WEB SECURITY

Defense Against the Dark Arts 101

FUNDAMENTAL CONCERNS

Authentication

Trusting that someone is who they say they are.

Communication

Transferring data through potentially unreliable middlemen.

Authorization

Giving resource access to the right people.

Control

Limiting or understanding the capabilities of agents.

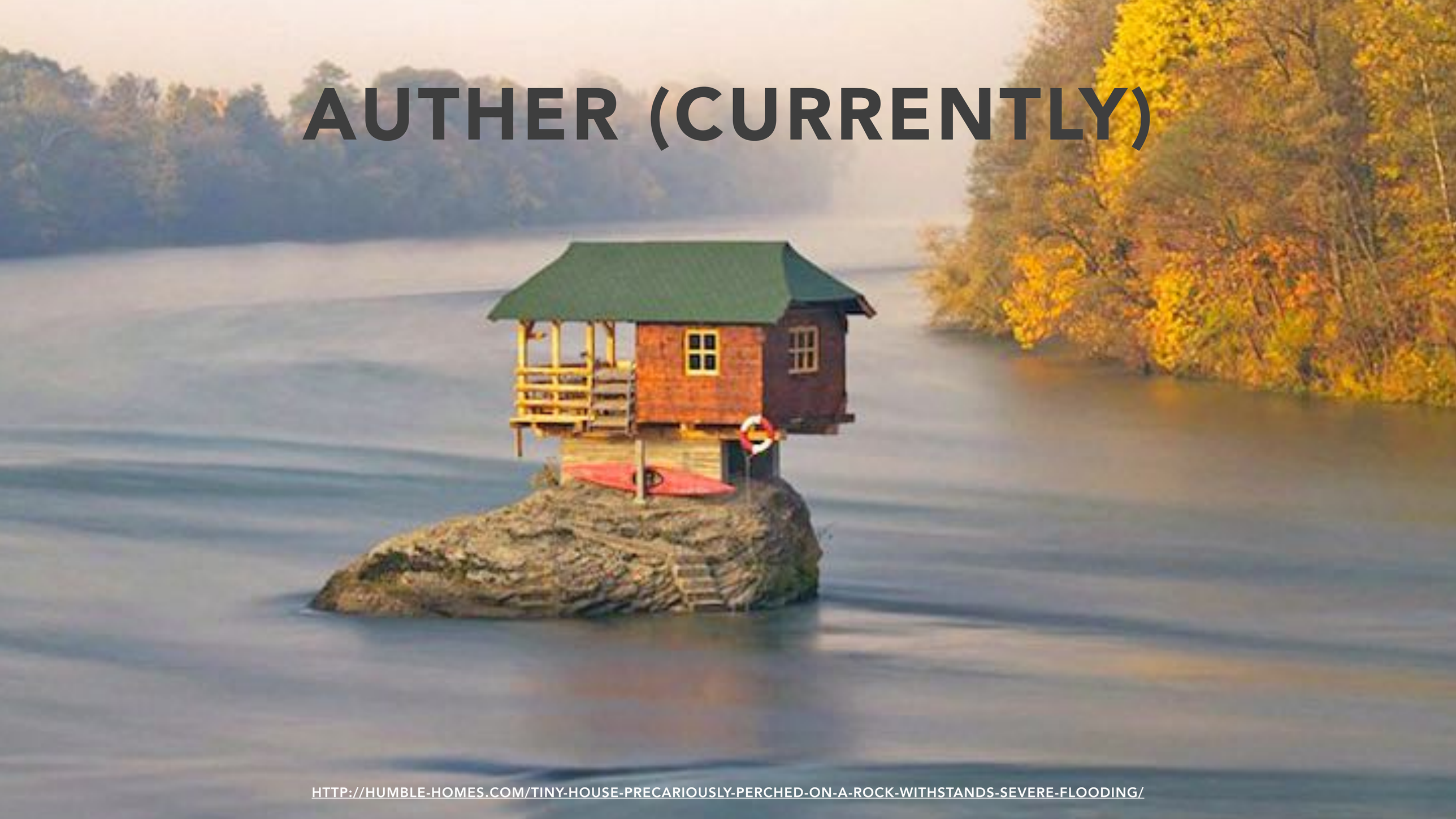
OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

AUTHER (CURRENTLY)

AUTHER (CURRENTLY)



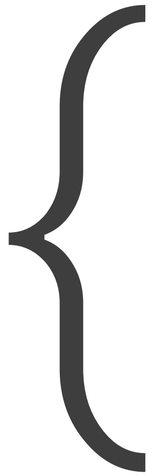
HTTP://HUMBLE-HOMES.COM/TINY-HOUSE-PRECARIOUSLY-PERCHED-ON-A-ROCK-WITHSTANDS-SEVERE-FLOODING/

WORKSHOP

- Game with 5 rounds
- Each round
  - instruction
  - attack
  - attack review
  - defense
  - defense review

WORKSHOP

- Game with 5 rounds
- Each round
  - instruction
  - attack
  - attack review
  - defense
  - defense review



- uncovering secrets
- improper access
- injection
- cross-site scripting
- data theft

UNCOVERING SECRETS (SECURITY MISCONFIGURATION)

UNCOVERING SECRETS

- Assume attacker has access to codebase
- Defense vulnerable if…
  - application secrets are easy to discover
  - files are improperly shared
- Bad stuff: app impersonation, decryption

UNCOVERING SECRETS

- Assume attacker has access to codebase
- Defense vulnerable if…
  - application secrets are easy to discover
  - files are improperly shared
- Bad stuff: app impersonation, decryption

not (yet) about user secrets

IMPROPER ACCESS (MISSING ACCESS CONTROL)

IMPROPER ACCESS

- Assume attacker is client
- Defense vulnerable if client can act outside of authorization
- Bad stuff: depends on the action and resource

IMPROPER ACCESS

- Assume attacker is client
- Defense vulnerable if client can act outside of authorization
- Bad stuff: depends on the action and resource

still **not (yet) about user secrets**

IMPROPER ACCESS

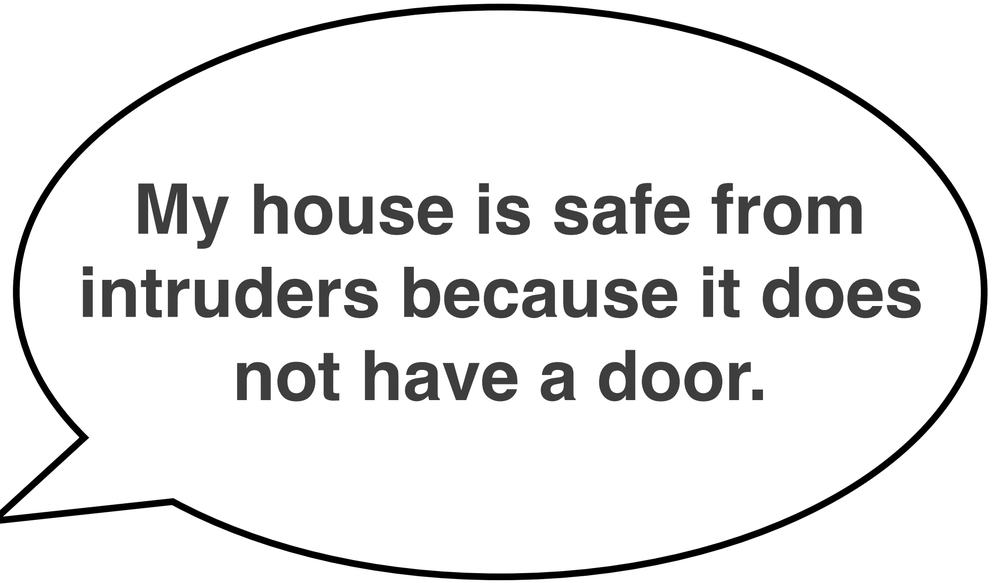
- Frontend “access control” is actually just good UX
- True access control comes from backend
- Considerations (be thorough)…
  - requested resource
  - requested action
  - agent making the request

BEWARE OVERPROTECTION

```
// "safe server"
var app = require('express')();
app.use(function (req, res) {
  res.status(403);
  res.send('NONE SHALL ENTER');
});
app.get('/', function (req, res) {
  res.sendFile(__dirname + '/index.html');
});
...
```

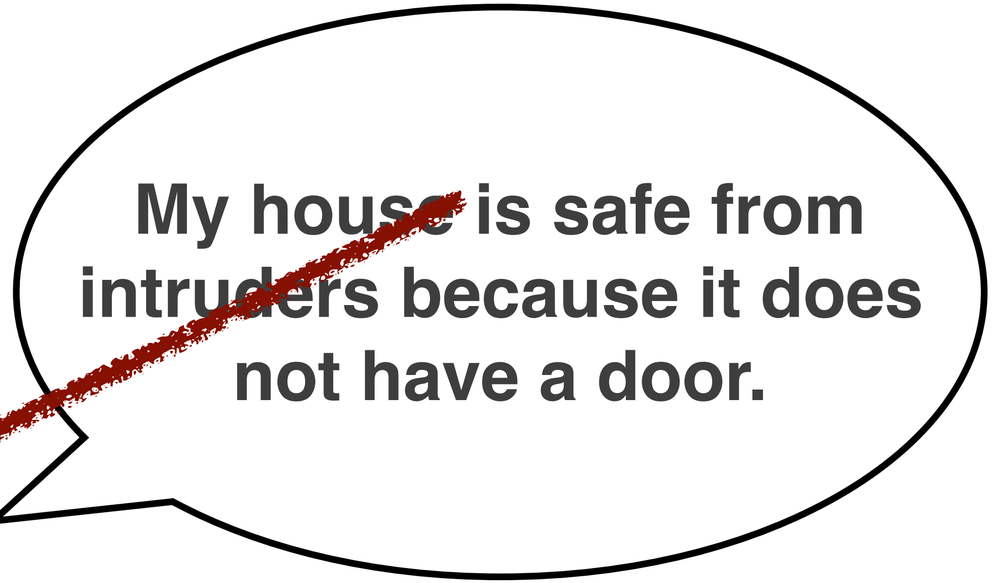
BEWARE OVERPROTECTION

```
// "safe server"
var app = require('express')();
app.use(function (req, res) {
  res.status(403);
  res.send('NONE SHALL ENTER');
});
app.get('/', function (req, res) {
  res.sendFile(__dirname + '/index.html');
});
...
```



BEWARE OVERPROTECTION

```
// "safe server"
var app = require('express')();
app.use(function (req, res) {
  res.status(403);
  res.send('NONE SHALL ENTER');
});
app.get('/', function (req, res) {
  res.sendFile(__dirname + '/index.html');
});
...
```



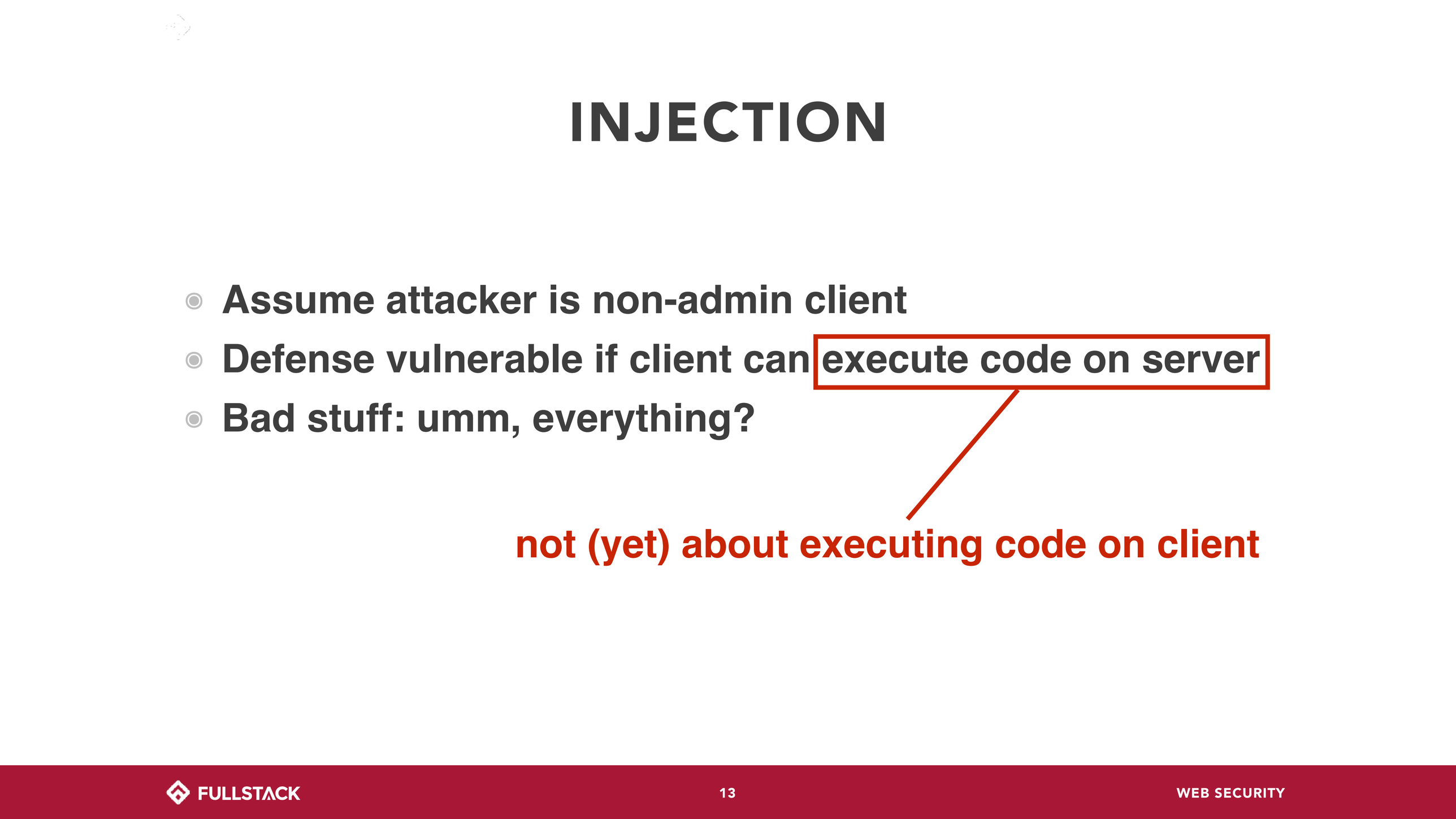
INJECTION

INJECTION

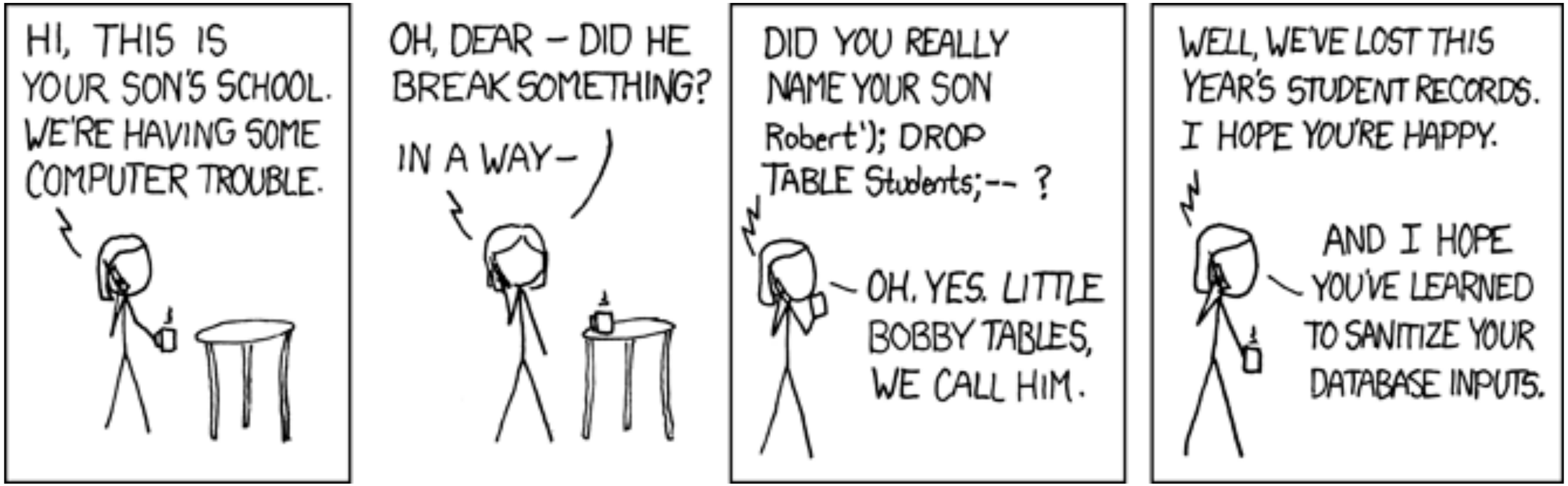
- Assume attacker is non-admin client
- Defense vulnerable if client can execute code on server
- Bad stuff: umm, everything?

INJECTION

- Assume attacker is non-admin client
- Defense vulnerable if client can execute code on server
- Bad stuff: umm, everything?



INJECTION



HTTPS://XKCD.COM/327/

INJECTION *server-side execution of attacker-defined code*

```
...
// at end of middleware stack
app.use(function (req, res, next) {
  // allow client to specify *any* module
  var theModule = require(req.body.modulePath);
  // allow client to specify *any* method
  var method = theModule[req.body.methodName];
  // allow client to specify *any* arguments
  var args = req.body.args;
  // blindly invoke!
  var result = method.apply(theModule, args);
  res.json(result);
});
...
```

INJECTION *server-side execution of attacker-defined code*

```
POST /whatever HTTP/1.1
...
{
  "modulePath": "./user.model",
  "method": "destroy",
  "args": [{}]
}
```

```
...
// at end of middleware stack
app.use(function (req, res, next) {
  // allow client to specify *any* module
  var theModule = require(req.body.modulePath);
  // allow client to specify *any* method
  var method = theModule[req.body.methodName];
  // allow client to specify *any* arguments
  var args = req.body.args;
  // blindly invoke!
  var result = method.apply(theModule, args);
  res.json(result);
});
...
```

INJECTION *server-side execution of attacker-defined code*

User.destroy({});

```
POST /whatever HTTP/1.1
...
{
  "modulePath": "./user.model",
  "method": "destroy",
  "args": [{}]
}
```

```
...
// at end of middleware stack
app.use(function (req, res, next) {
  // allow client to specify *any* module
  var theModule = require(req.body.modulePath);
  // allow client to specify *any* method
  var method = theModule[req.body.methodName];
  // allow client to specify *any* arguments
  var args = req.body.args;
  // blindly invoke!
  var result = method.apply(theModule, args);
  res.json(result);
});
...
```

CROSS-SITE SCRIPTING

XSS

- Assume attacker is non-admin client
- Defense vulnerable if client can execute code on *another* client
- Bad stuff: yeah pretty much everything
- Two flavors: “stored” and “reflected”

STORED XSS

4 Comments The Atlantic 1 Login

Recommend Share Sort by Oldest

<script>alert('i am an xss attack');</script>

LOG IN WITH

OR SIGN UP WITH DISQUS ?

Name

STORED XSS

4 Comments The Atlantic 1 Login

Recommend Share Sort by Oldest

<script>alert('i am an xss attack');</script>

LOG IN WITH

OR SIGN UP WITH DISQUS ?

Name

submit →

STORED XSS

4 Comments The Atlantic 1 Login

Recommend Share Sort by Oldest

<script>alert('i am an xss attack');</script>

LOG IN WITH

OR SIGN UP WITH DISQUS ?

Name

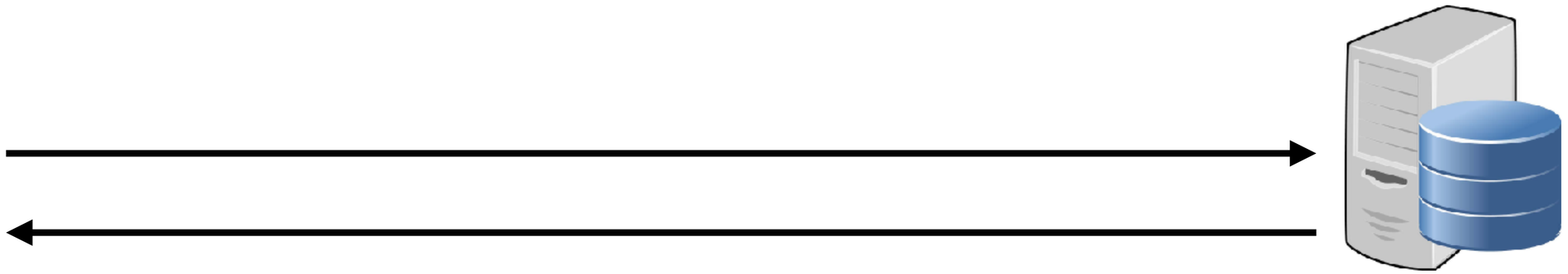
submit →

```
<script>alert('xss attack');</script>
```

STORED XSS

```
<script>alert('xss attack');</script>
```

STORED XSS



```
<script>alert('xss attack');</script>
```

STORED XSS

```
<script>alert('xss attack');</script>
```

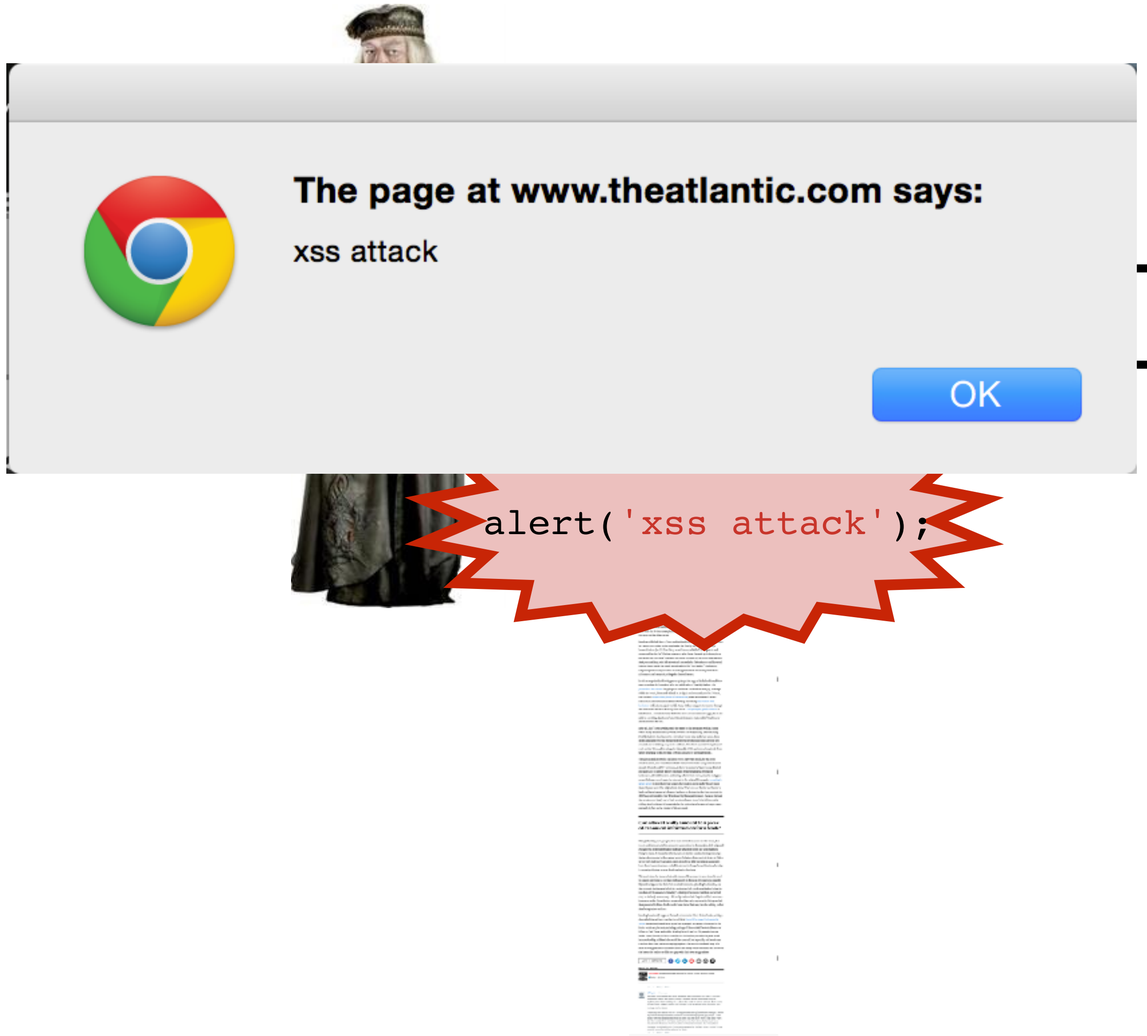
```
<script>alert('xss attack');</script>
```

STORED XSS

```
alert('xss attack');
```

```
<script>alert('xss attack');</script>
```

STORED XSS



```
<script>alert('xss attack');</script>
```

REFLECTED XSS

- Server sends parts of request in response
- Attacker forms link with script in it
- Victim clicks link
- Server responds with script
- Script runs on victim’s browser

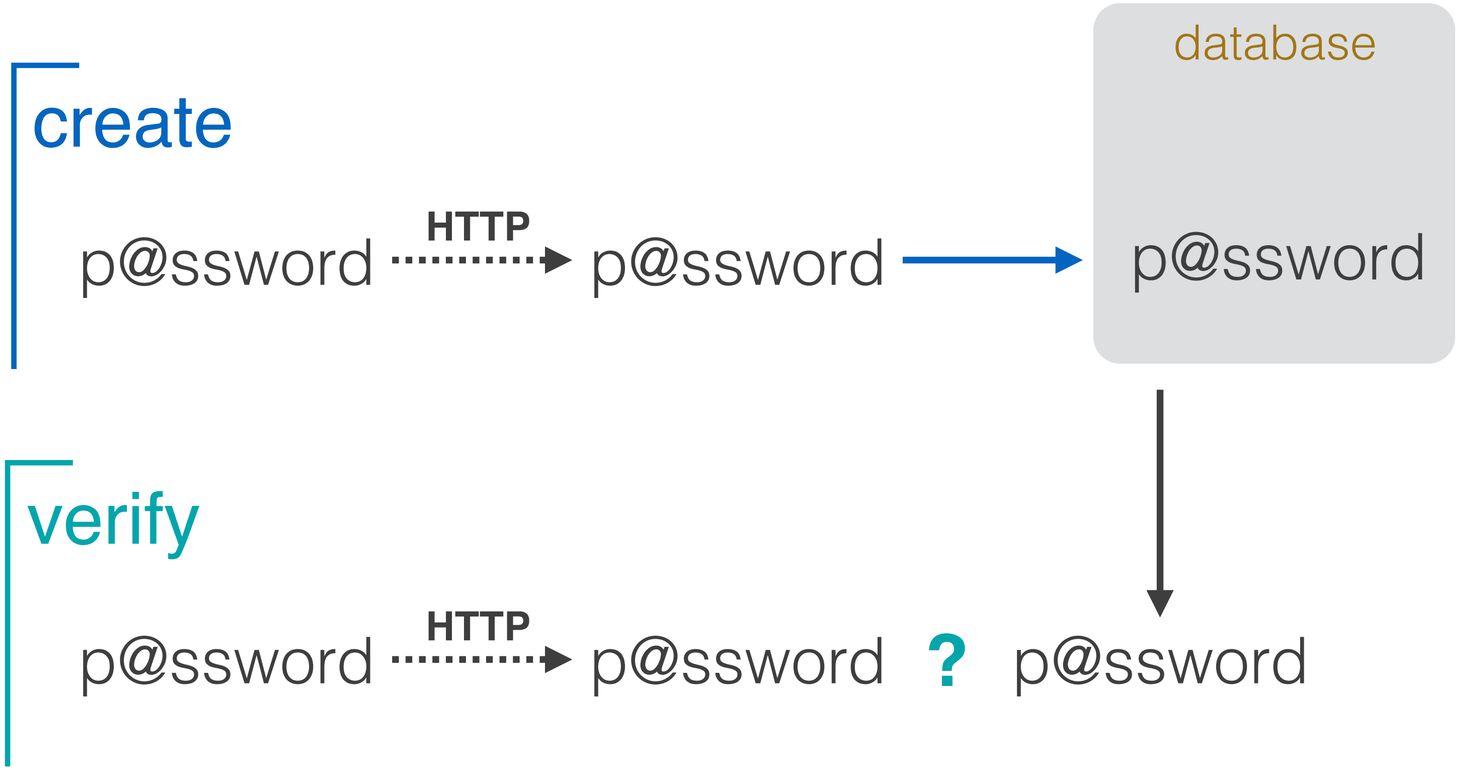
DATA THEFT
(BAD AUTH / DATA EXPOSURE)

"IDENTITY THEFT"

- Assume attacker has access to middlemen and database
- Defense vulnerable if communication or storage exposes passwords
- Bad stuff: user impersonation

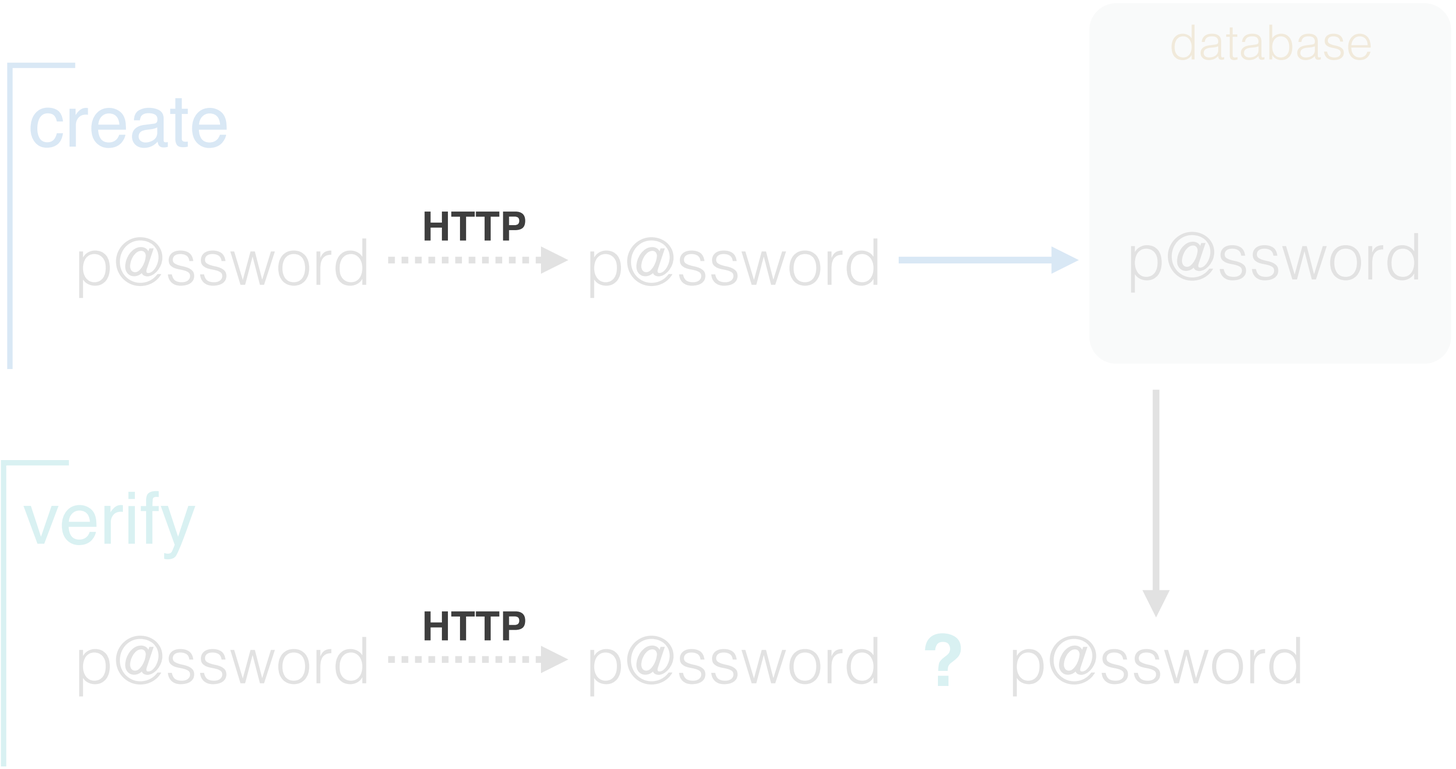
PASSWORD SECURITY

THE WORST WAY



PASSWORD SECURITY

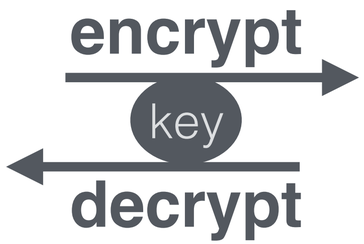
THE WORST WAY



ENCRYPTION

plaintext **scheme** **ciphertext**

word



981kje

HTTP

encryption

\+ “authentic” server

HTTPS

HTTP

encryption

+ “authentic” server } SSL

HTTPS

"AUTHENTIC" SERVER

- Has an SSL certificate
- Digitally signed
- Forms a web of trust
- Self-signed in development

HTTPS IN PRACTICE

With openssl generate a private key with…

```
$ openssl genrsa -out key.pem 2048
```

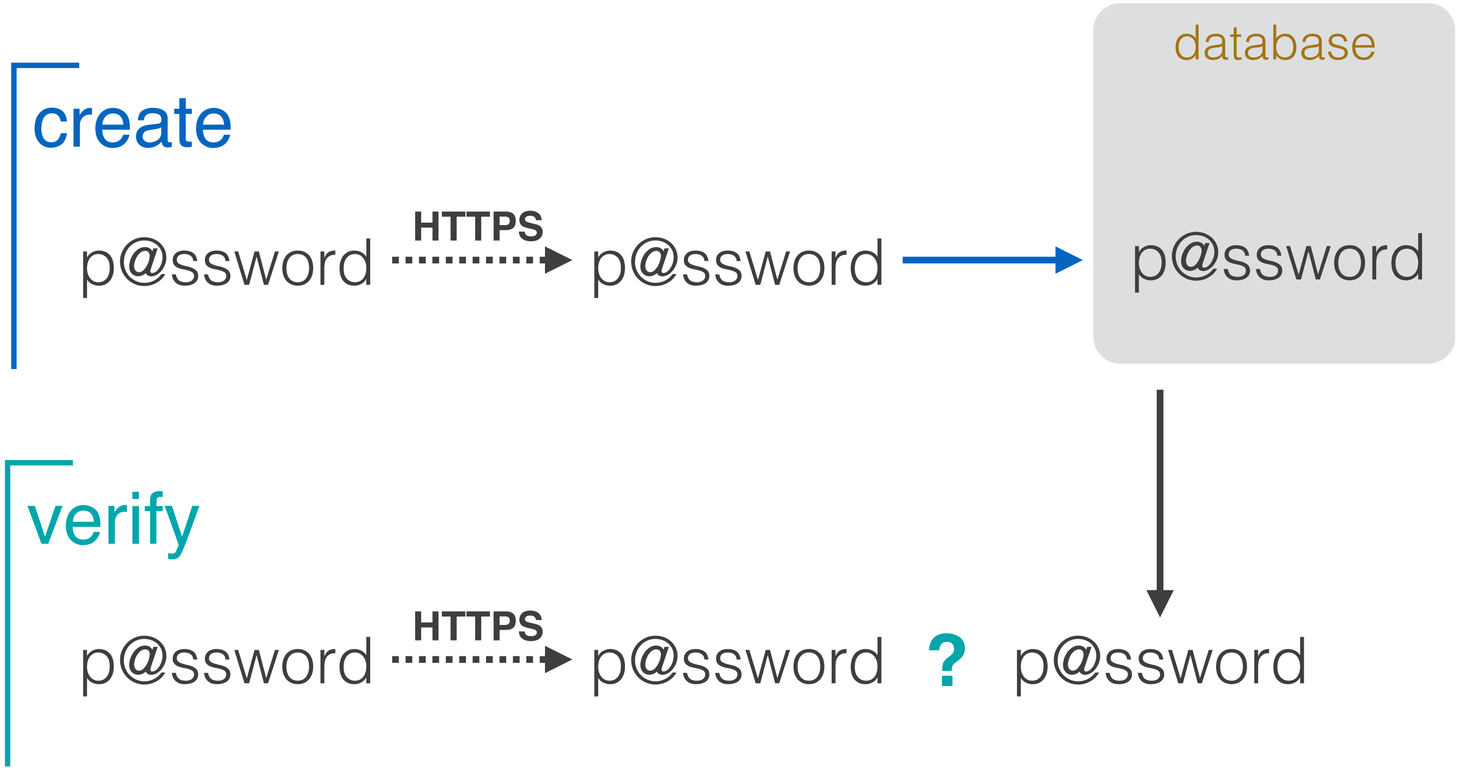
Then generate self-signed SSL certificate with…

```
$ openssl req -x509 -new -nodes -key key.pem -days 1024 -out cert.pem
```

Now use node's `https` library with this key and certificate

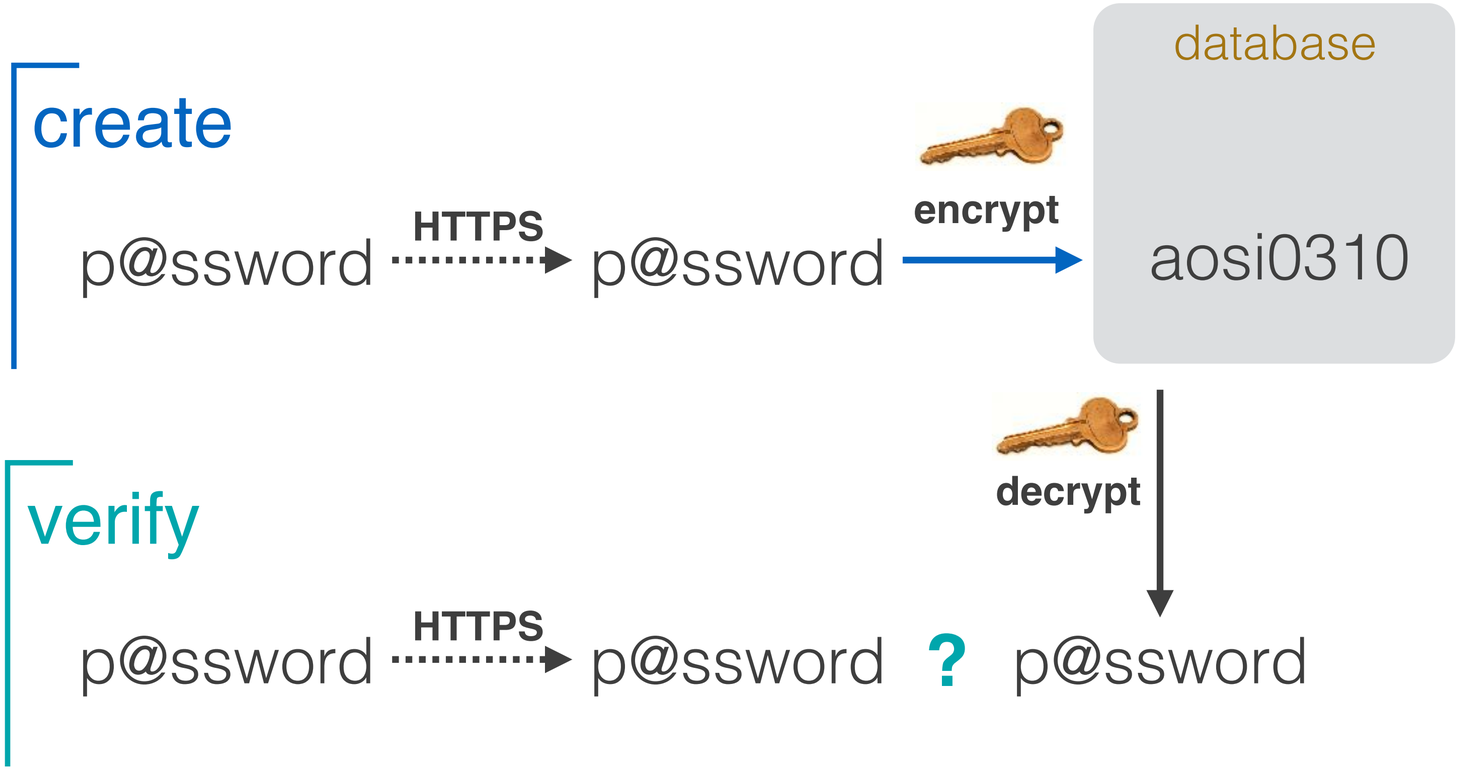
PASSWORD SECURITY

SECURE COMMUNICATION



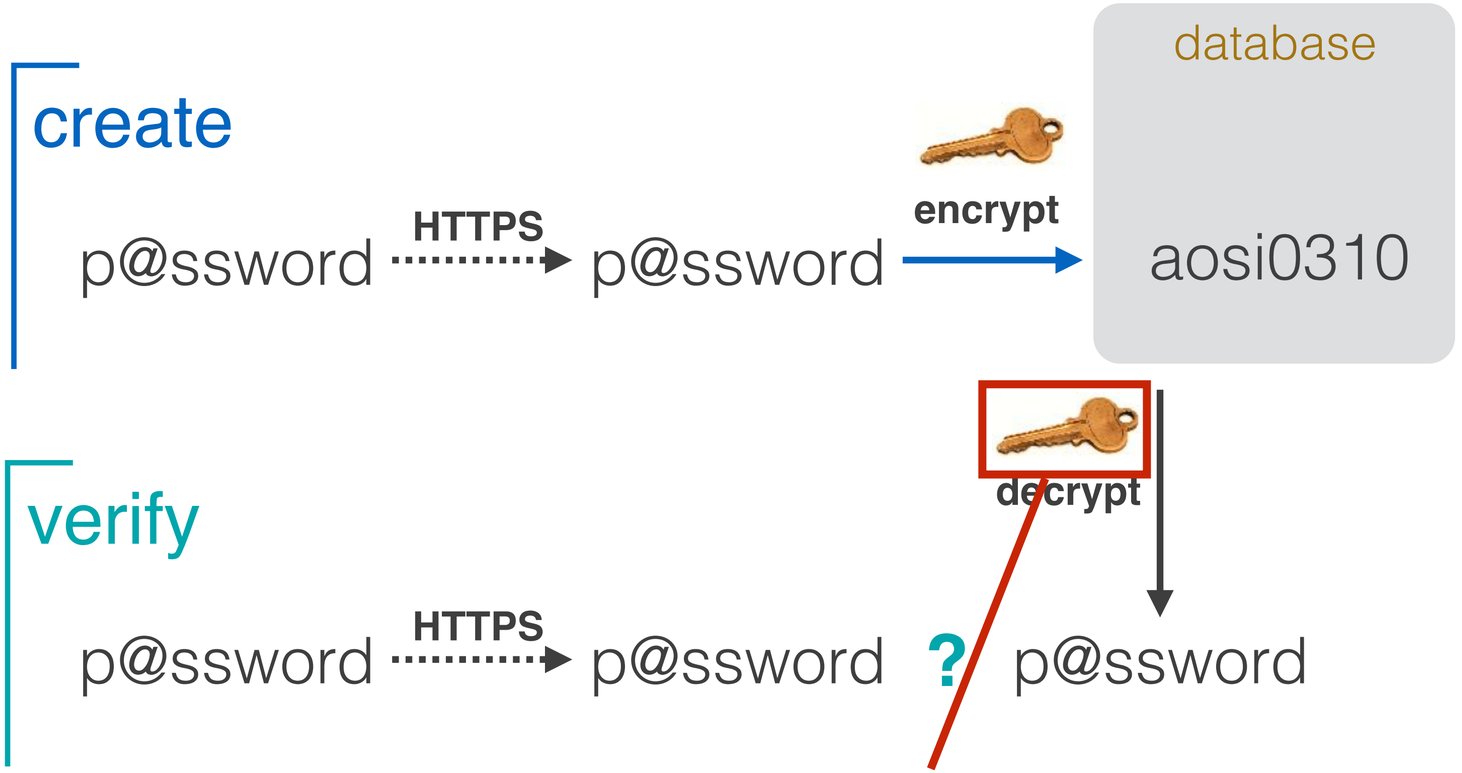
PASSWORD SECURITY

SECURE-ISH STORAGE



PASSWORD SECURITY

SECURE-ISH STORAGE



HASHING

string **algorithm** **hash**

word 

jads82

HASHING

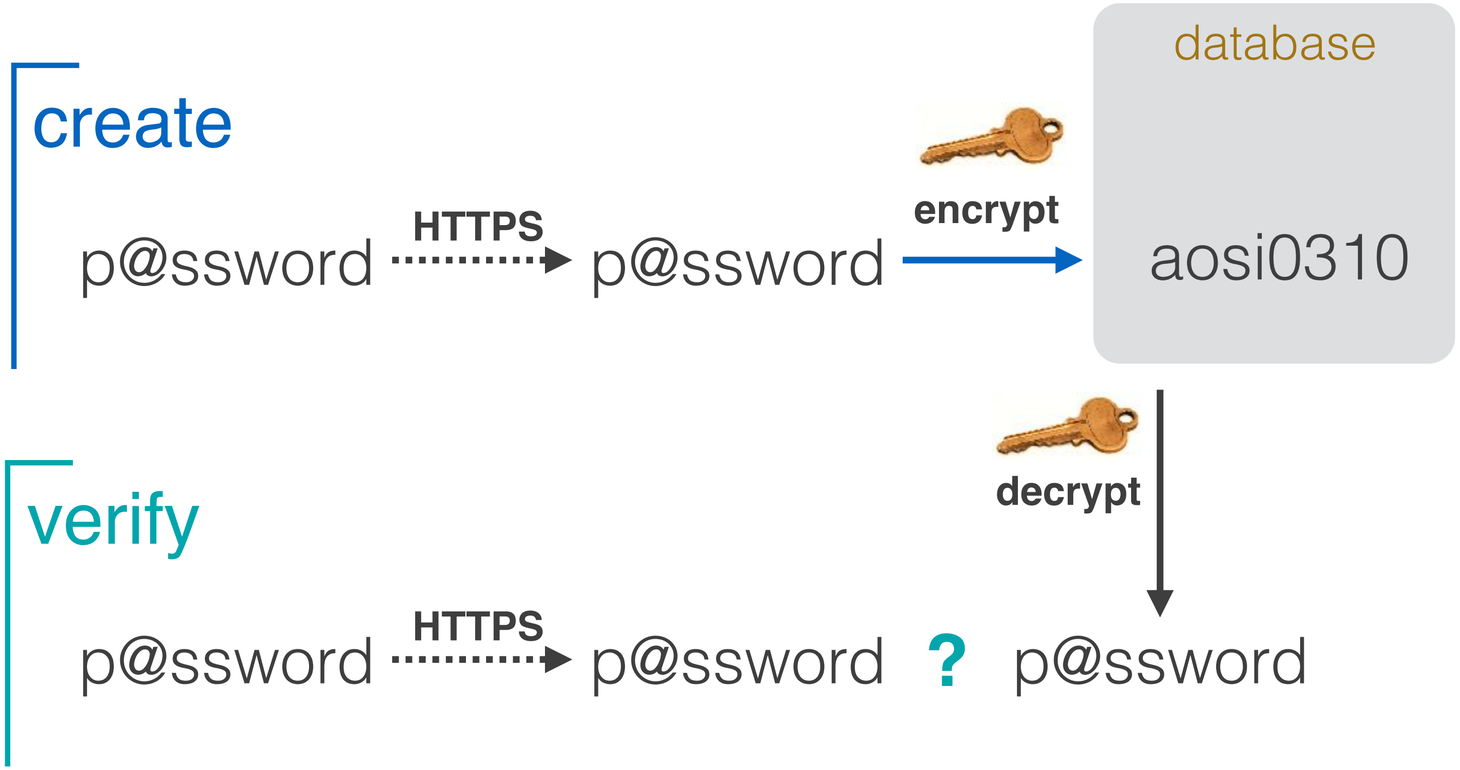
string **algorithm** **hash**

word 

jads82

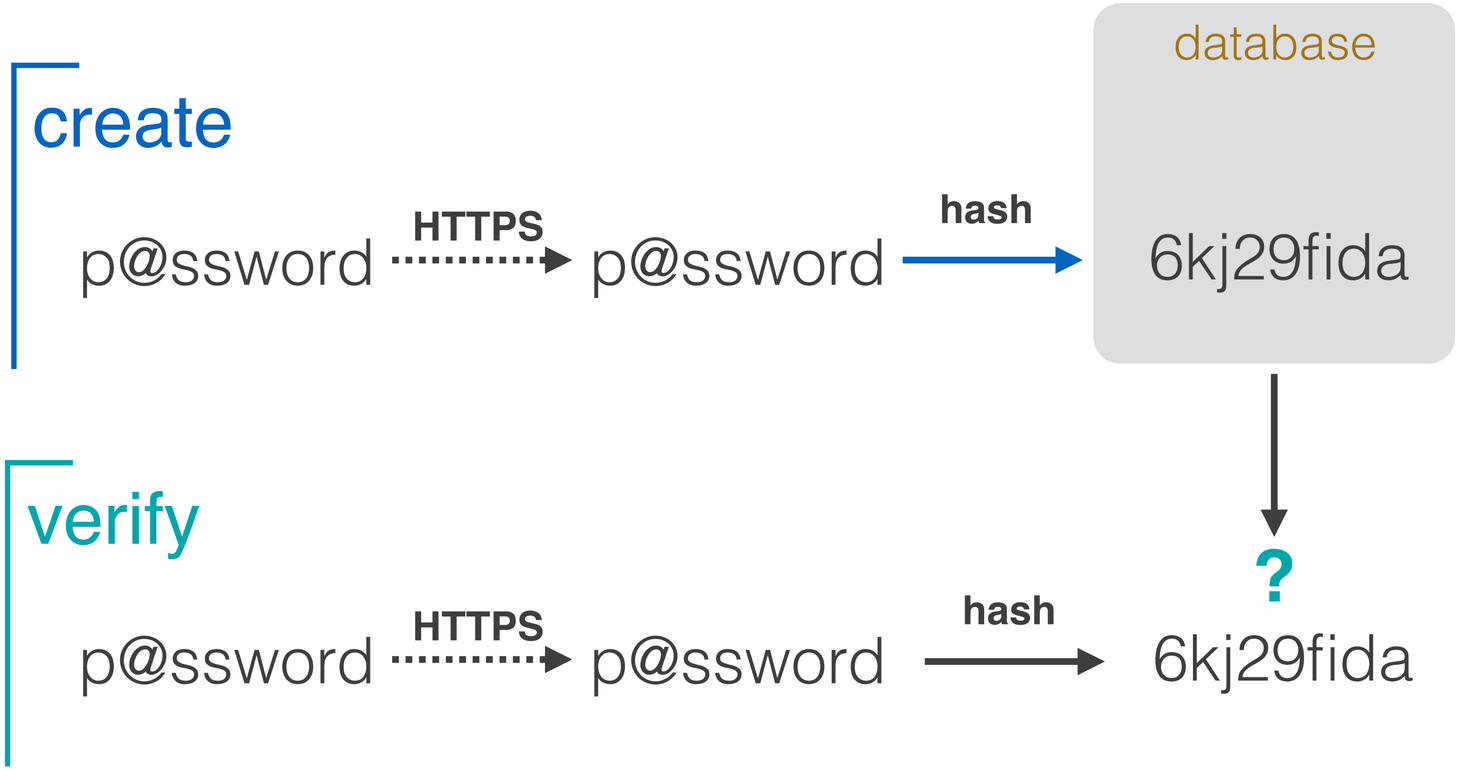
PASSWORD SECURITY

SECURE-ISH STORAGE



PASSWORD SECURITY

SECURE STORAGE



GOOD HASH KEY FUNCTION

Should be slow

Ultimately, this will hurt would-be attackers more than it will hurt you.

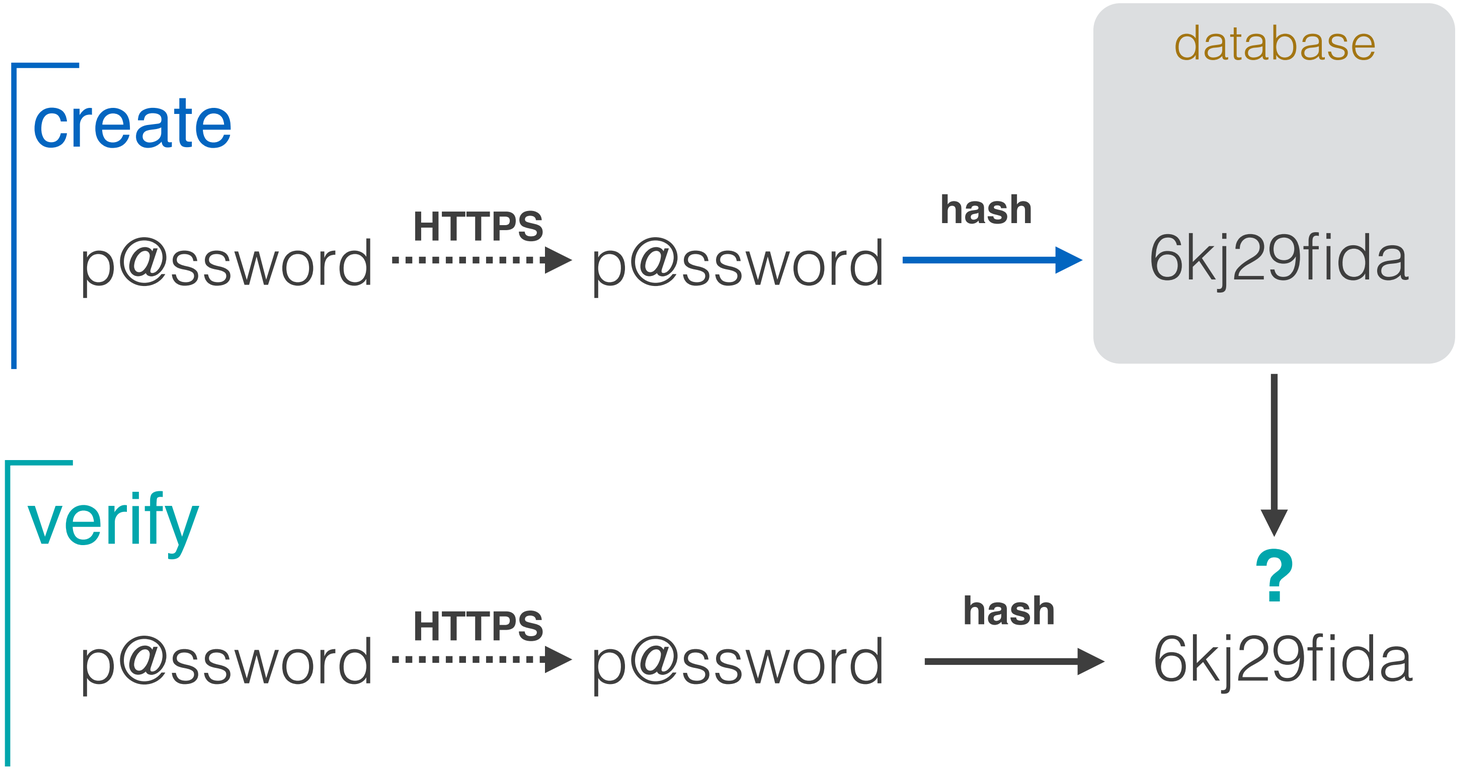
Should have a low collision frequency

Fewest possible duplicates. Or else two inputs could be indistinguishable.

PASSWORD SECURITY

Can we make it even better?

SECURE STORAGE

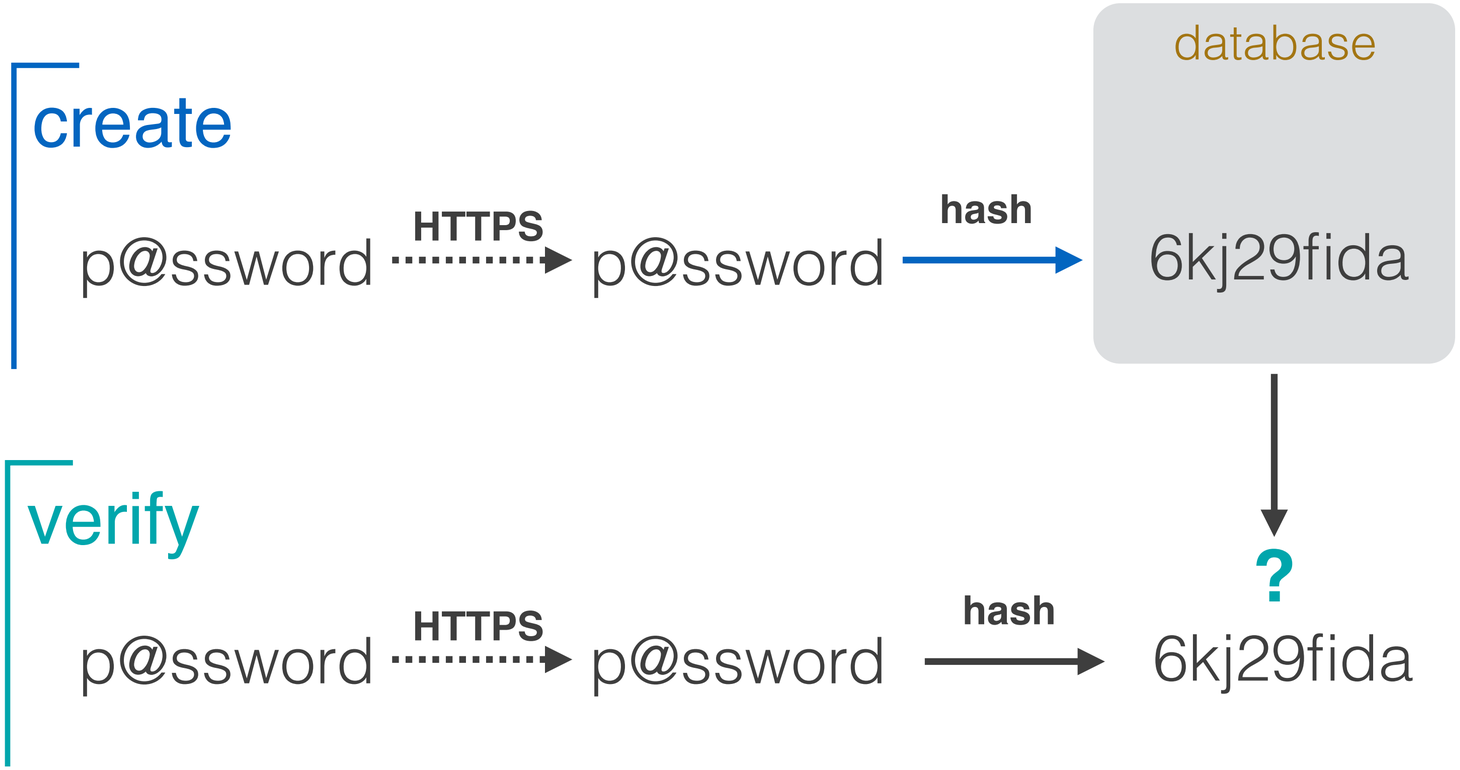


SALT

- Random string, unique to each user
- Added before hashing password
- Two users with the same password have different hashes
- Hashes are not computable ahead-of-time

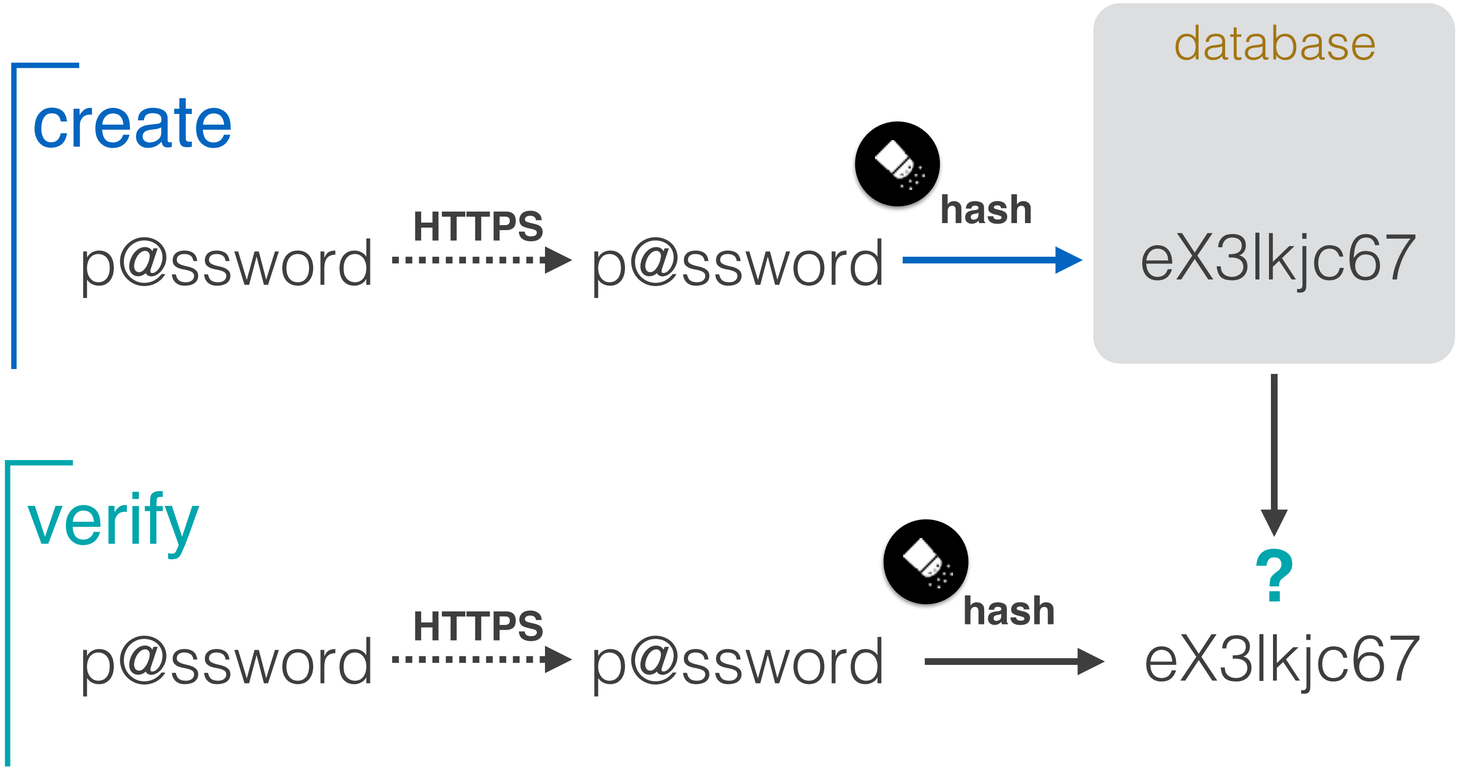
PASSWORD SECURITY

SECURE STORAGE



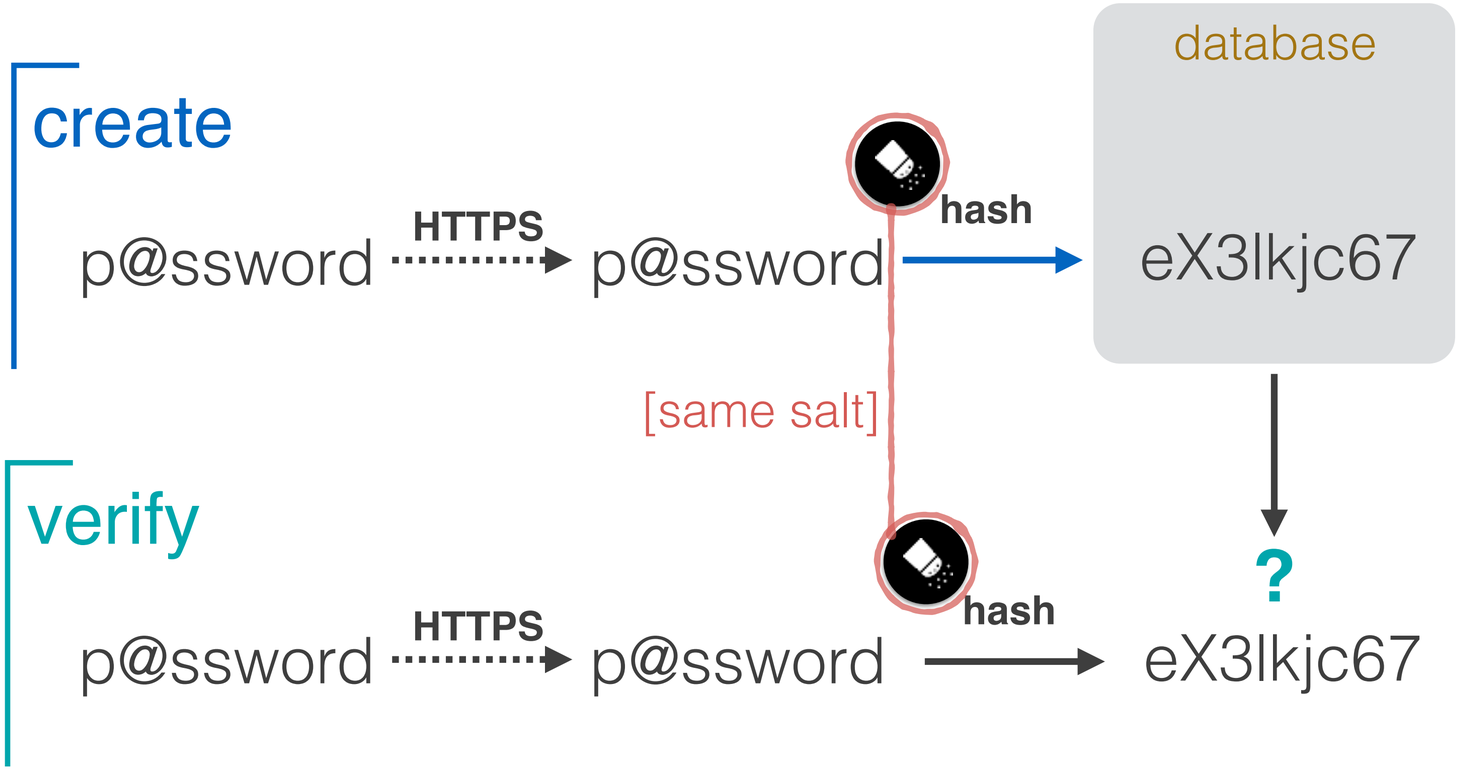
PASSWORD SECURITY

SECURE STORAGE



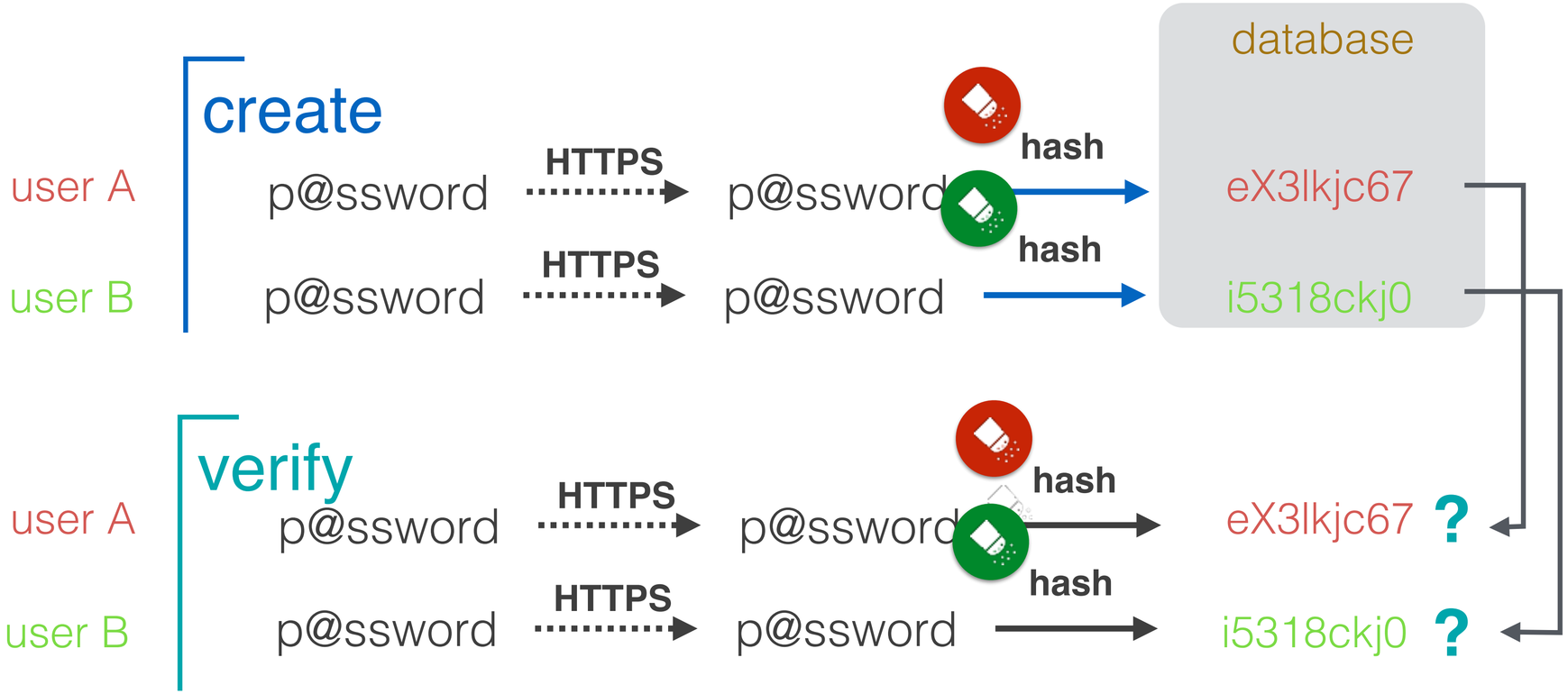
PASSWORD SECURITY

SECURE STORAGE



PASSWORD SECURITY

SECURE STORAGE



HASHING IN PRACTICE

```
// built-in node library
var crypto = require('crypto');
var salt = crypto.randomBytes(16);
var iterations = 1;
var bytes = 64;
var buffer = crypto.pbkdf2Sync('password', salt, iterations, bytes);
var hash = buffer.toString('base64');
// ...
```

OTHER CONSIDERATIONS

- Broken authentication flow
- Oversharing data

BROKEN AUTH

- Assume attacker is guest client
- Defense vulnerable if signup or login are improper
- Bad stuff: user impersonation, admin impersonation

OVERSHARING

- Assume attacker is non-admin client
- Defense vulnerable if attacker can see sensitive info of another
- Bad stuff: failed user privacy, NSA loves you

GOOD AUTH

- Communication is secure
- Storage is secure
- Cannot set privileges via signup
- Logging in *requires* username and password
- Data is not inadvertently shared

RECAP

FUNDAMENTAL CONCERNS

Authentication

Trusting that someone is who they say they are.

Communication

Transferring data through potentially unreliable middlemen.

Authorization

Giving resource access to the right people.

Control

Limiting or understanding the capabilities of agents.

OWASP TOP 10 (2013)

Server-side code execution

Allows for impersonation

Client-side code execution

Access control can be circumvented

Vulnerable default/inherited settings

Data is insecurely transmitted, stored, or simply overshared

Users can do things they shouldn’t be allowed to do

Abuse the target website’s trust in the browser

Third-party tools are vulnerable

Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection Server-side code execution

Allows for impersonation

Client-side code execution

Access control can be circumvented

Vulnerable default/inherited settings

Data is insecurely transmitted, stored, or simply overshared

Users can do things they shouldn't be allowed to do

Abuse the target website's trust in the browser

Third-party tools are vulnerable

Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
	Client-side code execution
	Access control can be circumvented
	Vulnerable default/inherited settings
	Data is insecurely transmitted, stored, or simply overshared
	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
	Access control can be circumvented
	Vulnerable default/inherited settings
	Data is insecurely transmitted, stored, or simply overshared
	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
	Vulnerable default/inherited settings
	Data is insecurely transmitted, stored, or simply overshared
	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

[source]

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
	Data is insecurely transmitted, stored, or simply overshared
	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

[source]

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
	Third-party tools are vulnerable
	Abusable open-ended forwarding

source

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
	Abusable open-ended forwarding

[source]

OWASP TOP 10 (2013)

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

weak **authentication**

poor **authorization**

insecure **communication**

breakdown of **control**

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

weak **authentication** | poor **authorization** | insecure **communication** | breakdown of **control**

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

weak **authentication** | poor **authorization** | insecure **communication** | breakdown of **control**

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

weak **authentication** | poor **authorization** | insecure **communication** | breakdown of **control**

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

weak **authentication** | poor **authorization** | insecure **communication** | breakdown of **control**

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

Injection	Server-side code execution
Broken Authentication	Allows for impersonation
XSS	Client-side code execution
Direct References	Access control can be circumvented
Security Misconfiguration	Vulnerable default/inherited settings
Data Exposure	Data is insecurely transmitted, stored, or simply overshared
Missing Access Control	Users can do things they shouldn't be allowed to do
XSRF	Abuse the target website's trust in the browser
Vulnerable Components	Third-party tools are vulnerable
Unvalidated Redirects	Abusable open-ended forwarding

source

	Exploitability	Prevalence	Detectability	Impact
Injection	easy	common	average	severe
Broken Authentication	average	widespread	average	severe
XSS	average	very widespread	easy	moderate
Direct References	easy	common	easy	moderate
Security Misconfiguration	easy	common	easy	moderate
Data Exposure	difficult	uncommon	average	severe
Missing Access Control	easy	common	average	moderate
XSRF	average	common	easy	moderate
Vulnerable Components	average	widespread	difficult	moderate
Unvalidated Redirects	average	uncommon	easy	moderate

source

	Exploitability	Prevalence	Detectability	Impact
Injection	easy	common	average	severe
Broken Authentication	average	widespread	average	severe
XSS	average	very widespread	easy	moderate
Direct References	easy	common	easy	moderate
Security Misconfiguration	easy	common	easy	moderate
Data Exposure	difficult	uncommon	average	severe
Missing Access Control	easy	common	average	moderate
XSRF	average	common	easy	moderate
Vulnerable Components	average	widespread	difficult	moderate
Unvalidated Redirects	average	uncommon	easy	moderate

source

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: do not execute arbitrary code on the server.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: verify credentials, use HTTPS, hash and salt passwords.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: do not execute arbitrary code on the client.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: clients should only be able manipulate resources indirectly, through the server.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: be wary of default security configurations.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: encrypt data in transit and storage; share only proper fields.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: appropriately restrict certain users to certain actions on certain resources.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: do not only use cookies for session authentication.

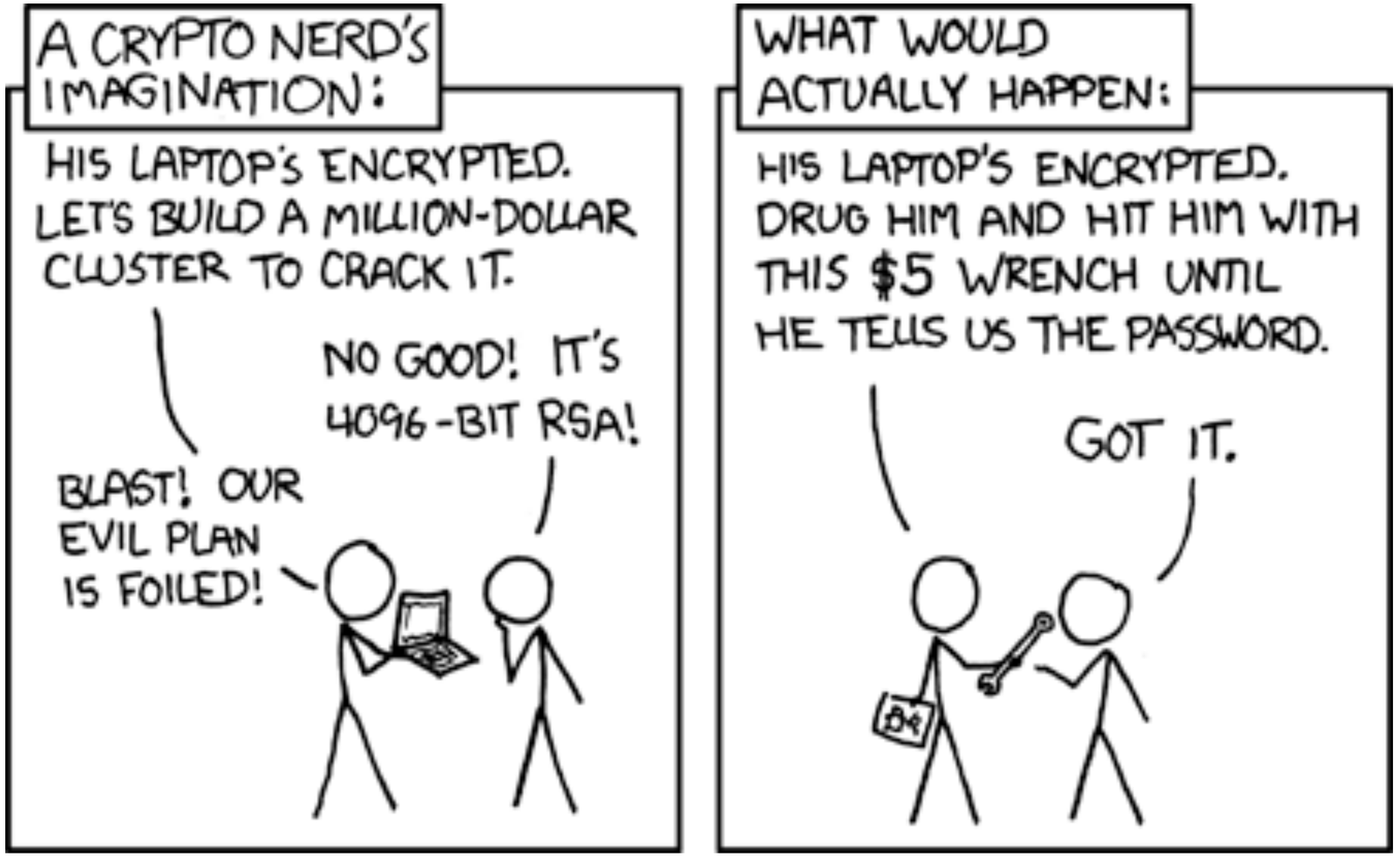
Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: carefully consider the libraries you use.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example

Lesson: forwards should be defined by the developers, not the users.

Injection	Server-side code execution	example
Broken Authentication	Allows for impersonation	example
XSS	Client-side code execution	example
Direct References	Access control can be circumvented	example
Security Misconfiguration	Vulnerable default/inherited settings	example
Data Exposure	Data is insecurely transmitted, stored, or simply overshared	example
Missing Access Control	Users can do things they shouldn't be allowed to do	
XSRF	Abuse the target website's trust in the browser	example
Vulnerable Components	Third-party tools are vulnerable	example
Unvalidated Redirects	Abusable open-ended forwarding	example



HTTPS://XKCD.COM/538/