Securing Your Web Applications Using IBM® Rational® AppScan Standard Edition

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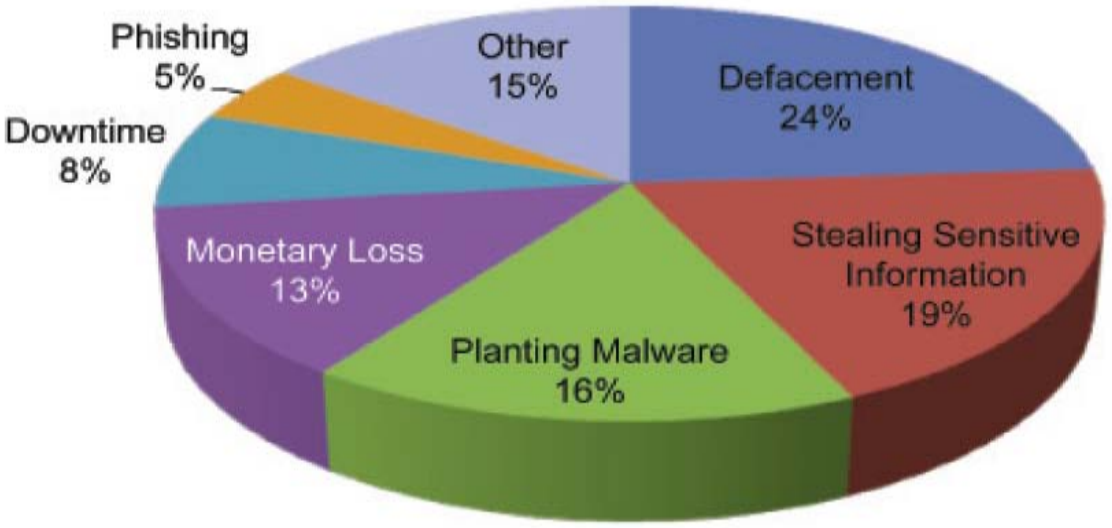
Rational. software

Agenda

- Quick Intro
  - 2009 reported Web Application Security Incidents
- IBM Rational AppScan
  - Overview
  - Demo
  - Wrap up

Drivers for Web Application Attacks*

Attack Goal	%
Defacement	24%
Stealing Sensitive Information	19%
Planting Malware	16%
Monetary Loss	13%
Downtime	8%
Phishing	5%
Deceit	2%
Worm	1%
Link Spam	1%
Information Walfare	1%



Web Applications hacks have replaced email as the preferred delivery method of Malware (viruses, root kits and trojans)

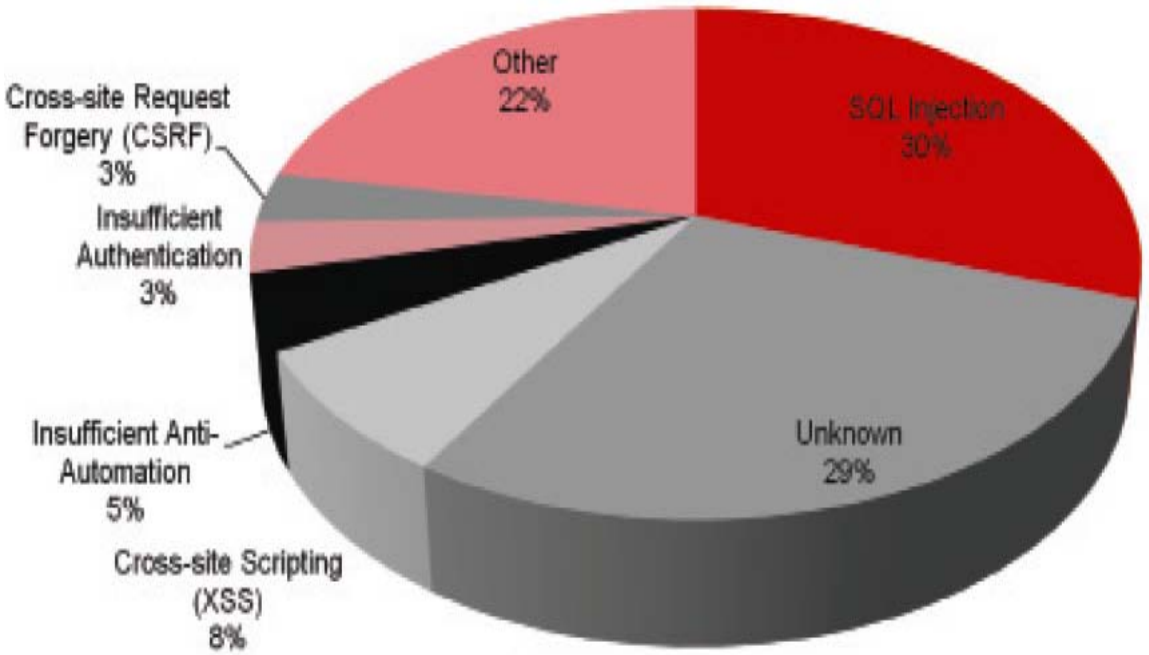
*From Web Hacking Incidents Database 2008

SQL injection vector used to plant malware

- Over 500,000 Web Sites compromised via SQL injection
  - Done via automated attack which altered contents of back end database and injected malicious script
  - Turned legitimate Web Sites into Malware distribution centres

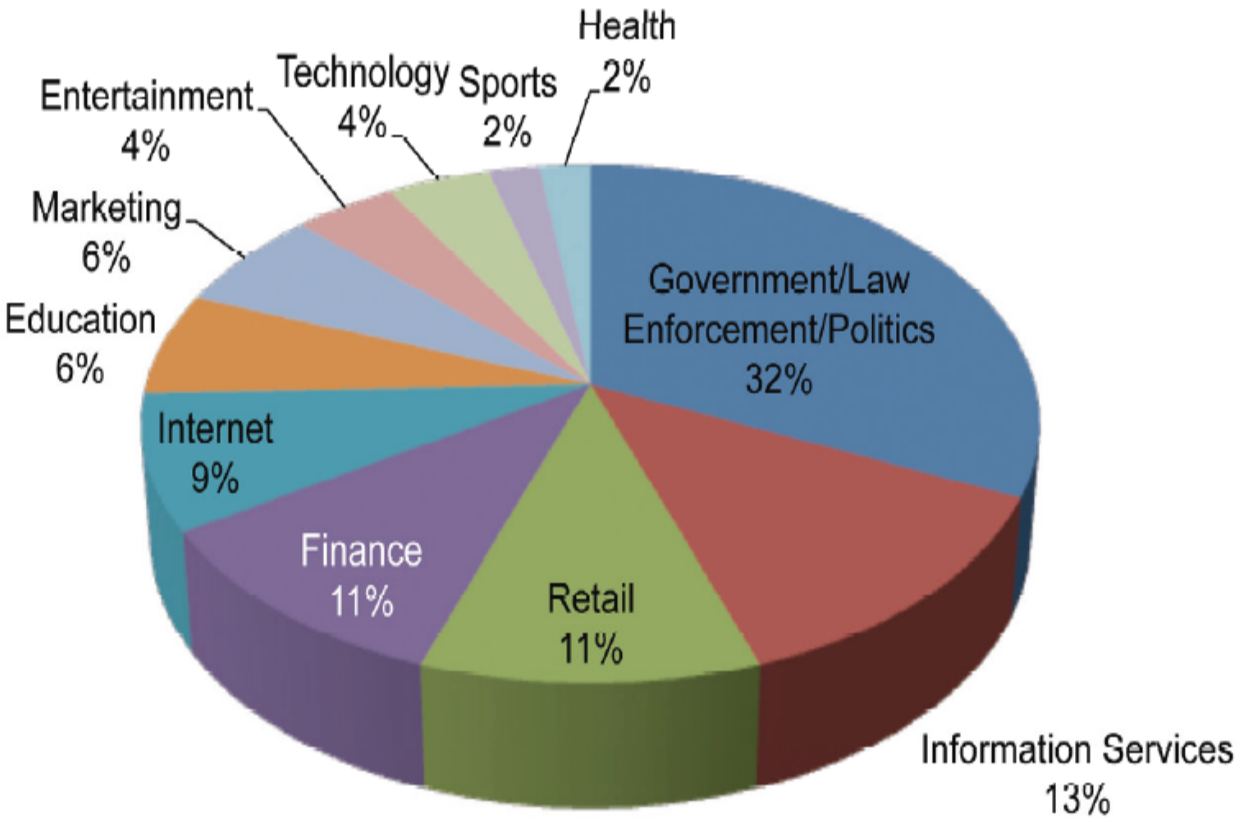
Incident by Attack Type (2008)

Attack / Vulnerability Used	%
SQL Injection	30%
Unknown	29%
Cross-Site Scripting (XSS)	8%
Insufficient Anti-Automation	5%
Insufficient Authentication	3%
Cross-Site Request Forgery (CSRF)	3%
OS Commanding	3%
Denial of Service	3%
Drive By Pharming	3%
Known Vulnerability	2%
Brute Force	2%
Credential / Session	2%



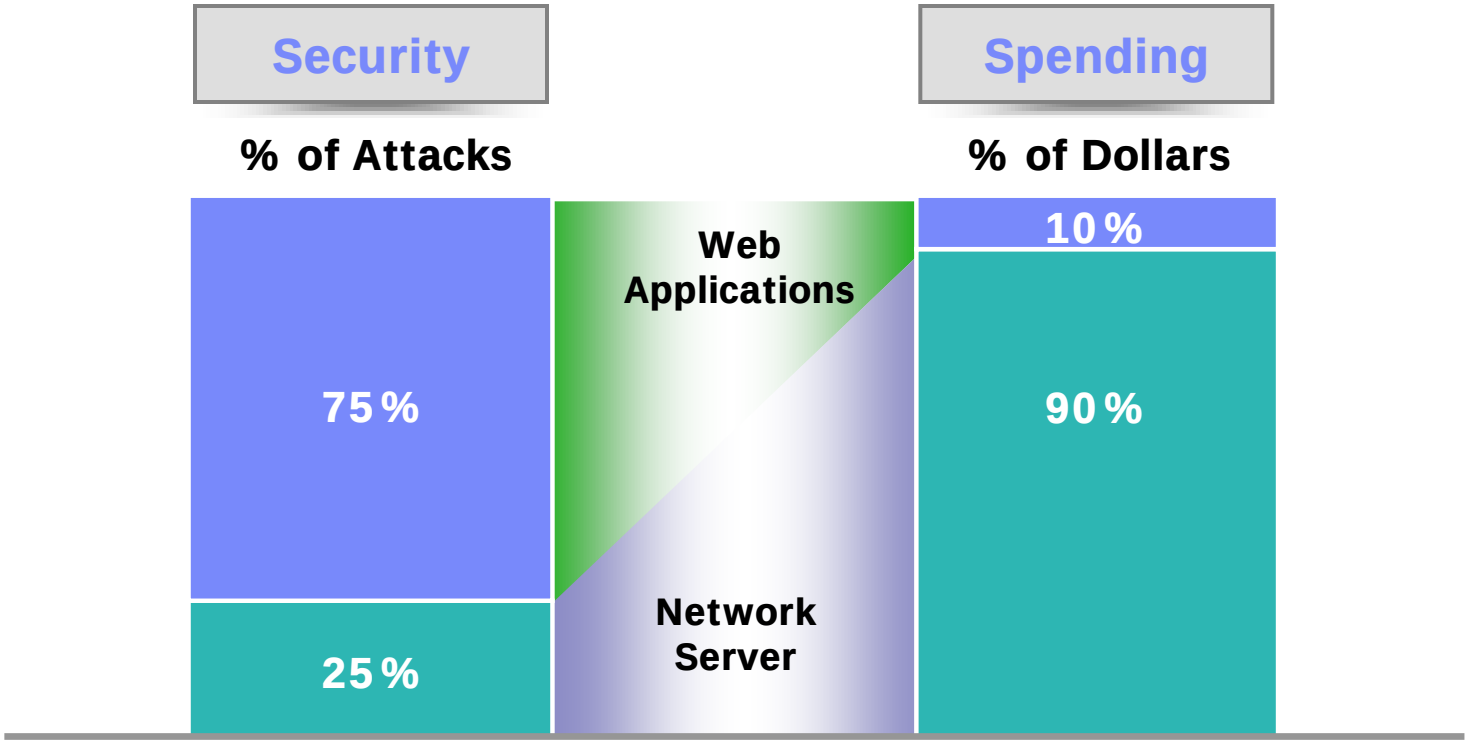
Incident by Organization Type

Vertical	%
Government, Security and Law Enforement	32%
Information Services	13%
Retail	11%
Internet	9%
Education	6%
Marketing	6%
Entertainment	4%
Technology	4%
Sports	2%
Health	2%



Security

The Challenge for Organizations



75% of All Attacks on Information Security Are Directed to the Web Application Layer

Sources: Gartner, Watchfire

Cost of an Application Security Breach

- Media attention/ Brand damage
- Sharp decline in Stock Prices
- Communication/Monitoring Service Costs
- Legal Fees (Reported $3-4 million/incident)
- FTC Penalties (Fines can range up to 15 million/incident)
- Additional 3rd party Audits
- New Security Spending
- Customer Lawsuits
- Customer Loss

TJ Maxx's Application Security Breach cost them over 200 million dollars!!

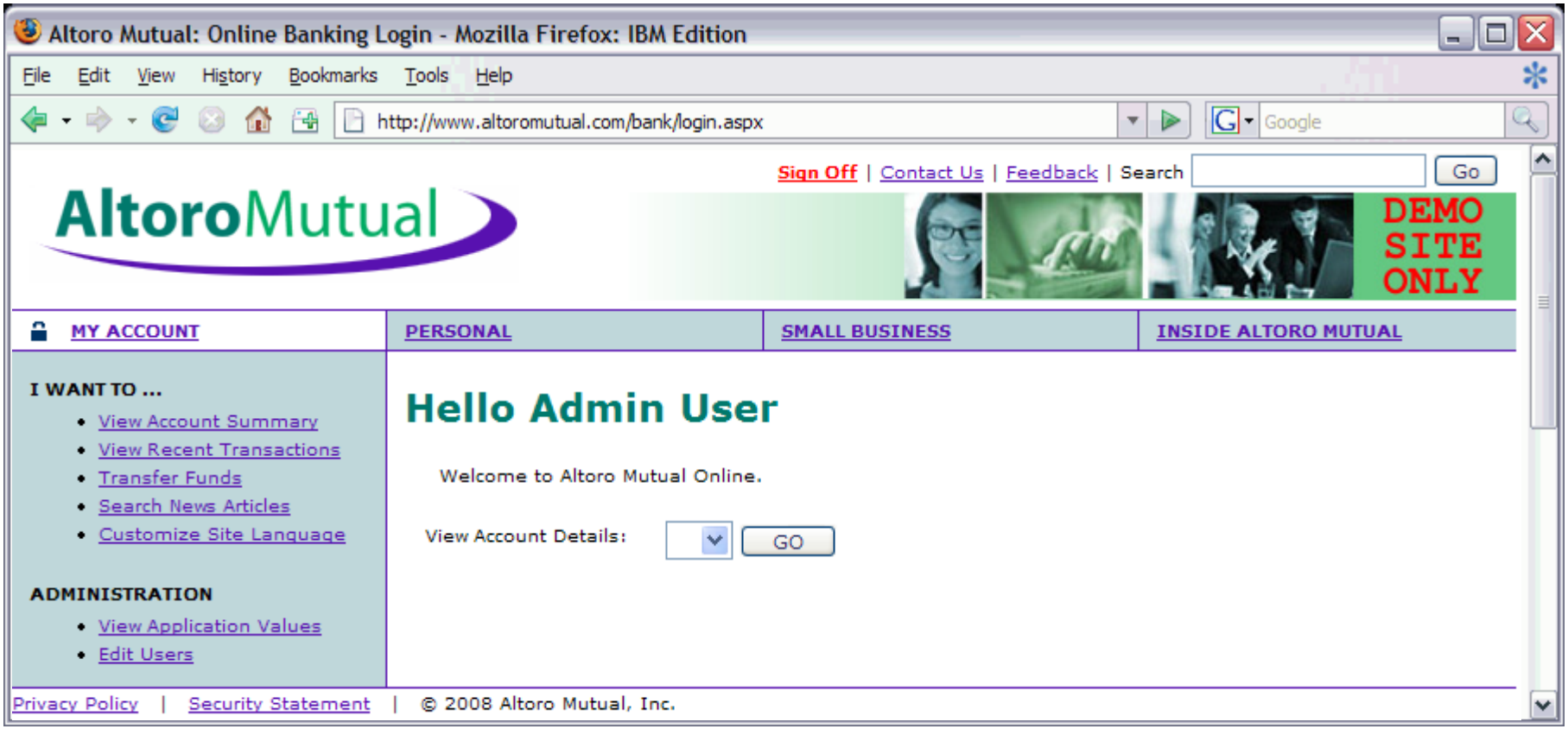
Why Application Security is a High Priority

- **Web applications are the #1 focus of hackers:**
  - 75% of attacks at Application layer (Gartner)
  - XSS and SQL Injection are #1 and #2 reported vulnerabilities (Mitre)
- **Most sites are vulnerable:**
  - 78% percent of easily exploitable vulnerabilities affected Web applications (Symantec)
  - 80% of organizations will experience an application security incident by 2010 (Gartner)
  - 90% of sites are vulnerable to application attacks (Watchfire)
- **Web applications are high value targets for hackers:**
  - Customer data, credit cards, ID theft, fraud, site defacement, etc
- **Compliance requirements:**
  - Payment Card Industry (PCI) Standards, GLBA, HIPPA, FISMA,

Organizations must mitigate the risk!

- They need to find and remediate vulnerabilities in Web applications before they are exploited by Hackers
- IBM Rational AppScan can help you do this!

Web App Security Issue Example: SQL Injection



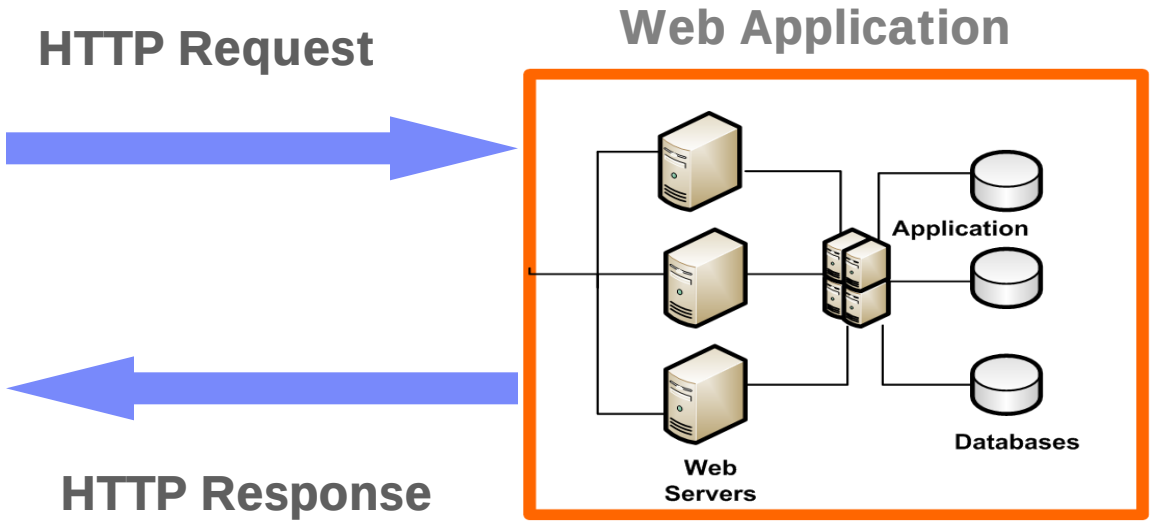
SELECT true FROM users
WHERE username = ‘’ AND password = ‘’

IBM Rational AppScan

- IBM Rational AppScan: A Web Application Security Scanner
  - Helps users find and remediate application-layer security issues in their web applications & web services
- IBM Rational AppScan Standard Edition
  - A standalone desktop application
- Who uses it?
  - Security Auditors - To bring automation to their audits
  - IT Security Teams - To reach beyond network security
  - QA engineers - To add Security to Functionality & Performance testing
  - Developers (to a lesser extent) – Wanting to be proactive about security

How does AppScan work?

- Approaches an application as a black-box
- Traverses a web application and builds the site model
- Determines the attack vectors based on the selected Test policy
- Tests by sending modified HTTP requests to the application and examining the HTTP response according to validate rules



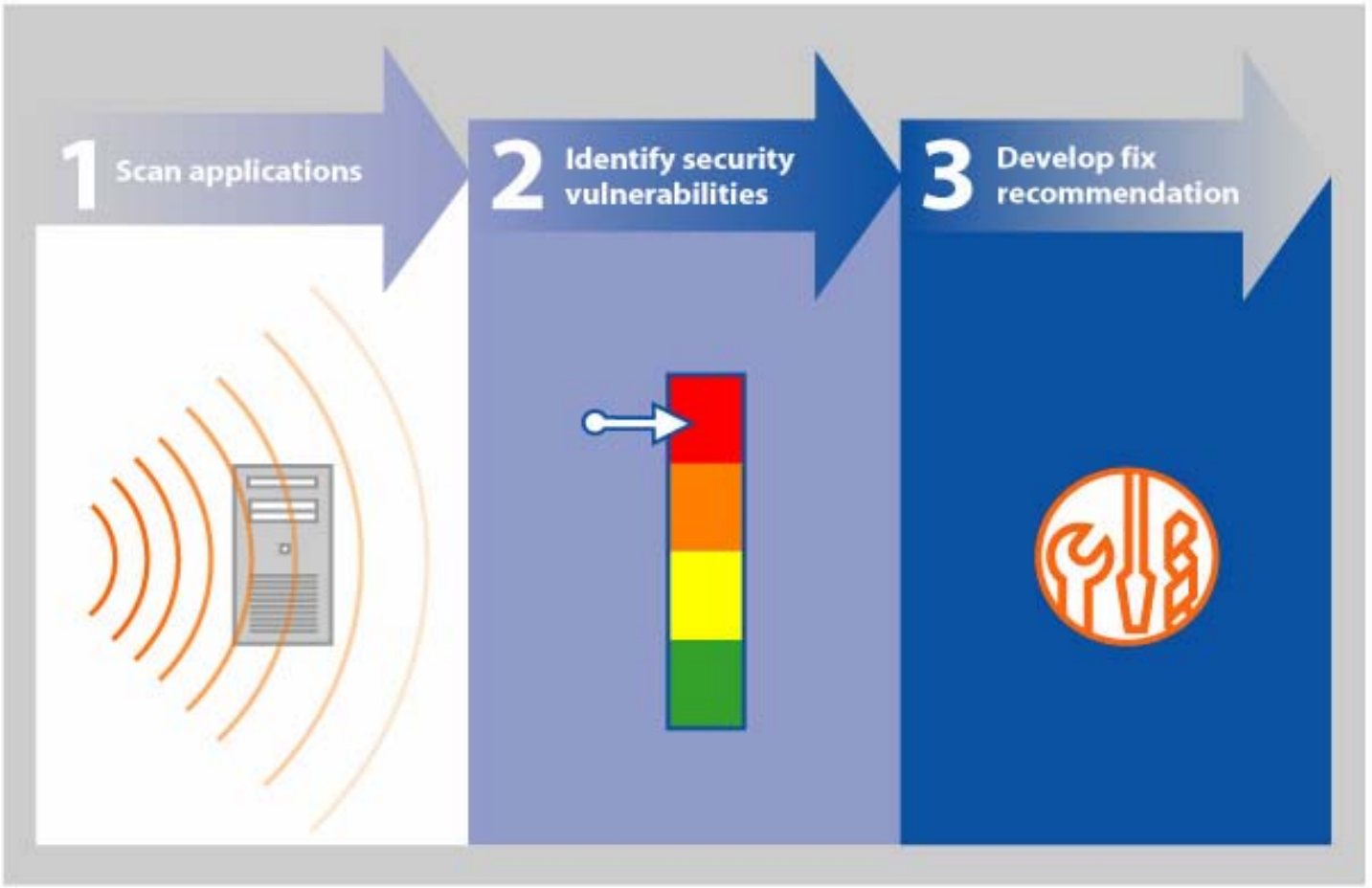
AppScan's Active Testing

- AppScan doesn't rely on metadata to flag issues
  - Such as saying "Apache version X.X is known to be vulnerable to Y"
- AppScan's tests actively look for the existence of a vulnerability
  - Mutate the inputs and logic of the application, as learned during the Explore
  - Assess if the application is vulnerable based on the resulting HTTP activity

SQL Injection Test Examples:

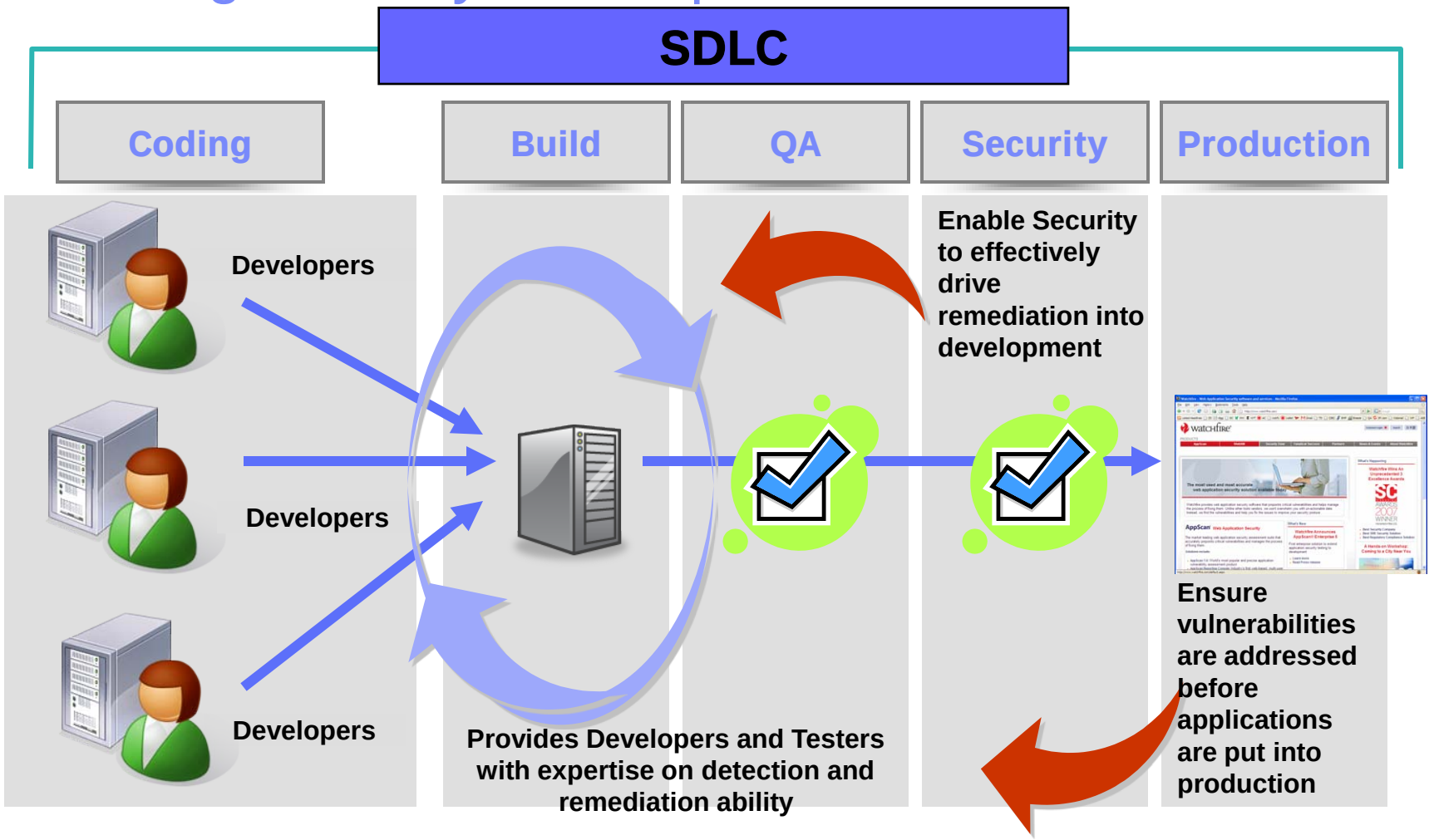
- Original Request: http://server/page.jsp?param=value
- Test Requests: http://server/page.jsp?param=‘ or 1=1 or ‘’=‘
  http://server/page.jsp?param=“ or 1=1 or “”=“
  http://server/page.jsp?param=‘ --
  http://server/page.jsp?param=+1+1+1
  …

AppScan Goes Beyond Pointing out Problems



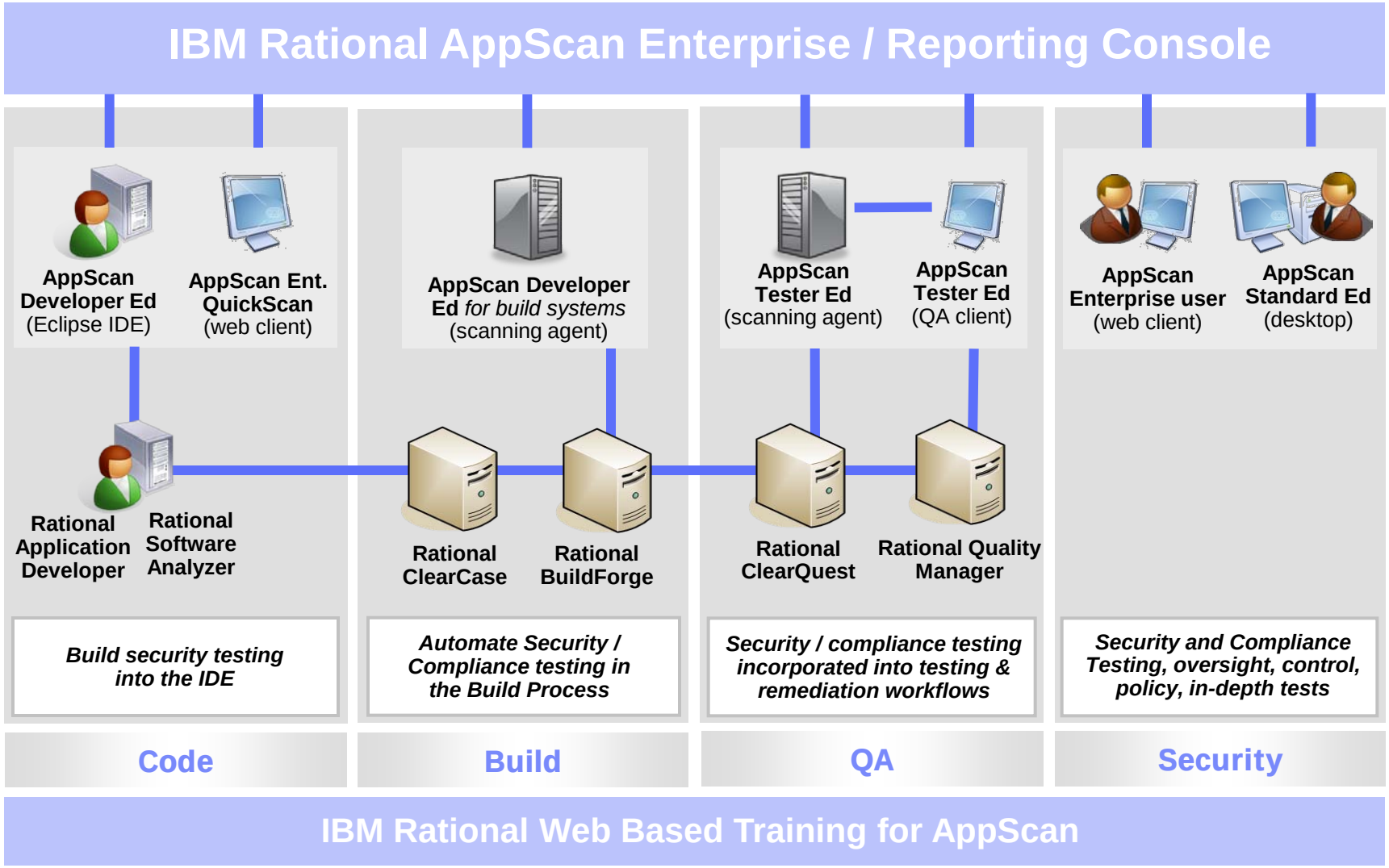

DEMO

Building Security & Compliance into the SDLC



IBM Rational AppScan SDLC Ecosystem

Includes Fall 2008 Releases




Questions