OWASP Top-10 2013

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About the OWASP Top 10

OWASP Top 10 is an Awareness Document

- Not a standard…

First developed in 2003

- Was probably 3rd or 4th OWASP project, after
  - Developers Guide
  - WebGoat
  - Maybe WebScarab ??

Released

- 2003, 2004, 2007, 2010, 2013

OWASP Top Ten (2013 Edition)

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- A1: Injection
- A2: Broken Authentication and Session Management
- A3: Cross-Site Scripting (XSS)
- A4: Insecure Direct Object References
- A5: Security Misconfiguration
- A6: Sensitive Data Exposure
- A7: Missing Function Level Access Control
- A8: Cross Site Request Forgery (CSRF)
- A9: Using Known Vulnerable Components
- A10: Unvalidated Redirects and Forwards

What Didn't Change

It's About Risks, Not Just Vulnerabilities

- Title is: "The Top 10 Most Critical Web Application Security Risks"

OWASP Top 10 Risk Rating Methodology

- Based on the OWASP Risk Rating Methodology, used to prioritize Top 10

OWASP Top 10 Risk Rating Methodology

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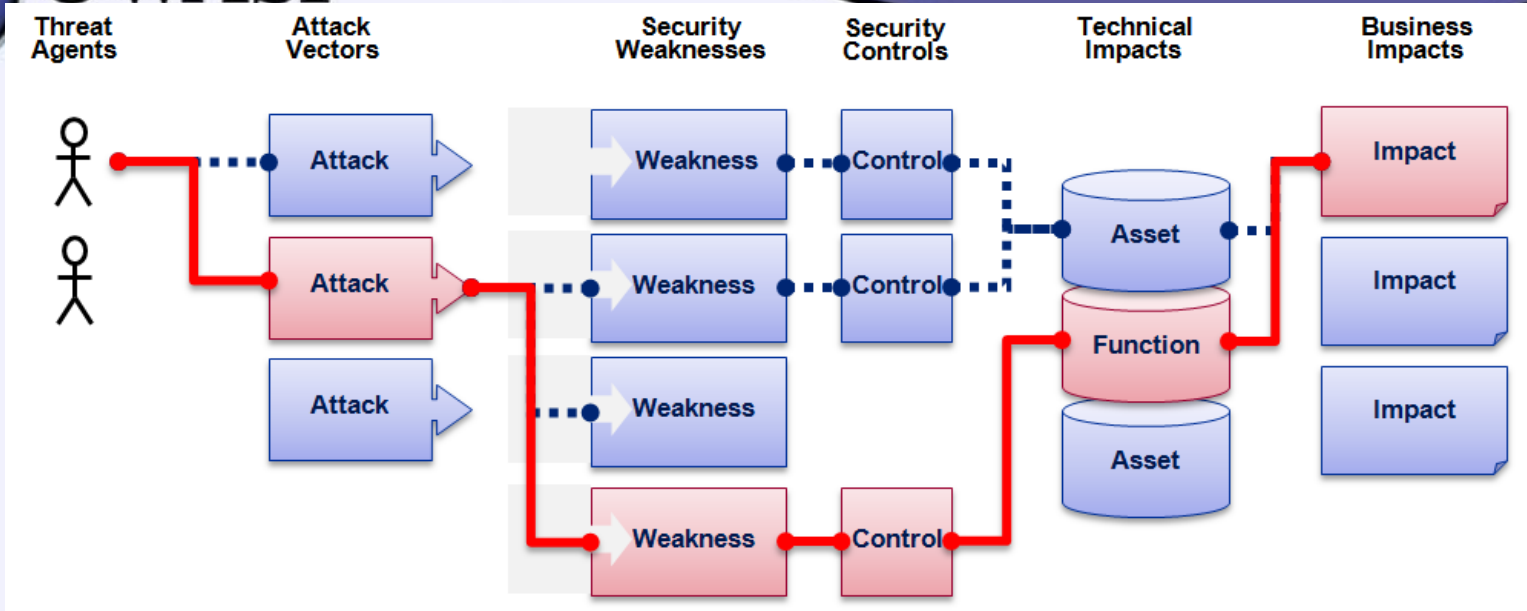

Threat Agent	Attack Vector	Weakness Prevalence	Weakness Detectability	Technical Impact	Business Impact
?	1 Easy	Widespread	Easy	Severe	?
	2 Average	Common	Average	Moderate	
	3 Difficult	Uncommon	Difficult	Minor	
	1	2	2	1	
		1.66	*	1	

Injection Example

1.66 weighted risk rating

What's Changed?

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Risks Added, Risks Merged, Risks Reordered

- Reordered: 7
- Added: 1
- Merged: 2 merged into 1
- Broadened: 1

Development Methodology For 2013

- Same as 2010, but
- Used more sources of vulnerability data
- All vulnerability data made public by each provider

Development Methodology for Next Version?

- More transparency
- Requested vulnerability data format
- Earlier community involvement

Mapping from 2010 to 2013 Top 10

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OWASP Top 10 – 2010 (old)	OWASP Top 10 – 2013 (New)
2010-A1 – Injection	2013-A1 – Injection
2010-A2 – Cross Site Scripting (XSS)	2013-A2 – Broken Authentication and Session Management
2010-A3 – Broken Authentication and Session Management	2013-A3 – Cross Site Scripting (XSS)
2010-A4 – Insecure Direct Object References	2013-A4 – Insecure Direct Object References
2010-A5 – Cross Site Request Forgery (CSRF)	2013-A5 – Security Misconfiguration
2010-A6 – Security Misconfiguration	2013-A6 – Sensitive Data Exposure
2010-A7 – Insecure Cryptographic Storage	2013-A7 – Missing Function Level Access Control
2010-A8 – Failure to Restrict URL Access	2013-A8 – Cross-Site Request Forgery (CSRF)
2010-A9 – Insufficient Transport Layer Protection	2013-A9 – Using Known Vulnerable Components (NEW)
2010-A10 – Unvalidated Redirects and Forwards (NEW)	2013-A10 – Unvalidated Redirects and Forwards
3 Primary Changes:	▪ Merged: 2010-A7 and 2010-A9 -> 2013-A6
▪ Added New 2013-A9: Using Known Vulnerable Components	▪ 2010-A8 broadened to 2013-A7

OWASP Top Ten 2010-A6 Security Misconfiguration

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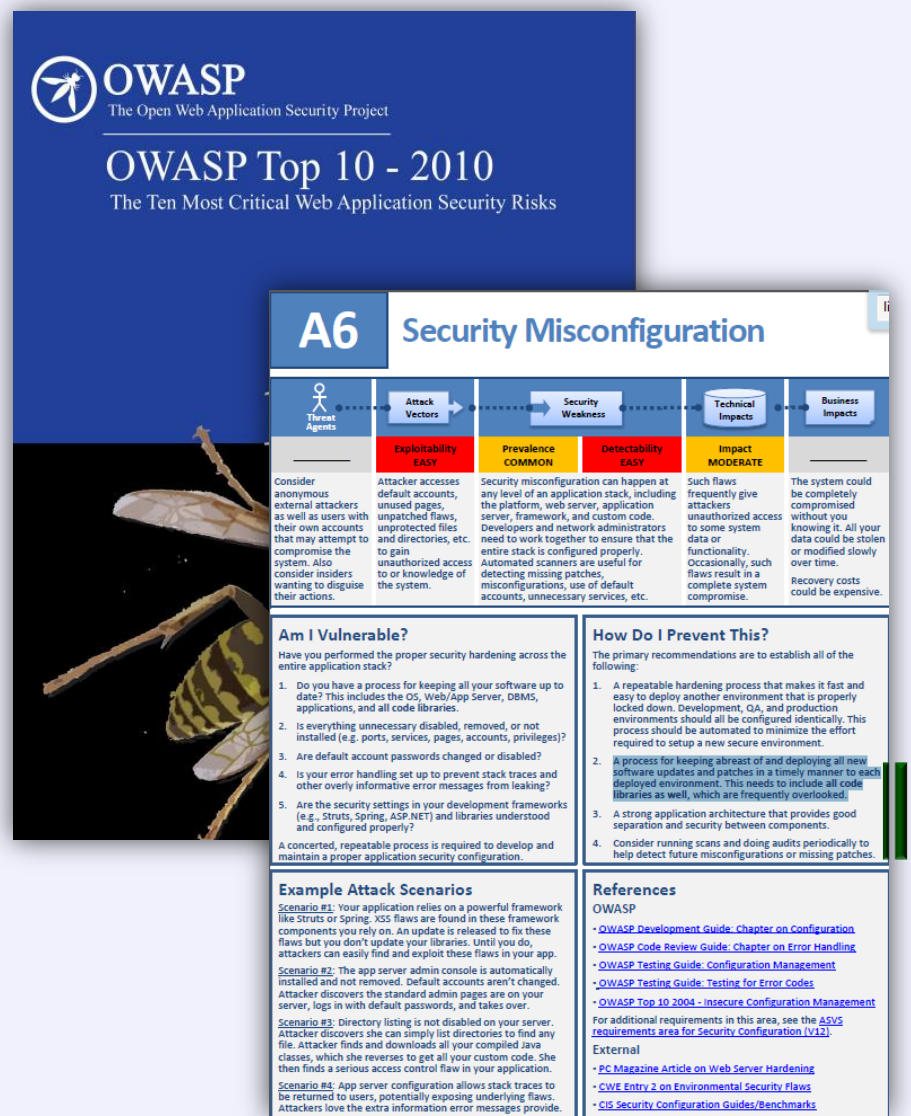


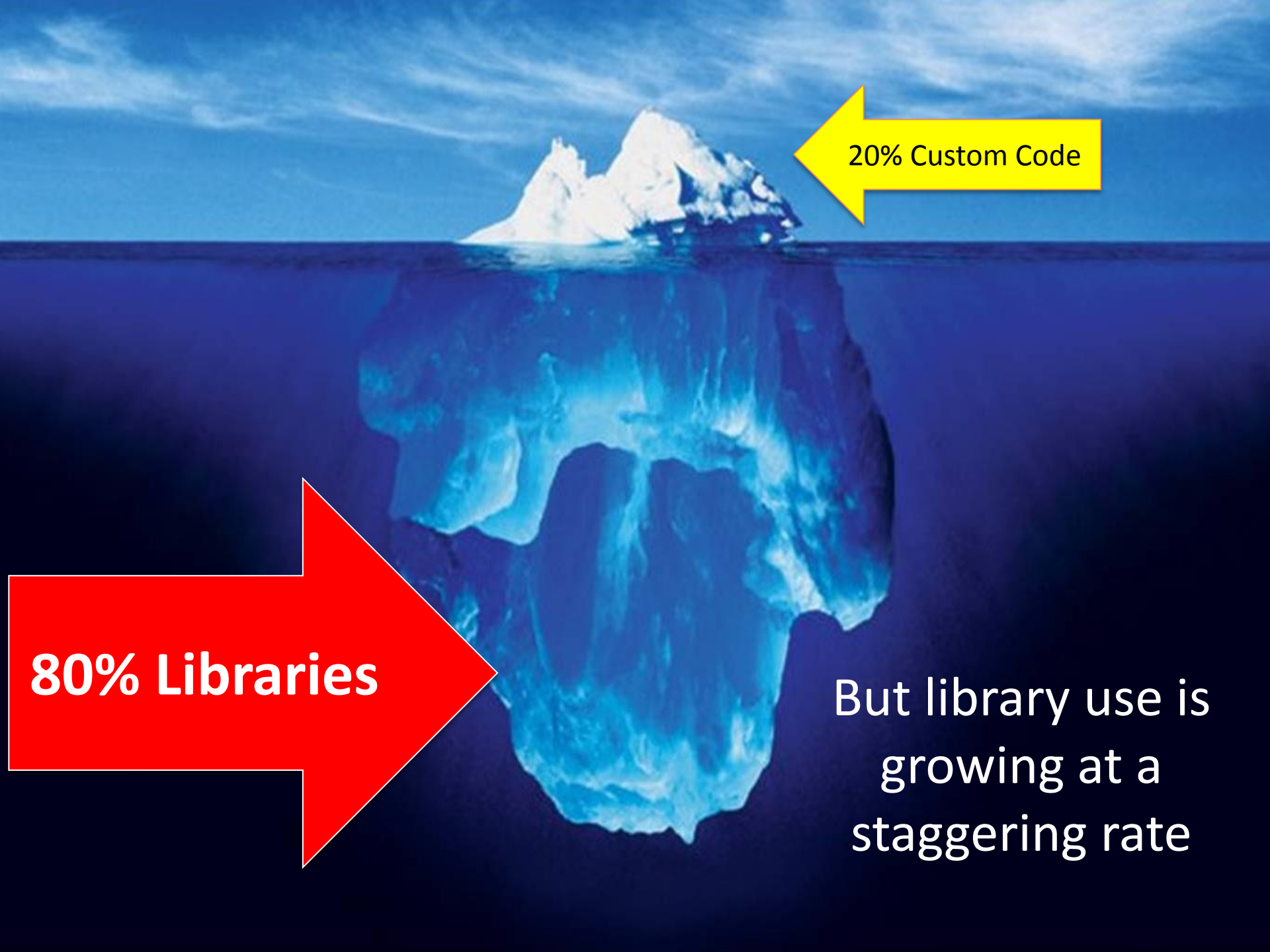
How Do I Prevent This?

The primary recommendations are to establish all of the following:

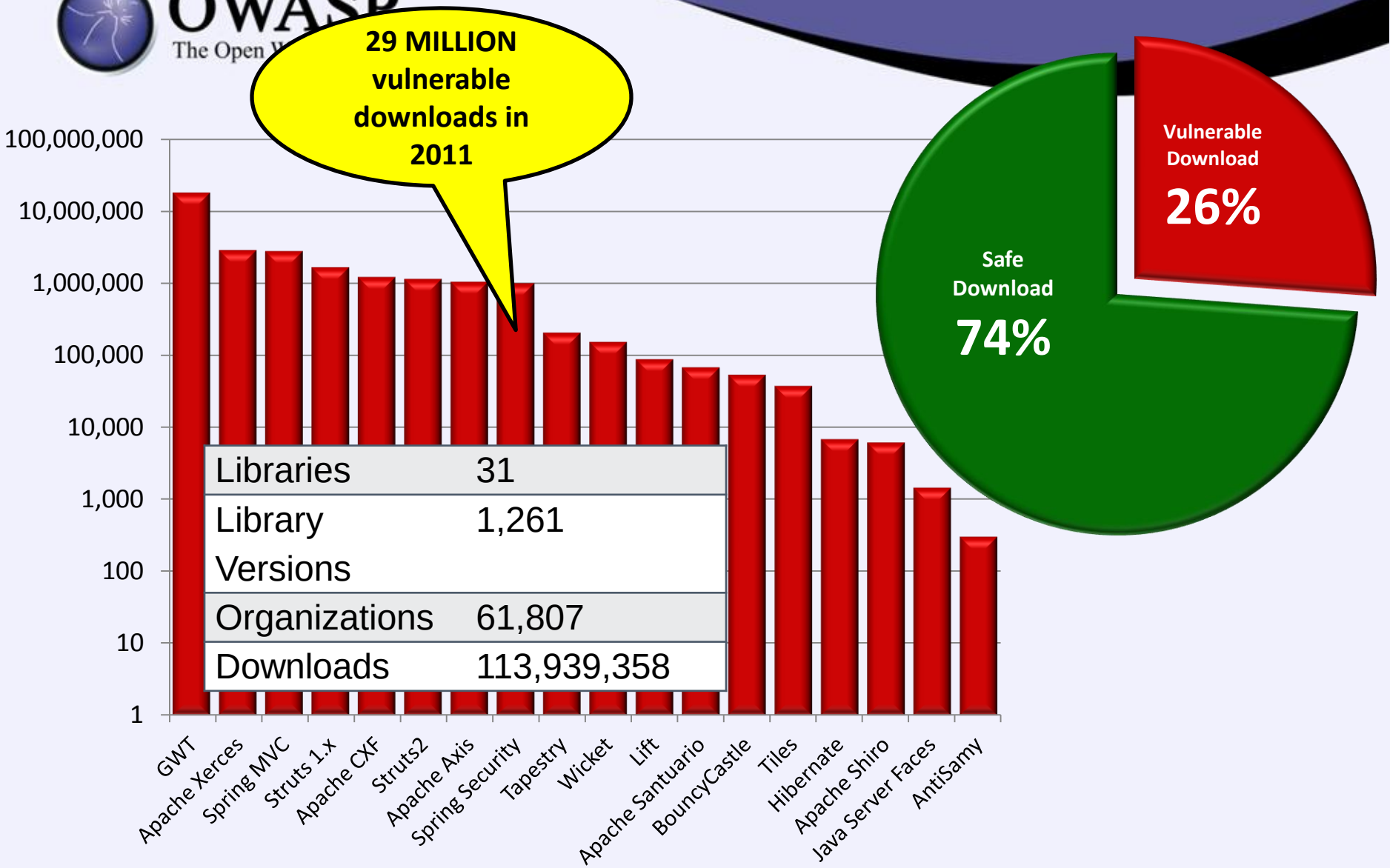
…

2. A process for keeping abreast of and deploying all new software updates and patches in a timely manner to each deployed environment. This needs to include **all code libraries as well**, which are frequently overlooked."

The amount of custom code
in an application hasn’t changed
very much in the past 10 years.


20% Custom Code
80% Libraries
But library use is growing at a staggering rate

Everyone Uses Vulnerable Libraries



https://www.aspectsecurity.com/news/press/the-unfortunate-reality-of-insecure-libraries

2013-A9 – Using Known Vulnerable Components

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Vulnerable Components Are Common

- Some vulnerable components (e.g., framework libraries) can be identified and exploited with automated tools
- This expands the threat agent pool beyond targeted attackers to include chaotic actors

Widespread

- Virtually every application has these issues because most development teams don't focus on ensuring their components/libraries are up to date
- In many cases, the developers don't even know all the components they are using, never mind their versions. Component dependencies make things even worse

Typical Impact

- Full range of weaknesses is possible, including injection, broken access control, XSS ...
- The impact could range from minimal to complete host takeover and data compromise

What Can You Do to Avoid This?

Ideal

- Automation checks periodically (e.g., nightly build) to see if your libraries are out of date
- Even better, automation also tells you about <u>known vulnerabilities</u>

Minimum

- By hand, periodically check to see if your libraries are out of date and upgrade those that are
- If any are out of date, but you really don't want to upgrade, check to see if there are any known security issues with these out of data libraries
  - If so, upgrade those

Could also

- By hand, periodically check to see if any of your libraries have any known vulnerabilities at this time
  - Check CVE, other vuln repositories
  - If any do, update at least these

Automation Example for Java – Use Maven 'Versions' Plugin

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Output from the Maven Versions Plugin – Automated Analysis of Libraries' Status against Central repository

Dependencies

Status	Group Id	Artifact Id	Current Version	Scope	Classifier	Type	Next Version	Next Incremental	Next Minor	Next Major
⚠	com.fasterxml.jackson.core	jackson-annotations	2.0.4	compile		jar		**2.0.5**	**2.1.0**	
⚠	com.fasterxml.jackson.core	jackson-core	2.0.4	compile		jar		**2.0.5**	**2.1.0**	
⚠	com.fasterxml.jackson.core	jackson-databind	2.0.4	compile		jar		**2.0.5**	**2.1.0**	
⚠	com.google.guava	guava	11.0	compile		jar		**11.0.1**	**12.0-rc1**	**12.0**
⚠	com.ibm.icu	icu4j	49.1	compile		jar				**50.1**
⚠	com.theoryinpractise	halbuilder	1.0.4	compile		jar		**1.0.5**		
⚠	commons-codec	commons-codec	1.3	compile		jar			**1.4**	
✓	commons-logging	commons-logging	1.1.1	compile		jar				
⚠	joda-time	joda-time	2.0	compile		jar			**2.1**	
⚠	net.sf.ehcache	ehcache-core	2.5.1	compile		jar		**2.5.2**	**2.6.0**	
⚠	org.apache.httpcomponents	httpclient	4.1.2	compile		jar		**4.1.3**	**4.2**	
⚠	org.apache.httpcomponents	httpclient-cache	4.1.2	compile		jar		**4.1.3**	**4.2**	
⚠	org.apache.httpcomponents	httpcore	4.1.2	compile		jar		**4.1.3**	**4.2**	
⚠	org.jdom	jdom	1.1	compile		jar		**1.1.2**		**2.0.0**
✓	org.slf4j	slf4j-api	1.7.2	provided		jar				

Most out of Date!

Details Developer Needs

This can automatically be run EVERY TIME software is built!!

The Merged 2013-A6 – Sensitive Data Exposure

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Two Related Topics Merged

- 2010-A7 – Insecure Cryptographic Storage
- 2010-A9 – Insufficient Transport Layer Protection
- To make room for New 2013-A9: Using Known Vulnerable Components

Storing and Transmitting Sensitive Data Insecurely

- Failure to identify all sensitive data
- Failure to identify all the places that this sensitive data gets stored
  - Databases, files, directories, log files, backups, etc.
- Failure to identify all the places that this sensitive data is sent
  - On the web, to backend databases, to business partners, internal communications
- Failure to properly protect this data in every location

Expanded 2013-A7 – Missing Function Level Access Control

Was: 2010-A8 – Failure to Restrict URL Access

- URLs are one way to access functions
- But not the only way …

Expand to Cover all Ways a Function Can Be Accessed

- URL to function directly
- URL plus parameter value(s) which indicate which function is being accessed
  - e.g., site/somedir/somepage?action=transferfunds

Typical Flaws

- Application simply doesn't check to see if function invocation is authorized
- Application does check for authorization, but check is flawed. (This would be broken function level access control, but missing is far more common.)

OWASP Top 10 2013 Development Methodology

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Gather Vulnerability Stats

- Ask previous contributors, solicit new contributors well known to Top 10 team, include unsolicited volunteers
  - 3 New Data Contributors Included: TrustWave, Veracode, Minded Security
- New: Each provider asked to make their data public. All Did.

Analyze Stats, Produce Initial Draft, Release for Public Comment

- Draft Released to OWASP Community Feb 15, 2013
- Public Comment Period Open for 90+ days (thru May 30, 2013)

Final Release Produced

- All Constructive Comments Considered
- Full documentation of Constructive Comments and how they were addressed documented
  - https://www.owasp.org/images/3/3d/OWASP_Top_10_-_2013_Final_Release_-_Change_Log.docx
- Released on June 12, 2013

OWASP Top 10 Future Development Methodology Ideas

Gather More Stats More Openly

- Issue Open Call For Vulnerability Stats Providers
- Provide Desired Stats Format (for consistency) and Require Public Reporting
- Consider all Stats Provided by Requested Deadline
- Don't Ignore Future Looking Threats
  - Like we did with CSRF in 2007, and Vulnerable Components in 2013

Consider Other Stats if They Make Sense

- We only have Vulnerability Prevalence Stats
- What about Stats for Exploitability, Detectability, Impact?
- We tried to consider some Exploitability stats in 2013, but couldn't find effective public stats

Expand Authoring Team

- Solicit Additional Volunteers

OWASP Top 10 Resources

- **Video Presentation of Each Item in OWASP Top 10 – 2010 (which is very similar)**
  - **Dave Wichers at OWASP AppSec DC (2009)**
  - **http://www.vimeo.com/9006276**

- **OWASP Top 10 – 2013 Presentation which goes through each item one by one**
  - **https://www.owasp.org/index.php/Top10**

- **Translations of OWASP Top 10 - 2013**
  - **French, Chinese, and Korean Translations complete**
  - **Many others are underway**
  - **https://www.owasp.org/index.php/Top10#tab=Translation_Efforts**

Thank you
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