Security

CS 144 Section, Fall 2010

pthreads Reminders

- **pthreads = POSIX threads API**
- **You'll need pthreads for lab 5, but most of the details are done for you in the example code**
- **Remember to acquire and release locks when accessing the NAT table**
- **Suggestion: use coarse locking (a single lock is fine)**
- **See given `sr_nat.c` and `sr_nat.h` for details**

Today: Security topics

- **Zombie botnets**
- **JavaScript Cross-site Request Forgery**

IRC

- **IRC: Internet Relay Chat [RFC 1459]**
- **Created in 1988 by Jarkko Oikarinen**
- **Still used today, especially by open source community**
- **Very simple ASCII protocol (usable with telnet)**
- **Thus, it's easy to write IRC clients**
- ***Telnet demo***

Zombie Botnets

- Zombies are malicious drone programs running on unsuspecting host computers
- Typically connect to an IRC server and wait for commands
- Can be installed a number of ways: malware, network attacker injecting commands, or exploiting a vulnerability
- Example vulnerability in phpBB from 2004

Control Commands

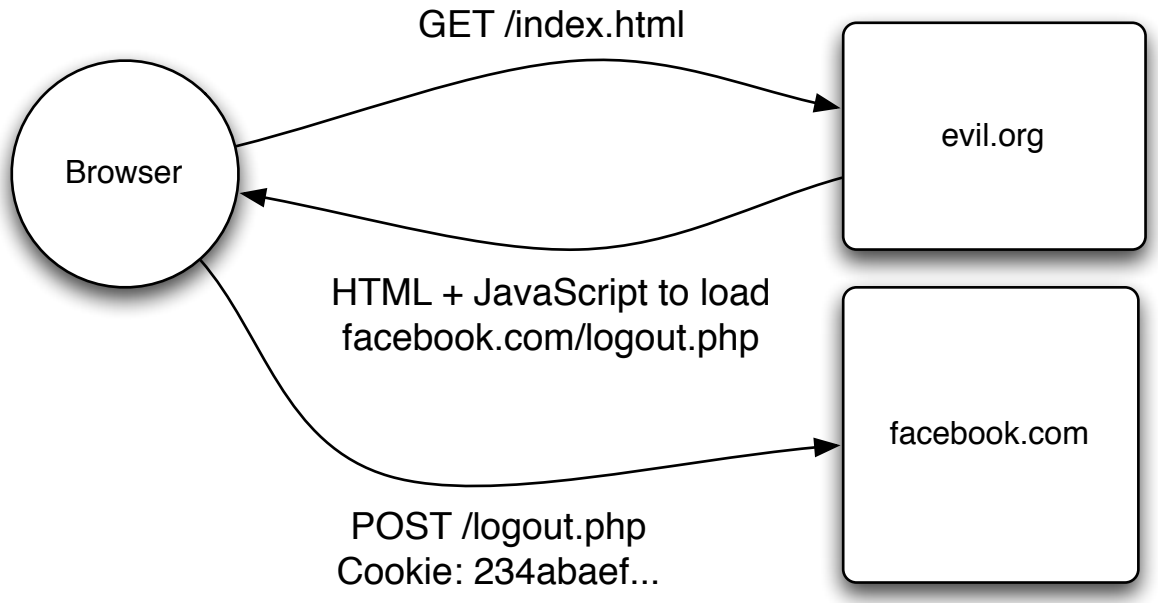
- `.mail` – **send an email**
- `.download` – **download a file**
- `.exec` – **run a command**
- `.udpflood` – **send UDP packets at a target**
- `.pscan` – **do a port scan on a target**
- **Just as good as having shell access to the machine!**

Zombie IRC Log

```
--- Day changed Sat Jun 12 2010
17:58 -!- krobelus [~via@187.126.192.104] has joined #botcrew
17:59 -!- [Y]inurl6398 [~inurl3908@189.126.193.10] has joined #botcrew
17:59 -!- [Y]inurl2290 [~inurl1312@hm2208.locaweb.com.br] has joined #botcrew
17:59 -!- [Y]inurl9724 [~inurl6074@hm231.locaweb.com] has joined #botcrew
18:00 < krobelus> .user 190985
18:00 < krobelus> .udpflood 189.1.164.34 900 900 1500
18:00 < [Y]inurl2290> [UdpFlood Started!]
18:00 < [Y]inurl6398> [UdpFlood Started!]
18:00 < [Y]inurl9724> [UdpFlood Started!]
```

- **Notice zombie hosts:** `locaweb.com.br`
- `whois 189.1.164.34`
- **Consider this scenario when configuring firewall policies**

JavaScript Cross-site Request Forgery (CSRF)



- **Can be done without violating the Same Origin Policy**

CSRF Demo

Protecting Against CSRF

- **Include a special hidden token that is submitted with the form**
- **Usually a hash of some user-specific data and a secret key**

```
<input type=‘‘hidden’’ autocomplete=‘‘off’’
 name=‘‘post_form_id’’
 value=‘‘3549e334daee0ef6dbc772c45cf517bf’’ />
```

Summary

- **Security concerns exist at all layers in the networking stack**
- **"Secure" protocols are sometimes not enough: phpBB attack works over SSL, too**
- **Network attackers can see and modify network traffic and cause unexpected behavior, including both of the examples shown here**