Main Challenge

Badge Manipulation

6) Badge Manipulation

Difficulty: 🎄🎄🎄🎄🎄

Bypass the authentication mechanism associated with the room near Pepper Minstix. A sample employee badge is available. What is the access control number revealed by the door authentication panel? *For hints on achieving this objective, please visit Pepper Minstix and help her with the* ***Yule Log Analysis*** *Cranberry Pi terminal challenge.*

Hint Challenge

The Yule Log Analysis

Cranberry Pi terminal challenge

Hint Challenge

The Yule Log Analysis

Cranberry Pi terminal challenge

Pepper Minstix at 2nd floor go right into corridor until end then left continue forward until you find him

Hi, I'm Pepper Minstix.

Have you heard of password spraying? It seems we've been victim.

We fear that they were successful in accessing one of our Elf Web Access accounts, but we don't know which one.

Parsing through .evtx files can be tricky, but there's a Python script that can help you convert it into XML for easier grep'ing.

Password Spraying

https://securityweekly.com/2017/07/21/tsw11/

if video didn't work go here :

https://www.youtube.com/watch?v=ZIOw_xfqkKM

Terminal Screen

```
                    lXMMMX;,,,,,,XMMMMK,,coddcclOkxoc,.
                  lk:oNMMMX;,,,,,XMMWN00o:,,,,,:MMMMMMoc;'
                .0l,,,,dNMMX;,,,,XNNWMMMk,,,,,,:MMMMMx,,,,:;.
               .K;,,,,,,,xWMX;,,;Kx:kWMMMk,,,,,:MMMM0,,,,,,,:k'
              .XkloooddolckWN:l0:,,,;kWMMO,,,,:MMMN;,,,,,cOWMMd
             ;oooc;,,,cMMMMMMxkO0,,,,,,,:OMM0,,,:MMWc,,,,lKMMMMWKo
           ;OMMWl,,,,,,cMMMMMO,,,:cc,,,,,,,:0M0,,:MMd,,,oXMMWKxc,,,c
         cOdXMMMWl,,,,,cMMMMX,,,,,,,:xxo:,,,,cK0,:MO,;xNWKxc,,,,,,,:.
       .0l,,,oNMMWl,,,,cMMMW:,,,,,,dXMWNMWXOdc;lxcX:xOxc,,,,,,,,,,,:
      ,0;,,,,,,,dNMWo,,,cMMMl,,,,,;xNMMMMW0kkkkkkddxdddxxxxxxxxxxxxxxxo
     .Wl,,,,,,,,,dWMo,,cMMx,,,:OWMMW0xc,:c,,:dOkcK:kc:ok0NMMMMMMMMMMMd
     KMMWXOdl;,,,,,;xWd,cM0,,l0MW0dc,,,,,,lkWWk:,OW,:XO:,,,;ldOXWMMMM'
    'MMMMMMMMMN0ko:,;kdcN;o00dc,,,,,,,,,,,0x;,,cMW,,;XWk;,,,,,,,:okk
    cNKKKKKKKKKKKKKKKkoodxxdcccccccccccccccco,,,:WMW,,,;XMWk;,,,,,,,l
    :x,,,,,,,,,,,,,cdkoOldldOKWMMMMMMMMMMMMx,,,XMMW,,,,;XMMWx,,,,;c
    .K,,,,,,,,,cd0WKl,xN,oXo,,,:ok0NMMMMMMc,,0MMMW,,,,,;KMMMNd;l'
     dl,,,,cx0WMM0c,,lMN,,oMXl,,,,,,;ldOX0',dMMMMW,,,,,,;KMMMK;
      OoxKWMMMWk:,,,;NMN,,,lWMKc,,,,,,,,ldclWMMMMW,,,,,,:oOl.
       OMMMMNx;,,,,,KMMN,,,,lWMM0c,,,,,l. .,cdkO00ccc:;,.
        cWXo,,,,,,,kMMMN,,,,,cWMMM0:,c:
         .Kc,,,,,,:MMMMN,,,,,,dMMMMWk'

I am Pepper Minstix, and I'm looking for your help.
Bad guys have us tangled up in pepperminty kelp!
"Password spraying" is to blame for this our grinchly fate.
Should we blame our password policies which users hate?

Here you'll find a web log filled with failure and success.
One successful login there requires your redress.
Can you help us figure out which user was attacked?
Tell us who fell victim, and please handle this with tact...

  Submit the compromised webmail username to
  runtoanswer to complete this challenge.
elf@9df3301ba913:~$
```

Solution

1. Recommended watch KringleCon - Beau Bullock' talk about password spraying:

   https://www.youtube.com/watch?v=khwYjZYpzFw

2. Let's list all files and directories using ls command :

   ls

```
elf@5fd62422222c:~$ ls
evtx_dump.py  ho-ho-no.evtx  runtoanswer
elf@5fd62422222c:~$
```

   Here you can see two files :

   evtx_dump.py Python script that can help you convert evtx into XML for easier grep'ing

   ho-ho-no.evtx Web log filled with failure and success in .evtx format

3. Let's convert ho-ho-no.evtx to readable xml format using python script evtx_dump.py:

   python2 evtx_dump.py ho-ho-no.evtx > ho-ho-no.xml

4. Use ls command again to check if the file converted :

```
elf@5fd62422222c:~$ ls
evtx_dump.py  ho-ho-no.evtx  ho-ho-no.xml  runtoanswer
elf@5fd62422222c:~$
```

5. View ho-ho-no.xml file using cat tool :

   cat ho-ho-no.xml

```
elf@fb2d5a3489f7:~$ cat ho-ho-no.xml
<?xml version="1.1" encoding="utf-8" standalone="yes" ?>

<Events>
<Event xmlns="http://schemas.microsoft.com/win/2004/08/events/event"><System><Provider Nam
e="Microsoft-Windows-Security-Auditing" Guid="{54849625-5478-4994-a5ba-3e3b0328c30d}"></Pr
ovider>
<EventID Qualifiers="">4647</EventID>
<Version>0</Version>
<Level>0</Level>
<Task>12545</Task>
<Opcode>0</Opcode>
<Keywords>0x8020000000000000</Keywords>
<TimeCreated SystemTime="2018-09-10 12:18:26.972103"></TimeCreated>
<EventRecordID>231712</EventRecordID>
<Correlation ActivityID="{fd18dc13-48f8-0001-58dc-18fdf848d401}" RelatedActivityID=""></Co
rrelation>
<Execution ProcessID="660" ThreadID="752"></Execution>
<Channel>Security</Channel>
<Computer>WIN-KCON-EXCH16.EM.KRINGLECON.COM</Computer>
<Security UserID=""></Security>
</System>
<EventData><Data Name="TargetUserSid">S-1-5-21-25059752-1411454016-2901770228-500</Data>
<Data Name="TargetUserName">Administrator</Data>
<Data Name="TargetDomainName">EM.KRINGLECON</Data>
<Data Name="TargetLogonId">0x0000000000969b09</Data>
</EventData>
</Event>
```

   Copy the xml text to notepad for easier lookup .

6. The evtx is a Event Viewer file so we will look for windows login event codes:

   4624 An account was successfully logged on

   4625 An account failed to log on

   You can find more about windows login event codes here :
   > https://www.ultimatewindowssecurity.com/securitylog/encyclopedia/default.aspx
   > https://docs.microsoft.com/en-us/windows/security/threat-protection/auditing/event-4625
   > https://docs.microsoft.com/en-us/windows/security/threat-protection/auditing/event-4624

7. Now let's use `grep` command to filter results , Look for failed attempts with code 4625 and export it to new file for easier analysis

   ```
   grep -A 35 "4625" ho-ho-no.xml > 4625.xml
   ```

   -B, --before-context=NUM print NUM lines of leading context

   -A, --after-context=NUM print NUM lines of trailing context

8. Let's filter IP address of machine from which failed login attempts was performed :

   ```
   grep "IpAddress" 4625.xml
   ```

   ```
   elf@20388254ab49:~$ grep "IpAddress" 4625.xml
   <Data Name="IpAddress">10.158.210.210</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   <Data Name="IpAddress">172.31.254.101</Data>
   ```

   We will notice this IP "172.31.254.101" as main source of failed logins, so we will mark this as the attacker ip .

9. Let's looking for successful attempts with code 4624 and export it to separated xml file for easier analysis

   ```
   grep -A 43 "4624" ho-ho-no.xml > 4624.xml
   ```

10. Let's filter events by attacker ip address "172.31.254.101" :

    ```
    grep -B 13 "172.31.254.101" 4624.xml
    ```

    ```
    elf@20388254ab49:~$ grep -B 13 "172.31.254.101" 4624.xml
    <Data Name="TargetUserName">minty.candycane</Data>
    <Data Name="TargetDomainName">EM.KRINGLECON</Data>
    <Data Name="TargetLogonId">0x000000000114a4fe</Data>
    <Data Name="LogonType">8</Data>
    <Data Name="LogonProcessName">Advapi  </Data>
    <Data Name="AuthenticationPackageName">Negotiate</Data>
    <Data Name="WorkstationName">WIN-KCON-EXCH16</Data>
    <Data Name="LogonGuid">{d1a830e3-d804-588d-aea1-48b8610c3cc1}</Data>
    <Data Name="TransmittedServices">-</Data>
    <Data Name="LmPackageName">-</Data>
    <Data Name="KeyLength">0</Data>
    <Data Name="ProcessId">0x00000000000019f0</Data>
    <Data Name="ProcessName">C:\Windows\System32\inetsrv\w3wp.exe</Data>
    <Data Name="IpAddress">172.31.254.101</Data>
    ```

    So we have successfully identified which user was attacked : minty candycane

11. Enter the name “minty candycane” into runtoanswer

Well, that explains the odd activity in Minty's account. Thanks for your help!
All of the Kringle Castle employees have these cool cards with QR codes on them that give us access to restricted areas.
Unfortunately, the badge-scan-o-matic said my account was disabled when I tried scanning my badge.
I really needed access so I tried scanning several QR codes I made from my phone but the scanner kept saying "User Not Found".
I researched a SQL database error from scanning a QR code with special characters in it and found it may contain an injection vulnerability.
I was going to try some variations I found on OWASP but decided to stop so I don't tick-off Alabaster.

Barcode Creation > Creating QR barcodes
https://www.the-qrcode-generator.com/

SQL Injection
https://www.owasp.org/index.php/SQL_Injection_Bypassing_WAF#Auth_Bypass

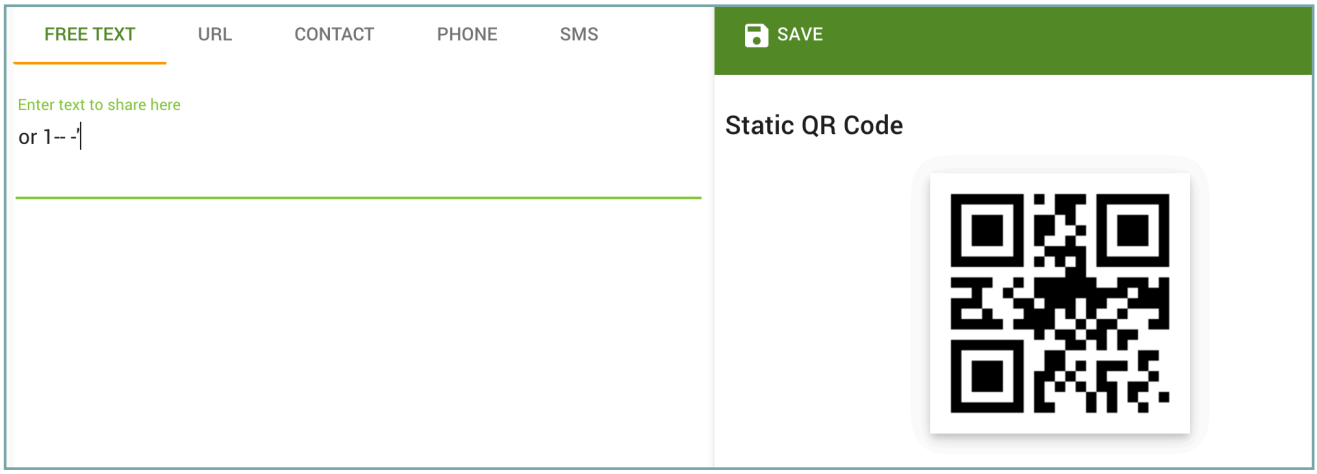
Main Challenge

Badge Manipulation

2nd floor from Pepper Minstix go to the end of the corridor then left until you reach the door on your right.

Solution

1. As OWASP website on how to bypass panels , Let's try some code variations :
   `or 1-- -'`
2. Let's create the QR barcode badge :
   - Go to the QR barcode generator : *https://www.the-qrcode-generator.com/*
   - Write the sample code in Free Text box > Export the QR to PNG file and save it :



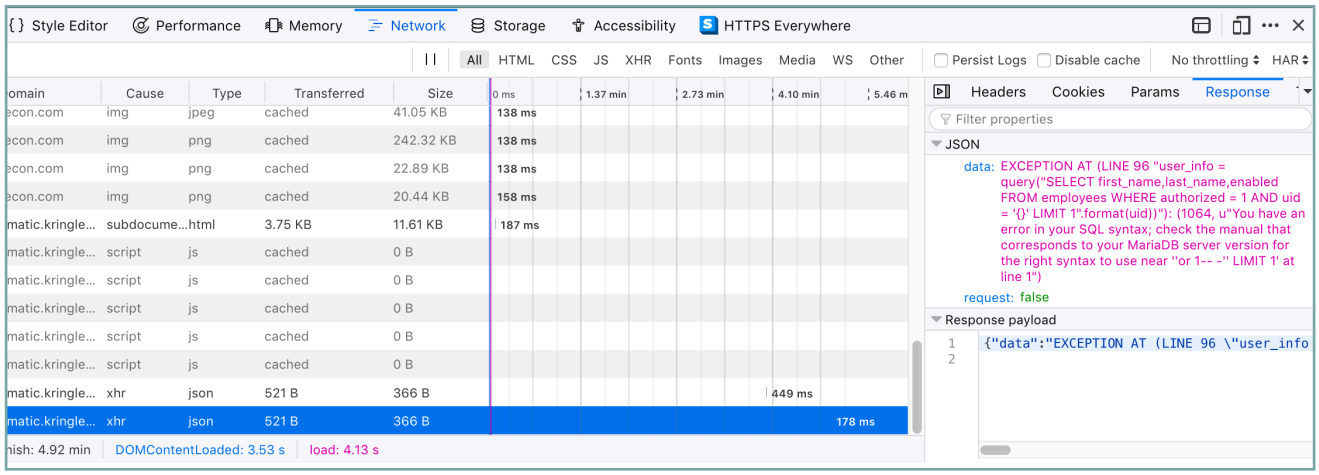
3. Go to the authentication panel then click usb port and upload the created qr png file :

   > if you get this error message "resource_id not set in cookie" , try to login from different browser where third party cookies enabled.

   After you upload the badge png file , you will get this error message :

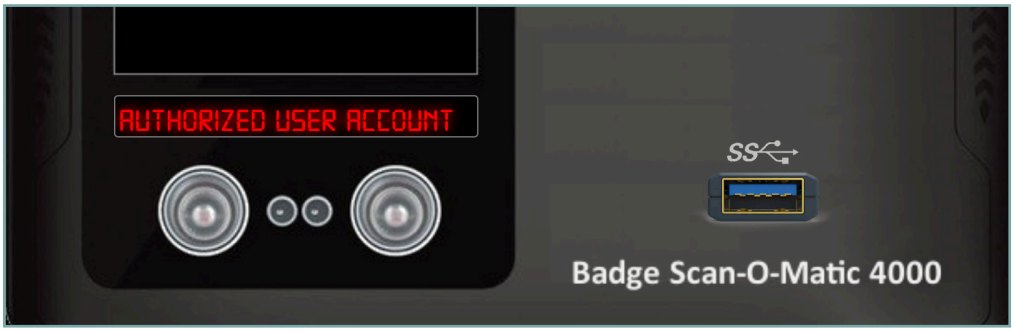
To view the full message using the following method :

- In Firefox : Right click > inspect element > network tab > reload button
- Then re-upload the qr file again
- Select last loaded item > Select response from right panel



EXCEPTION AT (LINE 96 "user_info = query("SELECT first_name,last_name,enabled FROM employees WHERE authorized = 1 AND uid = '{}' LIMIT 1".format(uid))"): (1064, u"You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near ''or 1-- -'' LIMIT 1' at line 1")

4. This error message give us the query used to validate the badge :
   SELECT first_name,last_name,enabled FROM employees WHERE authorized = 1 AND uid = '{}' LIMIT 1
   Where uid is our badge code and the interesting enabled, authorized variables.
5. Let's reshape our code and regenerate our qr badge :
   ' OR 1 = 1 #
   We will use or to select authorized accounts regardless the uid ,also will use # at the end to Inline comment the rest of the code because we need to ignores formatting of uid .
   As you can see will get the following error message :
   Authorized User Account Has Been Disabled!



6. Let's reshape our code again and regenerate our qr badge :

   ` OR enabled = 1 #

   We will use or to select enabled accounts regardless the uid or authorized accounts ,
   Also will try enabled with 1 then true to test the values .

   Successfully opened the door and also got the access control number :

   User Access Granted - Control number 198807

Go to your Badge > Objectives > Enter 19880715