SSP - Web Security

with Adam & Ryan

<;'"}()[]>{ XSSFish says, "Swim wif us"

Today's Topics

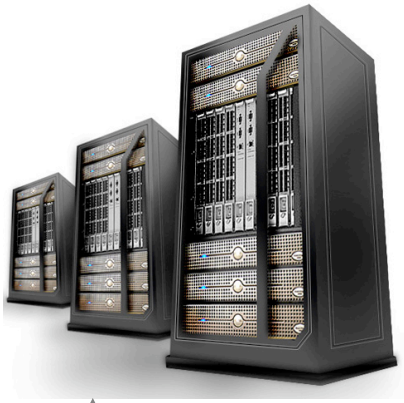
- Sessions
  - Why do we need them?
  - What weaknesses can attacker's take advantage of?
- Cross-site Scripting
  - Conceptually, what is it?
  - What can an attacker do with it?

A World w/o Sessions

get
/control_panel

Please login

A World w/o Sessions



send
/login

data from form:
user name = john
password = money$

Welcome John!

A World w/o Sessions

get
/control_panel

Please login

Example with Sessions

get
/control_panel

session id:
TH2S234S

Please login

Example with Sessions

send
/login

session id:
TH2S234S

data from form:
user name = john
password = money$

Welcome John!

Example with Sessions

session id:
TH2S234S

get
/control_panel

Hi John.

Here's your
control panel

Sessions Shouldn't Be

- Predictable
- Settable (session fixation)

Sessions Shouldn't Be

- **Predictable**
- Settable (session fixation)

Predictable Sessions

Session ID is **one** digit

send
/login

data from form:
user name = john
password = money$

session id: 3

Welcome John!

Victim

Predictable Sessions

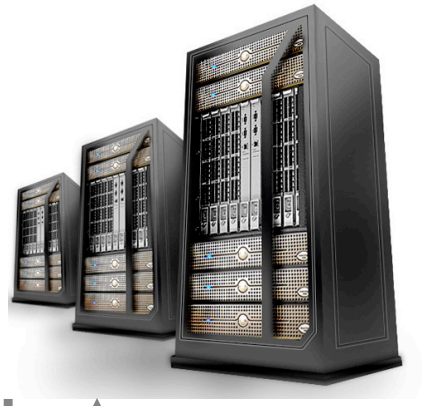
session id: 3

Victim

Predictable Sessions

session id: 3

Victim



session id:
1

get
/control_panel

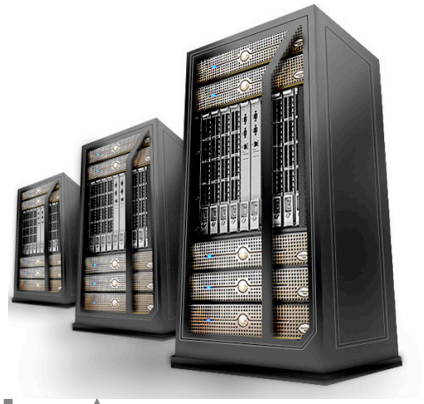
Please login

Attacker

Predictable Sessions

session id: 3

Victim



session id:
2

get
/control_panel

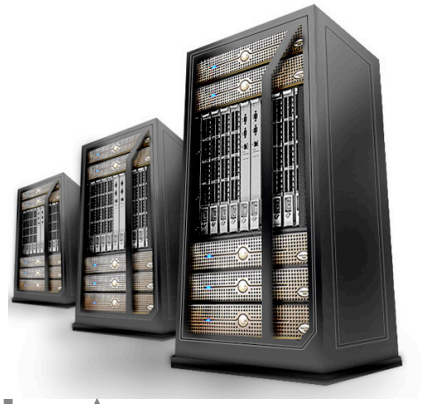
Please login

Attacker

Predictable Sessions

session id: 3

Victim



session id:
3

get
/control_panel

Hi John.

Here's your
control panel

Attacker

Sessions Shouldn't Be

- Predictable
- **Settable (session fixation)**

Session Fixation

Session Fixation

go here
/login?SID=I_KNOW

Session Fixation

go here
/login?SID=I_KNOW

get
/login?SID=I_KNOW

Session Fixation

go here
/login?SID=I_KNOW

session id:
I_KNOW

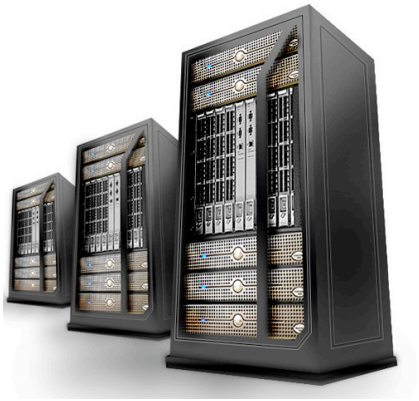
get
/login?SID=I_KNOW

Please login

Session Fixation

session id:
I_KNOW

Session Fixation

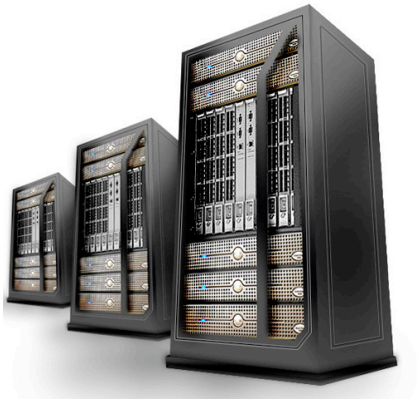


send
/login

data from form:
user name = john
password = money$

session id:
I_KNOW

Session Fixation



send
/login

Welcome John!

data from form:
user name = john
password = money$

session id:
I_KNOW

Session Fixation

session id:
I_KNOW

Session Fixation

session id:
I_KNOW

Hi John.

Here's your control panel

get /control_panel

session id:
I_KNOW

Cross Site Scripting (XSS)

- **What is it?**
  - Attacker is able to place his own code on a website
- **Why does it happen?**
  - Website fails to sanitize data that attacker sends to it

Cross Site Scripting (XSS)

- **XSS Attack**
  - Attacker places JavaScript on a website
  - Website visitors unknowingly run the JavaScript
  - Attacker has control of website visitor
    - he can force the visitor to perform an action on the website
    - he can steal Session IDs (and thus become the visitor)

XSS Example: A Blog

/submit_comment is vulnerable to XSS

XSS Example: A Blog

/submit_comment is vulnerable to XSS

submit
/submit_comment

XSS
Payload

XSS Example: A Blog

/submit_comment is vulnerable to XSS

submit
/submit_comment

XSS
Payload

Thank you for
your comment

XSS Example: A Blog

/view_comments contains XSS Payload

XSS Example: A Blog

/view_comments contains XSS Payload

session id:
TH2S234S

XSS Example: A Blog

/view_comments contains XSS Payload

get
/view_comments

session id:
TH2S234S

XSS Example: A Blog

/view_comments contains XSS Payload

get /view_comments

Here are the comments

session id: TH2S234S

XSS Example: A Blog

/view_comments contains XSS Payload

session id:
TH2S234S

session id:
TH2S234S

XSS Example: A Blog

attacker knows victim's session id

get
/control_panel

session id:
TH2S234S

XSS Example: A Blog

attacker knows victim's session id

Hi John.

get
/control_panel
session id:
TH2S234S

Here's your
control panel