How to break into Application Security world?

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Some of the points are real world examples for educational purpose and not to endorse any entity.
Agenda

- What’s wrong with this code?
- What can go wrong in this code?
- Application Security
- Application Security Engineer
- How to break into Application Security world?
Before we start

October is CyberSecurity Awareness Month

Twitter: @GetCyberSafe managed by Public Safety Canada.
What’s wrong with this code? 1/3

```c
if ((err = SSLHashSHA1.update(&hashCtx, &serverRandom)) != 0)
goto fail;
if ((err = SSLHashSHA1.update(&hashCtx, &signedParams)) != 0)
goto fail;
goto fail;
if ((err = SSLHashSHA1.final(&hashCtx, &hashOut)) != 0)
goto fail;
```
1. What’s wrong with this code? 2/3

```c
if ((err = SSLHashSHA1.update(&hashCtx, &serverRandom)) != 0)
goto fail;
if ((err = SSLHashSHA1.update(&hashCtx, &signedParams)) != 0)
goto fail;
goto fail; /* This line should not be here */
if ((err = SSLHashSHA1.final(&hashCtx, &hashOut)) != 0)
goto fail;
```

1. What's wrong with this code? 3/3

iOS 7.0.6

- Data Security

Available for: iPhone 4 and later, iPod touch (5th generation), iPad 2 and later

Impact: An attacker with a privileged network position may capture or modify data in sessions protected by SSL/TLS

Description: Secure Transport failed to validate the authenticity of the connection. This issue was addressed by restoring missing validation steps.

CVE-ID

CVE-2014-1266

https://support.apple.com/en-ca/HT202934
2. What can go wrong in this code? 1/2

String user = request.getParameter("user");
String pwd = request.getParameter("pwd");
String sql = "SELECT * FROM User WHERE user = '" + user + "' AND pwd = '" + pwd + "'";
Statement stmt = connection.createStatement();
ResultSet result = stmt.executeQuery(s);
2. What can go wrong in this code? 2/2

```java
String user = request.getParameter("user");
String pwd = request.getParameter("pwd");
String sql = "SELECT * FROM User WHERE user = " + user + " AND pwd = " + pwd + "\n; /*Query is constructed from request without any validation and …?*/
Statement stmt = connection.createStatement();
ResultSet result = stmt.executeQuery(s);
```

National Vulnerability Database - https://nvd.nist.gov/
Application Security

SANS 2016 State of Application Security: Skills, Configurations and Components

How mature do you consider your AppSec program to be?

- Very mature: 0.8%
- Mature: 3.3%
- Maturing: 3.5%
- Immature: 6.0%
- Nonexistent (Planning): 22.0%
- Nonexistent (No plans): 25.3%
- Unknown/Unsure: 37.5%
- Other: 1.6%
Application Security Engineer 1/2

Implement Secure Software Development Lifecycle (SSDLC) program

- Threat Modeling
- Risk Assessment
- Code Review
- Static and dynamic analysis
- Security testing
Application Security Engineer 2/2

Java Deserialization - AppSec Nightmare - WebLogic, WebSphere, JBoss, Jenkins, OpenNMS

- Remote Code Execution
- Denial of Service

How to break into Application Security world? 1/5

1) Learn and participate in open source projects such as OWASP (www.owasp.org) and http://www.webappsec.org/.

2) Useful tools -
   ● HTTP Proxy - OWASP ZAP, Burp Suite etc
   ● OWASP Dependency check
   ● OWASP Top 10 and CWE Top 25
   ● OWASP Application Security Verification Standard Project
   ● https://www.ssllabs.com/
   ● https://www.kali.org/
   ● https://www.owasp.org/index.php/Web_Application_Firewall
   ● Wireshark
3) Bug bounty programs and responsible disclosures:

- $15,000 award! @ http://www.anandpraka.sh/2016/03/how-i-could-have-hacked-your-facebook.html
  - Password reset code brute force protection even for lesser known test services!

- Sometimes the bug bounty policies might not be clear.
How to break into Application Security world? 3/5

- Professional communication
How to break into Application Security world? 4/5

4) Daily dose of security news:

1. https://www.reddit.com/r/netsec
2. https://isc.sans.edu/podcast.html
3. Bugtraq mailing list

5) Local Security groups - Vancouver

- https://vancitysec.org/
- http://infosecbc.org/
- BSidesVancouver 2017 - Volunteer
How to break into Application Security world? 5/5

6) Publish your research and views on Security - for example maintain a blog.

7) Certifications

8) Some good learning exercises
   - https://cryptopals.com/ - Crypto Challenges
   - OWASP WebGoat
References

Q & A