

# Computer Network Project 3 Simple Proxy Server

CSI4106-01

Fall, 2017

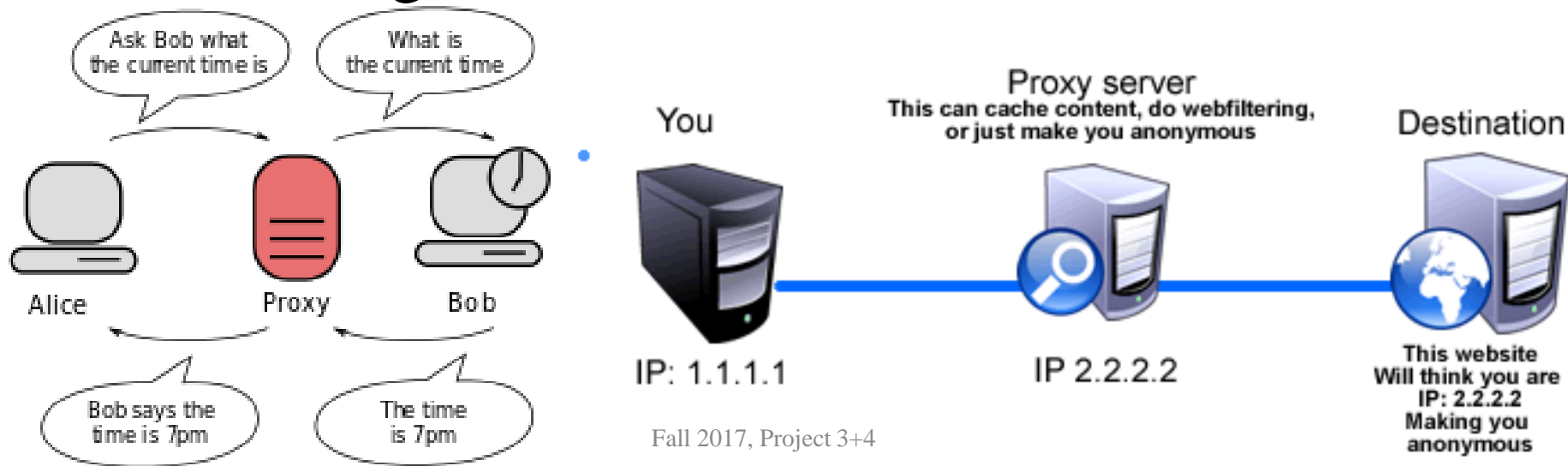
(Difficulty ★★★★★)

Prelim.

Before you do this  
project, you must be  
fully aware of  
**“Project Policy Notice”**

# What is a proxy server?

- An intermediary which deals with requests from clients seeking resources of other servers.
- Resides anywhere, between YOU and destination.
- The fundamental function: intercepting and forwarding traffic.

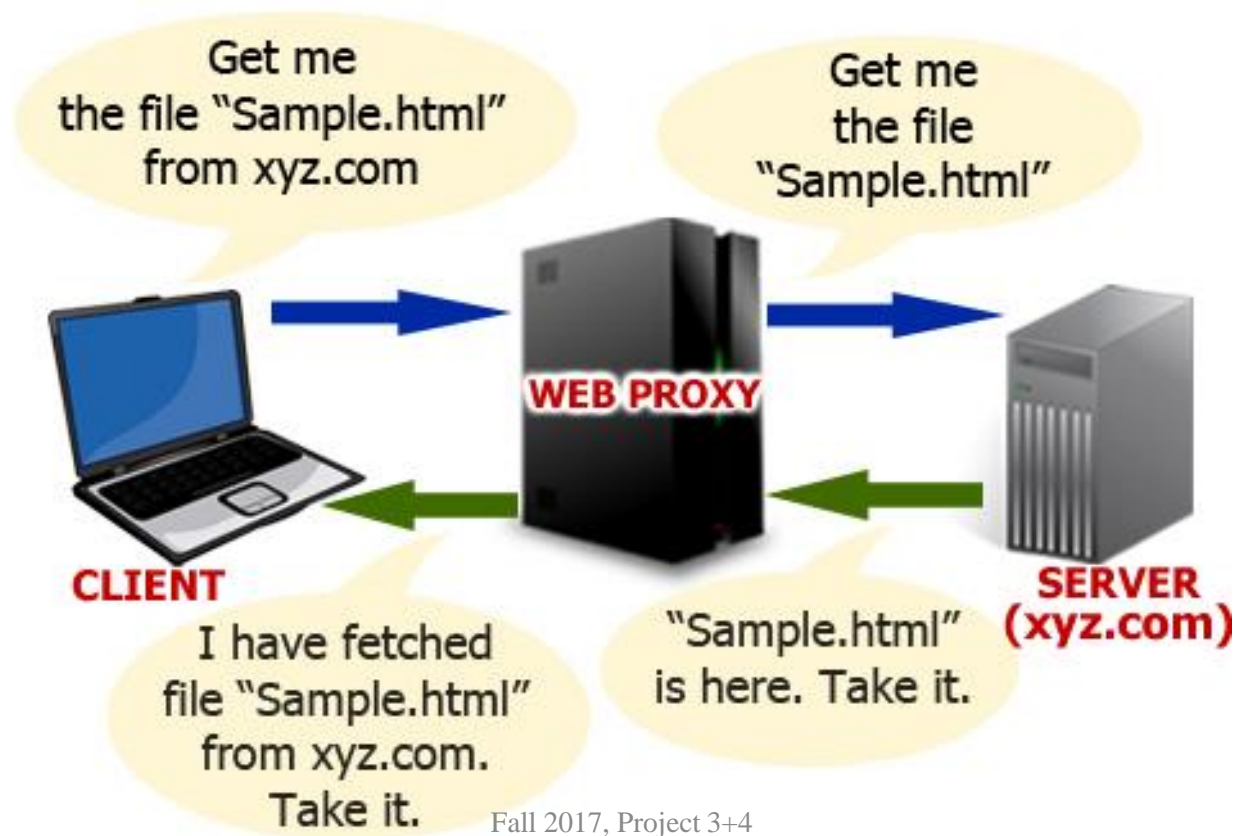


# The uses of proxy servers

- Filtering specific data (to block or redirect them)
  - Filtering of encrypted data
  - Bypassing filters / Censorship / Falsification
  - Translation (Localization for different markets)
- Logging or eavesdropping for monitoring traffic
  - Transparent Proxy
- Improving performance (Cache Server)
- *(e.g.) SSL/DNS/CGI/HTTP proxy*
- *(further...) Reverse, Anonymous, Tunneling...*

# How a http proxy server works?

- **Transparent Proxy on HTTP**



# Mandatory Assignment (100pts)

- Write a code of http **transparent** proxy server
- Implement Required Functions (1)~(3)
- *Your proxy server is running in background*
- *Your proxy server may be so slow...*
  - *Think about the reason and See AA1*
- Follow the usage format below

(Format) `./run.sh port`

(Example) `./run.sh 9001`

```
sh-3.2# ./run.sh 9001
```

```
Starting proxy server on port 9001
```

# Required Functions

## (1) Managing Two Sockets!

- **Question: Why does it need two sockets??**
- One socket for receiving Client Request!
- Another socket for fetching Response of the client request.
- You need to forward Requests/Responses.
- *Hint: Where should requests/responses go?*

# Required Functions\*\*\*

## (2) *Handling Persistent Connection*

- You do not have to implement persistent connection, but your proxy server may not work properly if you access a web server supporting the persistent connection.
- You have to modify HTTP header so that your proxy server does not communicate with the client or server using the persistent connection.
- Refer to *Background slide*, which explains the persistent connection and why *a dumb proxy* does not work.



# Required Functions

## (3) Logging on Command Line

- When a request from a client arrived, your proxy server should print out the precise logs.

\* ? is O or X (indicator)

Starting proxy server on port 9001

```
-----
1
[CLI connected to 127.0.0.1:4994]
[CLI ==> PRX --- SRV]
  > GET /static/a.js
[SRV connected to cs.yonsei.ac.kr:80]
[CLI --- PRX ==> SRV]
  > GET /static/a.js
[CLI --- PRX <== SRV]
  > 200 OK
  > application/javascript 3858bytes
[CLI <== PRX --- SRV]
  > 200 OK
  > application/javascript 6558bytes
[CLI disconnected]
[SRV disconnected]
```

Starting proxy server on port **PORT\_NUMBER**

```
-----
NO
[CLI connected to CLI_IP:CLI_PORT]
[CLI ==> PRX --- SRV]
  > Request_1st_Line_from_Client
[SRV connected to DST_DOMAIN:DST_PORT]
[CLI --- PRX ==> SRV]
  > Request_1st_Line_to_Server
[CLI --- PRX <== SRV]
  > Response_Status_Code_from_Server
  > Response_MIME_Type Response_Sizebytes
[CLI <== PRX --- SRV]
  > Response_Status_Code_to_Client
  > MIME_Type_to_Client Size_to_Clientbytes
[CLI disconnected]
[SRV disconnected]
```

# Background

- TCP (socket programming)
- HTTP Packet (request and response)
- All of Project 2
- Basic idea of HTML tag
- Browser' Proxy Setting (How to use proxy)
  - <https://support.google.com/chrome/answer/96815>
- HTTP Persistent Connection **\*\* (Important)**
  - <https://www.safaribooksonline.com/library/view/http-the-definitive/1565925092/ch04s05.html>

# Directions

- **This is an individual project**
- Language: **C or Python**
  - C: gcc 4.8.5
  - Python: Python 2 ( $\geq 2.7.5$ ) or Python 3 ( $\geq 3.5.2$ )
- OS: **CentOS 7 or Ubuntu 14.04** or higher
- You must use only *internal* libraries.
  - ***Any 3<sup>rd</sup> party framework: NOT ALLOWED***

# Deliverables:

**OS[c|u]\_YourID\_ProjectNo.zip**  
(e.g., **u\_2017147123\_3.zip**)

**>>>>> Do not include any folders in the zip file**  
**TA tests with `./setup.sh` && `./run.sh`**

- **project.py or project.c**

- Your code with detail comments

- **run.sh**

- This runs your webserver in **background**.

- **setup.sh**

- This should install dependencies or compile your code

- **report.pdf**

- Your comprehensive comments of this project

# •DUE DATE

16/Nov/2017 07:55:00 KST

No exception for exceeding deadline

# •Delay Policy

-33%pts for ~16/Nov 23:55:00

-66%pts for ~17/Nov 23:55:00

-100%pts for 17/Nov 23:55:00~

**You agree with the following statement  
by submitting your assignment on YSCEC**

**Ctrl+C and Ctrl+V  
is not Code Referencing,**

**Plagiarizing = 0pts = Fail**

**No exception for any kinds of cheating and copying**

# Score Policy: *Max. 100 pts*

1	Not submitted / not working / missing files	0 pts
2	Overdue → Delay	-33% pts/day
3	Your proxy server malfunctions	-20 pts/function
4	<b>The rules or directions are not followed</b>	-10 pts/rule
5	<b>Any 3<sup>rd</sup> party framework is used</b>	0 pts
6	<b>Plagiarizing / Over-implementation (Any kinds of Suspicion of Code-copy)</b>	0 pts
7	<b>Impolite Report / Lack of Comments</b>	0 pts / -50 <u>u</u> % pts

Questions are welcome on  
YSCEC but,

**“Try Google first”**

**“Look up others’ questions”**