Writing Secure CFML

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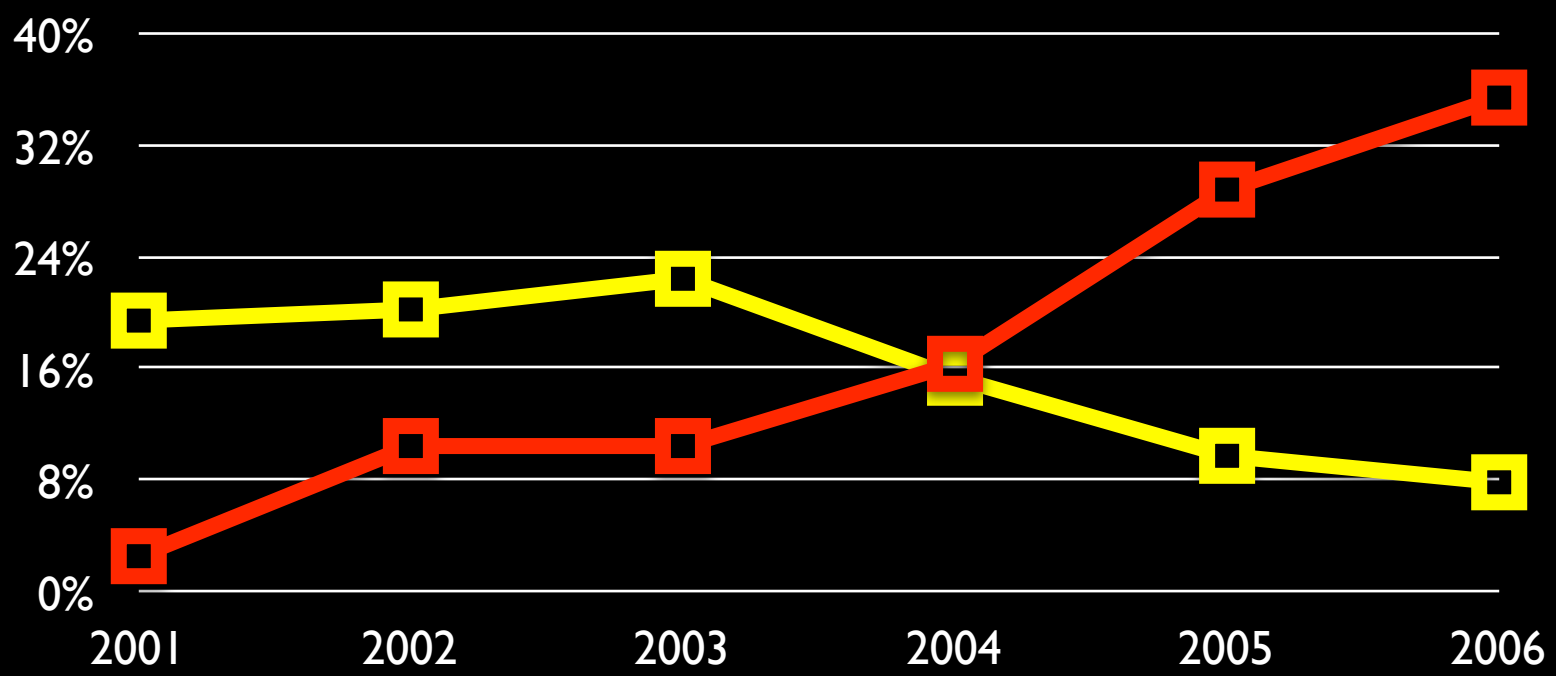
Who am I?

- 10+ Years using ColdFusion
- My Company Foundeo Inc.
  - ColdFusion Consulting
  - ColdFusion Products

Agenda:

1. Unchecked Input
2. File Uploads
3. XSS - Cross Site Scripting
4. SQL Injection
5. Cross Site Request Forgery
6. CRLF Injection

Web Apps Targeted

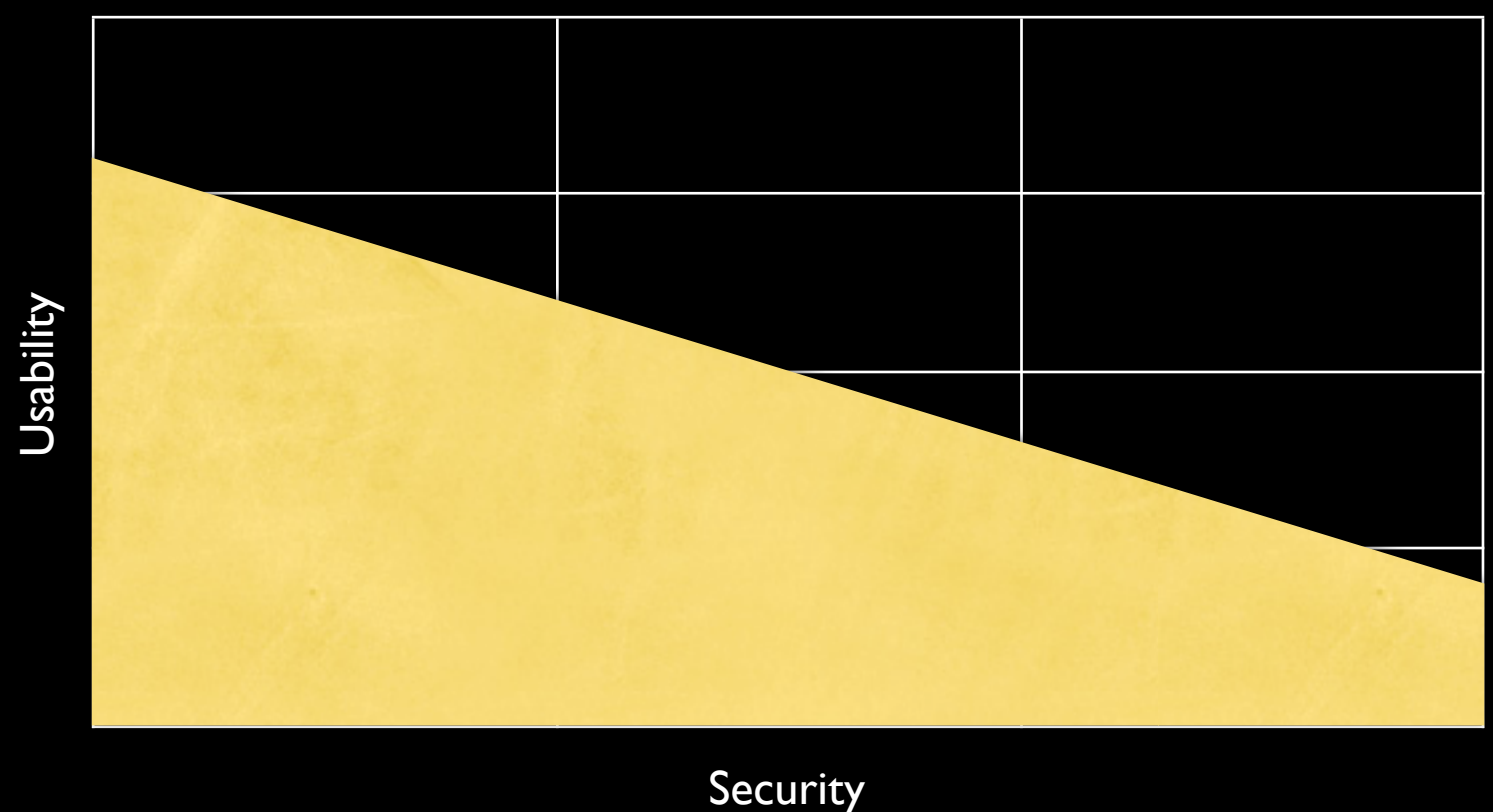


Source: http://cwe.mitre.org/documents/vuln-trends.html#table1

Three Simple Rules

- Trust No One
- Be Paranoid
- Validate Everything

Security vs. Usability



Security Tradeoffs

- Security vs. Usability
- Security vs. Performance
- Security vs. Time / Effort / Money

Unchecked Input

- The Cause of Most Security Problems
- Server Side Validation
  - IsValid Function
  - Regular Expressions

What are the inputs in a Web App?

The HTTP Request

- URL Variables
- FORM Variables
- Cookies
- HTTP Request Headers (CGI Scope)
  - User Agent
  - Referrer

What are the Inputs?

- Data sources used in your Application:
  - Databases
  - Files
  - HTTP and Web Service Responses
  - etc.

Uploading Files

- Most Web Sites let you Upload Photos or files.
  - Potentially the most dangerous thing your app will do.

Example: File Uploads

Best Practices for File Uploads

- Upload to a directory outside the web root or to a static content server (S3).
- Always Check the File Extension
  - cffile.serverFileExt
- Use the “accept” attribute, but never trust it.
- Check File Names as well

Best Practices for File Uploads

- Validate file is in proper format
  - IsImageFile()
  - IsPDFFile()
  - jHOVE - Java API
- More: http://www.petefreitag.com/item/701.cfm

Cross Site Scripting

- Attacker crafts a request that executes a client side script.
  - Usually JavaScript
  - Flash
  - Applet
  - IFRAME
  - ActiveX

What's So Bad About XSS

- Stealing Cookies (session)
- Phishing

XSS Examples

ScriptProtect

- ColdFusion 7 Introduced ScriptProtect feature.
  - Catches many but not all XSS attacks.
  - Enabled globally or at the application level.
  - Configurable Regular Expressions
    - `WEB-INF/cfusion/lib/neo-security.xml`

Preventing XSS

- Escape HTML Tags and Quotes and more.
  - XMLFormat()
    - Escapes double quotes, single quotes and <tags>.
  - HTMLEditFormat()
    - Escapes <tags> and double quotes but not single quotes.
- Make Your Own Function (best)
  - Escape or Remove: < > ‘ “ ( ) ; #

Preventing XSS

- Validate Inputs
- Enforce Maximum String Length
- Convert Case (JS is case sensitive)

SQL Injection

- Very Dangerous
  - Execute ANY SQL Statement
  - Or ANY Program!
    - xp_cmdshell
- Very Easy to Prevent

Classic SQL Injection Example

```
<cfquery datasource=”db” name=”news”>
    SELECT title, story
    FROM news
    WHERE id = #url.id#
</cfquery>
```

/news.cfm?id=8;DELETE+FROM+news

Preventing SQL Injection

```
<cfquery datasource=”db” name=”news”>
    SELECT title, story
    FROM news
    WHERE
      id = <cfqueryparam value=”#url.id#”
        cfsqltype=”cf_sql_integer”>
</cfquery>
```

CFQUERYPARAM

- Can and should be used in
  - WHERE Clauses
  - INSERT Statements
  - UPDATE Statements
  - All variables in your query
    - Where allowed

Cross Site Request Forgery

- How “samy”, a MySpace user made 1 million friends in less than 20 hours.

Cross Site Request Forgery

- Samy found a clever way to execute javascript on his MySpace profile page.
  - Whenever a MySpace user visited his profile samy's script would add himself as a friend on their profile.
  - For a few hours Samy caused MySpace to shut down for "maintenance".

Cross Site Request Forgery

- Takes advantage of a logged in user.
  - Performs a privileged action on their behalf.

CSRF + XSS

- You don't need an XSS hole to perform a Cross Site Request Forgery (CSRF).
  - However, with an XSS hole, HTTP POST requests can be executed behind the scenes with AJAX.
- CSRF could be performed by an IFRAME on a malicious web site.

Cross Site Request Forgery Example

Mitigating CSRF Attacks

- Server Side Confirmations
- Require HTTP POST when performing operations.
- Don’t allow foreign HTTP referrers.
- Require password for sensitive operations.
- Include a hash in the form based on authenticated user’s credentials.

CRLF Injection

```
<cfheader name="Content-Type"
          value="#url.type#">
```

- CRLF = Chr(13) & Chr(10)
- CFHEADER

Session Hijacking

- If an attacker knows a user's session id(s) (CFTOKEN & CFID) they can impersonate the user.

Ways Session ID's are Compromised

- Passing CFID & CFTOKEN in query string.
  - CFLOCATION does this by default, use addtoken="false"
- Cookies can be stolen with cross site scripting attacks.
- Traffic sniffing

Ways to Prevent Hijacking

- Use SSL
- Don't put session ids in the URL
- Use long session ids
  - Enable "Use UUID for CFTOKENs"
  - J2EE Sessions
- Secure & HTTPOnly Cookies
- Integrity checking

Don't Disclose Server Details

- Error messages may show:
  - File Paths
  - Source Code
  - Database Table and Column Names
- Use a Global Error Handler or CFERROR

Require SSL / HTTPS

- Prevent sniffing
- Browsers run at a higher security level lowering success rates on some attacks.
- Secure cookies
  - <cfcookie secure=”true” ...>

HackMyCF.com

FuseGuard

Foundeo's Web Application Firewall for Coldfusion

- Announcing Version 2.0
  - Lower Price (starts at $349/app)
  - Log Viewer GUI
  - File Upload Filter
  - foundeo.com/security/

Thanks.

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