ABOUT

Yoann "`fuzzy`" Lamouroux

- Sysadmin/Technical Leader at @nbs-system
- Security enthusiast
- Suze advocate (not the Linux RedHat-ish distro)
- Likes: `python` and `vim`

trolls : @xoxopowo (twitter), legreffier (freenode)

`ylamouroux@ubuntu.com`

TRIVIA

Started in 1996, by Daniel Stenberg ... for an IRC bot project

- Available almost everywhere
- >20 years old, still getting updates
- Integrated with many tools
- MIT/X License (quite close to BSD)

means: `"Client URL Request Library"`

READY ?

silly one and only `curl`-ing pun in this presentation

QUITE A LOT OF USE-CASE

it is misused a lot too

You usually need it for a quick check.

Manpage = 2700 lines

Therefore : this mini-talk

HTTP

- What the web is built upon (but you probably knew that)
- It's (usually) how your apps will talk
  - API !
  - REST !
  - IoT !
- It's a TCP protocol (it's reliable, it needs an IP)

CENSORSHIP

I won't say anything about :

DNS

> *how a domain is matched to one or more IPs*

Just don't mix up the:

- domain name:

> *the mechanism to get an IP from a domain name*

- and the "`Host`" header

> *the actual site you'll request to an IP*

(more on "`Host`" later)

HTTPS

> *how the http gets wrapped in a ssl-encrypted tunnel*

Just patch your things

(╯°□°)╯︵ ┻━┻

YOUR COMPUTER SAYS TO THAT IP :

1. I want `'/'`
2. on the site **named** : `example.com`
3. Some more info (about your browser and what it can do)
4. Even more info (if you were already there) 🍪
5. [nothing] (it will actually send an empty line)

*Only 1st, 2nd and 5th steps are mandatory in an **HTTP** request*

CLIENT → SERVER

```
* Connected to example.com (93.184.216.34) port 80 (#0)
* > GET / HTTP/1.1
* > Host: example.com
* > User-Agent: curl/7.58.0
* > Accept: */*
* >
```

THE SERVER ANSWERS :

1. HTTP Return code (200, 404, 50x (oh sh...))
2. Some infos about the datas (size, type, taste)
3. Some infos for you (your browser) in case you come back 🍪
4. Stuffs (`html`... if you're on the web)

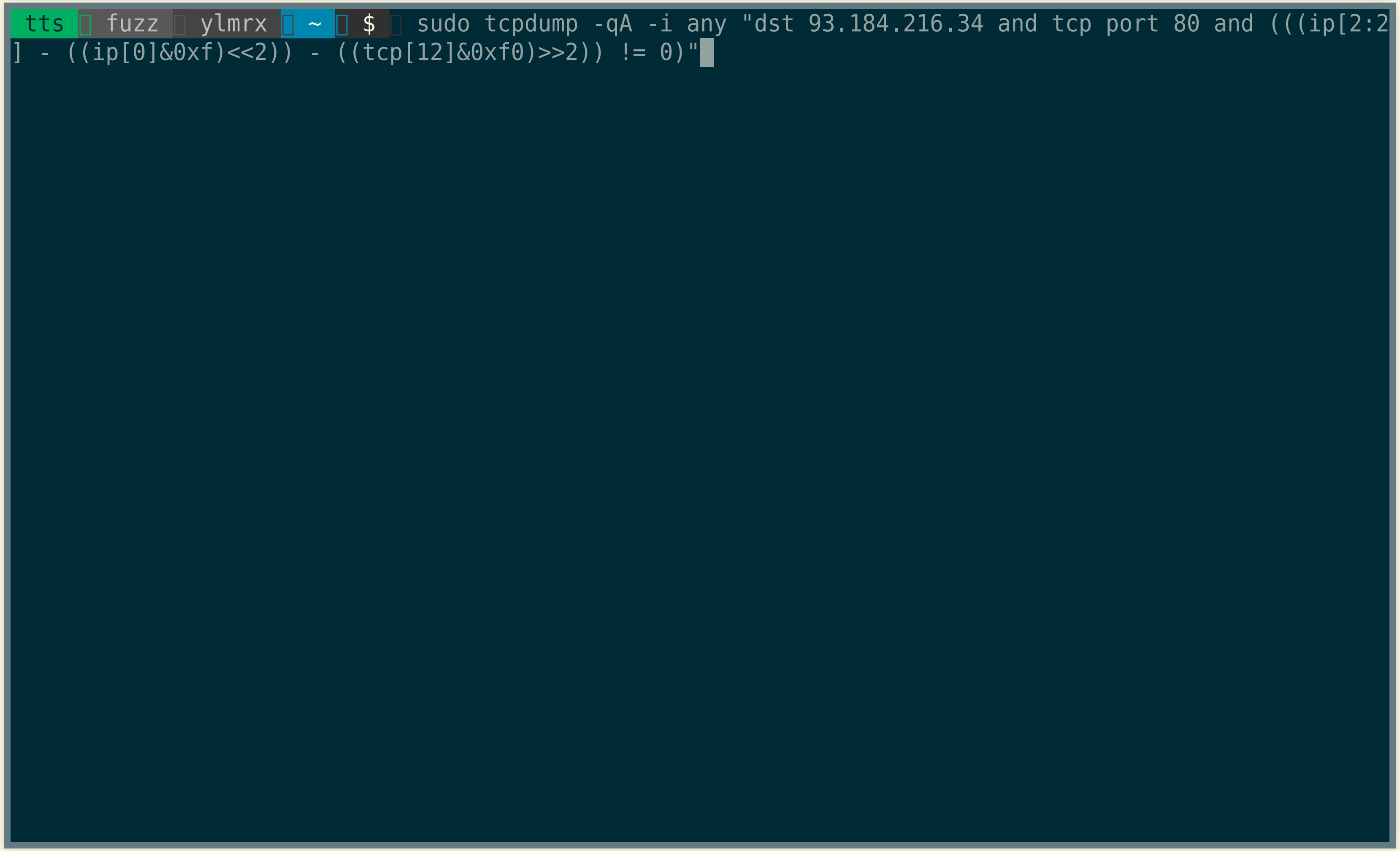
CLIENT ← SERVER

```
< HTTP/1.1 200 OK
< Cache-Control: max-age=604800
< Content-Type: text/html
< Date: Thu, 28 Jun 2018 17:03:42 GMT
< Etag: "1541025663+ident"
< Expires: Thu, 05 Jul 2018 17:03:42 GMT
< Last-Modified: Fri, 09 Aug 2013 23:54:35 GMT
< Server: ECS (dca/532C)
< Vary: Accept-Encoding
< X-Cache: HIT
< Content-Length: 1270
<
```

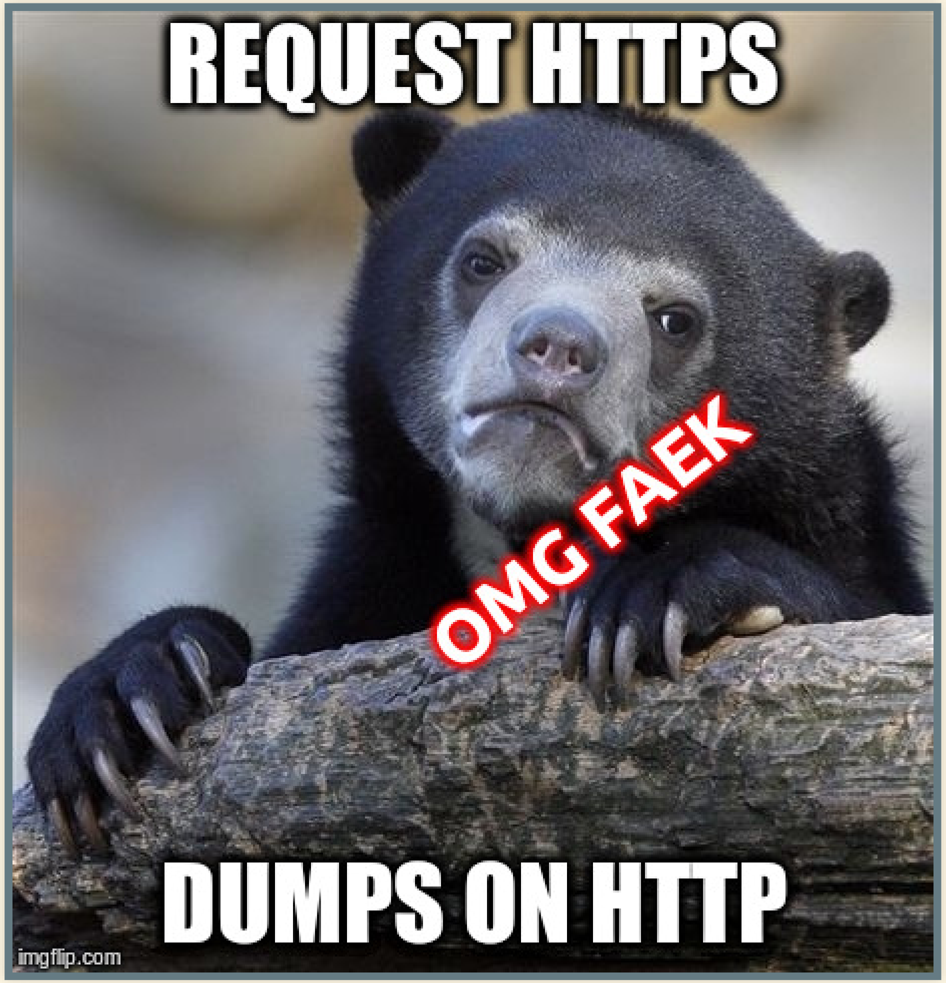
IT'S WHAT YOUR BROWSER DO :

https://example.com

🕺 🕺 🕺 🕺 🕺 inb4 epic tcpdump capture coming your way. 🕺 🕺 🕺 🕺 🕺



```
tts  fuzz  ylmrx  ~  $  sudo tcpdump -qA -i any "dst 93.184.216.34 and tcp port 80 and (((ip[2:2
] - ((ip[0]&0xf)<<2)) - ((tcp[12]&0xf0)>>2)) != 0)"
```


REQUEST HTTPS
OMG FAEK
DUMPS ON HTTP
imgflip.com

HOW NOT TO USE CURL

```
curl -vI https://example.com/
```

- Sometimes HEAD is not allowed
- It will only get metadata (`Headers`)
- **this is not a reliable test** (you're not issuing the right request)

You actually want :

```
curl -v https://www.example.com > /dev/null
```

`Show your 1337-skills, omg. OMG!, /dev pseudo-file and stream redirection` 😻

Despite you can use "`-o [FILE]`" to output to any file instead of `stdin`, there's no direct option to disable output.

You're testing (locally?) some website, you need to have a resolution to an IP you and trick DNS for whatever reason.

you usually don't need to edit `/etc/hosts`

DO YOU EVEN RESOLVE ?

```
curl -v --resolve www.example.com:80:127.0.0.1 http://www.example
```

See mom ? No sudo vim in /etc !

DO YOU EVEN .CURLRC ?

You don't want to type this long command every time !

Edit `~/.curlrc`, add those options :

```
--resolve www.example.com:80:127.0.0.1
```

(you can add many off these "`--resolve`" or whatever curl option)

DO YOU SCRIPT ?

I saw this, once :

```
curl -v https://anothercoolsite.com/ 2>&1 | grep -v "HTTP/1.1 200
echo "Something was wrong"
```

- curl has many exit codes.
- just echo that "**$?**" bad boy !
- to long to list, read the man.

⚠

A bad HTTP code (404, 504, ...) is not considered as an error by curl by default (it succeeded at making a request, which failed).

*Use "**`-f`**", so curl actually crashes.*

```
curl -vf https://anothercoolsite.com/
[ $? -eq 22 ] && echo "something was wrong"
```

Or even :

```
curl -f https://anothercoolsite.com/ || echo "something was wrong
```

HEADERS

- X-Forwarded-*, Host, User-Agent, know the basics
- No matter what, **`-H`** got you covered. (= `"--header"`)
- `"-A 'Opera 4.0'"` = `"-H 'User-Agent: Opera 4.0'"`

"That's cool for the trivial work, but I live in a real world. With real things."
(Twilight Sparkle, in My Little Pony, S4E08)

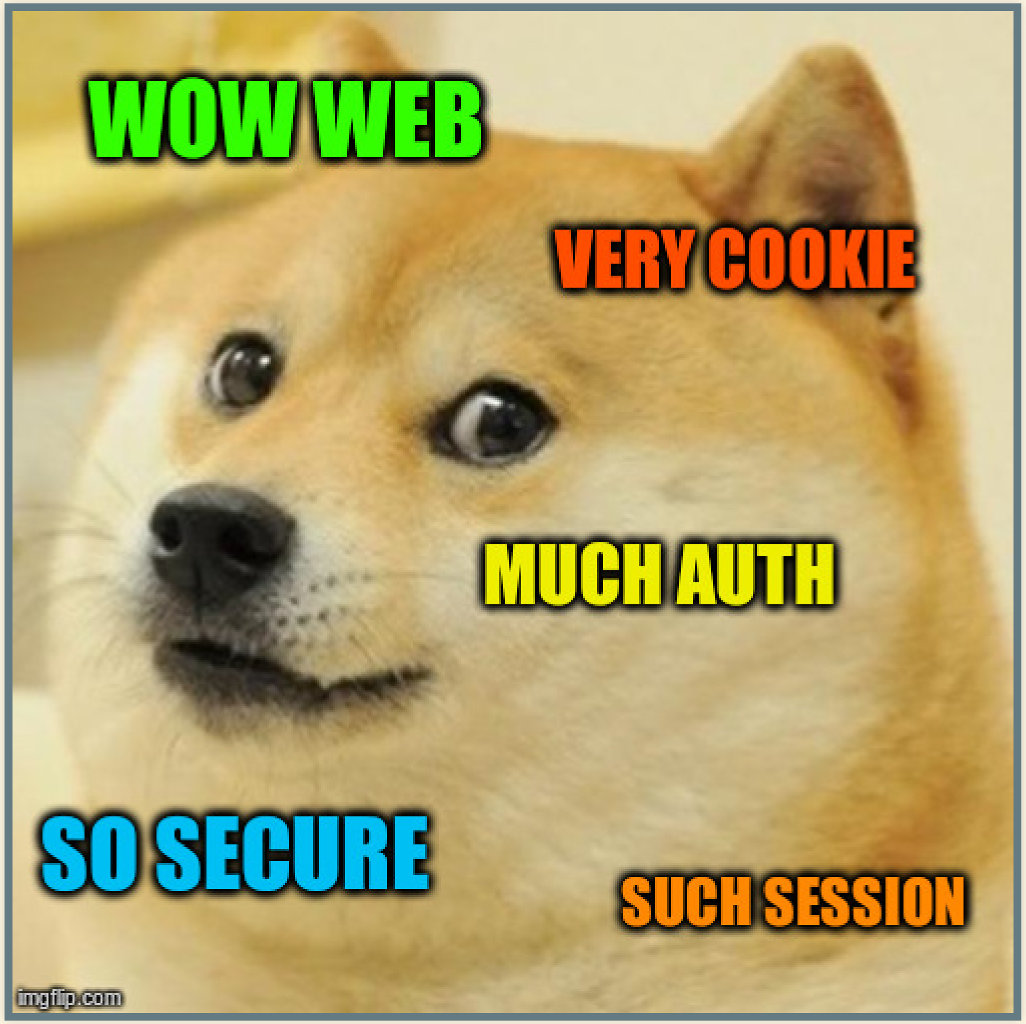
VERBS

Know about -X (specify the HTTP verb you need)

Now you can POST, PUT (and MORE) !

> *You can now auth to some services and post your useful original opinion on a blog*

REALLY


WOW WEB
VERY COOKIE
MUCH AUTH
SO SECURE
SUCH SESSION
imgflip.com

> *You'll need the `--data` option for those to be useful.*

YOU CAN RECORD COOKIES !

Usually goes something like :

-
  ```
  curl -X POST --data "login=admin;password=wowmuchsecure" --cookie-jar myjar.txt https://website.com
  ```
- get the auth cookie in `myjar.txt`

-
  ```
  curl --cookie "auth=1234567890abcdef https://website.com/
  ```

TIMINGS !

… and several other nice infos

- option is : --write-out "FMT_STRING"
- FMT_STRING: "foo bar %{var-name}"
- var-name:
  - time_total, time_connect, …
  - size_download, …
  - So many moar 😄

FIREFOX

You can have this automagically from Firefox :

- Developer Tools > Network > GET /
- Right click : Copy as Curl command !
- And work from there

BURPSUITE

You have a similar feature in BurpSuite which is a nice tool.

Shouldn't have talked about it… it ain't FOSS.

There's a **ton** more features :

- FTP
- HTTPS
- http/2 (if it's recent enough)
- SMTP/POP

SMTP, REALLY

IT WRITES YOUR C CODE !

Introducing : `--libcurl`

I barely scratched the surface. Use the talk as-is, or go check the manpage.

📚

Thank you.

❤