Web Security (II)

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Administrative Stuff

- **Proposal feedback**
  - **Revised proposal due Oct 22**
    - » **Timeline**
    - » **More clear description of problem & approach**
  - **Feedback on Oct 23**
    - » **3:30-5:30pm**
    - » **Each group 10mins**
    - » **Sign-up sheet**
- **BitBlaze info session**
  - **5pm, Soda 405**

Access Control in OS & Browser

- **Access control in OS**
  - **Principals**
  - **Resources**
  - **Policies?**
- **Access control in Browser**
  - **Principals**
    - » **Owner of web content**
  - **Resources**
    - » **Memory: heap of script objects**
    - » **Persistent state: cookies**
    - » **Display: HTML DOM**
    - » **Network communication**
  - **Policies?**

Same-Origin Principle (SOP)

- **Documents or scripts loaded from one origin cannot get or set properties of documents from a different origin**
- **Origin**
  - **Two pages have the same origin if the protocol, port, host are the same for both pages**
- **The origin of a script**
  - **The origin that a script is loaded is the origin of the document that contains the script rather than the origin that hosts the script**
  - **E.g., a.com/service.html contain <script src=http://b.com/lib.js>, can lib.js access a.com's or b.com's HTML DOM objects?**

Problems with SOP

- **Rigid: all-or-nothing**
  - **Insufficient for Mashup**
- **Too coarse-grained if site hosts unrelated pages**
  - **Example: Web server often hosts sites for unrelated parties**
    - **http://www.example.com/account/**
    - **http://www.example.com/otheraccount/**
  - **Same-origin policy, allows script on one page to access properties of document from another**

Trust Models in Mashup

- **Content provider P, content integrator T**

	P trusts T to access P's content	T trusts P to access T's resources	Content type
1 2	No	No	isolated access-controlled
3	No	Yes	open
4	Yes	No	unauthorized
5	Yes	Yes	open

Policy Enforcement

	P trusts T to access P's content	T trusts P to access T's resources	Content type	Abstraction	Run-as Principal
1 2	No	No	isolated access-controlled	<Frame> <ServiceInstance> & *CommRequest*	Provider Provider
3	No	Yes	open	<Script> (bad practice)	Integrator
4	Yes	No	unauthorized	<Sandbox> <OpenSandbox>	None
5	Yes	Yes	open	<Script>	Integrator

- **What are the OS analogous counterpart?**

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What Other Methods Can We Design to Address These Problems?

- **Capabilities**
  - **How capabilities may be used here?**
  - **Advantages?**
  - **Disadvantages?**
- **Crypto**
  - **How crypto may be used here?**
  - **Advantages?**
  - **Disadvantages?**
- **What other methods?**

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Discussion

- **How to compare with Tahoma?**
- **Open Mic**
  - **Questions, comments?**

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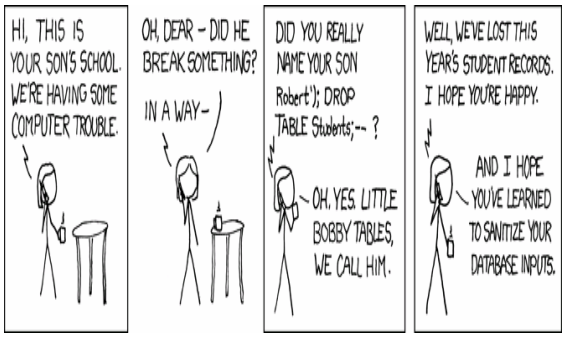
Input Validation in Web Security

- System takes input strings
- Incorporates input into output
- Output is interpreted
- Unexpected input may cause problems
- Examples
  - SQL Command Injection Attack
    - » 60% web applications vulnerable
    - » 100ks of private records exposed in 1 attack
  - Cross-site scripting (XSS) attack
    - » More than 21% vulnerabilities reported to CVE
    - » #1 reported vulnerability, surpassing buffer overflows



Pointer by Ari

Defenses

- Input filtering
  - Issues?
- MashupOS' defense against XSS?
- Other methods?