# CWE Coverage *Claims* Representation (CCR)

IT Security Automation Conference

October 31st 2011

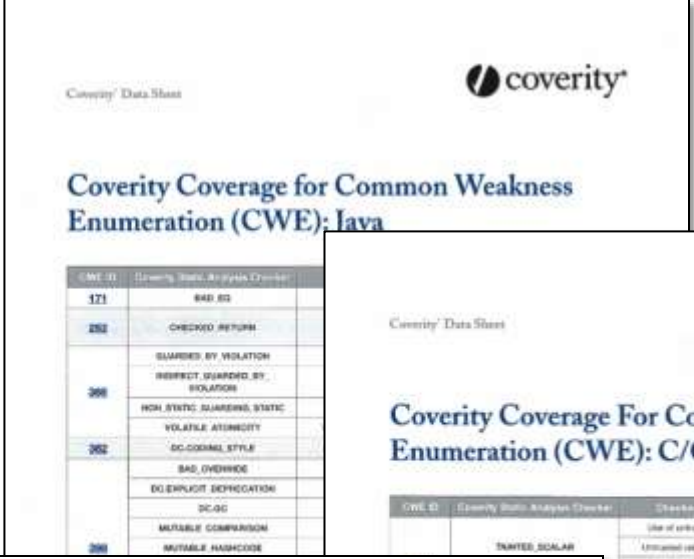
## a success story

**682** CWE’s defined

**29** companies declaring compatibility

of **49** products & services

# tool vendors are beginning to advertise coverage

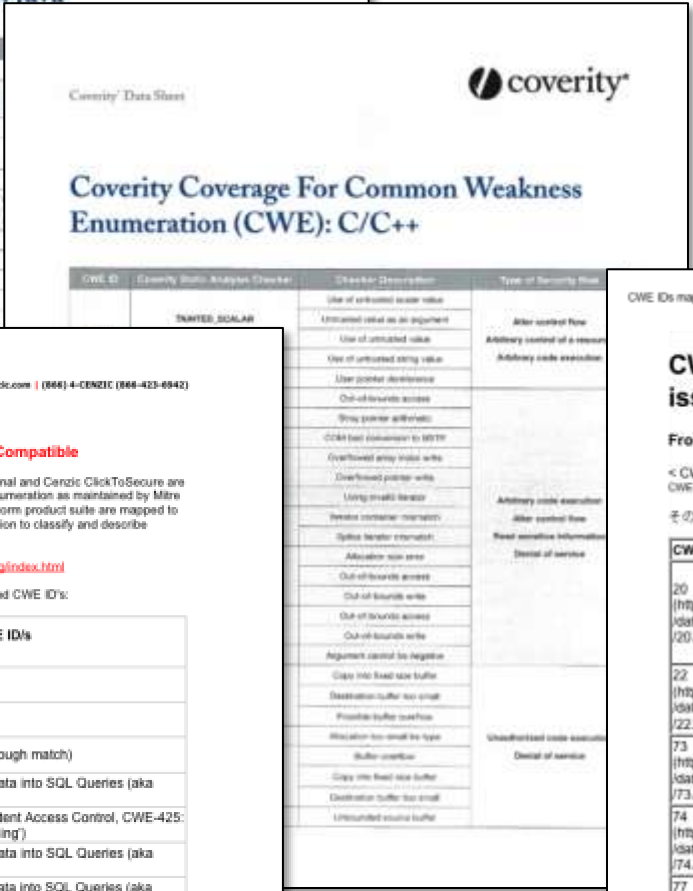


Coverity® Data Sheet

coverity®

## Coverity Coverage for Common Weakness Enumeration (CWE): Java

| CWE ID | Coverity Static Analysis Checker |
|---|---|
| 171 | BAD_EQ |
| 252 | CHECKED_RETURN |
| 366 | GUARDED_BY_VIOLATION |
|  | INDIRECT_GUARDED_BY_VIOLATION |
|  | NON_STATIC_GUARDING_STATIC |
|  | VOLATILE_ATOMICITY |
| 362 | DC.CODING_STYLE |
|  | BAD_OVERRIDE |
|  | DC.EXPLICIT_DEPRECATION |
|  | DC.GC |
|  | MUTABLE_COMPARISON |
| 398 | MUTABLE_HASHCODE |

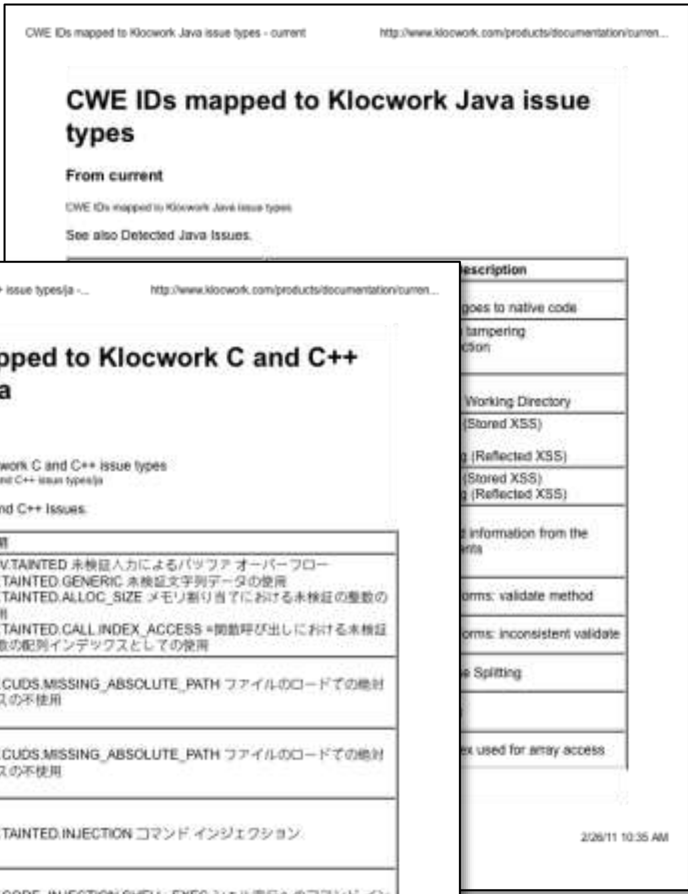


Coverity® Data Sheet

coverity®

## Coverity Coverage For Common Weakness Enumeration (CWE): C/C++

| CWE ID | Coverity Static Analysis Checker | Checker Description | Type of Security Risk |
|---|---|---|---|
|  | TAINTED_SCALAR | Use of untrusted scalar value | Alter control flow; Arbitrary control of a resource; Arbitrary code execution |
|  |  | Untrusted value as an argument |  |
|  |  | Use of untrusted value |  |
|  |  | Use of untrusted string value |  |
|  |  | User pointer dereference |  |
|  |  | Out-of-bounds access | Arbitrary code execution; Alter control flow; Read sensitive information; Denial of service |
|  |  | Stray pointer arithmetic |  |
|  |  | COM bad conversion to BSTR |  |
|  |  | Overflowed array index write |  |
|  |  | Overflowed pointer write |  |
|  |  | Using invalid iterator |  |
|  |  | Iterator container mismatch |  |
|  |  | Splice iterator mismatch |  |
|  |  | Allocation size error |  |
|  |  | Out-of-bounds access |  |
|  |  | Out-of-bounds write |  |
|  |  | Out-of-bounds access |  |
|  |  | Out-of-bounds write |  |
|  |  | Argument cannot be negative |  |
|  |  | Copy into fixed size buffer | Unauthorized code execution; Denial of service |
|  |  | Destination buffer too small |  |
|  |  | Possible buffer overflow |  |
|  |  | Allocation too small for type |  |
|  |  | Buffer overflow |  |
|  |  | Copy into fixed size buffer |  |
|  |  | Destination buffer too small |  |
|  |  | Unbounded source buffer |  |



CWE IDs mapped to Klocwork Java issue types - current http://www.klocwork.com/products/documentation/curren...

## CWE IDs mapped to Klocwork Java issue types

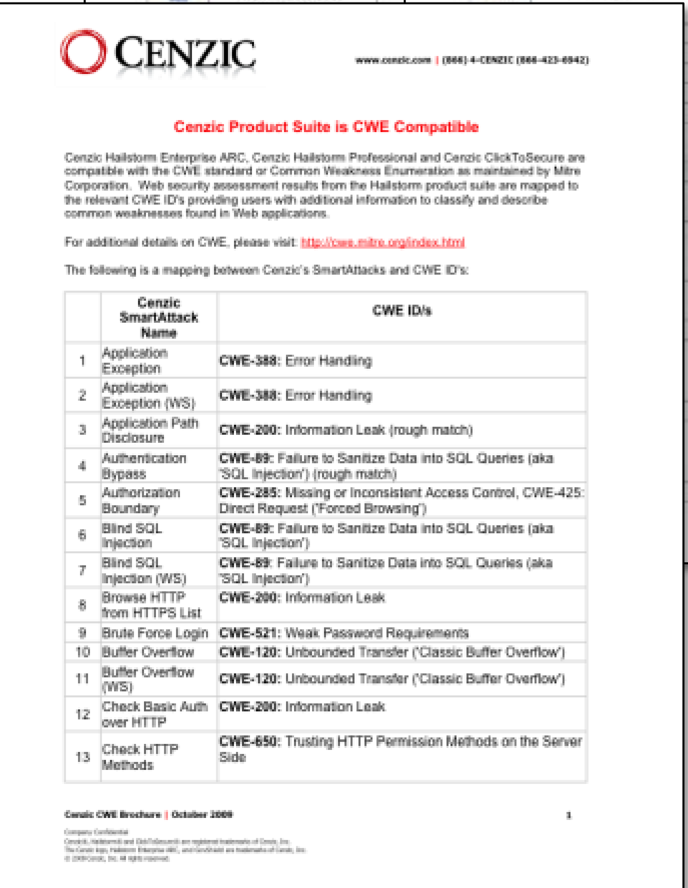
**From current**

CWE IDs mapped to Klocwork Java issue types

See also Detected Java Issues.

escription
goes to native code
tampering
ction
Working Directory
(Stored XSS)
g (Reflected XSS)
(Stored XSS)
g (Reflected XSS)
information from the
nts
orms: validate method
orms: inconsistent validate
e Splitting
ex used for array access

2/26/11 10:35 AM



CENZIC www.cenzic.com | (866) 4-CENZIC (866-423-6942)

## Cenzic Product Suite is CWE Compatible

Cenzic Hailstorm Enterprise ARC, Cenzic Hailstorm Professional and Cenzic ClickToSecure are compatible with the CWE standard or Common Weakness Enumeration as maintained by Mitre Corporation. Web security assessment results from the Hailstorm product suite are mapped to the relevant CWE ID's providing users with additional information to classify and describe common weaknesses found in Web applications.

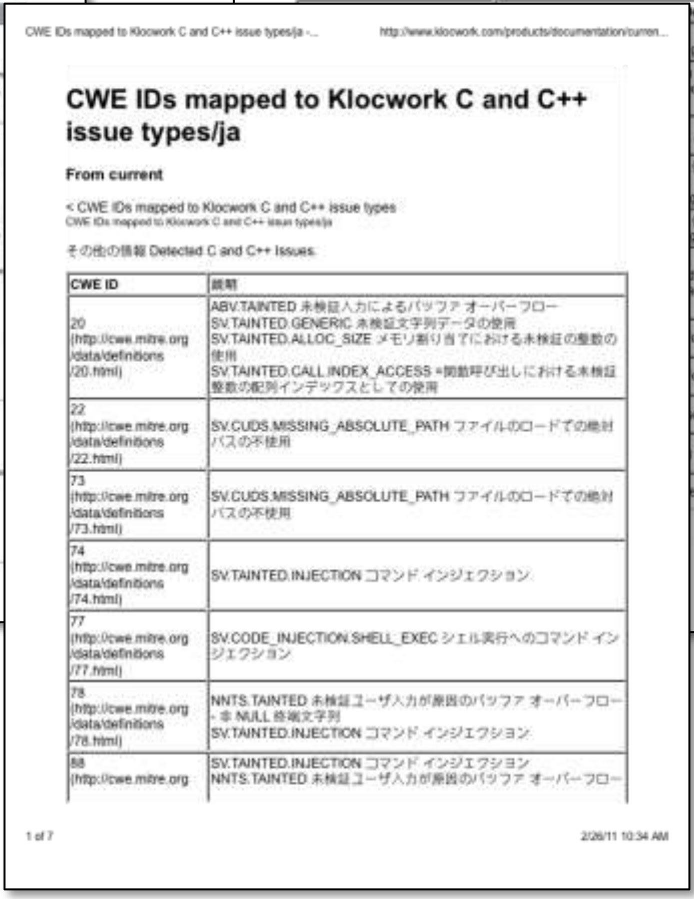
For additional details on CWE, please visit: http://cwe.mitre.org/index.html

The following is a mapping between Cenzic's SmartAttacks and CWE ID's:

|  | Cenzic SmartAttack Name | CWE ID/s |
|---|---|---|
| 1 | Application Exception | **CWE-388**: Error Handling |
| 2 | Application Exception (WS) | **CWE-388**: Error Handling |
| 3 | Application Path Disclosure | **CWE-200**: Information Leak (rough match) |
| 4 | Authentication Bypass | **CWE-89**: Failure to Sanitize Data into SQL Queries (aka 'SQL Injection') (rough match) |
| 5 | Authorization Boundary | **CWE-285**: Missing or Inconsistent Access Control, CWE-425: Direct Request ('Forced Browsing') |
| 6 | Blind SQL Injection | **CWE-89**: Failure to Sanitize Data into SQL Queries (aka 'SQL Injection') |
| 7 | Blind SQL Injection (WS) | **CWE-89**: Failure to Sanitize Data into SQL Queries (aka 'SQL Injection') |
| 8 | Browse HTTP from HTTPS List | **CWE-200**: Information Leak |
| 9 | Brute Force Login | **CWE-521**: Weak Password Requirements |
| 10 | Buffer Overflow | **CWE-120**: Unbounded Transfer ('Classic Buffer Overflow') |
| 11 | Buffer Overflow (WS) | **CWE-120**: Unbounded Transfer ('Classic Buffer Overflow') |
| 12 | Check Basic Auth over HTTP | **CWE-200**: Information Leak |
| 13 | Check HTTP Methods | **CWE-650**: Trusting HTTP Permission Methods on the Server Side |

**Cenzic CWE Brochure | October 2009** 1

Company Confidential
Cenzic, Hailstorm® and ClickToSecure® are registered trademarks of Cenzic, Inc.
The Cenzic logo, Hailstorm Enterprise ARC, and SmartAttacks are trademarks of Cenzic, Inc.
© 2009 Cenzic, Inc. All rights reserved.



CWE IDs mapped to Klocwork C and C++ issue types/ja -... http://www.klocwork.com/products/documentation/curren...

## CWE IDs mapped to Klocwork C and C++ issue types/ja

**From current**

< CWE IDs mapped to Klocwork C and C++ issue types
CWE IDs mapped to Klocwork C and C++ issue types/ja

その他の情報 Detected C and C++ Issues.

| CWE ID | 説明 |
|---|---|
| 20 (http://cwe.mitre.org/data/definitions/20.html) | ABV.TAINTED 未検証入力によるバッファ オーバーフロー<br>SV.TAINTED.GENERIC 未検証文字列データの使用<br>SV.TAINTED.ALLOC_SIZE メモリ割り当てにおける未検証の整数の使用<br>SV.TAINTED.CALL.INDEX_ACCESS 関数呼び出しにおける未検証整数の配列インデックスとしての使用 |
| 22 (http://cwe.mitre.org/data/definitions/22.html) | SV.CUDS.MISSING_ABSOLUTE_PATH ファイルのロードでの絶対パスの不使用 |
| 73 (http://cwe.mitre.org/data/definitions/73.html) | SV.CUDS.MISSING_ABSOLUTE_PATH ファイルのロードでの絶対パスの不使用 |
| 74 (http://cwe.mitre.org/data/definitions/74.html) | SV.TAINTED.INJECTION コマンド インジェクション |
| 77 (http://cwe.mitre.org/data/definitions/77.html) | SV.CODE_INJECTION.SHELL_EXEC シェル実行へのコマンド インジェクション |
| 78 (http://cwe.mitre.org/data/definitions/78.html) | NNTS.TAINTED 未検証ユーザ入力が原因のバッファ オーバーフロー - 非 NULL 終端文字列<br>SV.TAINTED.INJECTION コマンド インジェクション |
| 88 (http://cwe.mitre.org | SV.TAINTED.INJECTION コマンド インジェクション<br>NNTS.TAINTED 未検証ユーザ入力が原因のバッファ オーバーフロー |

1 of 7 2/26/11 10:34 AM

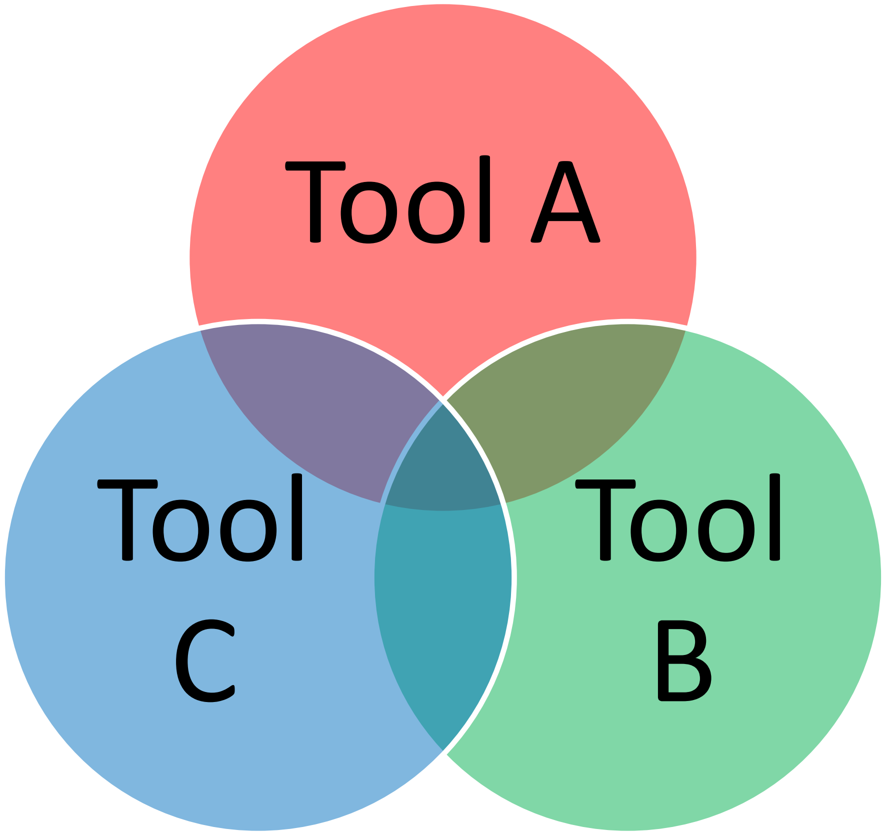
## a (relatively) simple idea…

lightweight and
define a ^ standard way

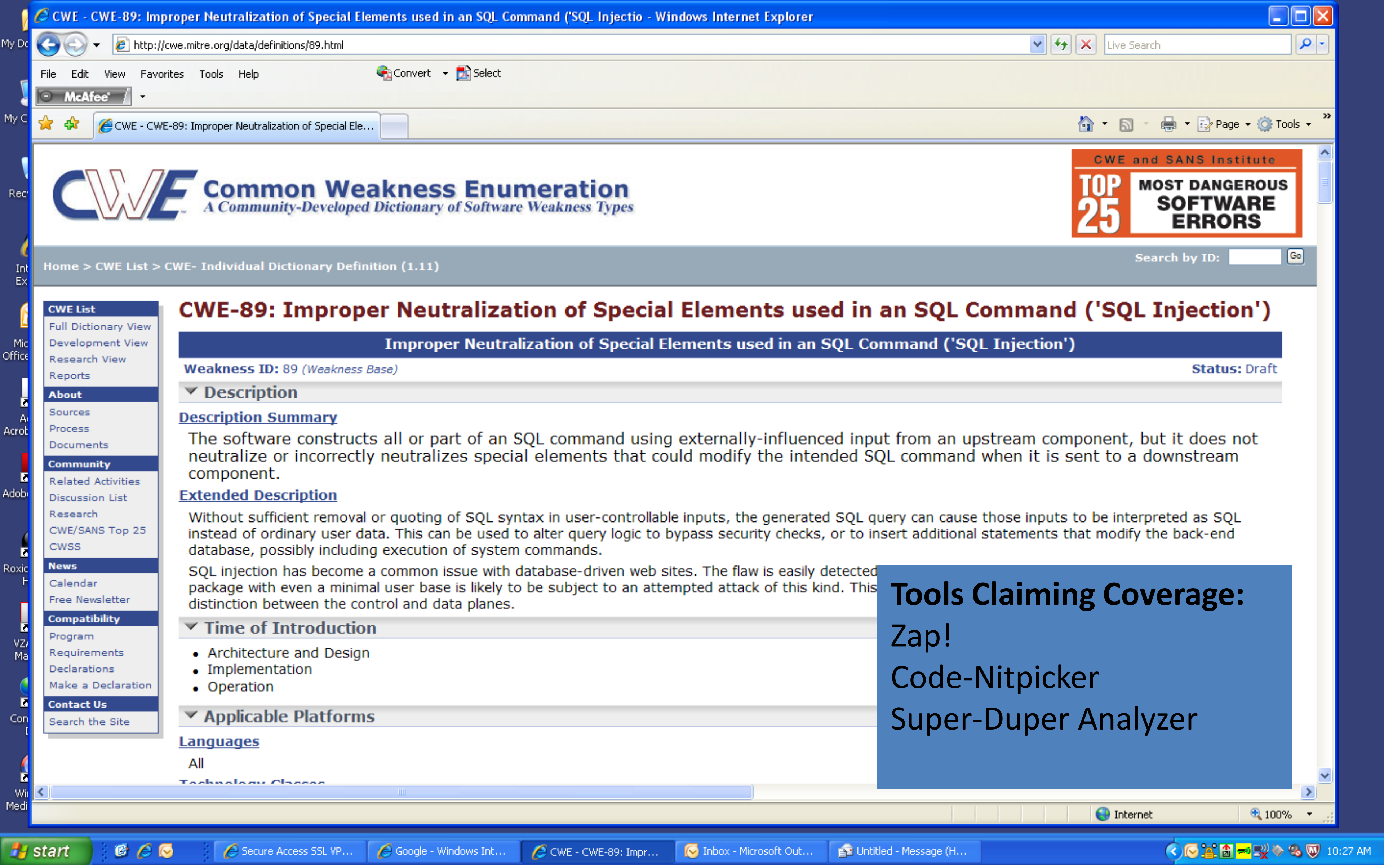
to represent CWE coverage *claims*

## some reasons…

**why do we need a standard representation?**



**to make it easy to compute coverage**



CWE - CWE-89: Improper Neutralization of Special Elements used in an SQL Command ('SQL Injectio - Windows Internet Explorer

http://cwe.mitre.org/data/definitions/89.html

Common Weakness Enumeration
A Community-Developed Dictionary of Software Weakness Types

CWE and SANS Institute TOP 25 MOST DANGEROUS SOFTWARE ERRORS

Home > CWE List > CWE- Individual Dictionary Definition (1.11)

Search by ID:

CWE List: Full Dictionary View, Development View, Research View, Reports
About: Sources, Process, Documents
Community: Related Activities, Discussion List, Research, CWE/SANS Top 25, CWSS
News: Calendar, Free Newsletter
Compatibility: Program, Requirements, Declarations, Make a Declaration
Contact Us: Search the Site

CWE-89: Improper Neutralization of Special Elements used in an SQL Command ('SQL Injection')

Improper Neutralization of Special Elements used in an SQL Command ('SQL Injection')

Weakness ID: 89 *(Weakness Base)* Status: Draft

Description

Description Summary

The software constructs all or part of an SQL command using externally-influenced input from an upstream component, but it does not neutralize or incorrectly neutralizes special elements that could modify the intended SQL command when it is sent to a downstream component.

Extended Description

Without sufficient removal or quoting of SQL syntax in user-controllable inputs, the generated SQL query can cause those inputs to be interpreted as SQL instead of ordinary user data. This can be used to alter query logic to bypass security checks, or to insert additional statements that modify the back-end database, possibly including execution of system commands.

SQL injection has become a common issue with database-driven web sites. The flaw is easily detected package with even a minimal user base is likely to be subject to an attempted attack of this kind. This distinction between the control and data planes.

Time of Introduction

- Architecture and Design
- Implementation
- Operation

Applicable Platforms

Languages

All

**Tools Claiming Coverage:**

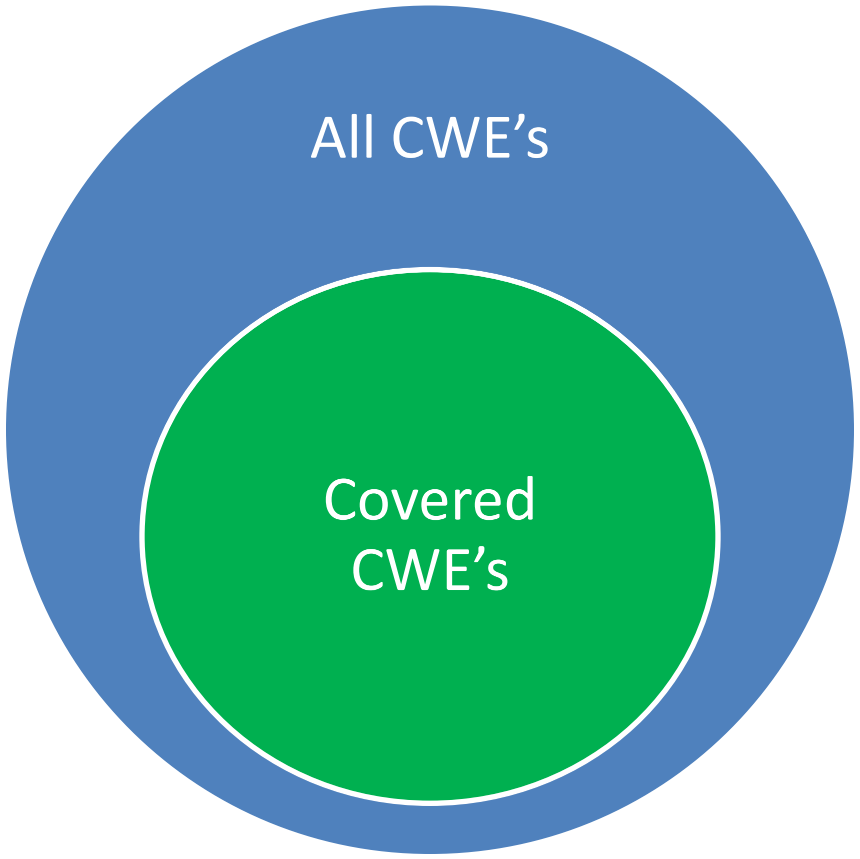
Zap!

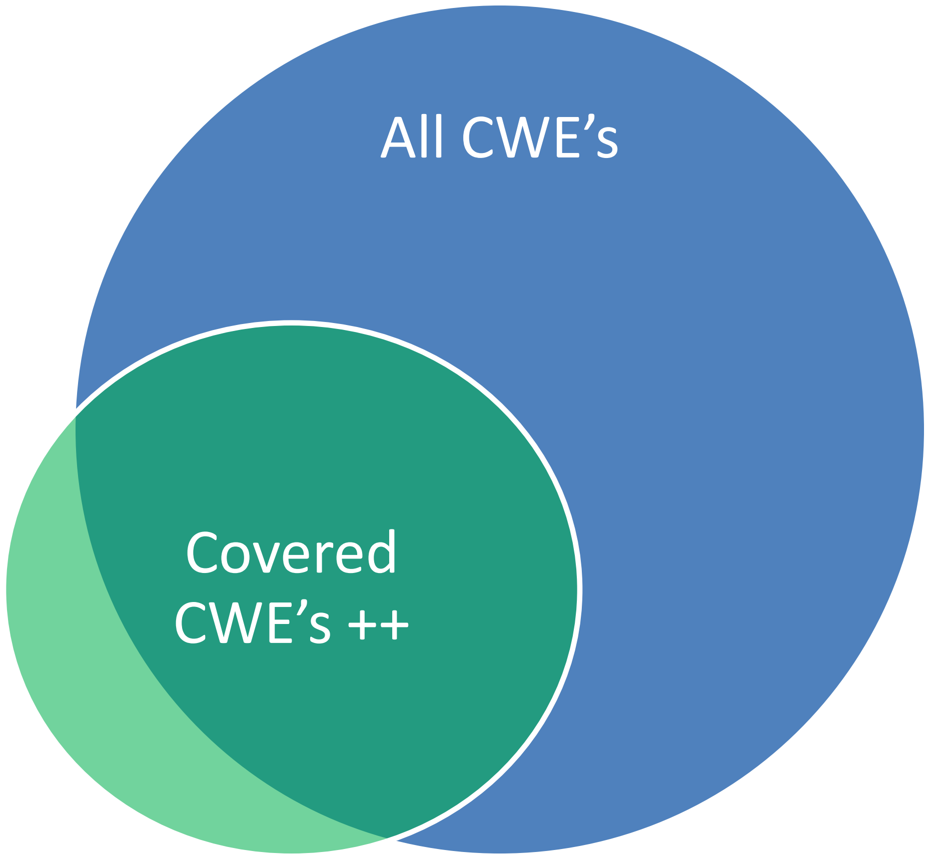
Code-Nitpicker

Super-Duper Analyzer

# help CWE users

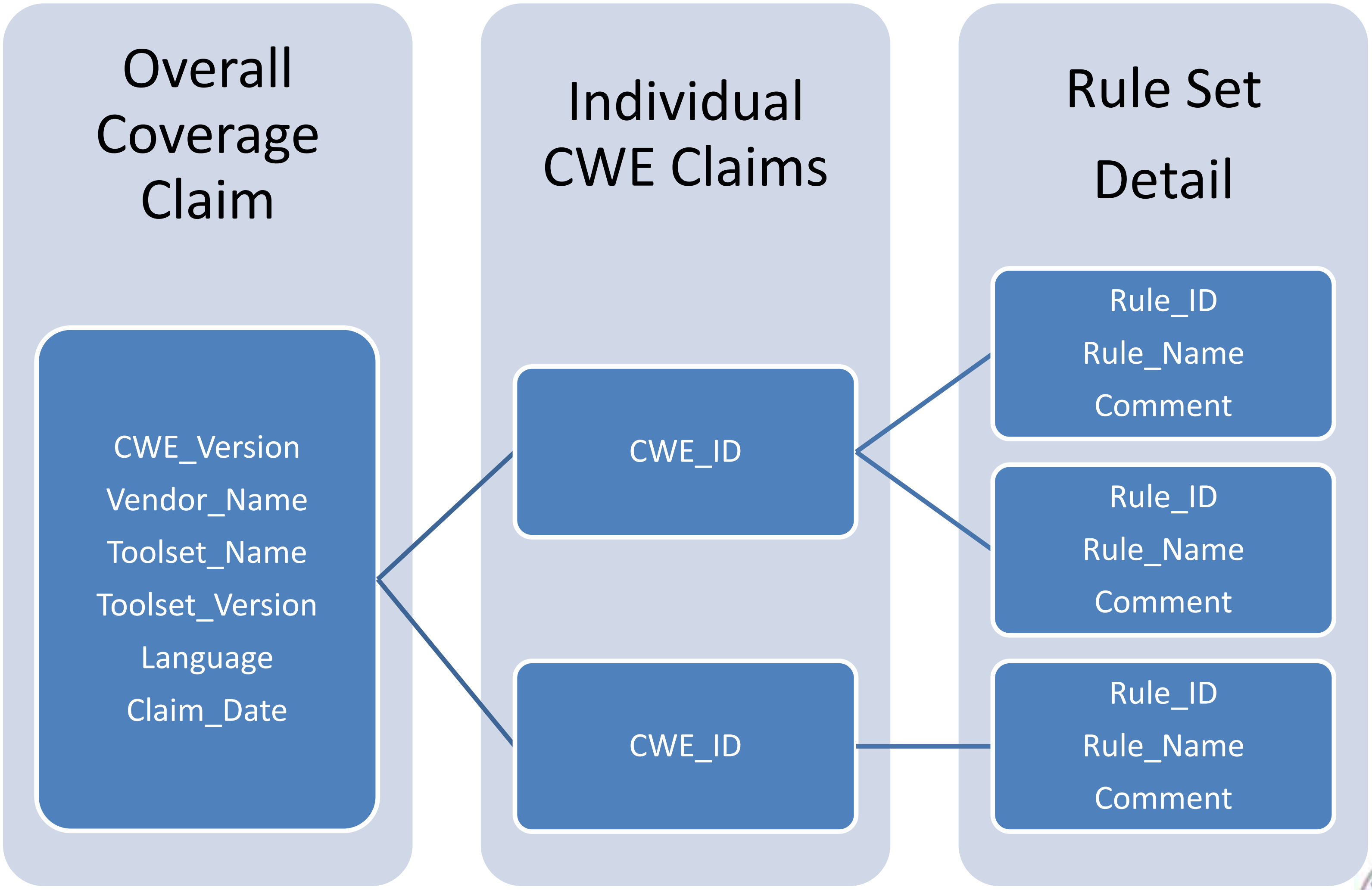
## to see where R&D might be needed

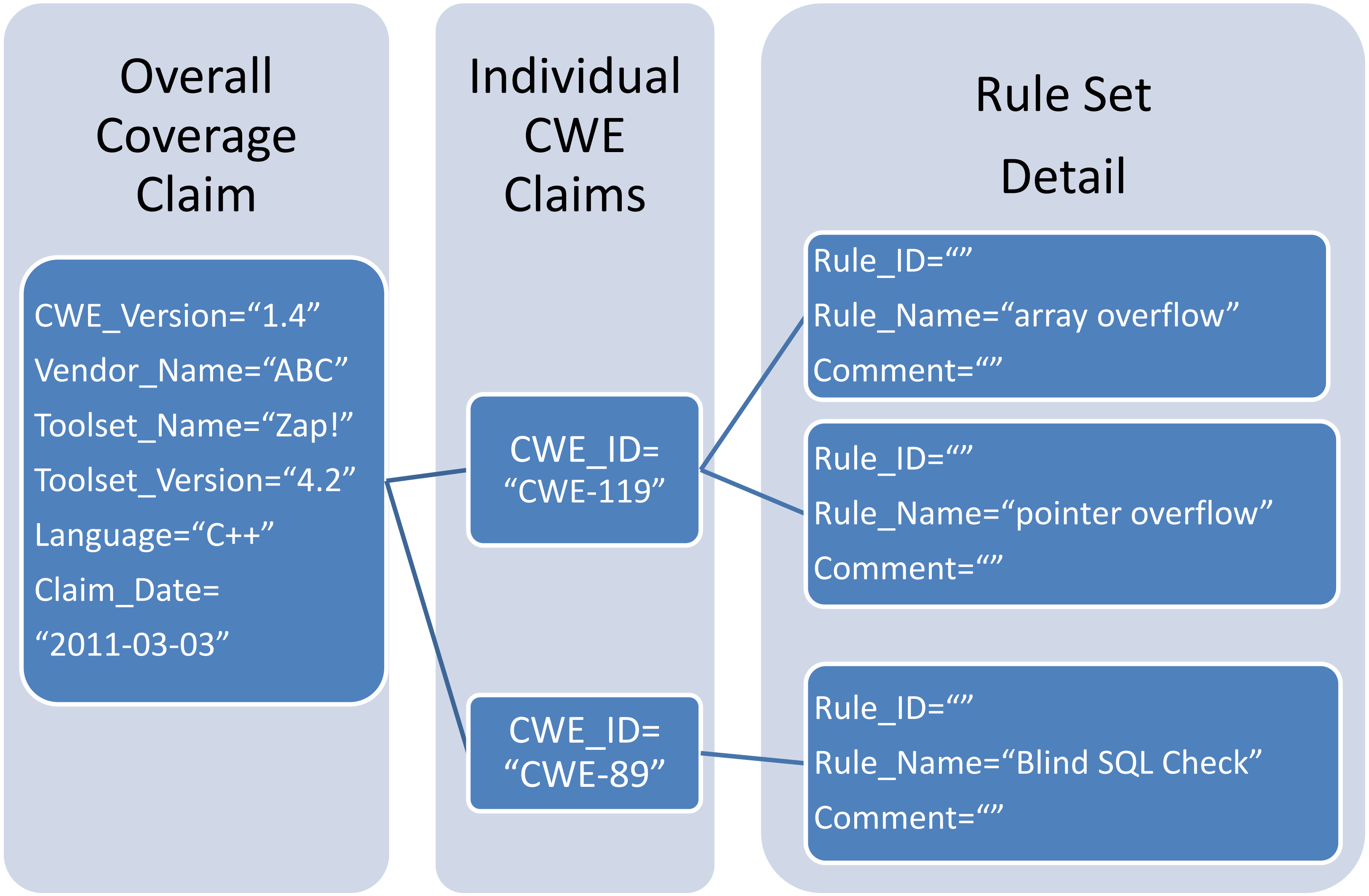




## to see where CWE may need to grow

# the general idea





## something more concrete

services vs. tools

**the are many open issues**

specificity of claims

CWE compatibility program

disclaimers

dynamic vs. static analysis

we <u>need</u> input from the community

today: starting point for discussion – CCR v0.3

**the action part**

input from users

**goals**

input from vendors

# Example

```
<?xml version="1.0" encoding="UTF-8" ?>
 <!-- Sample XML file generated by XMLSpy v2011 http://www.altova.com)
  -->
<!-- NOTE: this data was created by MITRE, using information published
    on the Internet by certain vendors.  It is being used to demonstrate
    CCR  and does not represent any official position by those vendors.  -->
<CWE_Coverage_Claims
    xsi:noNamespaceSchemaLocation="CWE_Coverage_Claims_Schema_v
    0.2.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<CWE_Coverage_Claim CWE_Version="???" Vendor_Name="Klocwork"
    Toolset_Name="?" Toolset_Version="?" Language_Type="Source Code"
    Language="??" Date_of_Claim="2011-04-01">
```

# Example (cont)

```xml
<Claims>
    <Claim CWE_ID="79" CWE_Name="XSS" Match_Accuracy="Exact">
        <CWE_Claim_Comments />
        <Rule_Set>
            <Rule Rule_ID="SV.XSS.DB" Rule_Name="">
                <Rule_Comments />
            </Rule>
            <Rule Rule_ID="SV.DATA.DB" Rule_Name="">
                <Rule_Comments />
            </Rule>
            <Rule Rule_ID="SV.XSS.REF" Rule_Name="">
                <Rule_Comments />
            </Rule>
        </Rule_Set>
    </Claim>
```

## Example (cont)

```
<Claim CWE_ID="352" CWE_Name="CSRF"
  Match_Accuracy="Not-Covered">
  <CWE_Claim_Comments>It is very difficult for
  static analysis to identify any CSRF issues,
  because each application has its own implicit
  security policy that dictates which requests
  can be influenced by an
  outsider.</CWE_Claim_Comments>
 </Claim>
```

# Example (cont)

```
<Claim CWE_ID="738" CWE_Name="Insecure Permissions"
   Match_Accuracy="CWE-more-abstract">
        <CWE_Claim_Comments>
        Checkers such as  SV.FIU.PERMISSIONS do provide some coverage,
        but typically, loose permissions for operations and custom
        permission models produce too many warnings from static analysis
        tools.
        </CWE_Claim_Comments>
        <Rule_Set>
                <Rule Rule_ID="SV.FIU.PERMISSIONS” Rule_Name="">
                        <Rule_Comments />
                </Rule>
        </Rule_Set>
 </Claim>
```

# Match_Accuracy Element

- **Exact** - The CWE entry exactly covers the same weakness/weaknesses as the given rule set.
- **CWE-more-abstract** - The CWE entry covers more concepts than the given rule set, but there are not any more precise matches available. For example, a rule set might detect resource consumption for a resource that is not specifically covered by CWE.
- **CWE-more-specific** - The CWE entry is more specific than the weakness reported by the given rule set, but the entry's parent(s) are not appropriate matches. This might indicate a difference in perspective between CWE and the capability providing the coverage mapping. It could also include a single rule that covers multiple CWE entries (which might imply that there would be multiple claims for a single rule/rule set).
- **CWE-partial** - The CWE entry is only a partial match with the weakness reported by the given rule set, but the entry is the closest available match.
- **Not-covered** - The CWE entry is not covered by any rule set. The provider is not required to include information about uncovered CWEs. The intention of this assertion is to provide a means for tool vendors to explain why their tool does not claim to discover a certain CWE-defined weakness, if they so choose.
- **No-CWE-available** - There is no CWE entry available that closely matches the weakness reported by the given rule set, but the provider believes that a CWE entry should exist for the reported weakness. The associated CWE_ID should be 0.
- **Not-CWE-applicable** - The rule/rule set is not applicable to CWE, i.e., it is not necessarily about a weakness. This could include rule sets related to coding style conformance, informational messages about the scan, etc. The associated CWE_ID should be -1. The provider is not required to include information about non-applicable rules.
- **Unknown** - The match accuracy is unknown. Typically this would be used by a third party who is creating a coverage claim and does not have insight into the technology.
- **No-claim** – The creator of the CCR document is asserting no claim with respect to this CWE.

Richard.Struse@dhs.gov

**thank you.**