wecahll_writeup

原创

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题目： Anderson Application Auditing

描述：You are in the role of a secret hacker. As always.
Your next job is the following:
VSA (Very Secret Agency) has followed very strict security policies for years, it is almost impossible to break into their network.
Unfortunately, that’s what your boss wants from you.
After some social engineering you gathered, that VSA wants to order some simple programs from SoftMicro software development corporation.
SoftMicro is the old partner for VSA, and he has implemented lots of backdoors for a commercial operating system named “Doors” for VSA.
SoftMicro’s software is usually crappy, but their network is very well defended - thanks to the very often attacks against SoftMicro’s network.
But VSA doesn’t accept any code from SoftMicro directly, because they hired a well known company named Anderson to audit every piece of code that are used at VSA.
Your plan is to hijack the communication between Anderson and SoftMicro, so you can analyse the program, and after Anderson audited the program, you will hijack the traffic between Anderson and VSA, exchange the program with your evil one, and the job is done.
The plan is great, but maybe not everything goes as planned…
Your first task is to hijack the communication between Anderson’s and SoftMicro’s network.
Here is the information you have already gathered:
The SoftMicro’s network is 207.46.197.0
Your public IP is 17.149.160.49
Anderson’s main page is Anderson
As you make progress on the challenge, you will get six pieces of a secret code, which is the proof that you have solved the challenge.
So, don’t forget to write down those secret code pieces.

解析你的角色是一个黑客，目的是入侵 vsa，而vsa想要从sorfMrcro外包程序，ms对一个叫做door的程序留下了许多后门。但是vsa并不是直接接受ms的代码，他们雇用了一个anderson的审计机构来审计所有的代码。计划劫持ms和anderson之间的通信，这样可以分析程序，当Anderson 审计结束之后，你将劫持Anderson和vsa之间的通信，留下恶意代码，**我们劫持双方的通信，做一个man-in-middle，是当anderson审查结束之后，将正确的代码发过去的时候，先经过我们，然后我门留下好的代码，发送恶意代码给vsa**

题目的第一部分目的是劫持双方的通信，给了两个ip地址和anderson的主页

注意题目总共有六部分，每解决一个部分会给出一个keyword，最后的keyword合起来就是本题的答案。

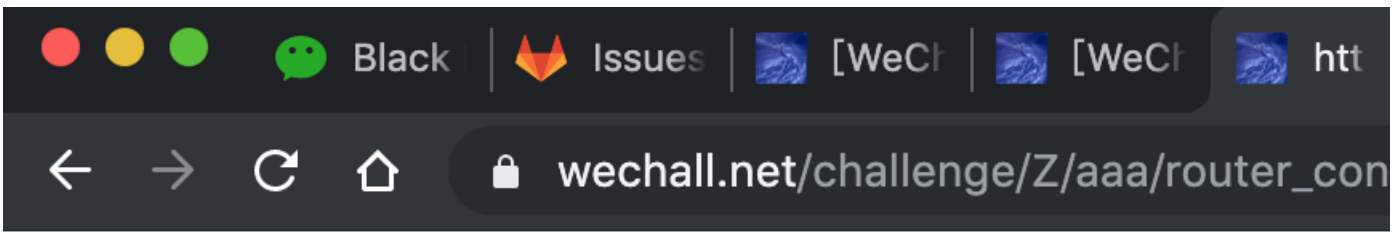
我们首先在anderson主页寻找隐藏信息，各个链接都点一下，发现parnter链接里又一个文档，打开如下

```
    AJP/1.3 8009
    http-alt 8080

    With the new built-in Core 32768 CPU-s, the webserver can service twice the Earth population, whe
    they make connection simultaneously.


Firewall:
    Version: 6.6
    Firewall Throughput: 2 GBps
    10/100 Interfaces: 8
    10/100/1000 Interfaces: 1

Router:
    Version: 23.6
    CPU Speed: 2 GHz
    RAM: 2 GB
    Flash Memory: 512 MB
    Notes: 20 front panel LEDs (including link/activity, collision detection and speed rating indicat


There is a default username/password for all modules (which is a very strong one),
but we strongly recommend to choose a new strong password for every module.

Default username:
admin

Default password:
jtqkcrInZpT


The web server config page is here:
www.example.com/webserver_config.html

The firewall config page is here:
www.example.com/firewall_config.html

The router config page is here:
www.example.com/router_config.html
```


文档里不仅给出了用户名和密码，还给出了三个网站，分别是

> The web server config page is here:
> www.example.com/webserver_config.html
>
> The firewall config page is here:
> www.example.com/firewall_config.html
>
> The router config page is here:
> www.example.com/router_config.html

三个网站都试一下，其实分析一下就可以知道是router_config.html，因为需要窃听通信，所以需要添加路由规则。
题目的网址是https://www.wechall.net/challenge/Z/aaa/index.php，所以路由网址是
https://www.wechall.net/challenge/Z/aaa/router_config.html



Router configuration

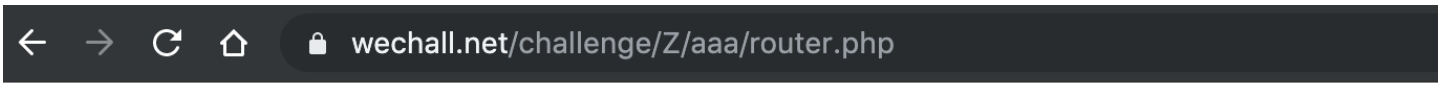
Router configuration

Username:

Password:

Login

输入用户名密码，这个用户名和密码是在文档里边被泄漏的。输入之后添加路由。



Login successful.
You can configure your router here, the syntax is the same as on all *NIX boxes.

Example: route add –net x.x.x.x netmask 255.255.255.0 gw x.x.x.x

Config command: route add -net x.x.x.x netmask 255.255.255.0 gw x.x.x.x

Login

`route add -net 207.46.197.0 netmask 255.255.255.0 gw 17.149.160.49`，进入下一部分

> New route added successfully.
1st part of the secret string: route

Actually, you found some very bad news on the net which may thwart your plans.

Anderson implemented PKI technology to digitally sign their documents, programs, etc.
It is very likely, that they will digitally sign the program you want to change when it is transferred to VSA.
Only one thing you have left as your final rescue. Anderson signs the MD5 hashes of
the programs/documents, so maybe you can create two different programs for Anderson – which have identical MD5 hashes.
The first good one will do the things as SoftMicro implemented,
but the second evil one will do what you want. Anderson analyses the good one, you change it to the bad one,
same hashes, same signature, game over.

Your journey continues here:
Generating hashes

第二部分分析题干中提示andersion通过pki加密，对文件进行数字签名，通过md5来验证文件，保证文件的完整性和信任性。所以如果我们需要用恶意程序替换正确程序，就需要将恶意程序的md5边成跟正确程序一样。点击链接，进入下一部分

这个全选之后会有提示，这个提示非常有用，一开始做的时候没有发现走了很多弯路但不发现也能做出来。其实界面有变化本身就是一个提示，这个也是ctf的魅力之一。
谷歌搜索md5 collision，打开网址网址
按照指令，使用evilizi来解决。

uick usage instructions:

ote for Windows users: the below instructions are for Unix/Linux. On Windows, you may have to append ".exe" to the names of executable files. Also, to use "make" ou must have the GNU tools installed and working.

1. Unpack the archive and build the library and tools:

   ```
   tar zxf evilize-0.2.tar.gz
   cd evilize-0.2
   make
   ```

   This creates the programs "evilize", "md5coll", and the object file "goodevil.o".
2. Create a C program with multiple behaviors. Instead of the usual top-level function main(), write two separate top-level functions main_good() and main_evil(). See the file hello-erase.c for a simple example.
3. Compile your program and link against goodevil.o. For example:

   ```
   gcc hello-erase.c goodevil.o -o hello-erase
   ```

4. Run the following command to create an initialization vector:

   ```
   ./evilize hello-erase -i
   ```

5. Create an MD5 collision by running the following command (but replace the vector on the command line with the one you found in step 4):

   ```
   ./md5coll 0x23d3e487 0x3e3ea619 0xc7bdd6fa 0x2d0271e7 > init.txt
   ```

   Note: this step can take several hours.
6. Create a pair of good and evil programs by running:

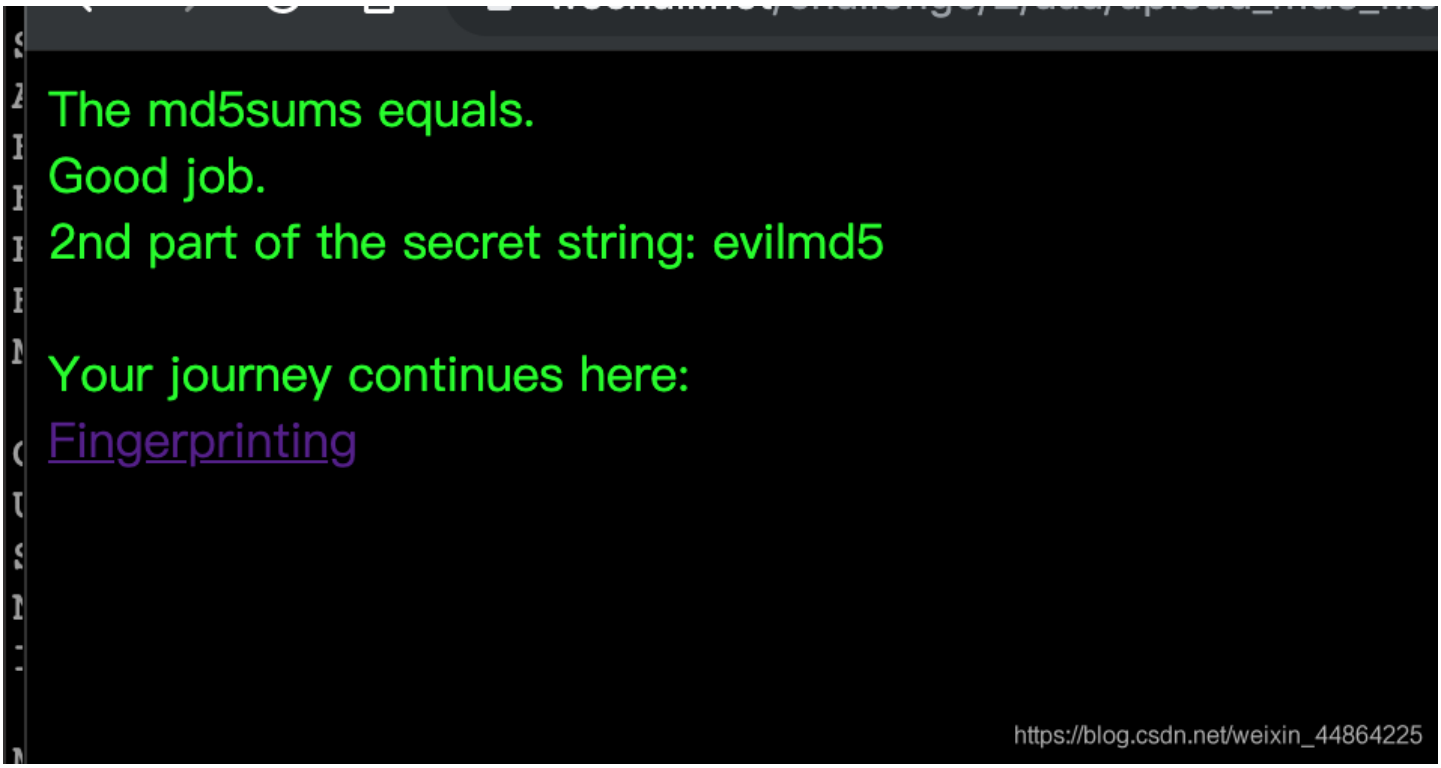
   ```
   ./evilize hello-erase -c init.txt -g good -e evil
   ```

   Here "good" and "evil" are the names of the two programs generated, and "hello-erase" is the name of the program you created in step 3.

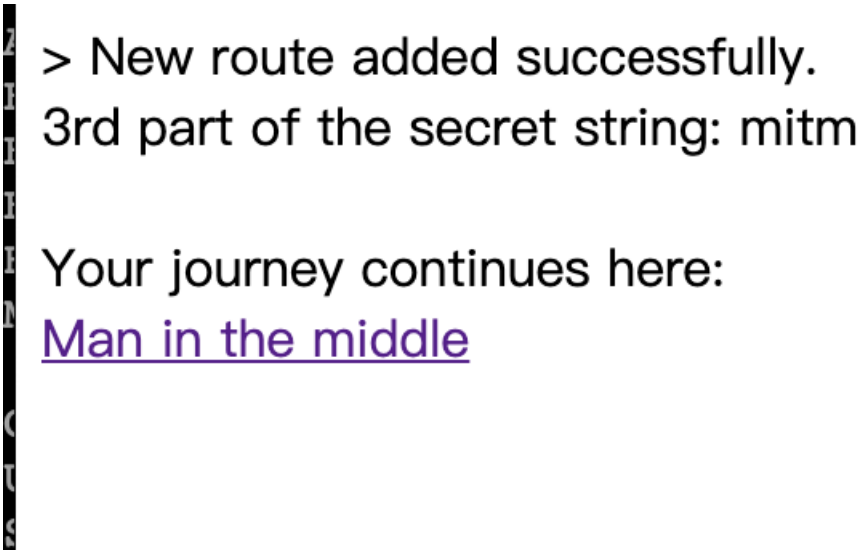
这个耗费的时间比较长，但是最终会生成两个程序 good和evil，正确程序和恶意程序按照如下写

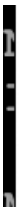
```
#include <stdio.h>
#include <unistd.h>

int main_good(int ac,char *av[]){
 fprintf(stdout,"Hello VSA employee");
 return 0;
}

int main_evil(int ac,char *av[]){
 fprintf(stdout,"I am a super VIRUS,game over.");
 return 0;

}
```

上传之后得到第二部分的密钥：evilmd5

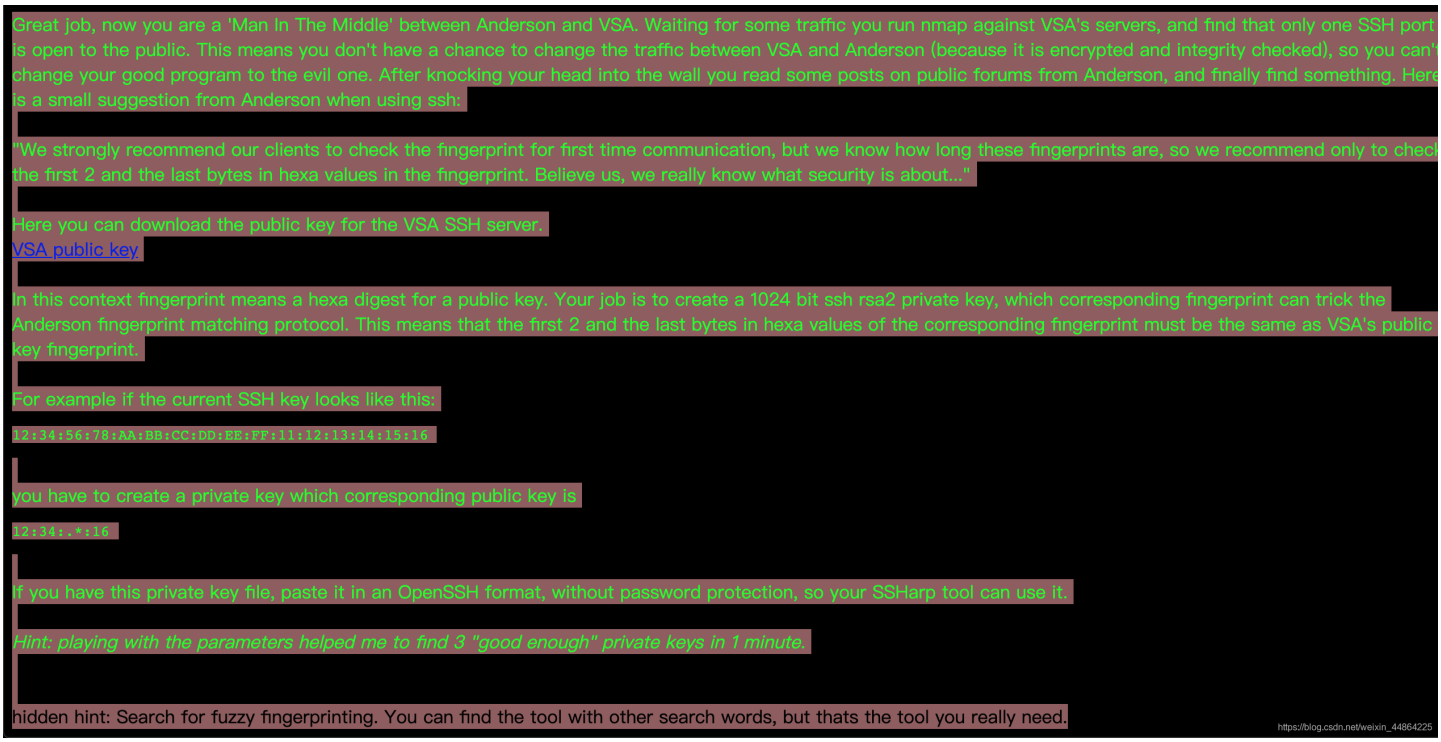


得到提示：**Your next task is to hijack the traffic between Anderson and VSA.**
VSA's IP network is 12.110.110.0 You know what to do…
我们再次重复，添加路由规则，得到





第三部分密钥get，进入下一部分。

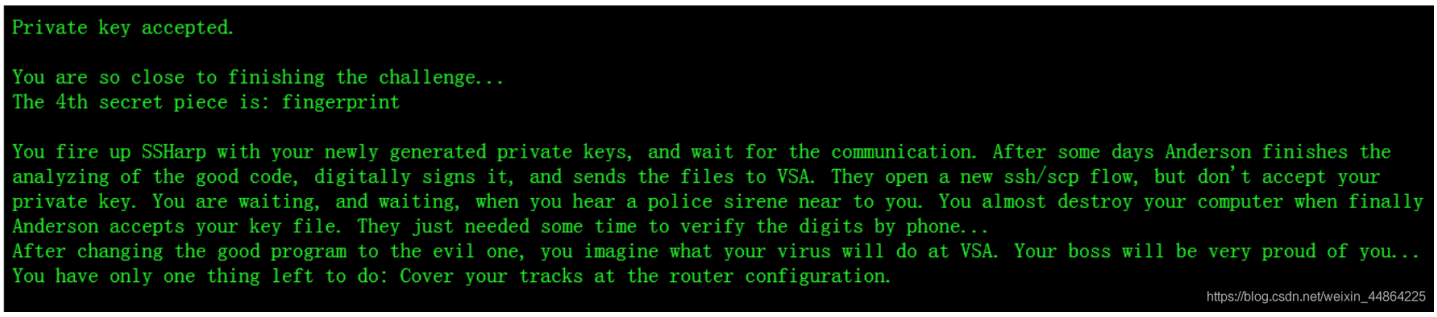


题目解析题目的意思就是想要提交恶意程序，先要发送密钥到ssh端口。但是ssh端口的人工会进行md5审查，使用fuzzy fingerprinting可以一定程度上迷惑端口的审查人，同时提出一些要求，当然，最后一部分仍用黑色字体写了小彩蛋。

https://bl4ckh47.wordpress.com/2009/10/25/fuzzy-fingerprinting/

关于fuzzy fingerprinting的背景，原理以及安装和使用都在上边的链接，但是关于安装，其链接和资源都有问题，安装耽误了我大概一天的时间，详细步骤在我另一篇博客中给出。ffp安装过程链接

上传私钥之后，提示要回去配置路由



主要就是删除路由规则，防止泄漏身份。

将路由的规则配置时候的命令中的add改成del就行

具体：

```
route del -net 207.46.197.0 netmask 255.255.255.0 gw 17.149.160.49
route del -net 12.110.110.0 netmask 255.255.255.0 gw 17.149.160.49
```

得到最后两个密钥，将所有密钥连起来为：

routeevilmd5mitmfingerprintgameover

就是题目最后的答案。