

www.google.com

0-255
.....
1.2.3.4
127.0.0.1
193.25.35.10

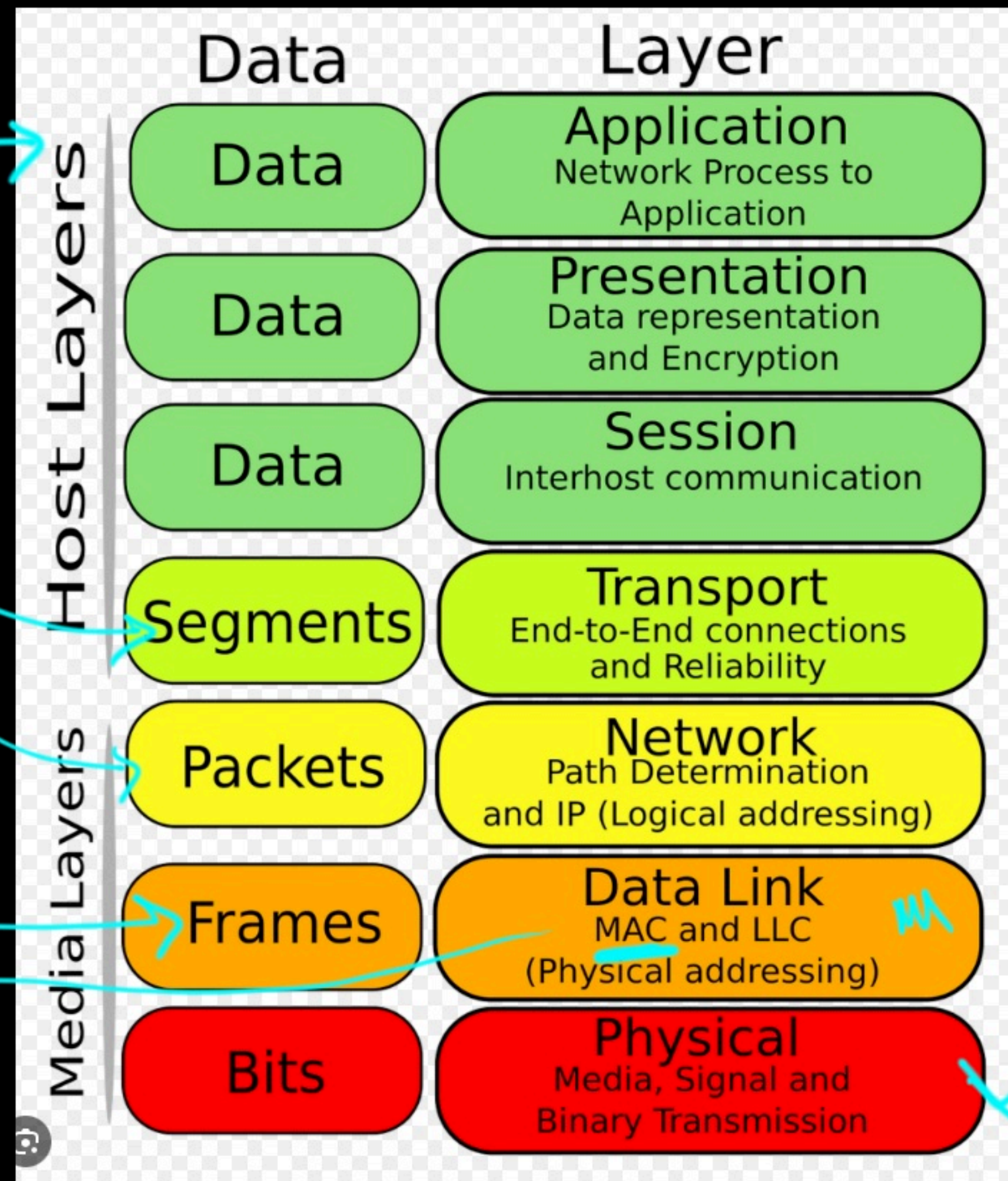
port

port
localhost:8080



http
tcp
ip

http - high-level



TCP

IP

Physical

0-255
2b: 00:00:00
FFFFF
9e:f9:2a:80:c3:cb
65k 65k 65k

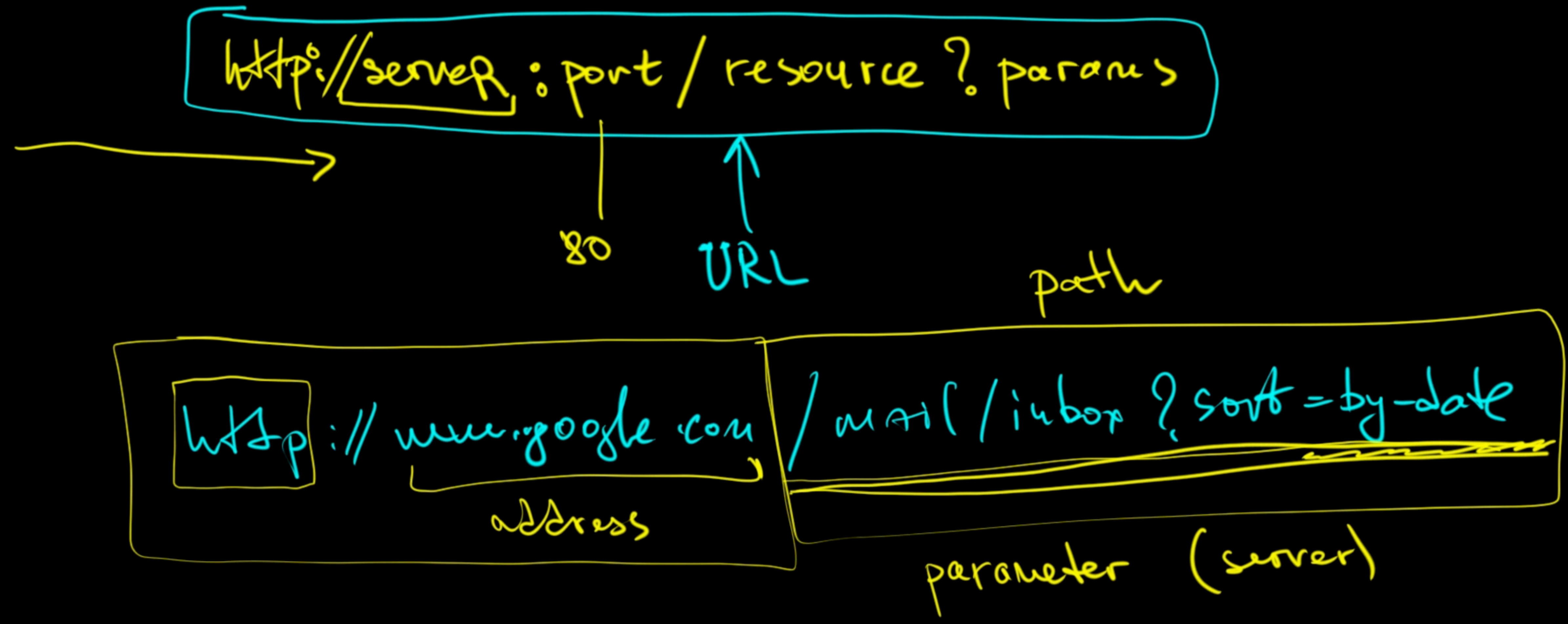
20600.000.000.000

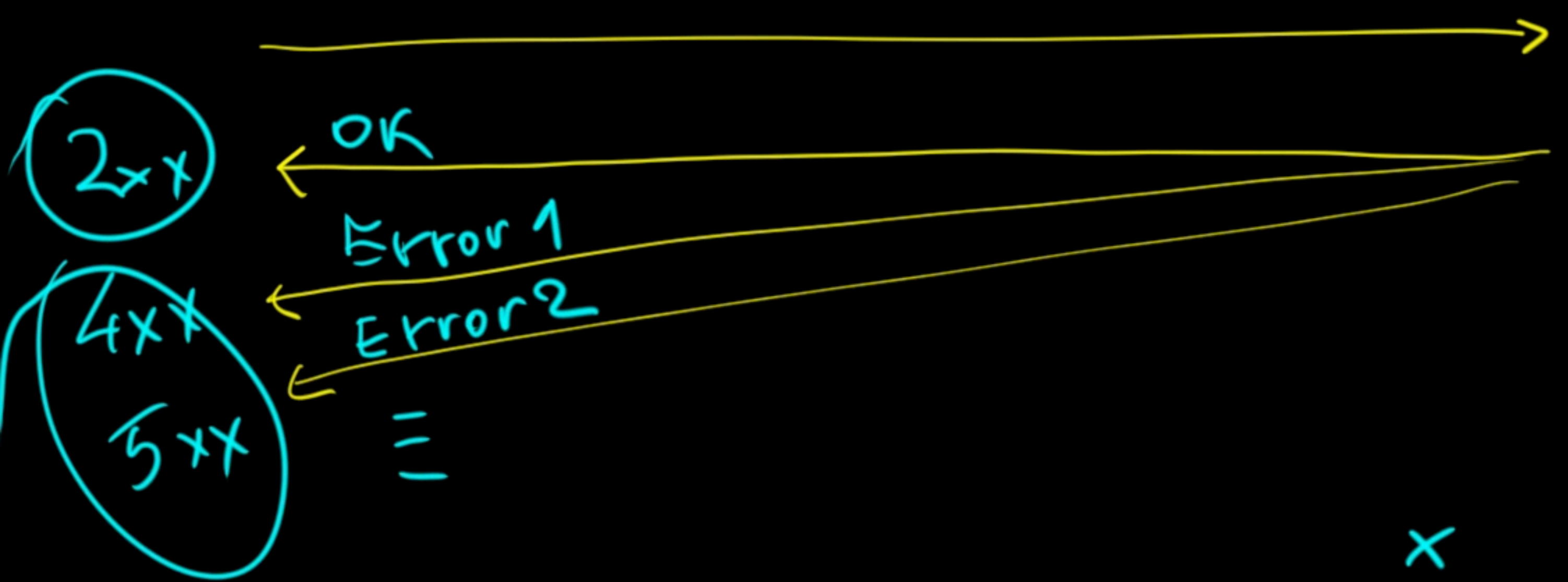
protocol

1+1
if (x=0)

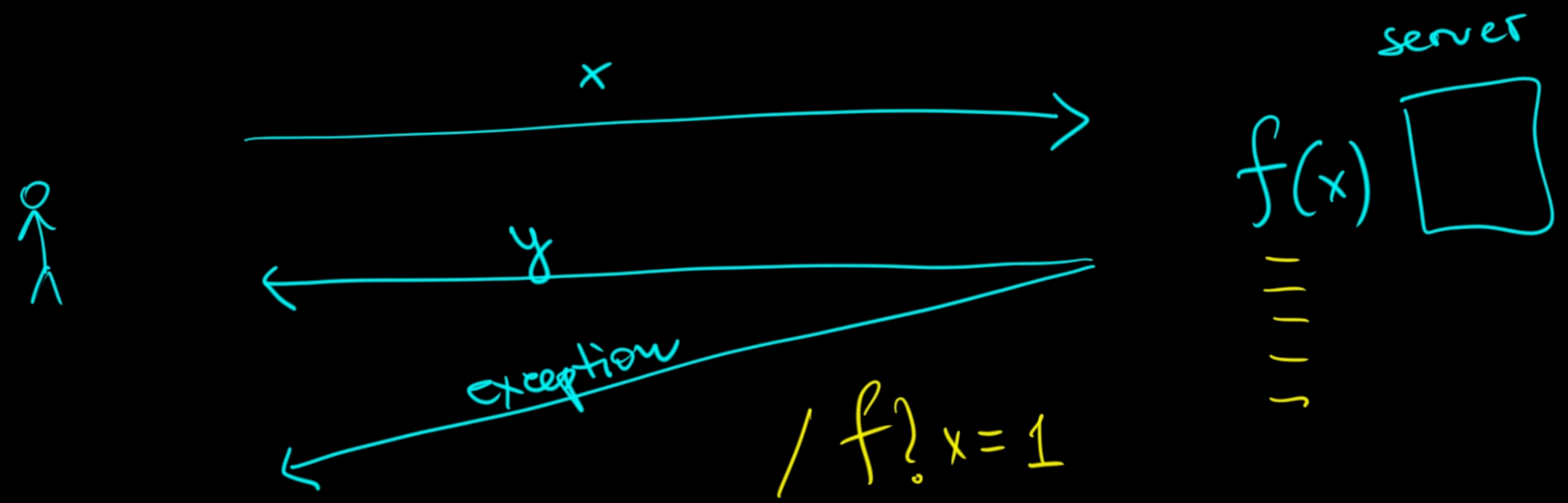
addr1 ^{byte} → addr2

http protocol

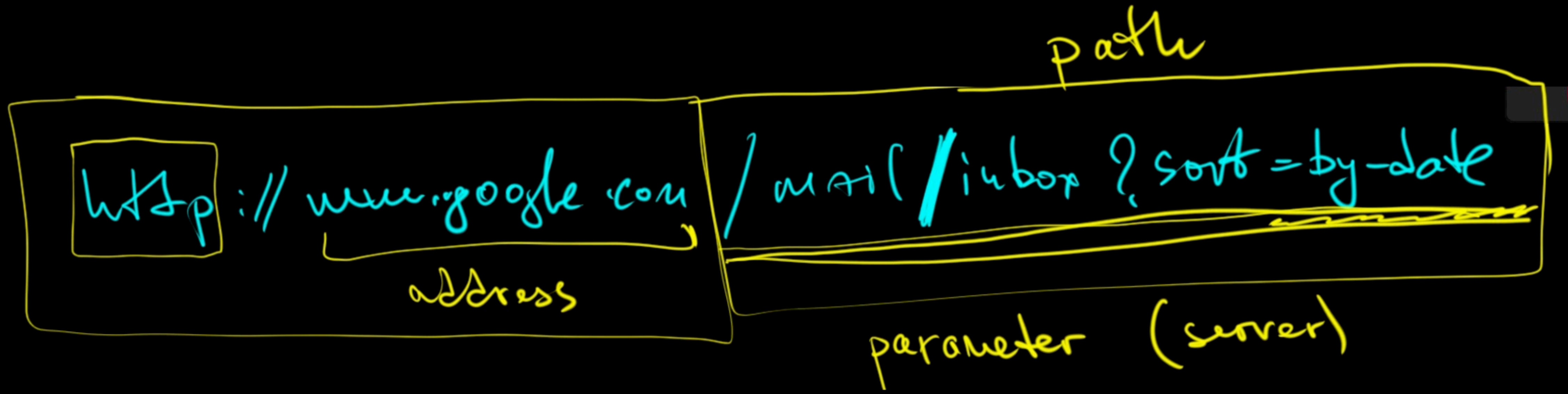




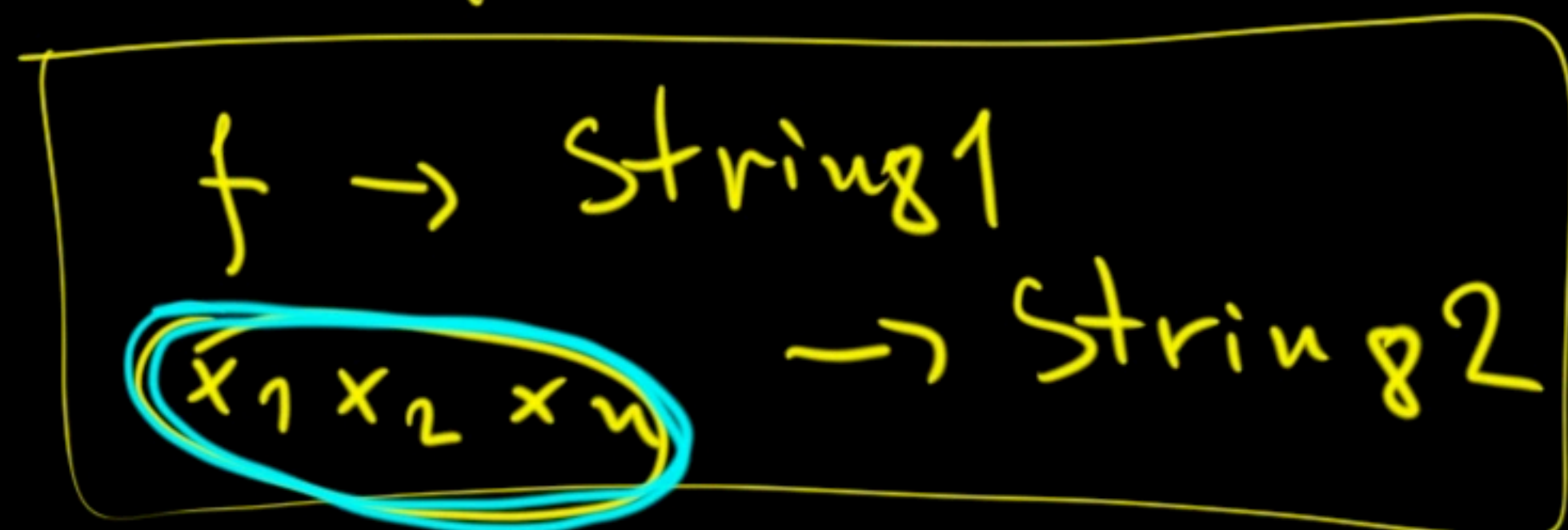
$$\text{path} \equiv f + x$$



$$y = \underline{f}(x)$$



client



http://server/string1 string2

request →

client

string1 string2 → string1
 → string2

string1 → $f_1/f_2/f_3$

string2 → x

string2 → x, y, z

no params

$f_2(x, y, z)$

$y = f(x) \mid \text{exception}$

2xx

4xx

response ←


```
Server server = new Server(port: 8080);  
  
ServletContextHandler handler = new ServletContextHandler();  
handler.addServlet(HelloServlet.class, pathSpec: "/hello");  
server.setHandler(handler);  
  
server.start();  
server.join();
```

1

2

3

4

5

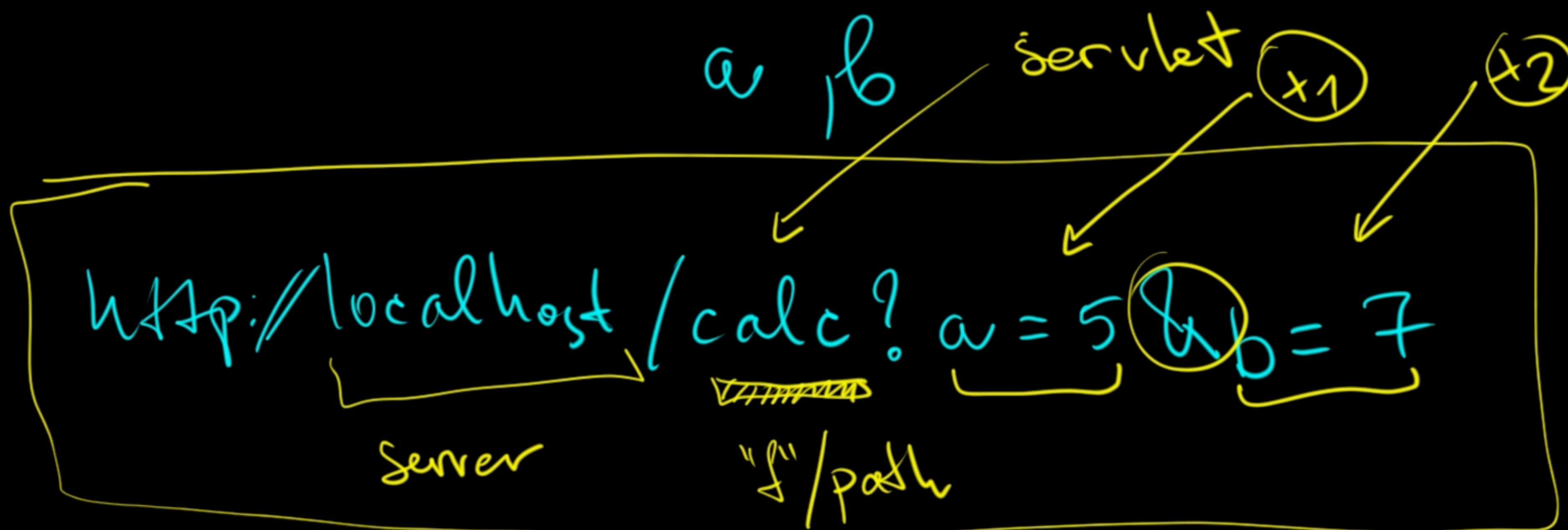
```
public class HelloServlet extends HttpServlet {  
    @Override  
    protected void doGet(HttpServletRequest req, HttpServletResponse resp)  
    {  
        try (PrintWriter w = resp.getWriter()) {  
            w.println("Hello World!");  
        }  
    }  
}
```

Hello World!

Handler \equiv Map < Path String, Function >


```
handler.addServlet(HelloServlet.class, pathSpec: "/hello");
```

```
public class HelloServlet extends HttpServlet {  
    @Override  
    protected void doGet(HttpServletRequest req, HttpServletResponse resp) {  
        try (PrintWriter w = resp.getWriter()) {  
            w.println("Hello World!");  
        }  
    }  
}
```



Server

a+b

Summary

URL: http://localhost:8080/calc?x=5&y=700

Status: 200 OK

Source: Network

Address: ::1:8080

Response

HTTP/1.1 200 OK

Content-Length: 13

Date: Sat, 16 Nov 2024 09:38:56 GMT

Server: Jetty(9.4.56.v20240826)

```
protected void doGet(
    HttpServletRequest rq,
    HttpServletResponse rs) throws ServletException,
    IOException {
    try (PrintWriter w = rs.getWriter()) {
        String sx = rq.getParameter(s: "x");
        String sy = rq.getParameter(s: "y");
        Integer x = Integer.parseInt(sx);
        Integer y = Integer.parseInt(sy);
        int z = x + y;
        w.printf("%d + %d = %d", x, y, z);
    }
}
```

5 + 700 = 705

13 bytes

Stream <HttpRequest>
 .map(r -> servlet(r))