Analytics machine

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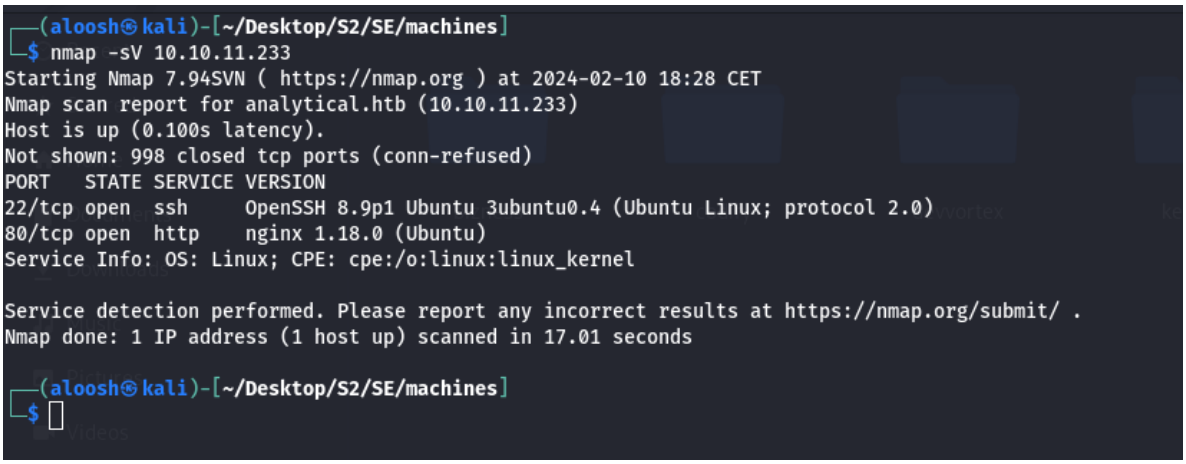
1 Finding the Vulnerability

1.1 Nmap

As always we start by scanning ports and services, we used the option -sV so get the software version with the open ports

and we got the following result:



```
┌──(aloosh㉿kali)-[~/Desktop/S2/SE/machines]
└─$ nmap -sV 10.10.11.233
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-02-10 18:28 CET
Nmap scan report for analytical.htb (10.10.11.233)
Host is up (0.100s latency).
Not shown: 998 closed tcp ports (conn-refused)
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 8.9p1 Ubuntu 3ubuntu0.4 (Ubuntu Linux; protocol 2.0)
80/tcp open  http    nginx 1.18.0 (Ubuntu)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 17.01 seconds

┌──(aloosh㉿kali)-[~/Desktop/S2/SE/machines]
└─$
```

Figure 1: result of Nmap.

As we can see, we have 2 open ports:

1. SSH (Port 22): OpenSSH 8.2p1 on Ubuntu.
2. HTTP (Port 80): Nginx 1.18.0 on Ubuntu, redirecting to `http://analytical.htb/`.

With port 22 we can't do much with that services since we don't have credentials to login with, so lets go for port 80.

and when we googled the ip address of the machine we were redirected to http://analytical.htb/ with error pag, to fix this we only need to add the ip and the host to our /etc/hosts in our local machine and we can see that the web page is now accessible.

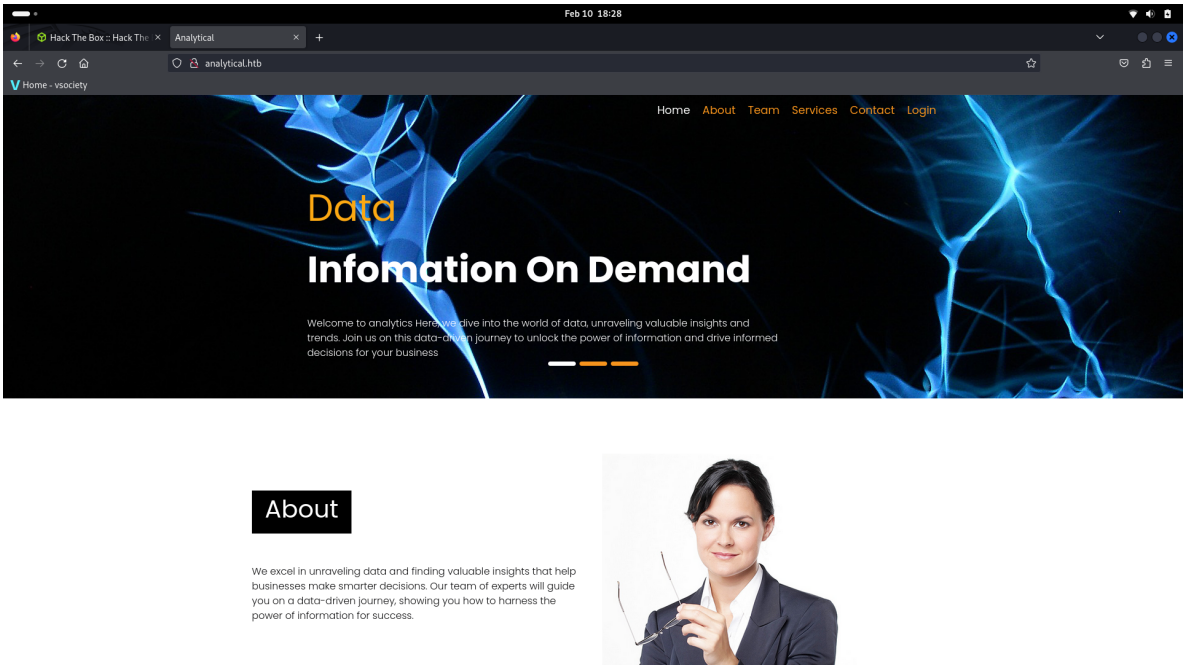


Figure 2: MainPage.

while browsing to the main page we found a simple login page. Intercepting requests with Burp revealed a redirect to http://data.analytical.htb, so we added that subdomain to /etc/hosts.

Visiting http://data.analytical.htb displayed a login page for Metabase.

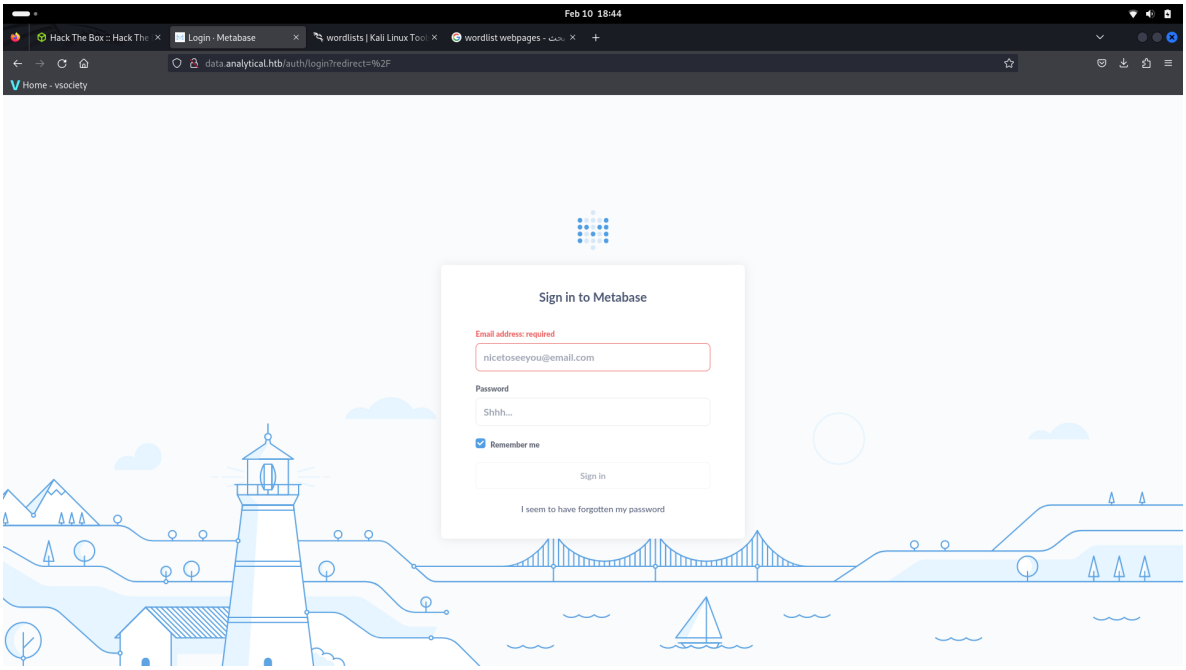


Figure 3: Metabase login page.

Metabase is an open source business intelligence tool. we looked for default credentials but apperently metabase doesn't have default credentials.

Brutforce didn't work too, so it was time to look for a known CVE, and indeed we found a known CVE with a public exploit.

1.2 CVE

CVE-2023-38646 is a critical vulnerability in Metabase open source and Metabase Enterprise editions. It allows an unauthenticated attacker to execute arbitrary commands on the server, at the server's privilege level. This means that the Metabase server can become a potential entry point for attacks

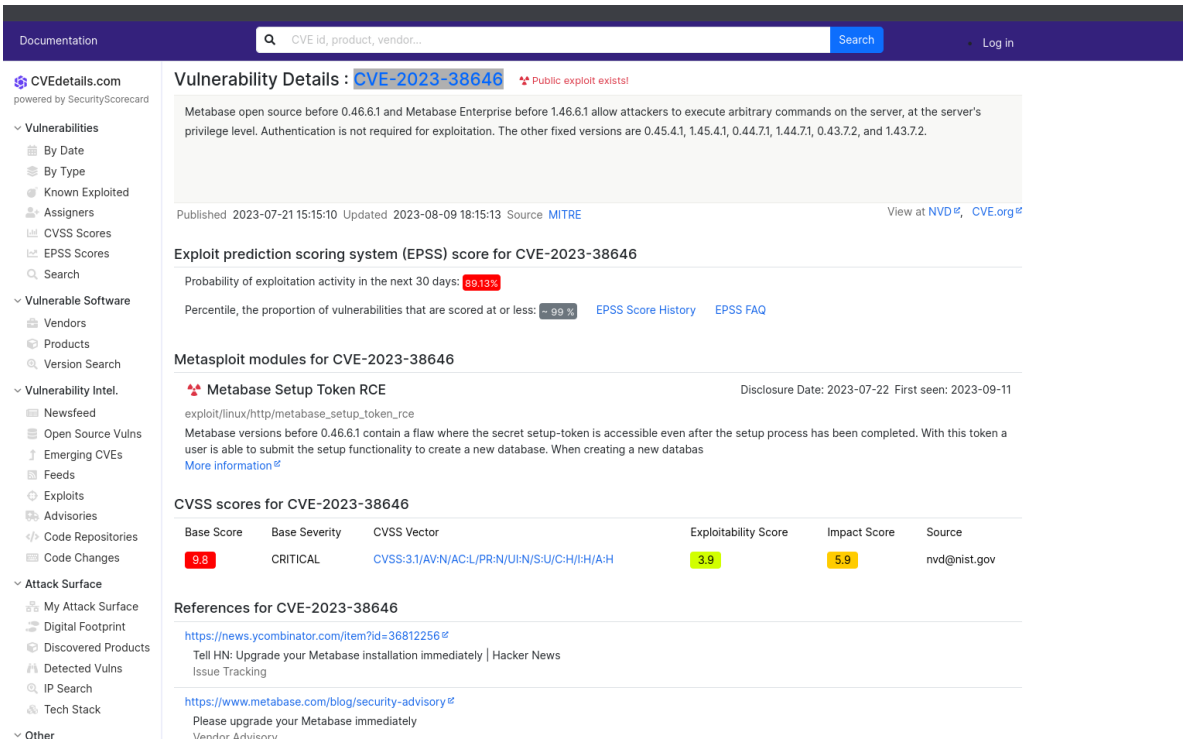


Figure 4: CVE for metabase.

we found the public exploit in the following github

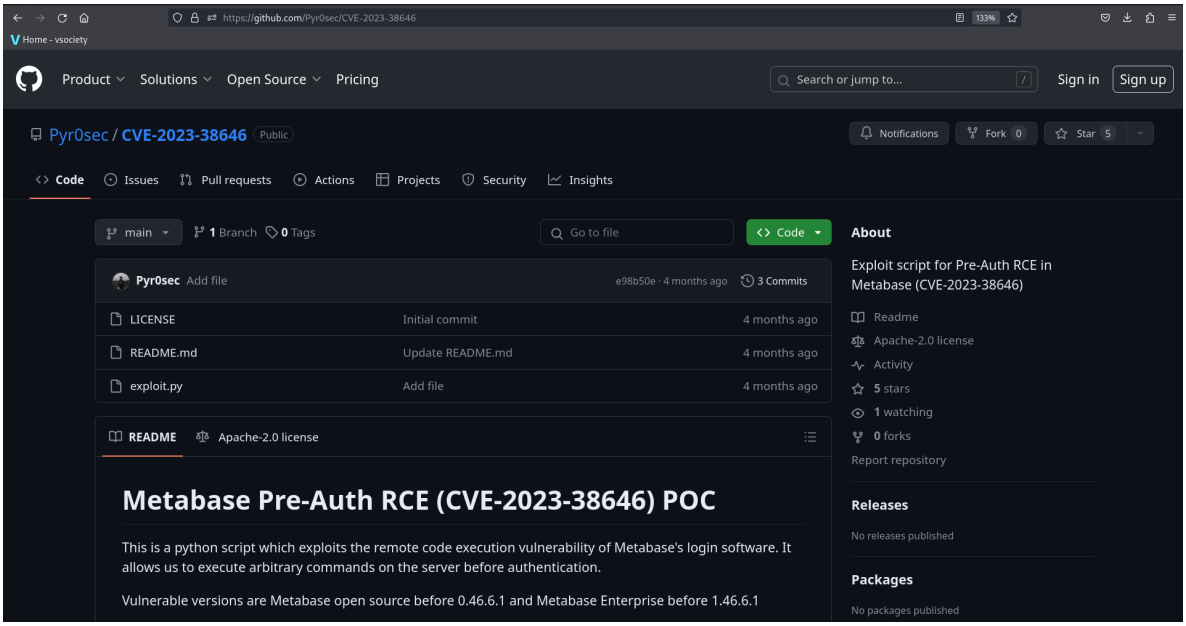


Figure 5: Gethub exploit.

the code in summery exploits an RCE vulnerability in Metabase by sending a crafted HTTP request to the /api/setup/validate endpoint. The request contains a malicious SQL statement that creates a trigger to execute arbitrary commands when a SELECT query is performed on a specific table. The attacker needs to know the target Metabase URL and a valid "Setup-Token" to exploit this vulnerability.

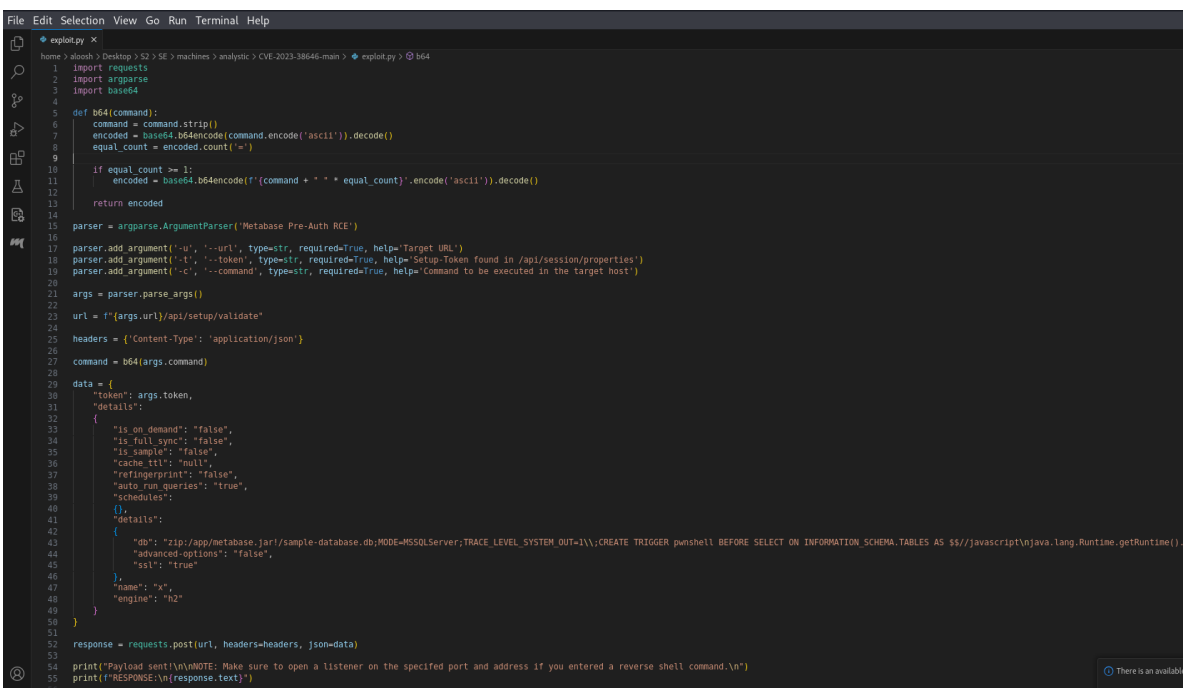


Figure 6: code exploit.

next step was to get the setup token that we ganna use in the exploit code, and it's found in /api/session/properties

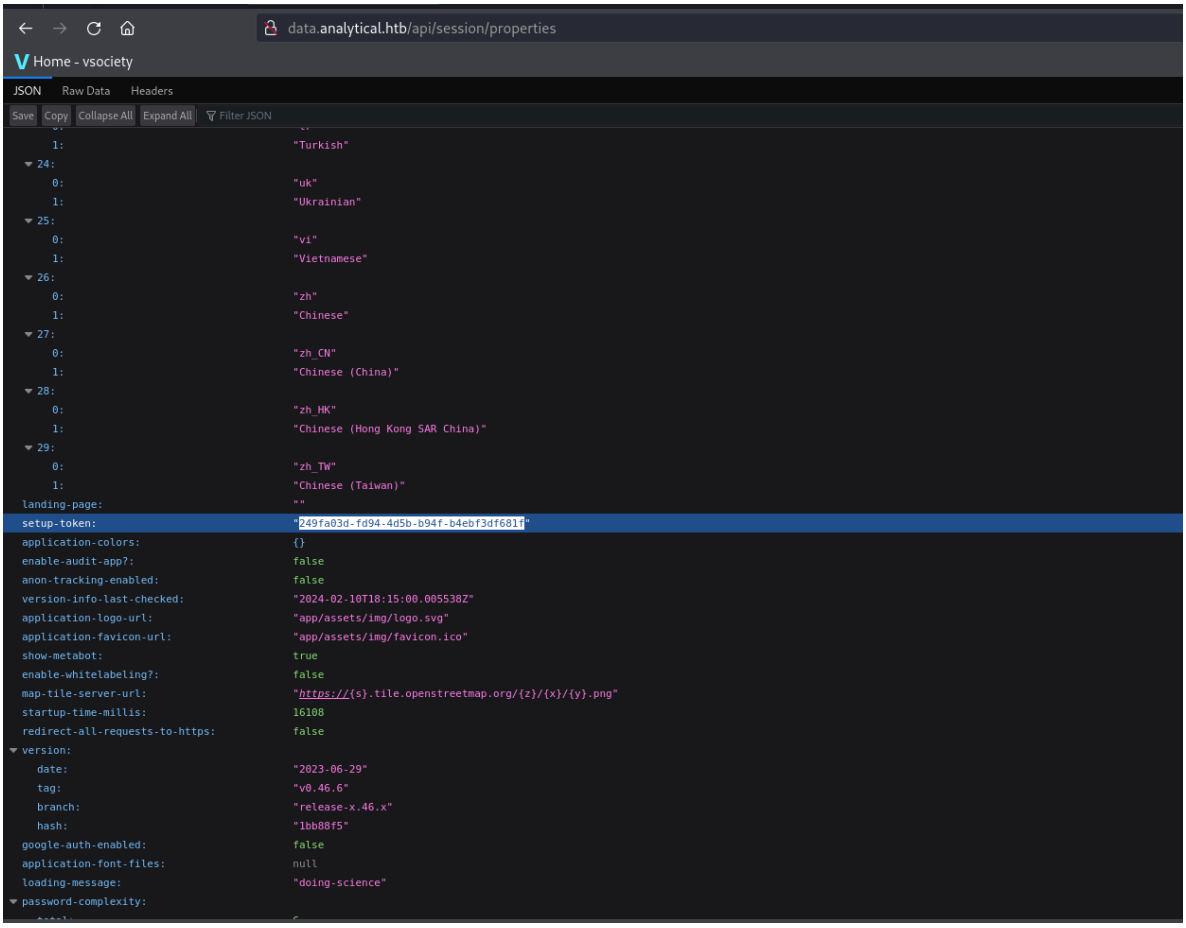


Figure 7: setup token.

2 Exploiting

using the exploit with the token enabled us to run a reverse shell on the target machine and gain a shell access as metabase user as the follwong 2 figures show.

Figure 8: executing the exploit.

Figure 9: Gain access metabase.

3 user flag

The problem here that we didn't find any user flag at metabase user home directory, so we started to look for his credentials, and that was so easy because the first place we looked at was the environment variables, and there was metabase user's credentials.

```
META_USER=metalytics
META_PASS=An4lytics_ds20223#
```

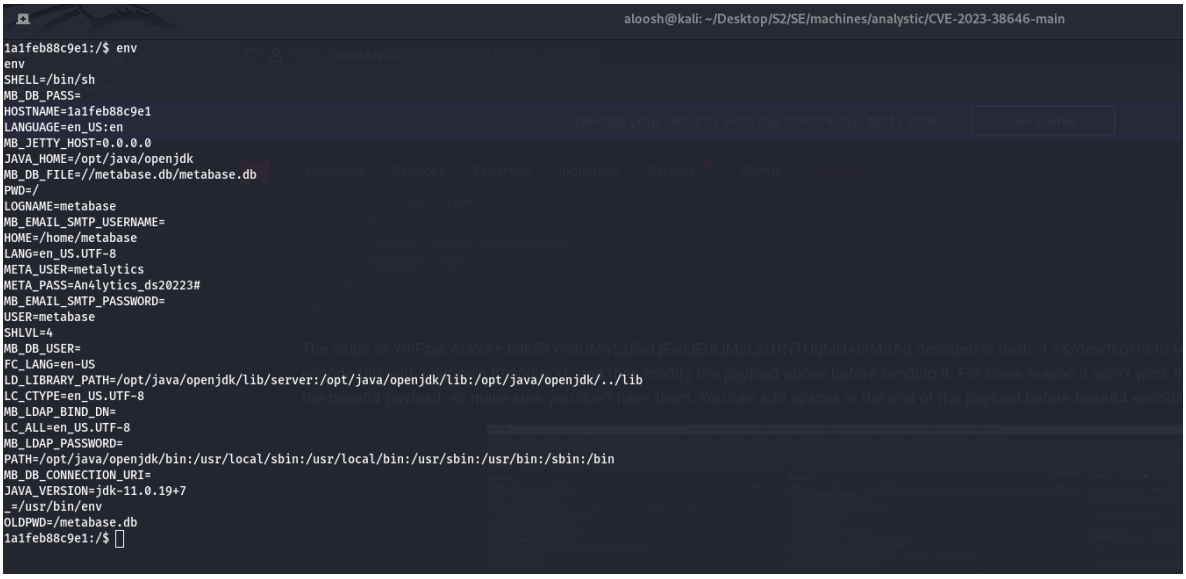


Figure 10: env.

now as we have metabase credentials we can login using ssh and the user flag was just there!!:

```
└─$ ssh metalytics@10.10.11.233
The authenticity of host '10.10.11.233 (10.10.11.233)' can't be established.
ED25519 key fingerprint is SHA256:TgNhCKF6jUX7MG8TC01/MUj/+u0EBasUVsdSQMHdyfY.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.10.11.233' (ED25519) to the list of known hosts.
metalytics@10.10.11.233's password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-25-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Sun Feb 11 02:21:51 PM UTC 2024

  System load:                0.13427734375
  Usage of /:                 93.2% of 7.78GB
  Memory usage:               25%
  Swap usage:                 0%
  Processes:                  155
  Users logged in:            0
  IPv4 address for docker0: 172.17.0.1
  IPv4 address for eth0:    10.10.11.233
  IPv6 address for eth0:    dead:beef::250:56ff:feb9:683e

  => / is using 93.2% of 7.78GB

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings


Last login: Sun Feb 11 13:06:06 2024 from 10.10.16.6
metalytics@analytics:~$ ls
user.txt
metalytics@analytics:~$ cat
user.txt
user.txt
^C
metalytics@analytics:~$ cat user.txt
89eeccf396fca6e6528217f58a8eda50
metalytics@analytics:~$
```

Figure 11: ssh to metabase user's acount.

4 root flag

As we always like to do, we started by listing metabase user's sudo permissions, but we didn't get lucky:

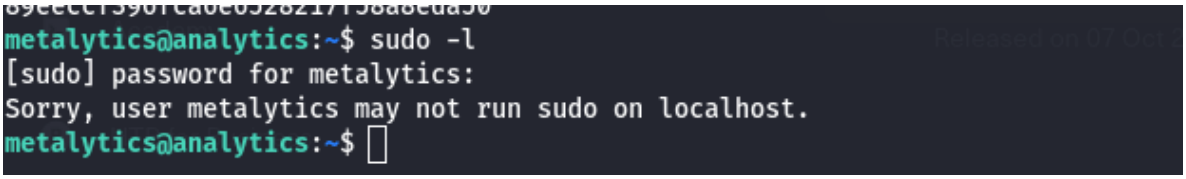


Figure 12: listing metabase user's sudo permissions.

then next step was to print system informations using uname -a:

Figure 13: system informations.

we tried to look for a vulnerability for this version, we found an interesting vulnerability that will give us a root access.

CVE-2023-2640 is a vulnerability found in the OverlayFS module of the Ubuntu kernel. It allows an unprivileged user to set privileged extended attributes on mounted files, leading them to be set on the upper files without the appropriate security checks. This flaw can be exploited by a local attacker to gain elevated privileges

source: https://www.crowdstrike.com/blog/crowdstrike-discovers-new-container-exploit/

then we execute the command found and we got root access

Figure 14: root access.

and now we can freely read the root flag

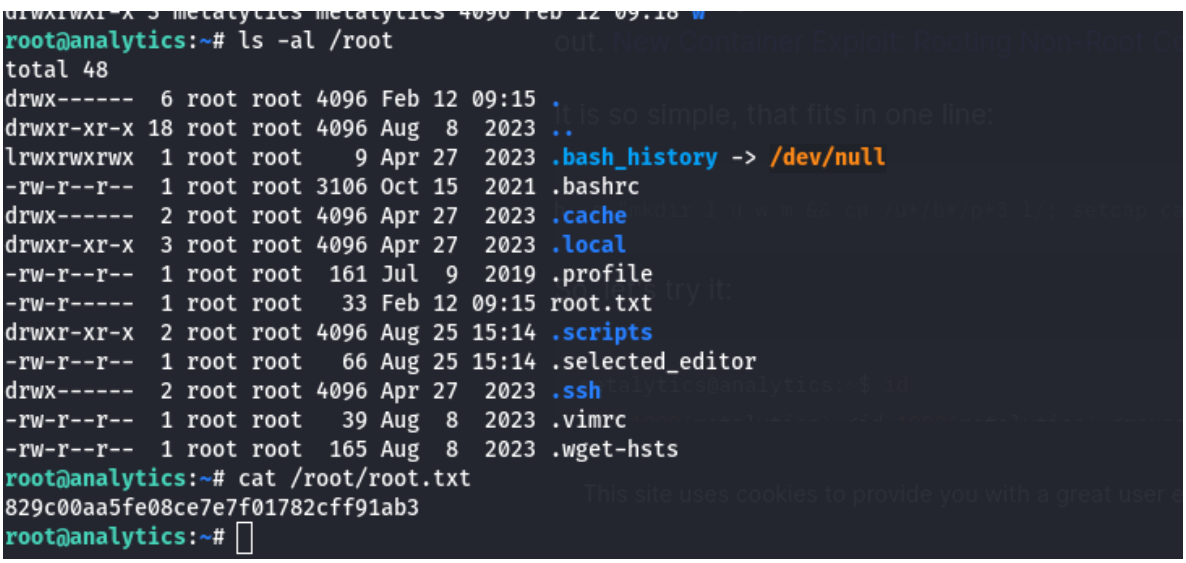


Figure 15: root flag.