

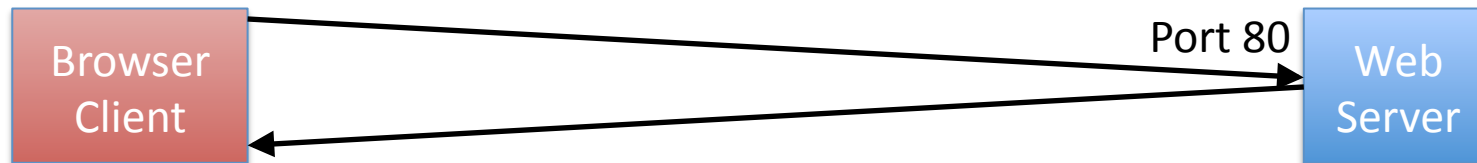
Notes on Programming Assignment 4

CE 156, Kerry Veenstra

Proxy Server

Requirements

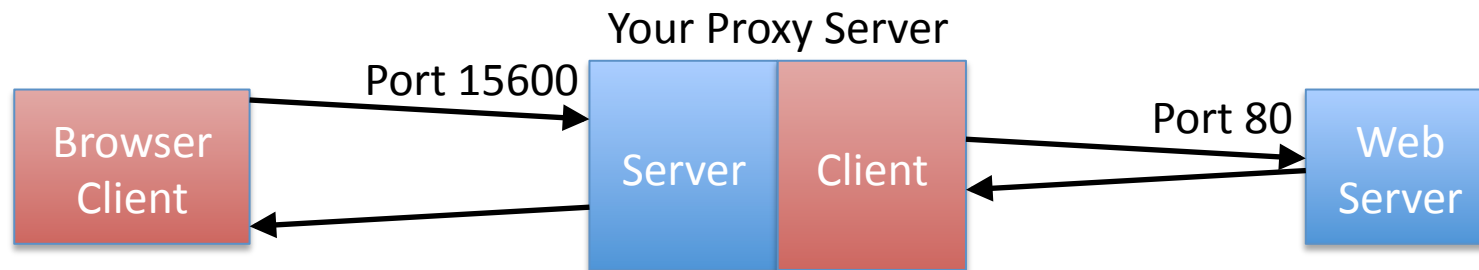
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Support GET and HEAD Requests

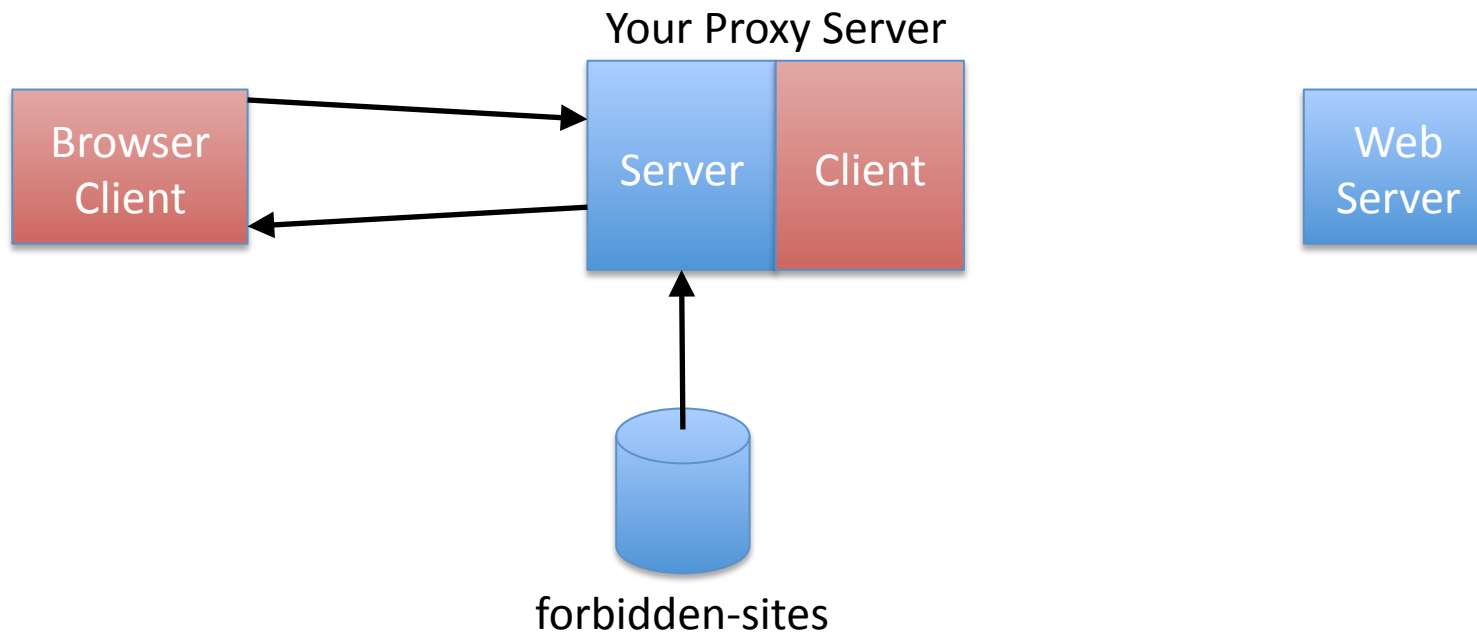
General Features

- The proxy server needs to support HTTP 1.0 and 1.1. It needs to handle only the GET and HEAD requests.
- A standard browser client (e.g., Firefox) will be used to generate the HTTP requests. You need to configure the browser to direct its requests to the proxy server by setting up the browser with the IP address and listening port number associated with the proxy server.
- Only one copy of the browser will be run at a time, but the server must be designed to support concurrent requests from the browser.

Block Access to Forbidden Sites

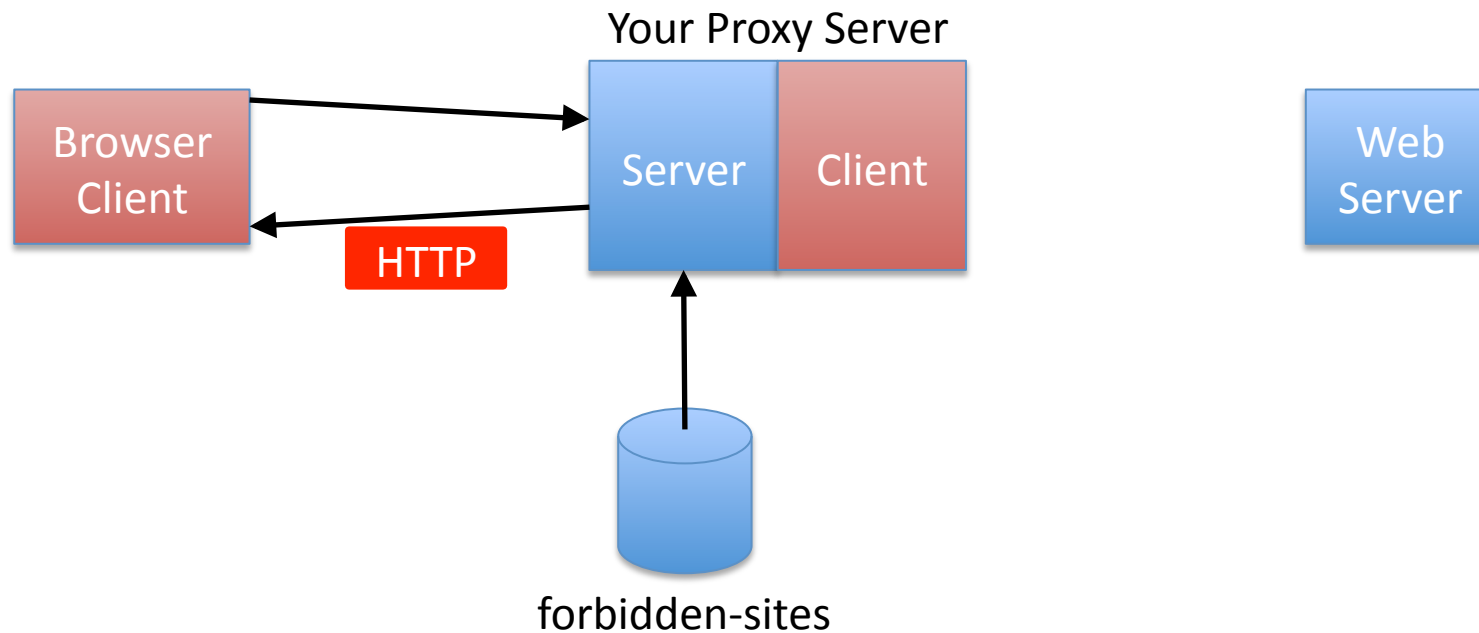
The list of forbidden sites is maintained in a file *forbidden-sites*. An example looks like:

`www.angrybirds.com`
`www.youtube.com`



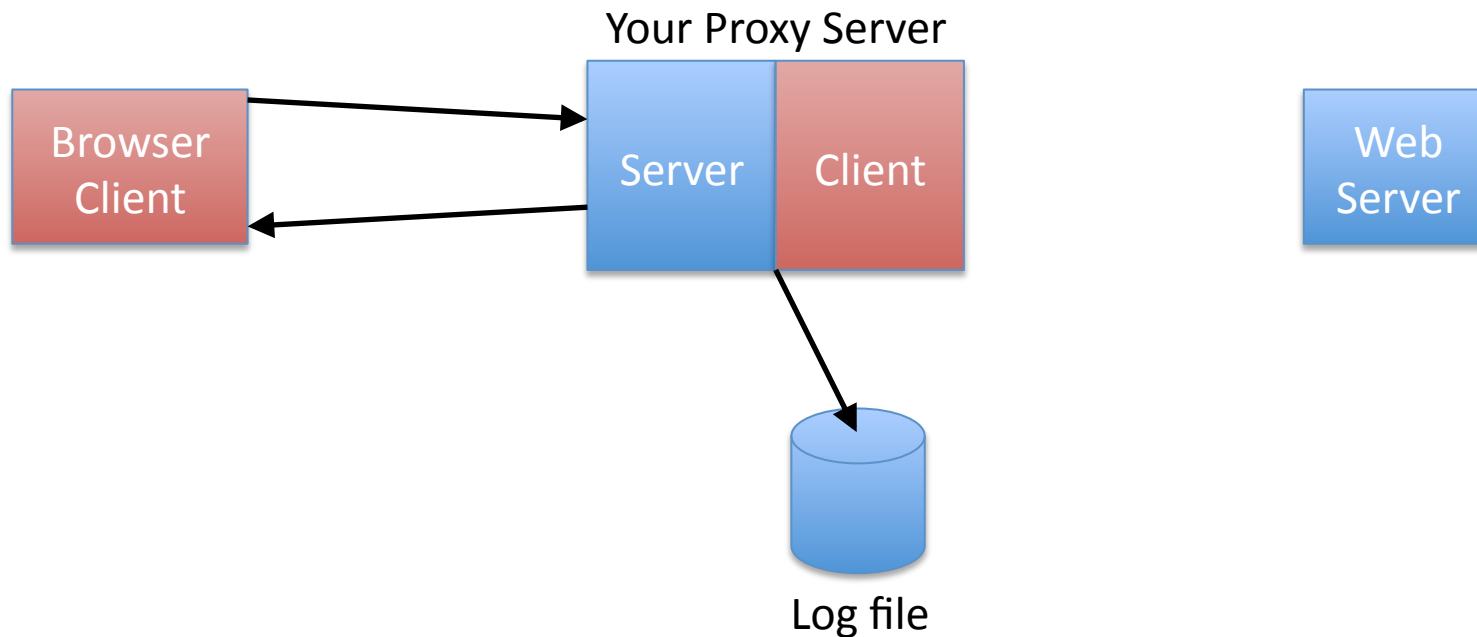
HTTP Status Codes

The proxy server must return an HTTP error response **403** (Forbidden URL) to the browser if the access is to a site in the *forbidden-sites* file. If the proxy server received an HTTP request method other than GET or HEAD, it should return an error code of **405** (Method not allowed) or **501** (Not implemented). The proxy server must also respond to any errors in the request (for example HTTP header fields missing or inconsistent) with the appropriate responses (for example, **400** Bad Request).



Logfile

- Date and time the request was received
- Type of request and HTTP version
- Requesting host name
- URI and server address
- Action taken by proxy (forwarded, filtered, etc.)
- Type of errors detected, if any



Options for Debugging: Browser and ...

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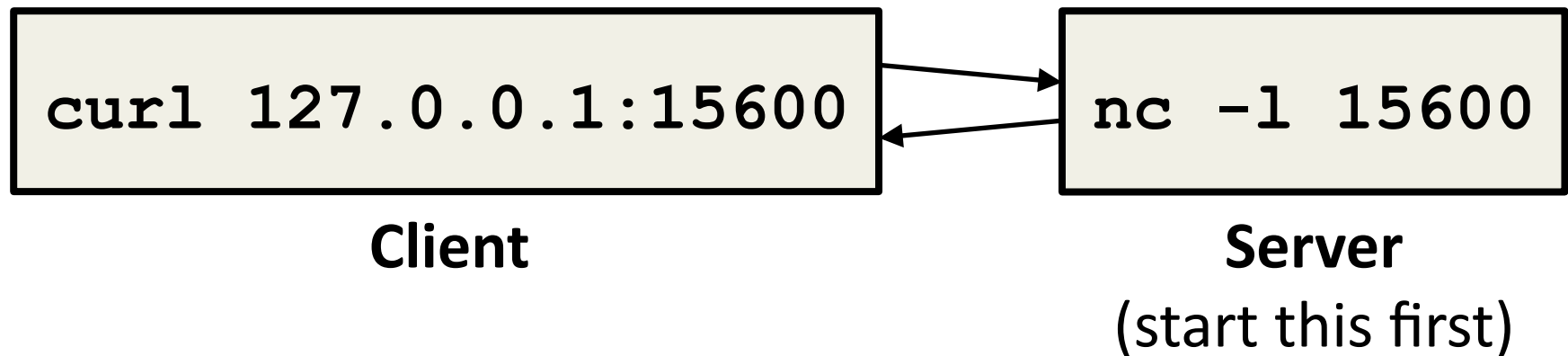
curl sends a GET request

```
curl www.example.com  
curl -v www.example.com  
curl -v --proxy 127.0.0.1:15600 www.example.com
```

nc (“netcat”) listens on a port

```
nc -l 15600
```

nc example #1: respond to *curl*



nc example #2: pretend to be a proxy

- Step 1: **set your browser to use a Web Proxy**
 - (Example for Safari)
 - Menu: **Safari → Preferences...**
 - Select **Advanced** tab
 - Press **Change Settings...** button near bottom
 - Check **Web Proxy (HTTP)**
 - Enter **Web Proxy Server** as unix1.lt.ucsc.edu
 - Enter your port
 - Press **OK** button
 - Press **Apply** button

nc example: pretend to be a proxy

- Step 2: **Log into unix1.lt.ucsc.edu**
- Step 3: **start *nc* to listen on a port**

```
nc -l 15600
```

nc example: pretend to be a proxy

- Step 4: **browse to www.google.com**
- Step 5: **type your reply into the terminal**

```
HTTP/1.1 200 OK
```

```
TEST
```

```
(Ctrl-D)
```

nc can send a file as a header

```
od -c header.txt  
cat header.txt | nc www.example.com 80  
cat header.txt | nc -x 127.0.0.1:15600 www.example.com 80
```

Persistent Connections

Persistent connections: Note that the browser will use persistent connections by default if it is using HTTP 1.1. In this case, either the client (browser) or the server may initiate the close. The proxy server must be able to deal with this by closing the connection on the other side when the TCP connection on one side closes.

```
HTTP/1.1 200 OK
Accept-Ranges: bytes
Cache-Control: max-age=604800
Content-Type: text/html
Date: Thu, 25 Feb 2016 00:09:09 GMT
Etag: "359670651+gzip"
Expires: Thu, 03 Mar 2016 00:09:09 GMT
Last-Modified: Fri, 09 Aug 2013 23:54:35 GMT
Server: ECS (cpm/F9D5)
X-Cache: HIT
x-ec-custom-error: 1
Content-Length: 1270
```


Concurrency

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Use fork() or threads

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