Epic Facepalm

Spectacular Appsec Failures Since About This Time Last Year

Will

John

Overview

SQL Injection

eWEEK SECURITY WATCH

ZIFF DAVIS enterprise

May 24, 2011 7:00 AM

Sony Woes Continue With SQL Injection Attacks

IT Security & Network Security News

Nokia Shuts Down Forums After SQL Injection Exposes Developer Info

Latest News

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SQL injection blamed for widespread DNS hack

```
SELECT *
FROM xaction
WHERE payee = 'Cyber Security Symposium'
ORDER BY paid_on DESC;
```

```
String payee = request.getParameter("payee");
String sql = "SELECT * "
  + "FROM xaction "
  + "WHERE PAYEE = '"
  + payee
  + "' ORDER BY paid_on DESC;"
rs = stmt.executeQuery(sql);
```

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```

```
Cyber' OR '1' = '1
```

```
SELECT *
FROM xaction
WHERE payee = 'Cyber' OR '1' = '1'
ORDER BY paid_on DESC;
```

```
String payee = request.getParameter("payee");
String sql = "SELECT * "
  + "FROM xaction "
  + "WHERE PAYEE = ?"
  + ORDER BY paid_on DESC;"
stmt = new PreparedStatement(sql);
stmt.setString(1, payee);
rs = stmt.executeQuery();
```

```
String payee = request.getParameter("payee");
String sql = "SELECT * "
  + "FROM xaction "
  + "WHERE PAYEE = ?"
  + ORDER BY paid_on DESC;"
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```

Parameterized Query Notes

- Most languages have them in some form
- Placeholder text may vary
- PHP/MySQL, use MySQLi driver
- Even available in ADO
- Often improves performance
- Blacklist “validation” insufficient
- Some things take extra work:

```
WHERE payee LIKE '%' + ? + '%'
```

- Use indirect reference for columns

About NoSQL

- Injection works exactly the same way
- Except you'll use JSON, XPATH, etc.
- Problem with mixing control channel and data channel
- Welcome back to 1971

Direct Object Reference

Turned to Horizontal Privilege Escalation


The Register®
Hardware
Software
Music & Media
Networks
Security
Cloud
Crime
Malware
Enterprise Security
Spam
ID
Print
Tweet
Like
15
Citigroup hack exploited easy-to-detect web flaw
Brute force attack exposes 200,000 accounts

Direct Object Reference

- Object ID (primary key value, etc.) passed to UI to refer back to that object
- Browser in control of the value
- User not checked for “entitlement” to that object ID

```
/view_account?account_id=1234

SELECT *
FROM account
WHERE account_id = ?; -- NOTE: NO SQLI
```

Preventing Direct Object Reference

- Check “entitlement” along with the query that makes the request

```
SELECT * FROM account WHERE
account_id = ? AND owner_name =
?
```

  (get owner_name from session, NOT cookie)
- Check “entitlement” with a separate query
- Don’t send direct objects - use indirect ones

Indirect Object Reference

- ```
  // When rendering the list of accounts the
  // user can manipulate
  session.setAttribute("ACCOUNTS",
    array of accounts);

  // When the user posts back
  id = request.getParameter("id");
  accts = session.getAttribute("ACCOUNTS");
  acct = accts.get(id);
  ```
  ```

Indirect Object Reference: Error Checking

- XSRF checking since IOR's have predictable ID's (1, 2, 3, etc.) - could be handled by using XSRF-token style IOR's
- Type checking on incoming ID (checking it's an integer or properly formatted XSRF token)
- Ensure the incoming ID is within the bounds of the list of objects
- Ensure the list of objects is in the session already

Clickjacking

BBC Mobile

NEWS TECHNOLOGY

Facebook "clickjacking" spreads across site

Mashable Tech

New Facebook Clickjacking Attack Uses Justin Bieber as Bait [WARNING]

June 02, 2010 by Christina Warren

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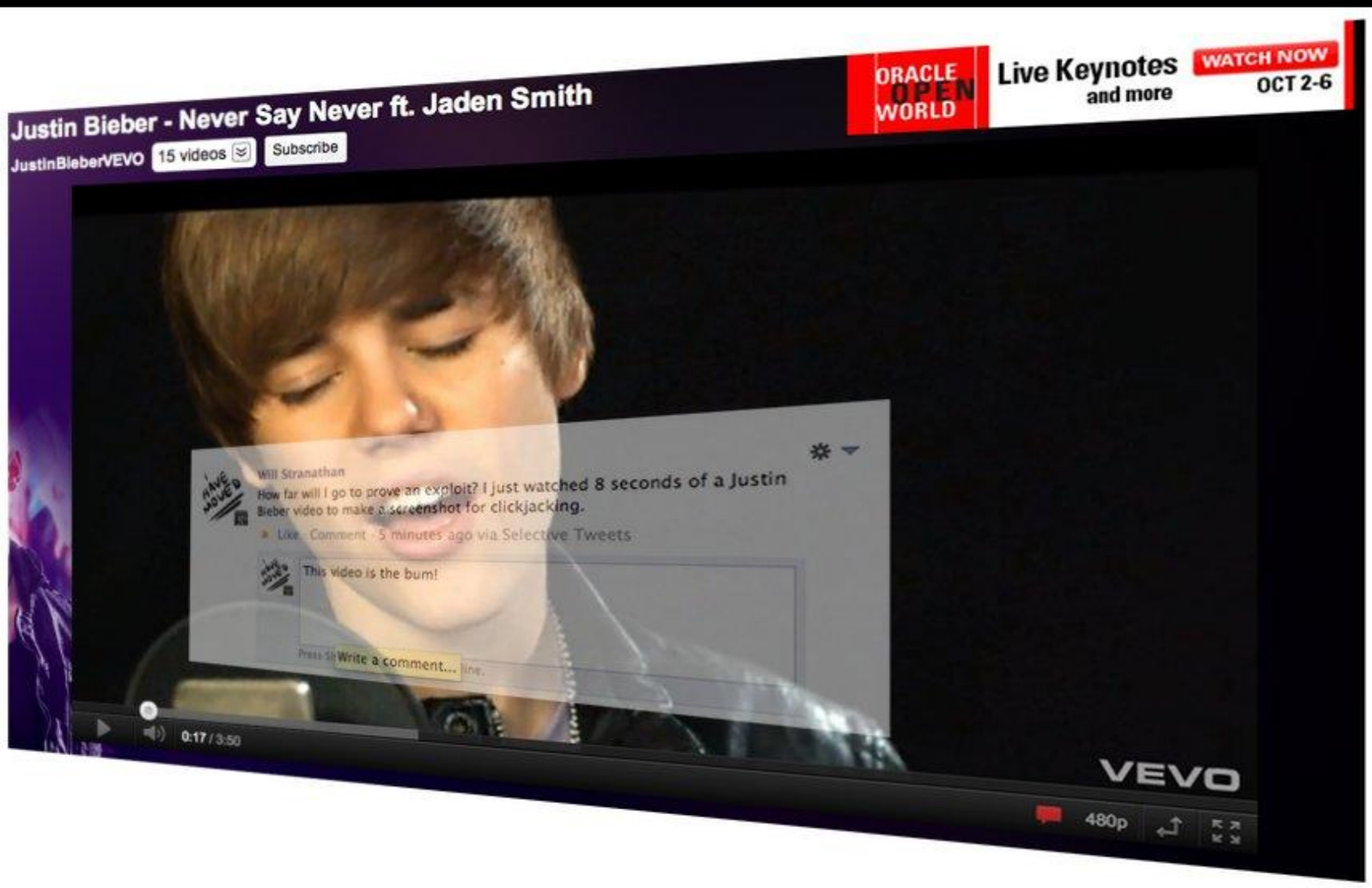
Justin Bieber - Never Say Never ft. Jaden Smith
JustinBieberVEVO
15 videos
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Live Keynotes and more
WATCH NOW
OCT 2-6
Will Stranathan
How far will I go to prove an exploit? I just watched 8 seconds of a Justin Bieber video to make a screenshot for clickjacking.
Like · Comment · 5 minutes ago via Selective Tweets
This video is the bum!
Write a comment...
0:17 / 3:50
VEVO
480p

Clickjacking

- Target site can be loaded in an `iframe`
- Target site has something that requires clicking
- Attacker uses a “lure” on their site
- Positions real target immediately above lure
- Makes `iframe` invisible with higher `z-index`
- User thinks they’re clicking the lure, but they’re clicking the target (with their cookies, etc.)

Clickjacking Uses

- XSRF token evasion
- “Like” button on Facebook
  - Useful for spreading malware
- Enabling the camera
- Ad click fraud

Clickjacking Code

```
vuln {
  position: absolute;
  top: 43 px;
  left: 97 px;
  opacity: 0.0;
  filter: alpha(opacity=0);
  z-index: 100;
}
...
<iframe
src="http://facebook.com/comment.php" class="vuln"></iframe>
```

Preventing Clickjacking

- X-FRAME OPTIONS
  - Most newer browsers
  - SAMEORIGIN or DENY
  - Easier than frame busting
  - Can be done in META in HEAD
- Framebusting
  - Lots of ways around it
  - Best approach for now is at https://www.owasp.org/index.php.Clickjacking

Wrapping Up

- SQL Injection in 2004 OWASP Top 10 (A6)
- Direct Object Reference in 2004 OWASP Top 10 (A2)
- Clickjacking - you’re welcome
- All of these can be found with
  - Basic webapp hacking
  - First two with static analysis (third, with standards and customization)

Thanks