代码审计 | [De1CTF 2019]SSRF Me

原创

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[De1CTF 2019]SSRF Me

前言

以为是flask模板注入，但是看了其他师傅的writeup后发现是一个代码审计的流程，那就安心审计代码吧。

提示flag在/flag.txt中

整理后代码

```
#! /usr/bin/env python
#encoding=utf-8
from flask import Flask
from flask import request
import socket
import hashlib
import urllib
import sys
import os
import json
reload(sys)
sys.setdefaultencoding('latin1')

app = Flask(__name__)

secert_key = os.urandom(16)


class Task:
    def __init__(self, action, param, sign, ip):
        self.action = action
        self.param = param
        self.sign = sign
        self.sandbox = md5(ip)
        if(not os.path.exists(self.sandbox)):          #SandBox For Remote_Addr
            os.mkdir(self.sandbox)

    def Exec(self):
        result = {}
```

```
        result['code'] = 500
        if (self.checkSign()):
            if "scan" in self.action:
                tmpfile = open("./%s/result.txt" % self.sandbox, 'w')
                resp = scan(self.param)
                if (resp == "Connection Timeout"):
                    result['data'] = resp
                else:
                    print resp
                    tmpfile.write(resp)
                    tmpfile.close()
                result['code'] = 200
            if "read" in self.action:
                f = open("./%s/result.txt" % self.sandbox, 'r')
                result['code'] = 200
                result['data'] = f.read()
            if result['code'] == 500:
                result['data'] = "Action Error"
        else:
            result['code'] = 500
            result['msg'] = "Sign Error"
        return result

    def checkSign(self):
        if (getSign(self.action, self.param) == self.sign):
            return True
        else:
            return False


#generate Sign For Action Scan.
@app.route("/geneSign", methods=['GET', 'POST'])
def geneSign():
    param = urllib.unquote(request.args.get("param", ""))
    action = "scan"
    return getSign(action, param)


@app.route('/De1ta',methods=['GET','POST'])
def challenge():
    action = urllib.unquote(request.cookies.get("action"))
    param = urllib.unquote(request.args.get("param", ""))
    sign = urllib.unquote(request.cookies.get("sign"))
    ip = request.remote_addr
    if(waf(param)):
        return "No Hacker!!!!"
    task = Task(action, param, sign, ip)
    return json.dumps(task.Exec())
@app.route('/')
def index():
    return open("code.txt","r").read()


def scan(param):
    socket.setdefaulttimeout(1)
    try:
        return urllib.urlopen(param).read()[:50]
    except:
        return "Connection Timeout"
```

```
def getSign(action, param):
    return hashlib.md5(secert_key + param + action).hexdigest()


def md5(content):
    return hashlib.md5(content).hexdigest()


def waf(param):
    check=param.strip().lower()
    if check.startswith("gopher") or check.startswith("file"):
        return True
    else:
        return False


if __name__ == '__main__':
    app.debug = False
    app.run(host='0.0.0.0')
```

首先我们看这个路由：

```
@app.route('/De1ta',methods=['GET','POST'])
def challenge():
    action = urllib.unquote(request.cookies.get("action"))
    param = urllib.unquote(request.args.get("param", ""))
    sign = urllib.unquote(request.cookies.get("sign"))
    ip = request.remote_addr
    if(waf(param)):
        return "No Hacker!!!!"
    task = Task(action, param, sign, ip)
    return json.dumps(task.Exec())
```

首先是创建了一个`Task`的类，`action、sign`的值是由**cookie**得到，而`param`的值就是直接通过GET方法传递`param`参数的值得到，`ip`就是你的`ip地址`，接着`param参数`会经过`waf`，如果过了`waf`，则执行这个类的**Exec**。
顺着这个思路，我们追溯到`waf`这个方法上:

```
def waf(param):
    check=param.strip().lower()
    if check.startswith("gopher") or check.startswith("file"):
        return True
    else:
        return False
```

这个waf还是比较简单的waf，只要求`param参数`不是以`gopher`和`file`开头就能过waf，也就是过滤了这两个协议，使我们不能通过协议读取文件来。

最终`Task`类的`Exec`方法自然是结题的关键，我们跟进一下：

```
  def Exec(self):
      result = {}
      result['code'] = 500
      if (self.checkSign()):
          if "scan" in self.action:
              tmpfile = open("./%s/result.txt" % self.sandbox, 'w')
              resp = scan(self.param)
              if (resp == "Connection Timeout"):
                  result['data'] = resp
              else:
                  print resp
                  tmpfile.write(resp)
                  tmpfile.close()
              result['code'] = 200
          if "read" in self.action:
              f = open("./%s/result.txt" % self.sandbox, 'r')
              result['code'] = 200
              result['data'] = f.read()
          if result['code'] == 500:
              result['data'] = "Action Error"
      else:
          result['code'] = 500
          result['msg'] = "Sign Error"
      return result
```

如果`self.checkSign()`为真，那么我们可以将传递的`param参数`进入到`scan`方法，先跟进`scan`方法：

```
def scan(param):
    socket.setdefaulttimeout(1)
    try:
        return urllib.urlopen(param).read()[:50]
    except:
        return "Connection Timeout"
```

这里是关键，通过我们构造的`param参数`发现达到进行任意文件读取的效果，所以我们现在要做的就是如何使`self.checkSign()`为真，跟进：

```
def checkSign(self):
        if (getSign(self.action, self.param) == self.sign):
            return True
        else:
            return False
def getSign(action, param):
 return hashlib.md5(secert_key + param + action).hexdigest()
```

只要我们在cookie中传入的`sign`==getSign(**cookie传入的action,GET传递的param**)就能返回`True`

在这里我们是不知道`secert_key`的值，从而无法得到`getSign`返回的值，但是在这里发现：

```
@app.route("/geneSign", methods=['GET', 'POST'])
def geneSign():
    param = urllib.unquote(request.args.get("param", ""))
    action = "scan"
    return getSign(action, param)
```

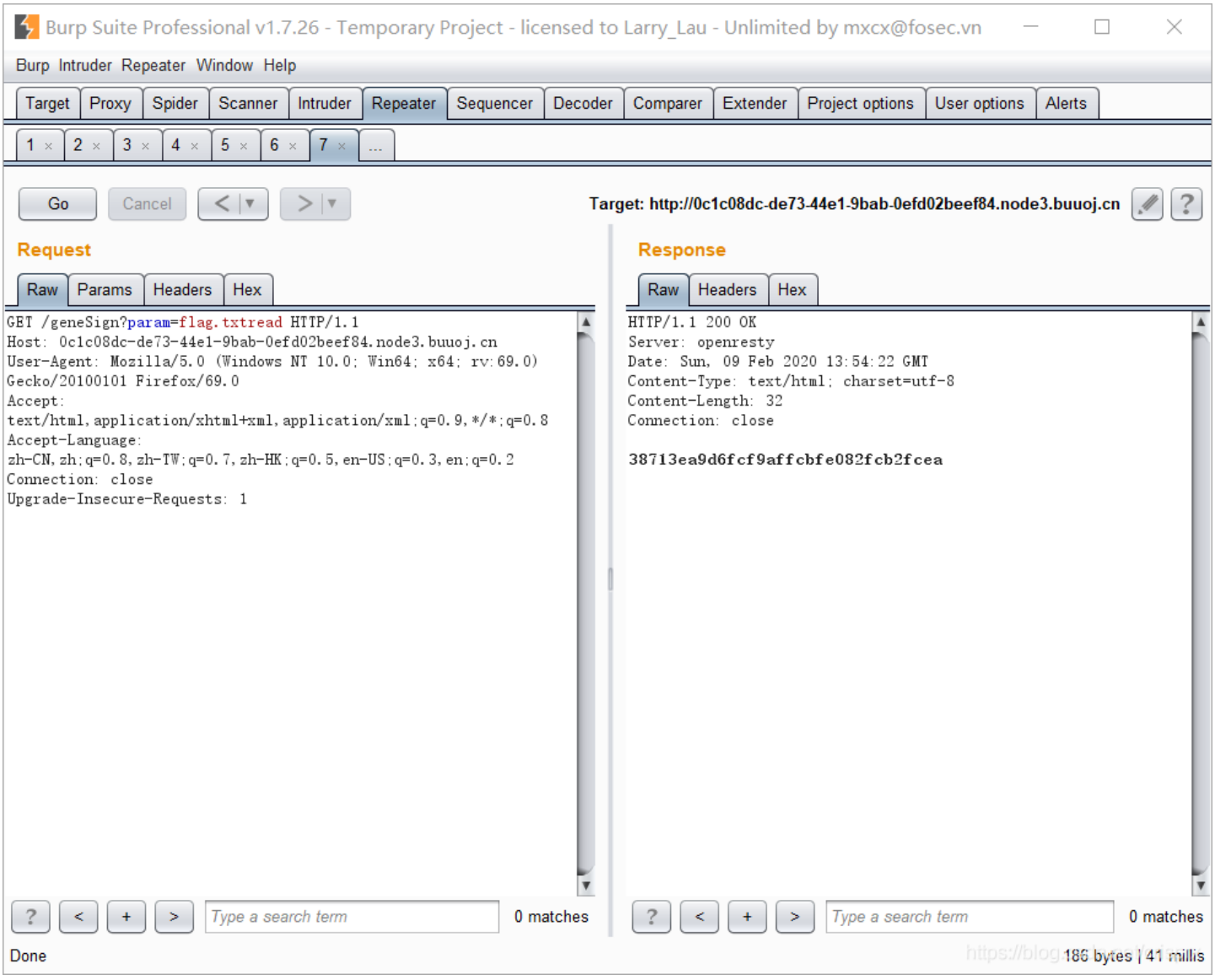
这里能够得到getSign('scan',GET传递的param)的值，这也是我们唯一能利用的地方，这里我们GET的`param参数`的值很明确，就是**flag.txt**,我们能通过geneSign得到的sign的值是md5(secret_key+`param`+'scan'),而最后我们在`/De1ta?param=`的值一定是flag.txt,而且必须要满足：

```
if "scan" in self.action
if "read" in self.action:
```

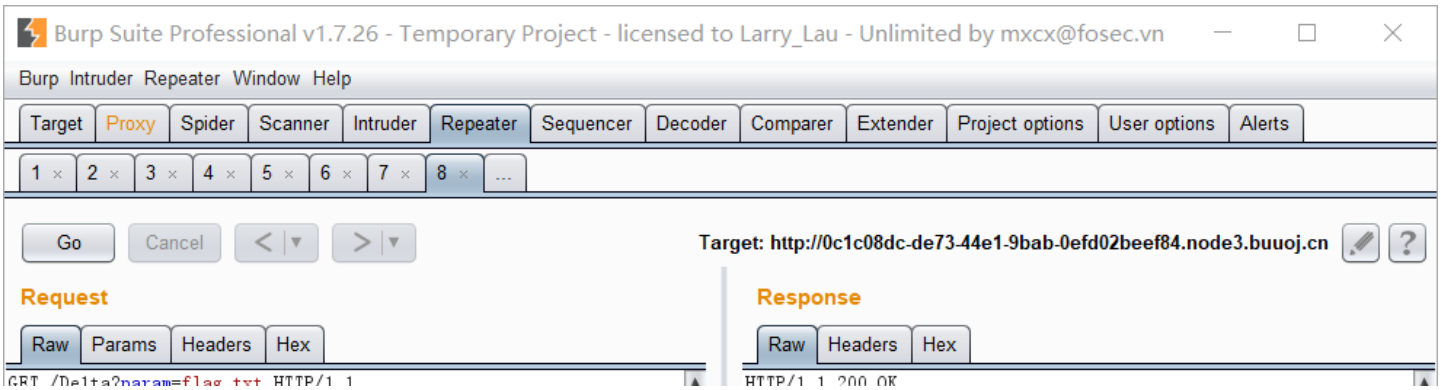
我们可以这样,在 `/geneSign` 的 `param参数` 的值为 flag.txtread，这样我们得到的sign就是 md5(secret_key+flag.txtreadscan),而访问 `/De1ta?param` 传递的值为 `flag.txt`，且**通过cookie传入的action**的值为 `readscan` ,这样

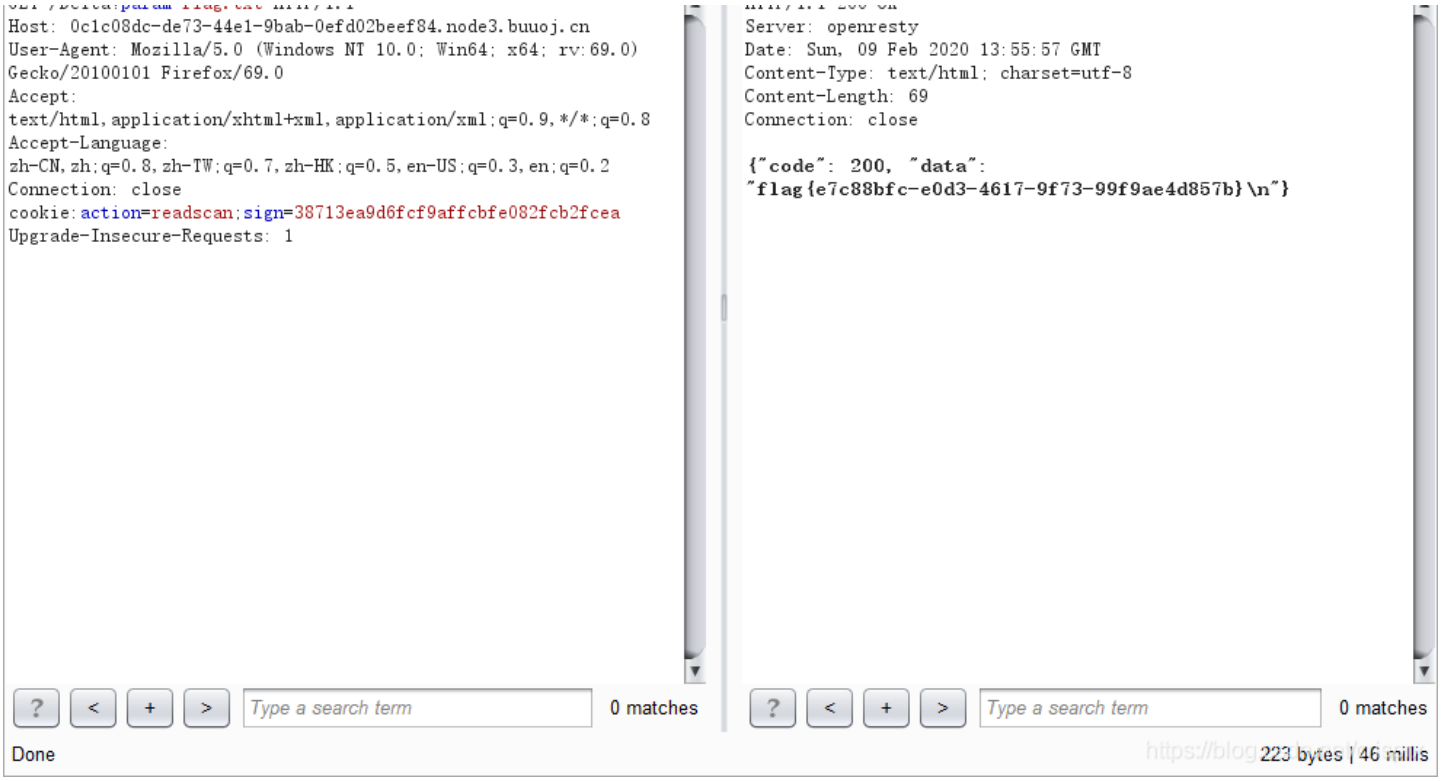
```
getSign(self.action, self.param) == getSign(flag.txtreadscan)
== md5(secret_key+flag.txtreadscan)
```

而这个sign我们是知道的，因此可以成功读取 `flag.txt`



得到 `sign=38713ea9d6fcf9affcbfe082fcb2fcea`；





传递`action`和得到的`sign`,得到flag!