De1CTF-2019部分wp

原创

CTF小白 于 2019-08-05 11:58:57 发布 1667 收藏

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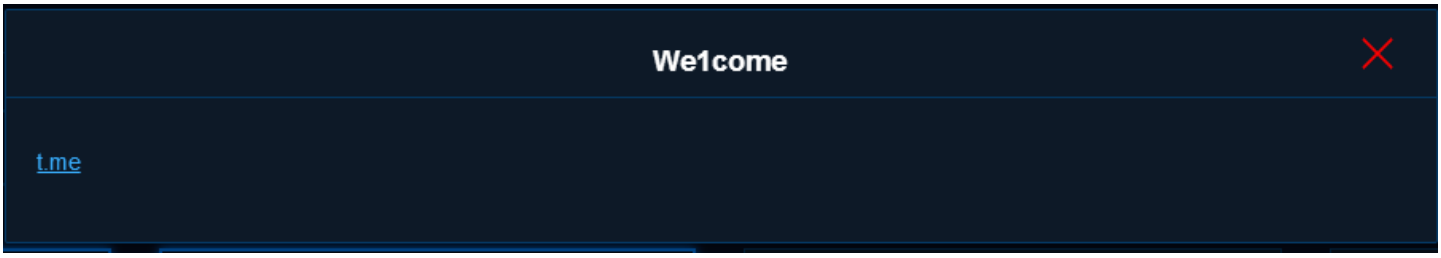
去De1CTF划了划水，发现自己是真的菜┻┳━ ┻┳━

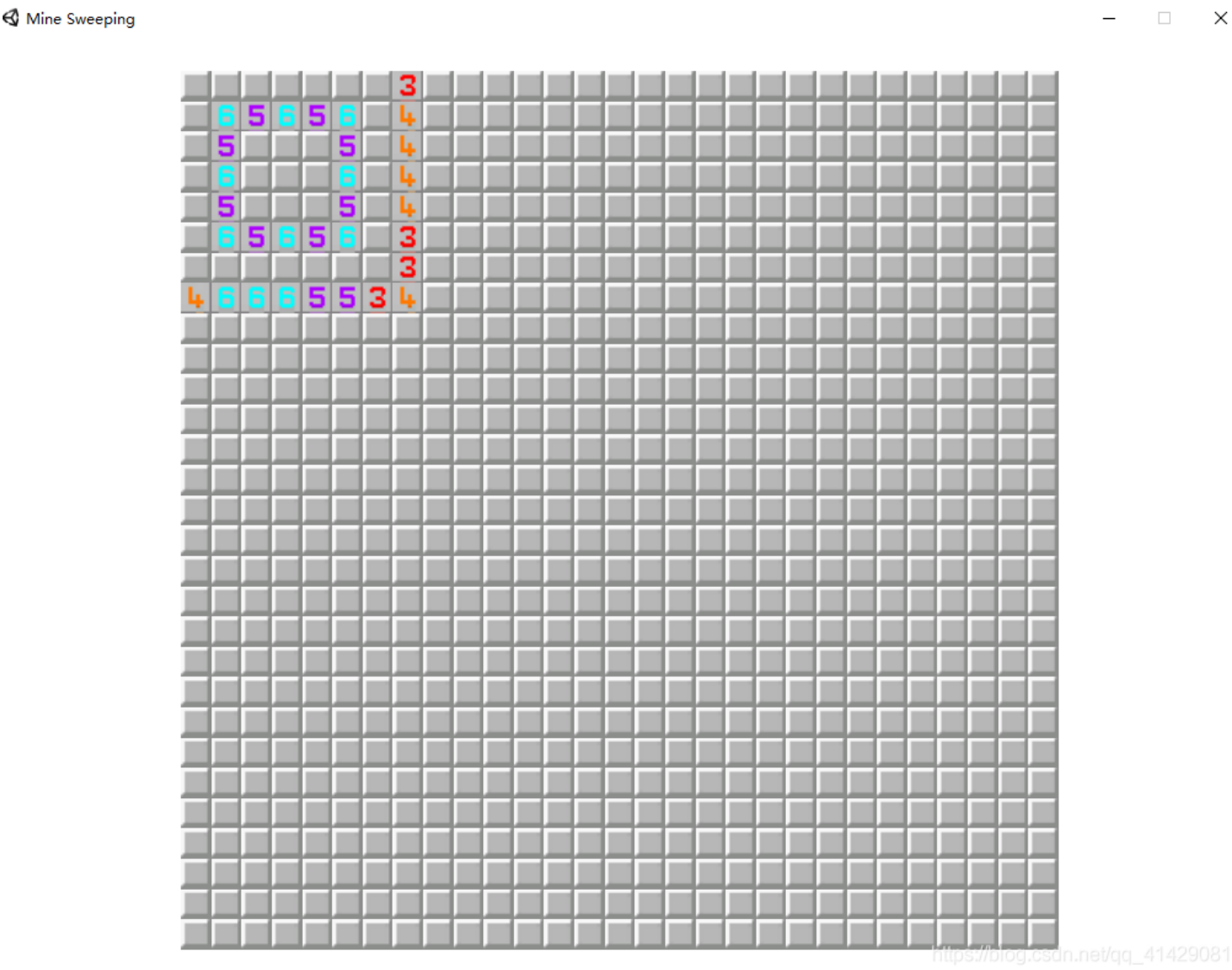
Misc1——We1come



https://t.me/De1CTF ，需要加Telegram群，需要VPN,群里有发签到的flag

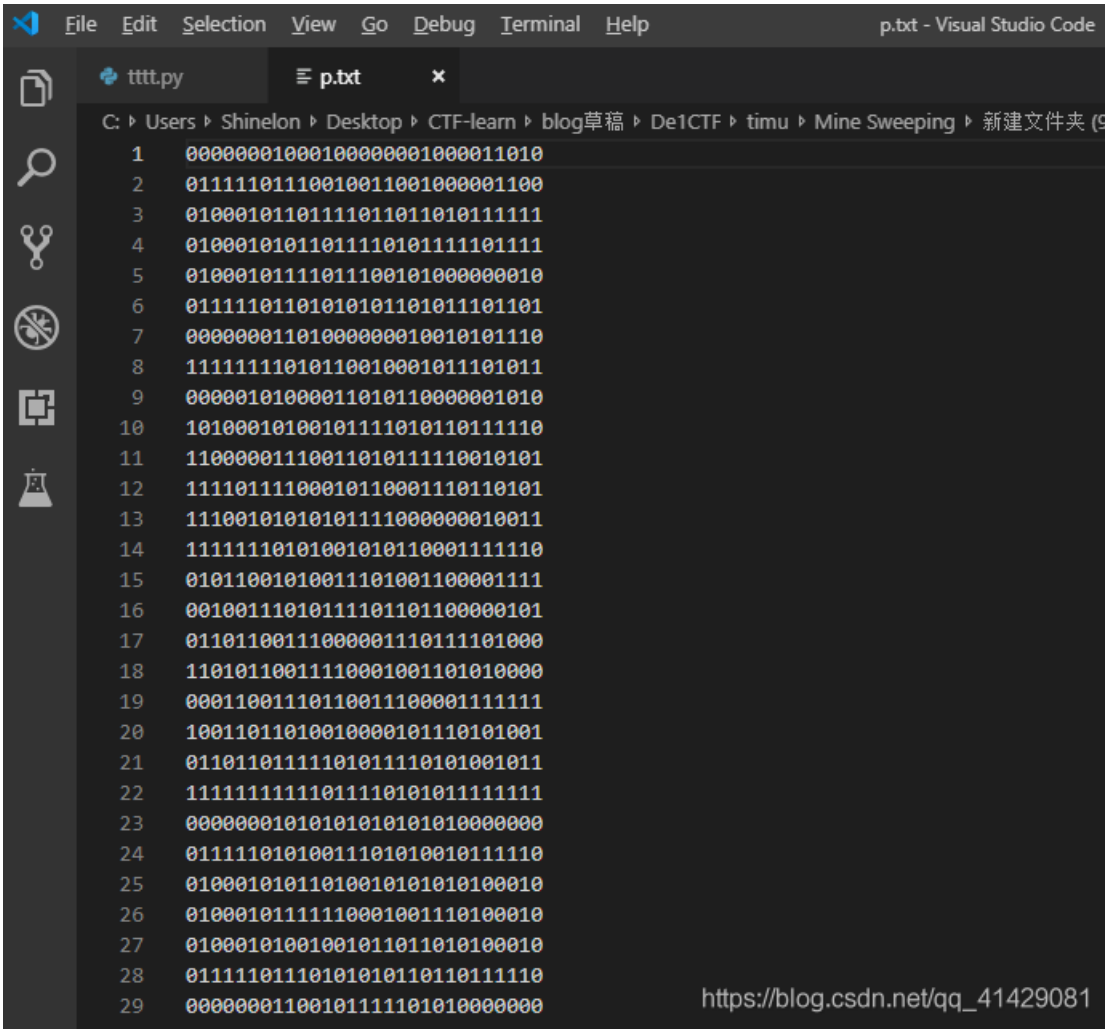
Misc2——Mine Sweeping

下载下来是一个扫雷游戏



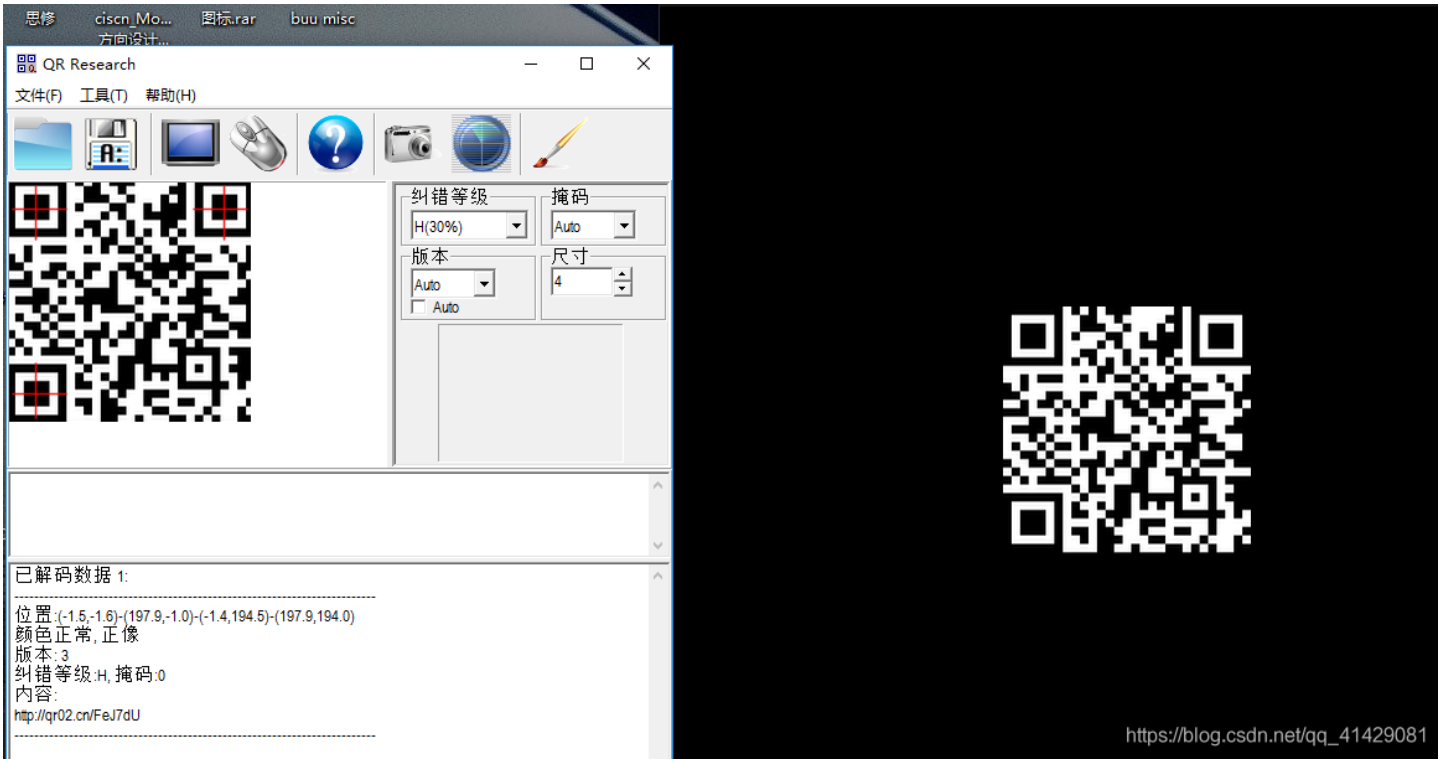
在没有雷的地方组成的其实是一个二维码，因为踩雷后不会重置雷的位置，所以爆破每一个点是否有雷就可以了。表示此生不再想玩扫雷了。

最后得到了大概是这样的布局



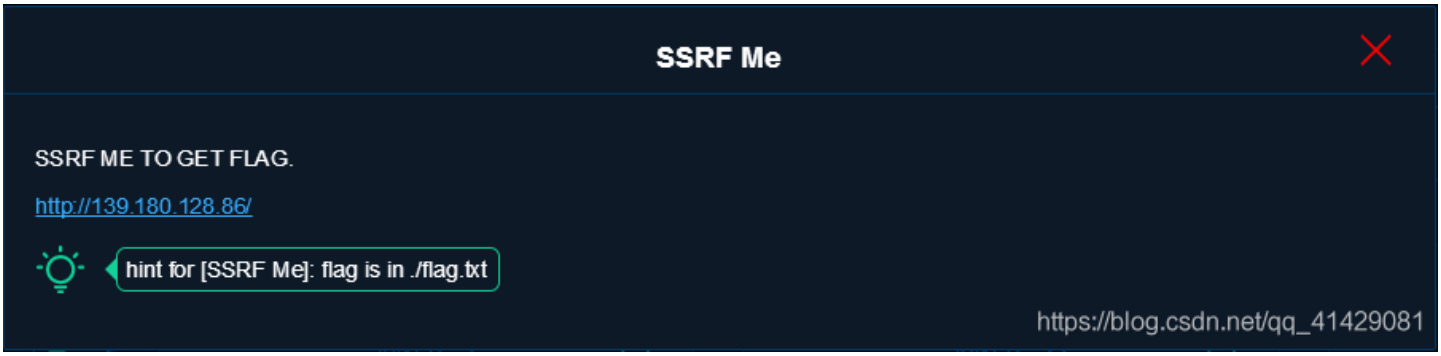
写个脚本画出来

```
from PIL import Image
import random
str2=[]
with open('p.txt', 'r') as f:
    str2=f.readlines()
str1=[]
for i in str2:
    str1.append(i)
    str1.append(i)
    str1.append(i)
    str1.append(i)
    str1.append(i)
    str1.append(i)

print(len(str1[0]))
print(len(str1))
c = Image.new("RGB",(len(str1[0]),len(str1)))
for j in range (0,len(str1)):
    for i in range (0,len(str1[0])-1):
        a=str1[j]
        if a[i]=="1":
            c.putpixel([i,j],(255,255,255))
        else :
            c.putpixel([i,j],(0,0,0))

c = c.resize((200, 200),Image.ANTIALIAS)
c.show()
c.save("c.png")
```



最后扫码得到网址，访问即可得到flag

Web1——SSRF Me



SSRF(Server-Side Request Forgery:服务器端请求伪造) 是一种由攻击者构造形成由服务端发起请求的一个安全漏洞。一般情况下，SSRF是要目标网站的内部系统。（因为他是从内部系统访问的，所有可以通过它攻击外网无法访问的内部系统，也就是把目标网站当中间人）

源码如下

```
#! /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.debug = False
    app.run(host='0.0.0.0',port=80)
```

说实话题目不是很难，就是代码有点长，要好好分析下代码逻辑。

首先可以知道，这段代码的主要的一个入口是在这里

```
@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())
```

通过访问/De1ta，会去获取cookie中的action和sign两个参数，同时还会获得一个url传参param。然后会去初始化一个Task对象，并且执行Task对象的Exec方法

然后执行Exec方法就看到调用了checkSign这个方法

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

他会去将我们传入的sign和getSign(self.action, self.param)比较，相等才能执行后面的关键代码

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

这个sign我们还有一个入口是可以获取的

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

所以其实我们只要之后传入的param和这个/geneSign传入的param一样，然后action也等于scan，然后拿这边返回给我们的sign是肯定可以通过checkSign的

```
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"
```

但是我们现在是要令scan和read都是action内容的一部分，才可以成功读到那边写入的数据。

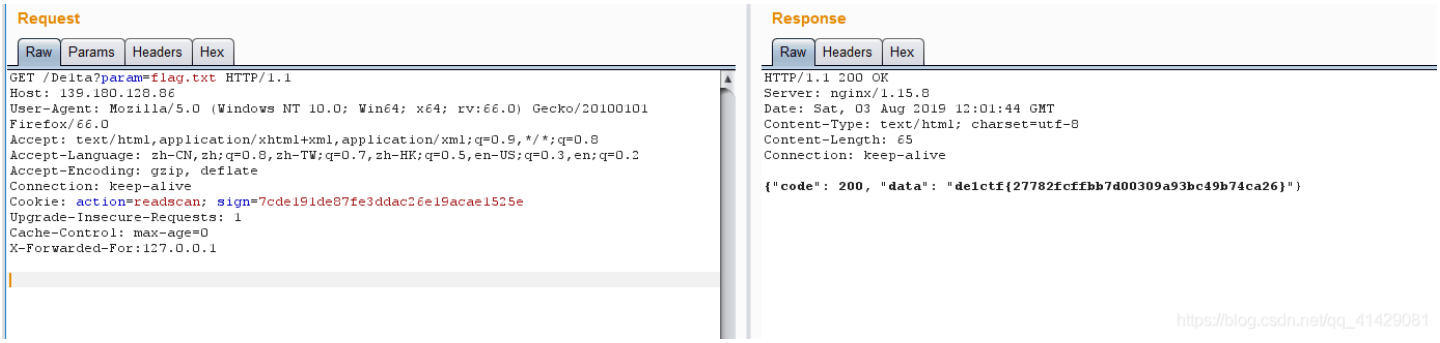
```
def scan(param):
    socket.setdefaulttimeout(1)
    try:
        return urllib.urlopen(param).read()[:50]
    except:
        return "Connection Timeout"
```

scan()这个方法就是访问param这个地址，将内容的前50读取出来
所以我们可以利用这个来读服务器内部的flag.txt文件

现在就是要令param等于”flag.txt”，action等于”readscan”，就可以获得flag。
所以我们需要知道的是
hashlib.md5(secert_key +”flag.txtreadscan”).hexdigest()
这个的返回值。

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

通过/geneSign可以构建，令param等于flag.txtread，然后action是scan，这样我们就能获得正确的sign



Crypto1——xorz

题目如下

```
from itertools import *
from data import flag,plain

key=flag.strip("de1ctf{").strip("}")
assert(len(key<38))
salt="WeAreDe1taTeam"
ki=cycle(key)
si=cycle(salt)
cipher = ''.join([hex(ord(p) ^ ord(next(ki)) ^ ord(next(si)))[2:].zfill(2) for p in plain])
print cipher
# output:
# 49380d773440222d1b421b3060380c3f403c3844791b2026513067211135b6229294a3c3222357e766b2f15561b35305e3c3b670e49382c
295c6c170553577d3a2b791470406318315d753f03637f2b614a4f2e1c4f21027e227a4122757b446037786a7b0e37635024246d60136f78
02543e4d36265c3e035a725c6322700d626b345d1d6464283a016f35714d434124281b607d315f66212d671428026a4f4f79657e34153f34
67097e4e135f187a21767f02125b375563517a3742597b6c394e78742c4a725069606576777c314429264f6e330d7530453f22537f5e3034
560d22146831456b1b72725f30676d0d5c71617d48753e26667e2f7a334c731c22630a242c7140457a4232462906441036c7e646208630e
745531436b7c51743a36674c4f352a5575407b767a5c747176016c0676386e403a2b42356a727a04662b4446375f36265f3f124b724c6e34
654470627764102506342001662922 5b43432428036f29341a2338627c47650b264c477c653a67043e6766152a485c7f3361726478065653
7e5468143f305f4537722352303c3d4379043d69797e6f3922527b24536e310d653d4c33696c635474637d0326516f745e610d7733403066
21105a7361654e3e392970687c2e335f3015677d4b3a724a4659767c2f5b7c16055a126820306c14315d6b59224a27311f747f336f4d5974
321a22507b22705a226c6d446a37375761423a2b5c29247163046d7e4703224437750830075172712632 6f117f7a38670c2b23203d4f2704
6a5c5e1532601126292f577776606f0c6d0126474b2a73737a41316362146e581d7c1228717664091c
```

给出脚本

```
import string
from binascii import unhexlify, hexlify
from itertools import *
```

```python
def bxor(a, b):     # xor two byte strings of different lengths
    if len(a) > len(b):
        return bytes([x ^ y for x, y in zip(a[:len(b)], b)])
    else:
        return bytes([x ^ y for x, y in zip(a, b[:len(a)])])

def hamming_distance(b1, b2):
    differing_bits = 0
    for byte in bxor(b1, b2):
        differing_bits += bin(byte).count("1")
    return differing_bits

def break_single_key_xor(text):
    key = 0
    possible_space = 0
    max_possible = 0
    letters = string.ascii_letters.encode('ascii')
    for a in range(0, len(text)):
        maxpossible = 0
        for b in range(0, len(text)):
            if(a == b):
                continue
            c = text[a] ^ text[b]
            if c not in letters and c != 0:
                continue
            maxpossible += 1
        if maxpossible > max_possible:
            max_possible = maxpossible
            possible_space = a
    key = text[possible_space] ^ 0x20
    return chr(key)

salt = "WeAreDe1taTeam"
si = cycle(salt)
b = unhexlify(b'49380d773440222d1b421b3060380c3f403c3844791b202651306721135b6229294a3c3222357e766b2f15561b35305e
3c3b670e49382c295c6c170553577d3a2b791470406318315d753f03637f2b614a4f2e1c4f21027e227a4122757b446037786a7b0e376350
24246d60136f7802543e4d36265c3e035a725c6322700d626b345d1d6464283a016f35714d434124281b607d315f66212d671428026a4f4f
79657e34153f3467097e4e135f187a21767f02125b375563517a3742597b6c394e78742c4a725069606576777c314429264f6e330d753045
3f22537f5e3034560d22146831456b1b72725f30676d0d5c71617d48753e26667e2f7a334c731c22630a242c7140457a4232462906444103
6c7e646208630e745531436b7c51743a36674c4f352a5575407b767a5c747176016c0676386e403a2b42356a727a04662b4446375f36265f
3f124b724c6e34654470627764102506342001662922 5b43432428036f29341a2338627c47650b264c477c653a67043e6766152a485c7f33
617264780656537e5468143f305f4537722352303c3d4379043d69797e6f3922527b24536e310d653d4c33696c635474637d0326516f745e
610d773340306621105a7361654e3e392970687c2e335f3015677d4b3a724a4659767c2f5b7c16055a126820306c14315d6b59224a27311f
747f336f4d5974321a22507b22705a226c6d446a37375761423a2b5c29247163046d7e4703224437750830075172712632 6f117f7a38670c
2b23203d4f27046a5c5e1532601126292f577776606f0c6d0126474b2a73737a41316362146e581d7c1228717664091c')
plain = ''.join([hex(ord(c) ^ ord(next(si)))[2:].zfill(2) for c in b.decode()])
b = unhexlify(plain)
print(plain)

normalized_distances = []

for KEYSIZE in range(2, 40):
    # 我们取其中前6段计算平局汉明距离
    b1 = b[: KEYSIZE]
    b2 = b[KEYSIZE: KEYSIZE * 2]
    b3 = b[KEYSIZE * 2: KEYSIZE * 3]
    b4 = b[KEYSIZE * 3: KEYSIZE * 4]
    b5 = b[KEYSIZE * 4: KEYSIZE * 5]
    b6 = b[KEYSIZE * 5: KEYSIZE * 6]
```

```
    normalized_distance = float(
        hamming_distance(b1, b2) +
        hamming_distance(b2, b3) +
        hamming_distance(b3, b4) +
        hamming_distance(b4, b5) +
        hamming_distance(b5, b6)
    ) / (KEYSIZE * 5)
    normalized_distances.append(
        (KEYSIZE, normalized_distance)
    )
normalized_distances = sorted(normalized_distances, key=lambda x: x[1])

for KEYSIZE, _ in normalized_distances[:5]:
    block_bytes = [[] for _ in range(KEYSIZE)]
    for i, byte in enumerate(b):
        block_bytes[i % KEYSIZE].append(byte)
    keys = ''
    try:
        for bbytes in block_bytes:
            keys += break_single_key_xor(bbytes)
        key = bytearray(keys * len(b), "utf-8")
        plaintext = bxor(b, key)
        print("keysize:", KEYSIZE)
        print("key is:", keys, "n")
        s = bytes.decode(plaintext)
        print(s)
    except Exception:
        continue
```