



Unforgivable Vulnerabilities

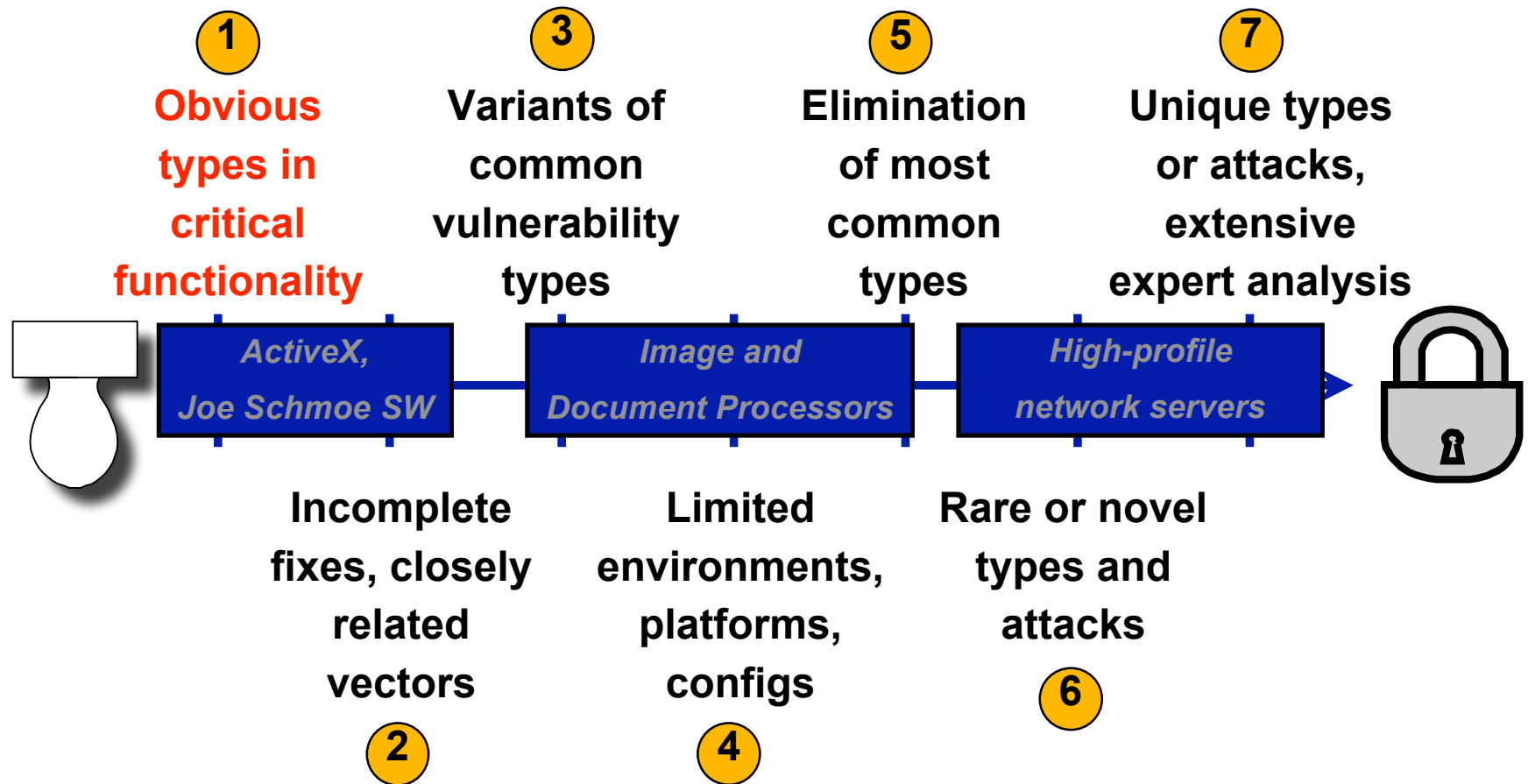
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The MITRE Corporation
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Introduction

- **Vulnerabilities are a fact of life**
- **Many vulnerabilities simply shouldn't be in software anymore**
- **Everything's obvious to smart people like us!**
- **How to identify the worst of the worst?**
- **What issues should give pause to consumers, and nightmares to vendors?**
- **Raw vulnerability numbers don't tell the whole story**

Typical Vulnerability History of a Product





Criteria for an “Unforgivable” Vulnerability

■ Precedence: Many have made the same mistake

Required

■ Documentation: The mistake is well-documented

Required

■ Obviousness: The attacks are obvious

■ Attack Simplicity: The manipulations are very simple

2 of 3

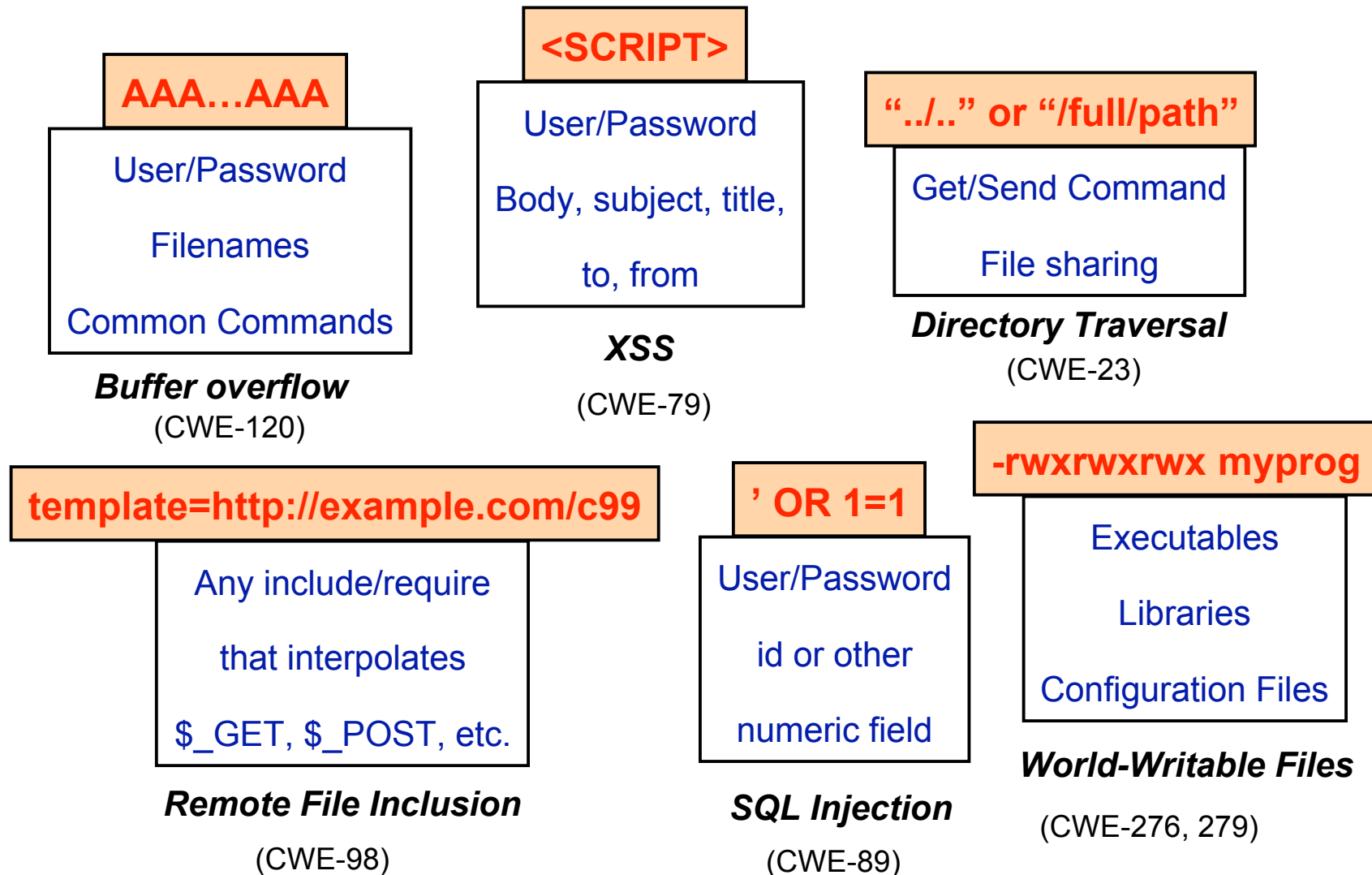
■ Found in Five: Able to be found with 5 minutes of effort

Required

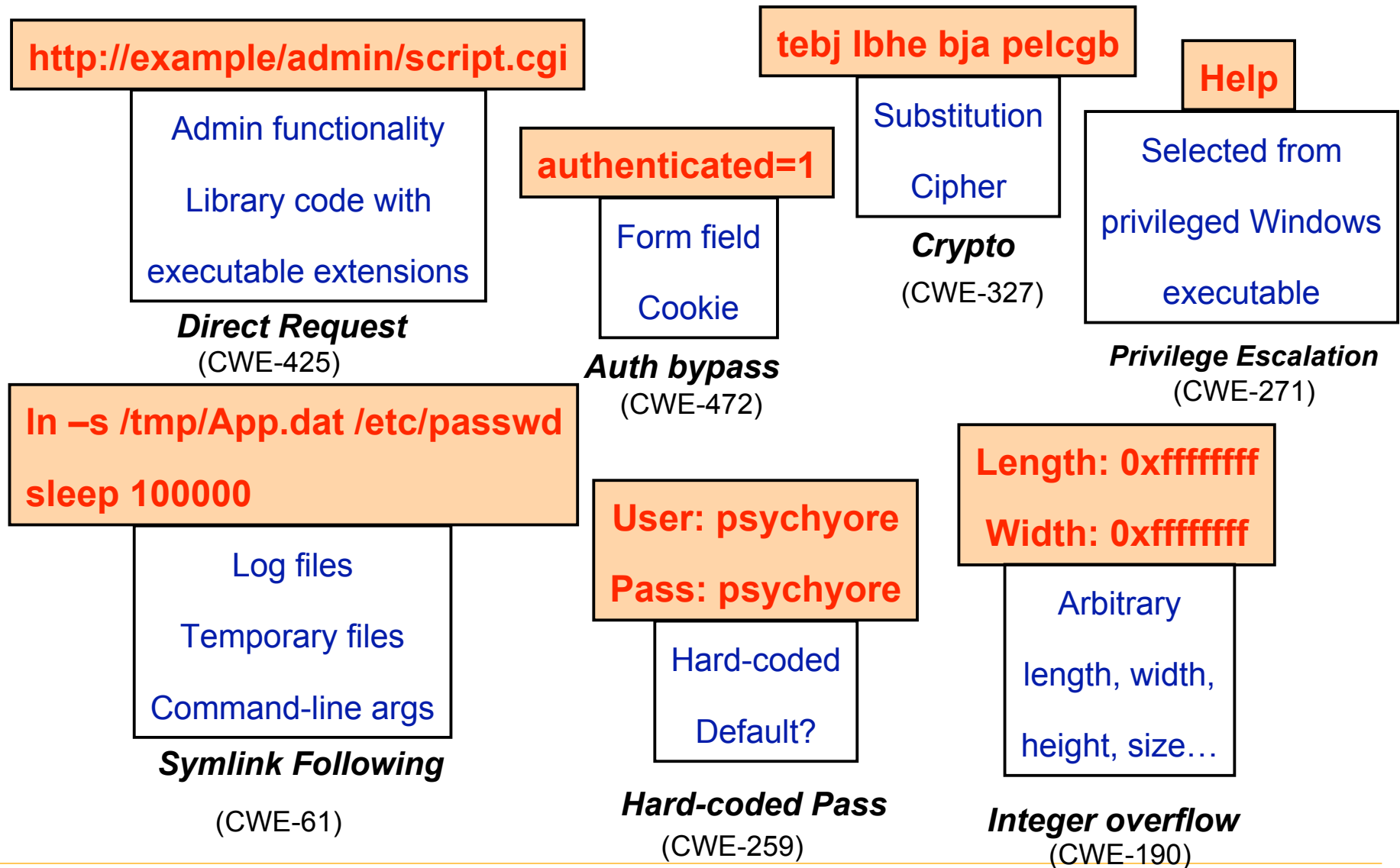


**We hold these
vulnerabilities to be
self-evident...**

The Lucky 13



The Lucky 13 (Continued)





Shall We Play a Game?

Do you have any more nominations?

Is the research community effectively getting the message across?

How long will it take one of these problems to show up in your favorite software?

How many Black Hat talks in new technologies demonstrate these problems?



VAAL-iation

- **Vulnerability Assessment Assurance Levels (Litchfield)**
 - Level of confidence: “how secure is software X?”
 - Based on an audit of a product
 - Depth of analysis: “how much effort was put into analysis?”
 - VAAL != Common Criteria
- **Move away from those pesky vulnerability counts!**
- **Communicate to consumers and each other**

The professional research community needs to stop pretending that basic research is magic and become more consumer-friendly. This means metrics.



Proposed VAAL Dimensions

- **Access Constraints**
 - Privileges/restrictions needed for access
- **Feature Frequency**
- **Potential Severity**
- **Novelty**
 - How new/unusual is the vuln/attack?
- **Vector Depth**
 - How “close together” are the entry point and the vulnerability?
- **Manipulation Complexity**
 - <SCRIPT> or RSnake head-scratcher?
- **Ubiquity**
 - Configuration, Platforms, Environments
- **Level of Effort**
 - Shhhh, never let them see you sweat



Unforgivable Vulnerabilities in VAAL-speak

- Low access constraints
- Very high feature frequency
- Very low novelty
- Low manipulation complexity
- Low level of effort

- Not directly applicable
 - Potential severity
 - Vector depth
 - Ubiquity



Related Work

- **Attack Surface Measurement (Howard, Manadhata, and Wing)**
- **Threat Modeling (*Trike*, *STRIDE*, Snyder)**
- **SAMATE: Software Assurance Metrics and Tool Evaluation (NIST)**
- **Security Quality Score (Wysopal/Veracode)**
- **CVSS: Common Vulnerability Scoring System (FIRST)**

- **See paper for details and more references**



Questions?