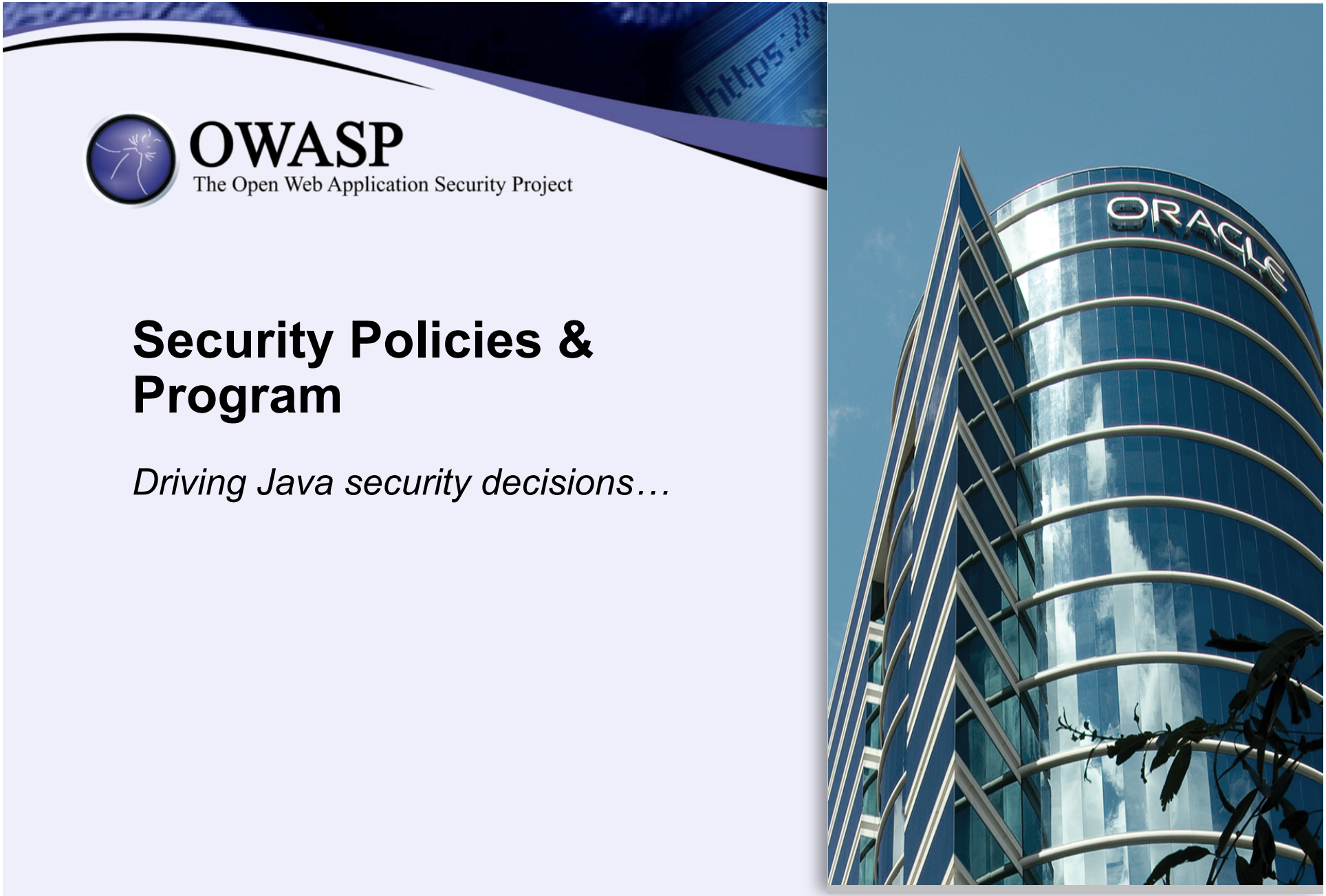
What is Oracle Doing in Java Security?

Efforts are broad but the message is simple…

- **Defend Java applets** – limit ability of attackers to use malicious applets as a means of attack
- **Accelerate Remediation** – accelerate production of security fixes
- **New Security Features** – new security countermeasures to strengthen Java



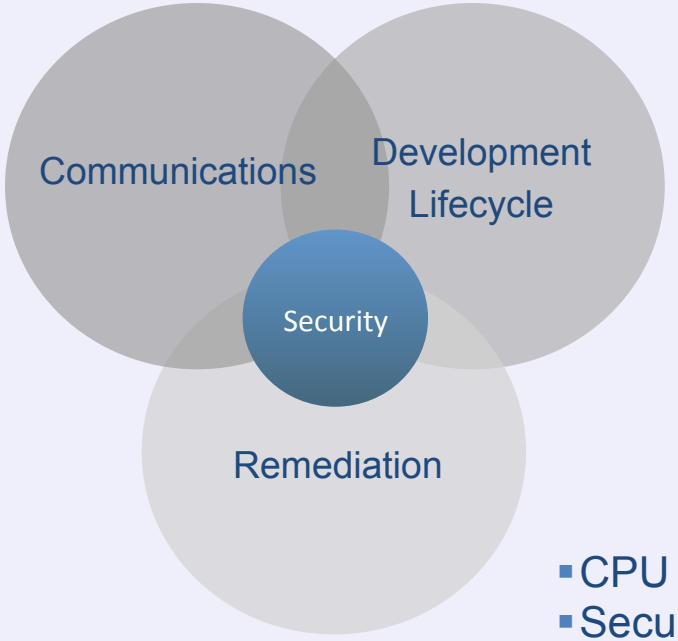
Security Policies & Program

Driving Java security decisions…

Security Policy

Larger areas of security policy at Oracle…

- SA/CPU RSS Feeds
- Security Blog
- eBlasts
- Java.com Security



- Architecture Review
- Peer Review
- Security Testing
- Post Mortems
- Anatomy of an Exploit

- CPU
- Security Alerts

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Security Policies – Communications

Different modes of security communication…

- Security Alerts (RSS feed)
- Critical Patch Update Advisories
- eBlasts
- Blogs (Security Assurance, Java PM)

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Security Policies – Communications (cont'd)

Why Oracle does not respond to published reports of alleged product vulnerabilities…

- Correcting and corroborating articles provides more information to attackers
- Many reports don't provide the required engineering details for proper verification. Technical details like: pre-conditions, impacts, remediation/ mitigation details are light or non-existent.
- Responding to individual reports forces communities to track vulnerabilities in social media sites – not good.

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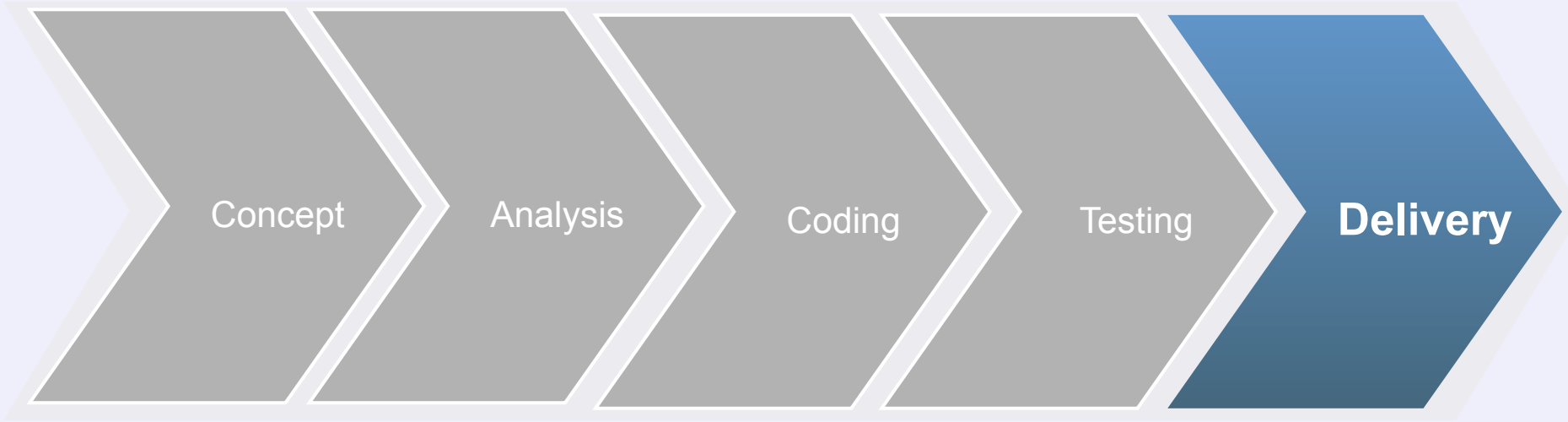
Security Policies – Communications (cont'd)

Why Oracle does not respond to published reports of alleged product vulnerabilities…

- The information Oracle releases is: precise, actionable, and everyone receives it at the same time.

Security Throughout the Development Lifecycle

Non-specific lifecycle methodology



Risk Factors

- Less Scrutiny
- More Scrutiny

Project Review

- Architecture
- Compliance

Peer Review

- Manual
- Automated

Security Tests

- Static Analysis
- Fuzzing

Java.com

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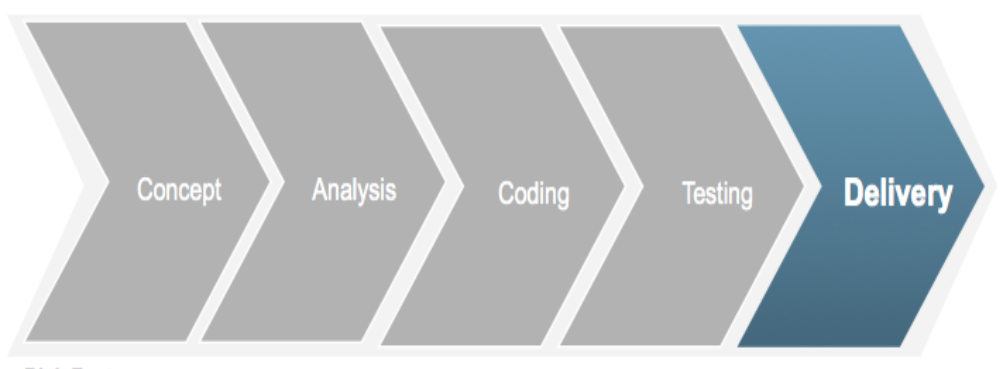
Outside the Development Lifecycle



Throughout Development Cycle

- GPS
- Ethical Hacking
- Security Training
- Tech Talks

…and more.

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Security Policies - Remediation

- Common Vulnerability Scoring System (CVSS)
- Vulnerabilities reviewed and CVSS score assigned
- Remediation strongly influenced by CVSS score

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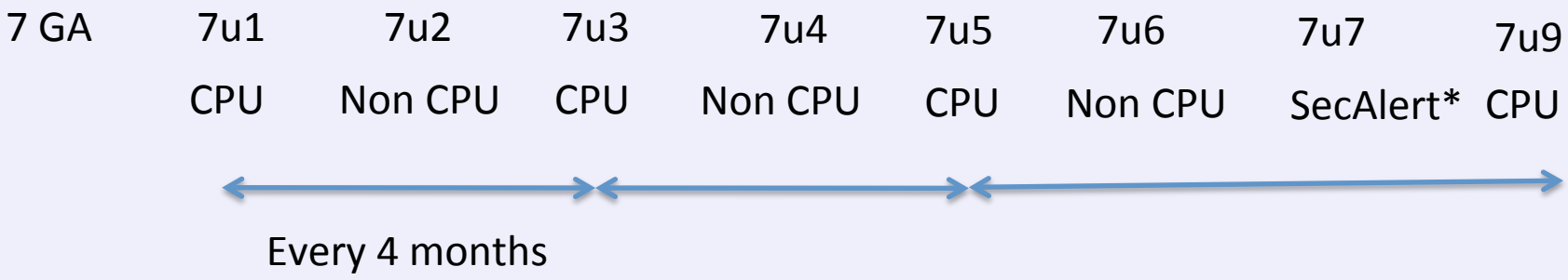
Security Policies - Remediation

- Critical Patch Updates (CPU) - Security patches
  - October, February, June for Java Platform Group
  - Java Platform Group Different from Oracle CPU

- Security Alerts (SA) – Emergency security patches
  - Avoid where not absolutely necessary.

Java Critical Patch Updates(CPU)



Rules for Java CPUs

- Main release for security vulnerabilities
- Covers all families (7, 6, 5.0, 1.4.2).
- CPU release triggers Auto-update
- Dates published 12 months in advance (but there have been changes)
- Security Alerts are released as necessary
- Based off the previous (non-CPU) release
- Released simultaneously on java.com and OTN
- Java moving to regular CPU cycle with other Oracle products, Oct 2013

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Platform Remediation Progress

Accelerating progress against backlog…

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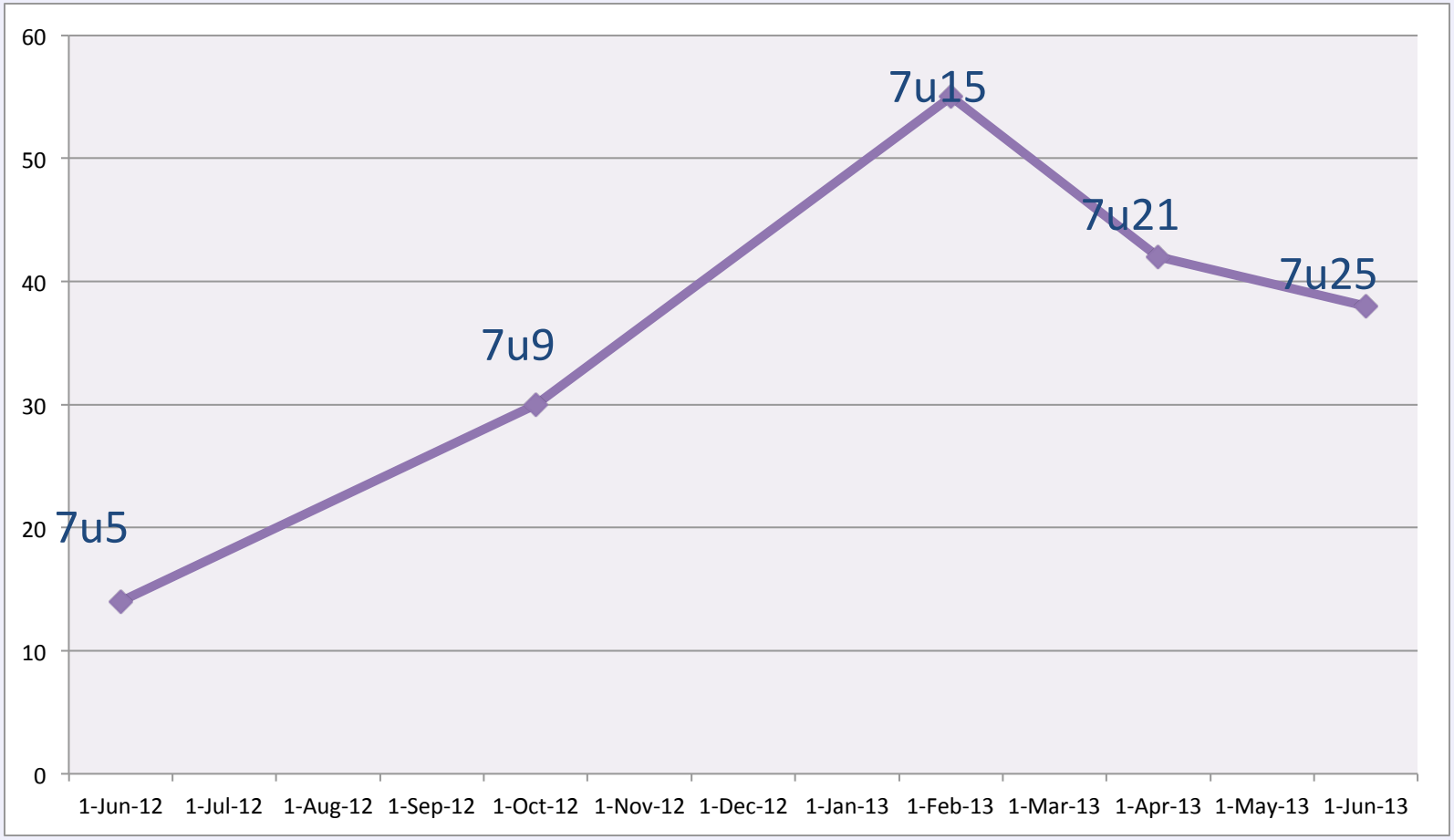
Remediation Highlights

- **Java Applets Running in Browsers** – highest exploitation risk area
- **Other Areas of Java** – figures spotlight applets, we are concerned about all Java use cases, Server for example
- **Progress** – significant over last year

Remediated Vulnerabilities/ Month



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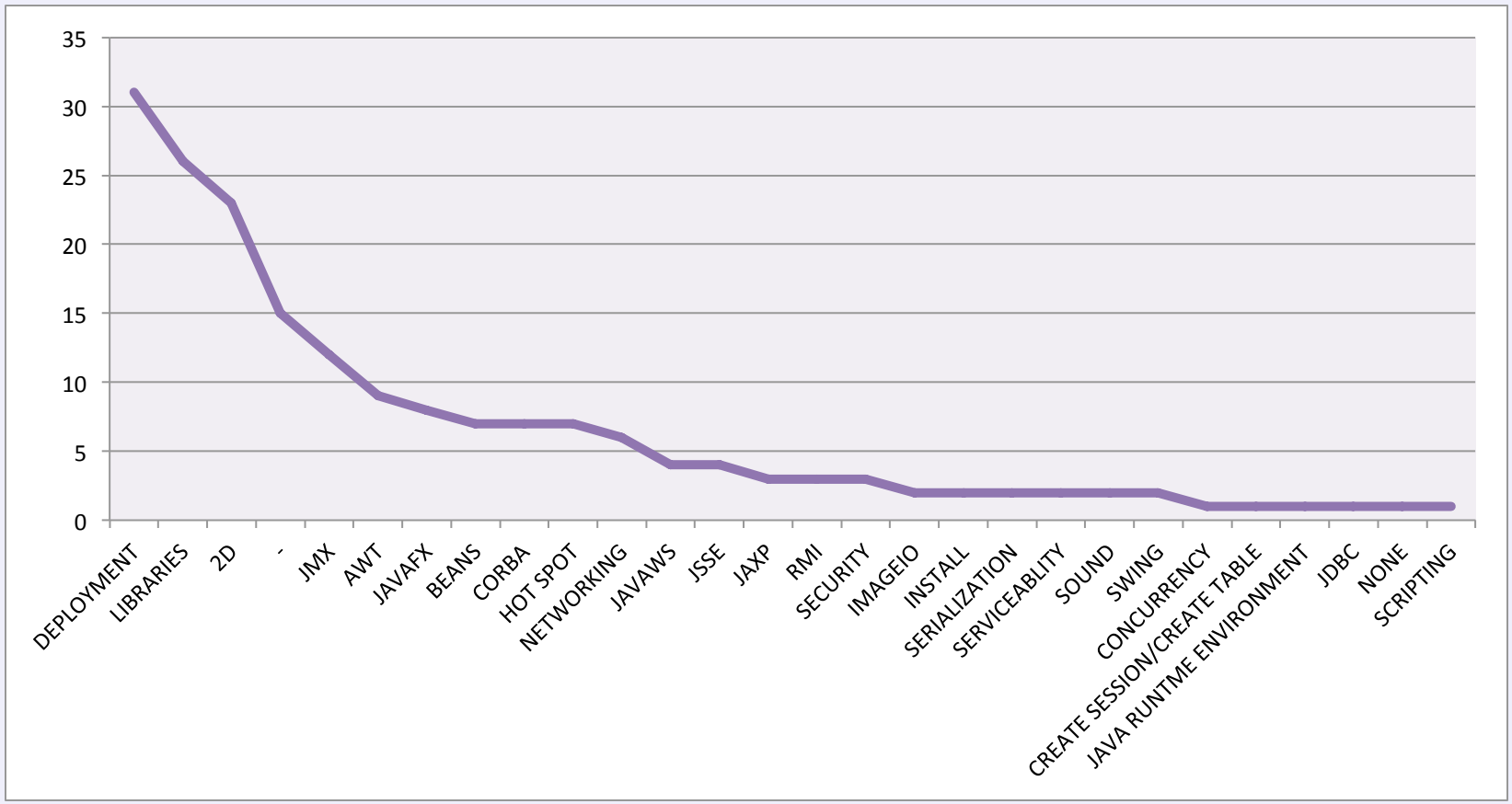
Remediated Vulnerabilities by Component Subtype



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Security Features Delivered

Security controls for today's challenges…

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Security Feature Highlights

Enable/Disable Java (DELIVERED JAVA 7 UPDATE 10)

- Feature within the Java Control Panel to enable or disable Java plugins

Hardcoded Best Before Date on JRE (DELIVERED JAVA 7 UPDATE 10)

- Java changes the way it operates if known to be vulnerable. For example, security dialogs communicate more risk for some activities

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Security Feature Highlights (cont'd)

Java Security Slider (DELIVERED JAVA 7 UPDATE 10)

- Adjust plugin security levels in accordance with end-user security risk preferences (or policies)

Signing for Sandboxed Applications (DELIVERED JAVA 7 UPDATE 21)

- Changing the security model to separate the notion of establishing identity of the signer and applet privileges. Previously, code-signing also granted applets privileges

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Security Feature Highlights (cont'd)

Server JRE (DELIVERED JAVA 7 UPDATE 21)

- Standard Java distribution without the plugin support.

Removed "Low" and "Custom" From Security Slider (DELIVERED JAVA 7 UDPATE 21)

- Low and Custom have been removed to reduce risk of desktop exploitation

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Security Feature Highlights (cont'd)

Dynamic Blacklisting (DELIVERED JAVA 7 UPDATE 21)

- Previously blacklisting was static to the Java release. Blacklisting is now updatable daily. Expanded scope of blacklisting includes: jars, code-signing certificates, and subsidiary CAs.

Lock JARs to Server (DELIVERED JAVA 7 UPDATE 25)

- Prevent applet code from being repurposed

Security Feature Highlights (cont'd)

Standardized Revocation Services (DELIVERED JAVA 7 UPDATE 25)

- Industry standard revocation services like CRL and OCSP are available in Java today.

Java Uninstaller (ONGOING)

- The goal of this effort is to cleanup old versions of Java that are no longer used. Old versions of Java can become a target for exploitation.

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Security Feature Highlights (cont'd)

Dynamic Rule Set (DRS) (EARLY ACCESS JAVA 7 UPDATE 40)

- DRS constrains enterprise desktop applets to authorized resources based upon system administrator defined policies

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Call to Action

Something we can all do…

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Vulnerability Reporting & Security Feature Suggestions

- Report Vulnerabilities
  - Support Customers: My Oracle Support
  - Others: secalert_us@oracle.com
- Suggest New Features
  - http://bugreport.sun.com/bugreport/

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Java Platform Support

- I provide the following as a service for those interested
- I'm in development, not sales. I do not receive a commission. ;o)

- 3 Options
  - Premier, 5 years from GA
  - Extended, Premier + 3 years
  - Sustaining, "as long as you own your Oracle products"

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Java Root Certificate Program

- Like web browsers, Java ships with root certificates
- Like web browsers, Java roots establish intrinsic "trust" for Java users
- Of course, the public is always free to include their own certificates or remove our defaults

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Securing Java

New Track for JavaOne Conference 2013 San Francisco

Challenge – many developers will never have the opportunity to attend a security conference

Answer – bring security education to developers

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Upcoming CPU's

- October 15, 2013 (transition to Oracle CPU schedule)
- January 14, 2014
- April 15, 2014
- July 15, 2014

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Help Us Keep You Secure

- To end users…
  - Keep your JRE's updated (auto-update on)
  - Practice defense-in-depth: harden OS, virus scanner, firewall
- To developers…
  - Support current JRE's so end users can upgrade
  - Sign your applications (use timestamp)
  - Validate untrusted data (input/output validation)
  - Review OWASP Top-10
  - Follow Secure Coding Guidelines for Java Language

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Help Us Keep You Secure (cont'd)

- Even more for developers…
  - Educate yourself
  - Attend JavaOne 2013 in San Francisco CA, USA
  - Alternatively review public media after conference concludes

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Additional References/Links

Security transparency, information available to the public…

- **Java 8: Secure the train** , Mark Reinhold, Java Chief Architect
- **Maintaining Security Worthiness of Java…** , Nandini Ramani, Java Engineering Leader
- **Security Fixing Policies** , Security policies available for public review
- **Oracle Security Vulnerability Disclosure Policies** , Information around vulnerability disclosure
- **Secure Coding Standards** , Security throughout development (SDLC) processes
- **Common Vulnerability Scoring System (CVSS)** , Vulnerability risk management

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Additional References/Links (cont'd)

Security transparency, information available to the public…

- **Critical Patch Update and Security Alerts**, Oracle's security patch and security hot fixes
- **Reporting Vulnerabilities**, Report vulnerabilities for any Oracle products(including Java)
- **Oracle Lifetime Support Policy**, Public literature on support for Fusion Middleware products (including Java)
- **Including Certificate Authority Root Certificates in Java**, Information around including digital root certificates in Java

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Additional References/Links (cont'd)

Security transparency, information available to the public…

- **Java Platform Group, Product Management Blog**, News about Java security features and plans
- **Oracle Security Assurance Blog**, News about Java Critical Patch Updates and Security Alerts
- **Secure Coding Guidelines for Java Language**, Secure coding practices for Java language

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Questions?