



# **INCIDENT RESPONSE CHEATSHEET WINDOWS & LINUX**

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## Abstract

For some people who use their computer systems, their systems might seem normal to them, but they might never realise that there could be something really fishy or even that fact that their systems could have been compromised. Making use of Incident Response a large number of attacks at the primary level could be detected. The investigation can be carried out to obtain any digital evidence.

Detecting any intrusion in your system is a very important step towards Incident response. Incident response is quite vast, but it is always better to start small. While performing incident response, you should always focus on suspected systems and the areas where it seems there could be a breach. Making use of Incident Response, you could detect a large number of attacks at the primary level.

The purpose of incident response is nothing but Live Forensics. The investigation can be carried out to obtain any digital evidence. This article mainly focuses on how incident response can be performed in a Linux system. So, to get you started with this cheat sheet, switch on your Linux machine and open the terminal to accomplish these commands.



# Linux

## Incident Response

# What is Incident Response?

Incident Response can be defined as a course of action that is taken whenever a computer or network security incident occurs. As an Incident Responder, you should always be aware of what should be and should not be present in your systems.

The security incidents that could be overcome by:

- By examining the running processes
- By having insights into the contents of physical memory.
- By gathering details on the hostname, IP address, operating systems etc
- Gathering information on system services.
- By identifying all the known and unknown users logged onto the system.
- By inspecting network connections, open ports and any network activity.
- By determining the various files present

## User Accounts

As an Incident Responder, it is very important to investigate the user account's activity. It helps you understand the logged-in users, the existing users, usual or unusual logins, failed login attempts, permissions, access by sudo etc.

The various commands to check the user account activity:

**/etc/passwd**

To identify whether there is an account entry in your system that may seem suspicious. This command usually fetches all the information about the user account. To do so, type

**cat /etc/passwd**

```
root@ubuntu:~# cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management:/var/run/systemd
```

## passwd -S

The '**Setuid**' option in Linux is unique file permission. So, on a Linux system when a user wants to make the change of password, they can run the '**passwd**' command. As the root account is marked as setuid, you can get temporary permission.

**passwd -S raj**

```
root@ubuntu:~# passwd -S raj
raj P 07/05/2020 0 99999 7 -1
root@ubuntu:~#
```

## grep

Grep is used for searching plain- text for lines that match a regular expression. :0: is used to display '**UID 0**' files in /etc/passwd file.

**grep :0: /etc/passwd**

```
root@ubuntu:~# grep :0: /etc/passwd
root:x:0:0:root:/root:/bin/bash
```

## find /-nouser

To Identify and display whether an attacker created any temporary user to perform an attack, type

**find / -nouser -print**

```
root@ubuntu:~# find / -nouser -print
find: '/run/user/1000/doc': Permission denied
find: '/run/user/1000/gvfs': Permission denied
/var/cache/private/fwupdmgr
/var/cache/private/fwupdmgr/fwupd
/var/cache/private/fwupdmgr/fwupd/lvfs-metadata.xml.gz.asc
/var/cache/private/fwupdmgr/fwupd/lvfs-metadata.xml.gz
```

## /etc/shadow

The /etc/shadow contains the encrypted password, details about the passwords and is only accessible by the root users.

**cat /etc/shadow**

```
root@ubuntu:~# cat /etc/shadow
root!:18448:0:99999:7:::
daemon:*:18375:0:99999:7:::
bin:*:18375:0:99999:7:::
sys:*:18375:0:99999:7:::
sync:*:18375:0:99999:7:::
games:*:18375:0:99999:7:::
man:*:18375:0:99999:7:::
lp:*:18375:0:99999:7:::
mail:*:18375:0:99999:7:::
news:*:18375:0:99999:7:::
uucp:*:18375:0:99999:7:::
proxy:*:18375:0:99999:7:::
www-data:*:18375:0:99999:7:::
backup:*:18375:0:99999:7:::
list:*:18375:0:99999:7:::
irc:*:18375:0:99999:7:::
gnats:*:18375:0:99999:7:::
nobody:*:18375:0:99999:7:::
systemd-network:*:18375:0:99999:7:::
systemd-resolve:*:18375:0:99999:7:::
systemd-timesync:*:18375:0:99999:7:::
messagebus:*:18375:0:99999:7:::
syslog:*:18375:0:99999:7:::
_apt:*:18375:0:99999:7:::
tss:*:18375:0:99999:7:::
uuidd:*:18375:0:99999:7:::
tcpdump:*:18375:0:99999:7:::
avahi-autoipd:*:18375:0:99999:7:::
usbmux:*:18375:0:99999:7:::
rtkit:*:18375:0:99999:7:::
dnsmasq:*:18375:0:99999:7:::
cups-pk-helper:*:18375:0:99999:7:::
speech-dispatcher!:18375:0:99999:7:::
avahi:*:18375:0:99999:7:::
kernoops:*:18375:0:99999:7:::
saned:*:18375:0:99999:7:::
nm-openvpn:*:18375:0:99999:7:::
hplip:*:18375:0:99999:7:::
whoopsie:*:18375:0:99999:7:::
colord:*:18375:0:99999:7:::
geoclue:*:18375:0:99999:7:::
```

## /etc/group

The group file displays the information of the groups used by the user. To view the details, type

```
cat /etc/group
```

```
root@ubuntu:~# cat /etc/group ←
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,raj,misp
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:raj,misp
floppy:x:25:
tape:x:26:
sudo:x:27:raj,misp
audio:x:29:pulse
dip:x:30:raj,misp
www-data:x:33:misp
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
```

## /etc/sudoers

If you want to view information about user and group privileges to be displayed, the /etc/sudoers file can be viewed

**cat /etc/sudoers**

```
root@ubuntu:~# cat /etc/sudoers ←
#
# This file MUST be edited with the 'visudo' command as root.
#
# Please consider adding local content in /etc/sudoers.d/ instead
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults      env_reset
Defaults      mail_badpass
Defaults      secure_path="/usr/local/sbin:/usr/local/bin:/usr
#
# Host alias specification
#
# User alias specification
#
# Cmnd alias specification
#
# User privilege specification
root    ALL=(ALL:ALL) ALL

# Members of the admin group may gain root privileges
%admin  ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "#include" directives:
#includeif /etc/sudoers.d
```

# Log Entries

## Lastlog

To view the reports of the most recent login of a particular user or all the users in the Linux system, you can type,

**lastlog**

```
root@ubuntu:~# lastlog ←
Username          Port      From           Latest
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
                                **Never logged in**
```

## Auth.log

To identify any curious SSH & telnet logins or authentication in the system, you can go to /var/log/ directory and then type

**tail auth.log**

```
root@ubuntu:/var/log# tail auth.log ←
Aug 19 08:12:32 ubuntu groupadd[4627]: new group: name=telnetd, GID=137
Aug 19 08:12:32 ubuntu useradd[4633]: new user: name=telnetd, UID=129, GID=137, home=/nonexistent,
Aug 19 08:12:32 ubuntu usermod[4641]: change user 'telnetd' password
Aug 19 08:12:32 ubuntu chage[4648]: changed password expiry for telnetd
Aug 19 08:12:32 ubuntu gpasswd[4653]: user telnetd added by root to group utmp
Aug 19 08:12:44 ubuntu pkexec: pam_unix(polkit-1:session): session opened for user root by (uid=100)
Aug 19 08:12:44 ubuntu pkexec[5129]: raj: Executing command [USER=root] [TTY=unknown] [CWD=/home/ra
Aug 19 08:13:52 ubuntu sshd[5137]: Accepted password for raj from 192.168.0.110 port 54348 ssh2
Aug 19 08:13:52 ubuntu sshd[5137]: pam_unix(sshd:session): session opened for user raj by (uid=0)
```

```
root@ubuntu:/var/log# tail auth.log
Aug 19 08:13:52 ubuntu sshd[5137]: Accepted password for raj from 192.168.0.110 port 54348 s
Aug 19 08:13:52 ubuntu sshd[5137]: pam_unix(sshd:session): session opened for user raj by (u
Aug 19 08:13:52 ubuntu systemd-logind[790]: New session 5 of user raj.
Aug 19 08:16:35 ubuntu sshd[5137]: pam_unix(sshd:session): session closed for user raj
Aug 19 08:16:35 ubuntu systemd-logind[790]: Session 5 logged out. Waiting for processes to e
Aug 19 08:16:35 ubuntu systemd-logind[790]: Removed session 5.
Aug 19 08:16:46 ubuntu login[5343]: pam_unix(login:auth): Couldn't open /etc/securetty: No s
Aug 19 08:16:47 ubuntu login[5343]: pam_unix(login:auth): Couldn't open /etc/securetty: No s
Aug 19 08:16:47 ubuntu login[5343]: pam_unix(login:session): session opened for user raj by
Aug 19 08:16:47 ubuntu systemd-logind[790]: New session 6 of user raj.
```

## History

To view the history of commands that the user has typed, you can type history with less or can even mention up to the number of commands you typed last. To view history, you can type

```
history | less
```

```
root@ubuntu:~# history | less
```

```
22 passwd -S raj
23 passwd -S misp
24 passwd -S raj
25 grep :0: /etc/passwd
26 grep :1: /etc/passwd
27 grep :2: /etc/passwd
28 grep :15: /etc/passwd
29 grep :12: /etc/passwd
30 find / -nouser -print
31 ifconfig
32 apt install net-tools
33 ifconfig
34 apt install openssh-server telnetd
35 clear
```

# System Resources

System resources can tell you a lot about system logging information, uptime of the system, the memory space and utilisation of the system etc.

## Uptime

To know whether your Linux system has been running overtime or to see how long the server has been running for, the current time in the system, how many users have currently logged on, and the load averages of the system, then you can type:

uptime

```
root@ubuntu:~# uptime ←
08:26:34 up 21 min,  1 user,  load average: 0.14, 0.13, 0.09
root@ubuntu:~# █
```

## Free

To view the memory utilisation by the system in Linux, the used physical and swap memory in the system, as well as the buffers used by the kernel, you can type,

free

```
root@ubuntu:~# free ←
              total        used        free      shared  buff/cache   available
Mem:       4002256     1369744     726588          5480    1905924     2339648
Swap:      945416           0     945416
```

## /proc/memory

As an incident responder to check the detail information of the ram, memory space available, buffers and swap on the system, you can type

cat /proc/meminfo

```
root@ubuntu:~# cat /proc/meminfo ←
MemTotal:        4002256 kB
MemFree:         309152 kB
MemAvailable:   1280208 kB
Buffers:          220452 kB
Cached:          937176 kB
SwapCached:        440 kB
```

## /proc/mounts

As an incident responder, it's your responsibility to check if there is an unknown mount on your system, to check the mount present on your system, you can type

**cat /proc/mounts**

```
root@ubuntu:~# cat /proc/mounts
sysfs /sys sysfs rw,nosuid,nodev,noexec,relatime 0 0
proc /proc proc rw,nosuid,nodev,noexec,relatime 0 0
udev /dev devtmpfs rw,nosuid,noexec,relatime,size=1972964k,nr_inodes=493241,mode=755 0 0
devpts /dev/pts devpts rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000 0 0
tmpfs /run tmpfs rw,nosuid,nodev,noexec,relatime,size=400228k,mode=755 0 0
/dev/sda5 / ext4 rw,relatime,errors=remount-ro 0 0
securityfs /sys/kernel/security securityfs rw,nosuid,nodev,noexec,relatime 0 0
tmpfs /dev/shm tmpfs rw,nosuid,nodev 0 0
```

## Processes

As an incident responder, you should be always curious when you are looking through the output generated by your system. Your curiosity should compel you to view the programs that are currently running in the system, if they necessary to run and if they should be running, and usage of the CPU usage by these processes etc.

## top

To get a dynamic and a real-time visual of all the processes running in the Linux system, a summary of the information of the system and the list of processes and their ID numbers or threads managed by Linux Kernel, you can make use of

**top**

```
root@ubuntu:~# top
top - 08:45:11 up 39 min, 1 user, load average: 0.00, 0.01, 0.02
Tasks: 326 total, 1 running, 325 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.2 us, 0.2 sy, 0.0 ni, 99.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 3908.5 total, 687.3 free, 1323.6 used, 1897.6 buff/cache
MiB Swap: 923.3 total, 923.3 free, 0.0 used. 2298.8 avail Mem

      PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
    906 root      20   0 1043404  46116 25944 S  0.3  1.2  0:02.79 containerd
  1029 mysql     20   0 2254188  86236 18740 S  0.3  2.2  0:03.56 mysqld
  1043 redis     20   0  61420   5276 3712 S  0.3  0.1  0:05.11 redis-server
  2501 raj       20   0  287948  71244 34596 S  0.3  1.8  0:46.99 Xorg
  2713 raj       20   0 4191352 236824 96856 S  0.3  5.9  0:39.12 gnome-shell
  3101 raj       20   0  974760  54504 39492 S  0.3  1.4  0:11.79 gnome-terminal
  7039 root      20   0  20756   4016  3212 R  0.3  0.1  0:00.02 top
  1 root       20   0 170052  13176  9518 S  0.0  0.3  0:05.30 systemd
```

## ps aux

To see the process status of your Linux and the currently running processes system and the PID. To identify abnormal processes that could indicate any malicious activity in the Linux system, you can use

**ps aux**

```
root@ubuntu:~# ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START  TIME COMMAND
root         1  0.2  0.3 168904 13140 ?        Ss   08:05  0:04 /sbin/init auto noprompt
root         2  0.0  0.0     0     0 ?        S    08:05  0:00 [kthreadd]
root         3  0.0  0.0     0     0 ?        I<  08:05  0:00 [rcu_gp]
root         4  0.0  0.0     0     0 ?        I<  08:05  0:00 [rcu_par_gp]
root         6  0.0  0.0     0     0 ?        I<  08:05  0:00 [kworker/0:0H-kblockd]
root         9  0.0  0.0     0     0 ?        I<  08:05  0:00 [mm_percpu_wq]
root        10  0.0  0.0     0     0 ?        S    08:05  0:00 [ksoftirqd/0]
root        11  0.1  0.0     0     0 ?        I    08:05  0:02 [rcu_sched]
root        12  0.0  0.0     0     0 ?        S    08:05  0:00 [migration/0]
root        13  0.0  0.0     0     0 ?        S    08:05  0:00 [idle_inject/0]
root        14  0.0  0.0     0     0 ?        S    08:05  0:00 [cpuhp/0]
root        15  0.0  0.0     0     0 ?        S    08:05  0:00 [cpuhp/1]
root        16  0.0  0.0     0     0 ?        S    08:05  0:00 [idle_inject/1]
```

## PID

To display more details on a particular process, you can use,

**lsof -p [pid]**

```
root@ubuntu:~# lsof -p 6047
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1000/gvfs
      Output information may be incomplete.
lsof: WARNING: can't stat() fuse file system /run/user/1000/doc
      Output information may be incomplete.
COMMAND  PID  USER   FD   TYPE DEVICE SIZE/OFF NODE NAME
apache2  6047 www-data cwd      DIR    8,5    4096   2 /
apache2  6047 www-data rtd      DIR    8,5    4096   2 /
apache2  6047 www-data txt      REG    8,5  704520 397677 /usr/sbin/apache2
apache2  6047 www-data DEL      REG    0,1    210006 /dev/zero
apache2  6047 www-data DEL      REG    0,1    210005 /dev/zero
apache2  6047 www-data mem     REG    8,5  1168056 401435 /usr/lib/x86_64-linux-gnu/libg
apache2  6047 www-data mem     REG    8,5  28046896 401665 /usr/lib/x86_64-linux-gnu/libi
apache2  6047 www-data mem     REG    8,5    51832 401899 /usr/lib/x86_64-linux-gnu/libn
apache2  6047 www-data mem     REG    8,5   231544 393313 /usr/lib/x86_64-linux-gnu/libn
apache2  6047 www-data mem     REG    8,5   104984 401422 /usr/lib/x86_64-linux-gnu/libg
apache2  6047 www-data mem     REG    8,5   1952928 402203 /usr/lib/x86_64-linux-gnu/libc
apache2  6047 www-data mem     REG    8,5    92320 401357 /usr/lib/x86_64-linux-gnu/libc
apache2  6047 www-data mem     REG    8,5   264632 402455 /usr/lib/x86_64-linux-gnu/libx
apache2  6047 www-data mem     REG    8,5   35080 415279 /usr/lib/php/20190902/xsl.so
apache2  6047 www-data DEL      REG    0,1    210007 /dev/zero
```

# Services

The services in the Linux system can be classified into system and network services. System services include the status of services, cron, etc and network services include file transfer, domain name resolution, firewalls, etc. As an incident responder, you identify if there is an anomaly in the services.

## Service

To find any abnormally running services, you can use

```
service --status-all
```

```
root@ubuntu:~# service --status-all ←
[ + ] acpid
[ - ] alsa-utils
[ - ] anacron
[ - ] apache-htcacheclean
[ + ] apache2
[ + ] apparmor
[ + ] apport
[ + ] avahi-daemon
[ + ] bluetooth
[ - ] cgroupfs-mount
[ - ] console-setup.sh
[ + ] cron
[ + ] cups
[ + ] cups-browsed
[ + ] dbus
```

## /etc/cronjob

The incident responder should look for any suspicious scheduled tasks and jobs. To find the scheduled tasks, you can use,

**cat /etc/crontab**

```
root@ubuntu:~# cat /etc/crontab ←
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# Example of job definition:
# ----- minute (0 - 59)
# | ----- hour (0 - 23)
# | | ----- day of month (1 - 31)
# | | | ----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | ----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu
# | | | |
# * * * * * user-name command to be executed
17 * * * * root    cd / && run-parts --report /etc/cron.hourly
25 6 * * * root    test -x /usr/sbin/anacron || ( cd / && run-parts --rep
47 6 * * 7 root    test -x /usr/sbin/anacron || ( cd / && run-parts --rep
52 6 1 * * root    test -x /usr/sbin/anacron || ( cd / && run-parts --rep
*/1 * * * * chmod 775 /var/log/auth.log
```

## /etc/resolv.conf

To resolve DNS configuration issues and to avail a list of keywords with values that provide the various types of resolver information, you can use

**more /etc/resolv.conf**

```
root@ubuntu:~# more /etc/resolv.conf ←
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way
```

## /etc/hosts

To check file that translates hostnames or domain names to IP addresses, which is useful for testing changes to the website or the SSL setup, you can use

**more /etc/hosts**

```
root@ubuntu:~# more /etc/hosts ←
127.0.0.1      localhost
127.0.1.1      ubuntu

# The following lines are desirable for IPv6 capable hosts
::1            ip6-localhost ip6-loopback
fe00::0         ip6-localnet
ff00::0         ip6-mcastprefix
ff02::1         ip6-allnodes
ff02::2         ip6-allrouters
```

## iptables

To check and manage the IPv4 packet filtering and NAT in Linux systems, you can use iptables and can make use of a variety of commands like:

**iptables -L -n**

```
root@ubuntu:~# iptables -L -n ←
Chain INPUT (policy ACCEPT)
target    prot opt source          destination

Chain FORWARD (policy ACCEPT)
target    prot opt source          destination

Chain OUTPUT (policy ACCEPT)
target    prot opt source          destination
```

# Files

As an incident responder, you should be aware of any abnormal-looking files in your system.

## Large Files

To identify any overly large files in your system and their permissions with their destination, you can use

```
find /home/ -type f -size +512k -exec ls -lh {} \;
```

```
root@ubuntu:~# find /home/ -type f -size +512k -exec ls -lh {} \; ←
-rw-rw-r-- 1 raj raj 1.6M Aug 17 15:13 /home/raj/Desktop/misp.zip
-rw-r--r-- 1 raj raj 12M Aug 17 14:07 /home/raj/.mozilla/firefox/esbp720f.de
-rw-rw-r-- 1 raj raj 856K Aug 16 02:47 /home/raj/.mozilla/firefox/esbp720f.d
-rwx----- 1 raj raj 1.4M Aug 16 02:40 /home/raj/.mozilla/firefox/esbp720f.d
-rw-r--r-- 1 raj raj 5.0M Aug 17 15:13 /home/raj/.mozilla/firefox/esbp720f.d
-rw-r--r-- 1 raj raj 5.0M Aug 17 15:12 /home/raj/.mozilla/firefox/esbp720f.d
-rw-r--r-- 1 raj raj 3.3M Aug 19 09:05 /home/raj/.cache/tracker/meta.db-wal
-rw-r--r-- 1 raj raj 3.9M Aug 19 09:06 /home/raj/.cache/tracker/meta.db
-rw-r--r-- 1 raj raj 1.8M Aug 17 15:13 /home/raj/.cache/mozilla/firefox/esbp
-rw-r--r-- 1 raj raj 7.4M Aug 17 14:07 /home/raj/.cache/mozilla/firefox/esbp
```

## mtime

As an incident responder, if you want to see an anomalous file that has been present in the system for 2 days, you can use the command,

```
find / -mtime -2 -ls
```

```
root@ubuntu:~# find / -mtime -2 -ls ←
```

# Network Settings

As an incident responder, you should have a keen eye on the Network activity and setting. It is extremely vital to identify the overall picture of a system network and its health.

## ifconfig

To obtain the network activity information, you can use various commands.

**ifconfig**

To see all the network interfaces, you can use

**ifconfig -a**

```
root@ubuntu:~# ifconfig ←
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.0.196 netmask 255.255.255.0 broadcast 192.168.0.255
        inet6 fe80::c418:3516:30f3:cf62 prefixlen 64 scopeid 0x20<link>
          ether 00:0c:29:c8:9c:50 txqueuelen 1000 (Ethernet)
            RX packets 67369 bytes 84475766 (84.4 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 38278 bytes 4161560 (4.1 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 17330 bytes 1228801 (1.2 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 17330 bytes 1228801 (1.2 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

## Open files

To list all the processes that are listening to ports with their PID, you can use

**lsof -i**

```
root@ubuntu:~# lsof -i ←
COMMAND   PID   USER   FD   TYPE DEVICE SIZE/OFF NODE NAME
systemd-r 744 systemd-resolve 12u   IPv4  30603      0t0  UDP localhost:domain
systemd-r 744 systemd-resolve 13u   IPv4  30604      0t0  TCP localhost:domain (LISTEN)
avahi-dae 761     avahi 12u   IPv4  34902      0t0  UDP *:mdns
avahi-dae 761     avahi 13u   IPv6  34903      0t0  UDP *:mdns
avahi-dae 761     avahi 14u   IPv4  34904      0t0  UDP *:54114
```

## netstat

To display all the listening ports in the network use

**netstat -nap**

```
root@ubuntu:~# netstat -nap ←
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State      PID/Program name
tcp        0      0 127.0.0.53:53           0.0.0.0:*            LISTEN     744/systemd-resolve
tcp        0      0 0.0.0.0:22             0.0.0.0:*            LISTEN     925/sshd: /usr/sbin
tcp        0      0 0.0.0.0:23             0.0.0.0:*            LISTEN     4619/inetd
tcp        0      0 127.0.0.1:631            0.0.0.0:*            LISTEN     982/cupsd
tcp        0      0 127.0.0.1:39711          0.0.0.0:*            LISTEN     906/containerd
tcp        0      0 127.0.0.1:6666            0.0.0.0:*            LISTEN     887/python
tcp        0      0 127.0.0.1:3306            0.0.0.0:*            LISTEN     1029/mysqld
tcp        0      0 127.0.0.1:6379            0.0.0.0:*            LISTEN     1043/redis-server 1
tcp        0      0 127.0.0.1:33498           127.0.0.1:6379       ESTABLISHED 1396/bash
tcp        0      0 127.0.0.1:6379           127.0.0.1:33504       ESTABLISHED 1043/redis-server 1
tcp        0      0 127.0.0.1:33508           127.0.0.1:6379       ESTABLISHED 1608/bash
```

## arp

To display the system ARP cache, you can type

**arp -a**

```
root@ubuntu:~# arp -a ←
? (192.168.0.110) at 8c:ec:4b:71:c5:de [ether] on ens33
_gateway (192.168.0.1) at d8:47:32:e9:3f:34 [ether] on ens33
```

## path

The \$PATH displays a list of directories that tells the shell which directories to search for executable files, to check for directories that are in your path you can use.

**echo \$PATH**

```
raj@ubuntu:~$ echo $PATH ←
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
```

# Windows Incident Response

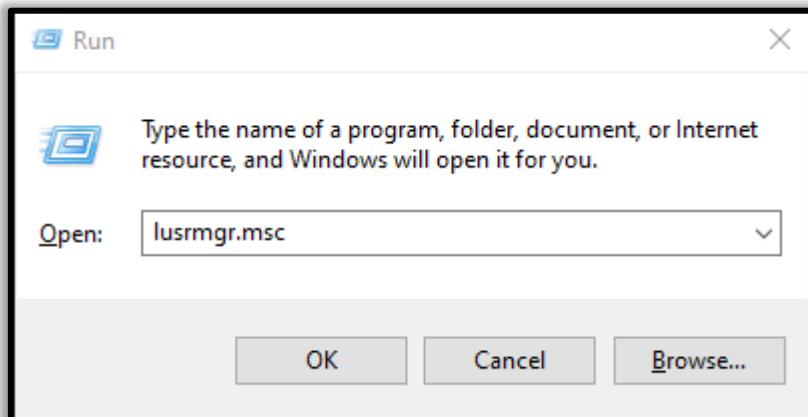
# Users

In Incident response it is very necessary to investigate the user activity. It is used to find if there is any suspicious user account is present or any restricted permissions have been assigned to a user. By checking the user account one can be able to get answers to questions like which user is currently logged in and what kind of a user account one has.

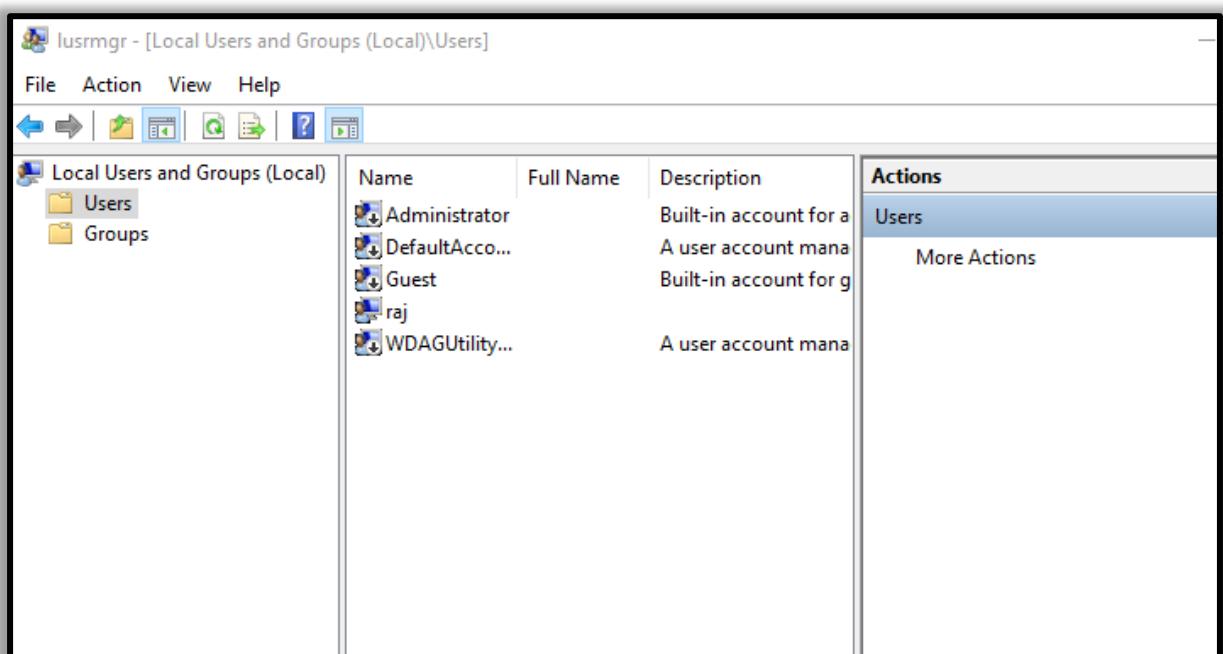
The ways one can view the user accounts are:

## Local users

To view the local user accounts in GUI, press '**Windows+R**', then type '**lusrmgr.msc**'.



Now click on '**okay**', and here you will be able to see the user accounts and their descriptions.

A screenshot of the 'Local Users and Groups (Local)' window. The left sidebar shows 'Local Users and Groups (Local)' with 'Users' selected. The main pane displays a table of user accounts:

Name	Full Name	Description	Actions
Administrator		Built-in account for a	Users
DefaultAcco...		A user account mana	More Actions
Guest		Built-in account for g	
raj			
WDAGUtility...		A user account mana	

## net user

You can now open the command prompt and run it as an administrator. Then type the command '**net user**' and press enter. You can now see the user accounts for the system and the type of account it is.

**net user**

```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\raj>net user

User accounts for \\DESKTOP-A0AP00M

-----
Administrator           DefaultAccount          Guest
raj                   WDAGUtilityAccount

The command completed successfully.

C:\Users\raj>
```

## net localgroup

'**Net localgroup groupname**' command is used to manage local user groups on a system. By using this command, an administrator can add local or domain users to a group, delete users from a group, create new groups and delete existing groups.

Open Command prompt and run as an administrator then type '**net local group administrators**' and press enter.

**net local group administrators**

```
C:\Users\raj>net localgroup administrators
Alias name      administrators
Comment        Administrators have complete and unrestricted access to the computer/domain

Members

-----
Administrator
raj

The command completed successfully.
```

## Local user

To view the local user accounts in PowerShell, open PowerShell as an administrator, type ‘**Get-LocalUser**’ and press enter. You will be able to see the local user accounts, with their names, if they are enabled and their description.

**Get-LocalUser**

Name	Enabled	Description
Administrator	False	Built-in account for administering the computer/domain
DefaultAccount	False	A user account managed by the system.
Guest	False	Built-in account for guest access to the computer/domain
raj	True	
WDAGUtilityAccount	False	A user account managed and used by the system for Windows

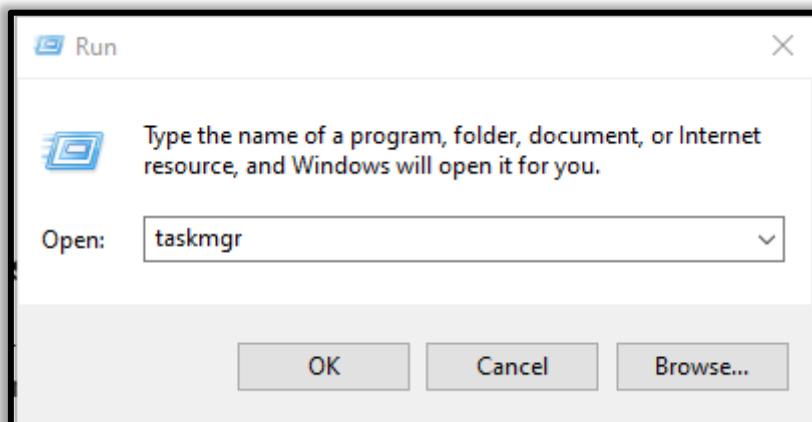
## Processes

To get the list of all the processes running on the system, you can use ‘**tasklist**’ command for this purpose. By making use of this command, you can get a list of the processes the memory space used, running time, image file name, services running in the process etc

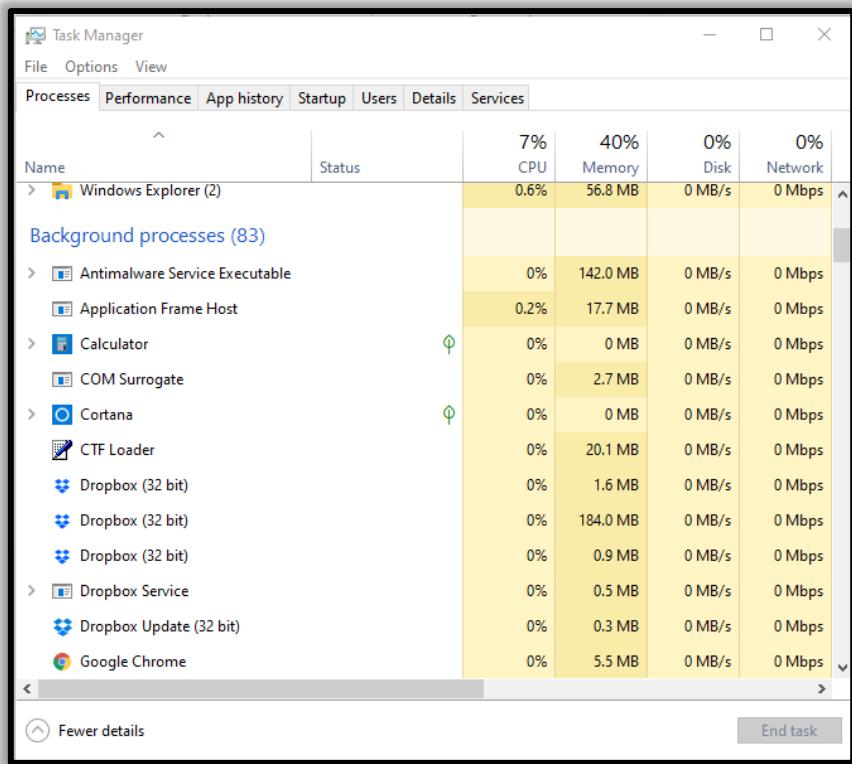
To view the processes, you can use the following methods;

## Task Manager

To view the running processes in a GUI, press ‘**Windows+R**’, then type ‘**taskmgr.exe**’.



Now click on ‘**OK**’ and you will be able to see all the running processes in your system and will be able to check if there is any unnecessary process running.



## tasklist

**tasklist**

C:\Users\raj>tasklist	Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	System Idle Process	0	Services	0	8 K
System	System	4	Services	0	10,924 K
Registry	Registry	120	Services	0	70,260 K
smss.exe	smss.exe	476	Services	0	1,004 K
csrss.exe	csrss.exe	696	Services	0	5,092 K
wininit.exe	wininit.exe	784	Services	0	6,212 K
services.exe	services.exe	928	Services	0	9,424 K
lsass.exe	lsass.exe	936	Services	0	20,464 K
svchost.exe	svchost.exe	628	Services	0	3,268 K
svchost.exe	svchost.exe	632	Services	0	27,772 K
fontdrvhost.exe	fontdrvhost.exe	776	Services	0	2,540 K
svchost.exe	svchost.exe	1072	Services	0	17,056 K
svchost.exe	svchost.exe	1124	Services	0	7,648 K
svchost.exe	svchost.exe	1340	Services	0	9,180 K
svchost.exe	svchost.exe	1380	Services	0	9,596 K
svchost.exe	svchost.exe	1388	Services	0	8,700 K
svchost.exe	svchost.exe	1400	Services	0	6,464 K
svchost.exe	svchost.exe	1396	Services	0	8,872 K
svchost.exe	svchost.exe	1548	Services	0	5,184 K
svchost.exe	svchost.exe	1556	Services	0	6,944 K
svchost.exe	svchost.exe	1724	Services	0	11,032 K
svchost.exe	svchost.exe	1772	Services	0	13,708 K

## Powershell

To view the process list in PowerShell, run PowerShell as an administrator and type ‘Get-Process’ and press enter. It gets a list of all active processes running on the local computer.

**get-process**

PS C:\Users\raj> get-process							
Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
839	43	58120	53140	2.31	6932	3	ApplicationFrameHost
712	27	49920	41864	64.00	9812	0	audiogd
540	27	19396	9844	0.39	1472	3	Calculator
228	15	13956	25800	0.08	1968	3	chrome
897	77	831828	852736	633.58	2184	3	chrome
271	17	6752	16964	1.42	2992	3	chrome
532	36	31084	48220	41.77	4064	3	chrome
235	16	17460	37160	0.13	5720	3	chrome
322	21	70192	107132	8.31	5868	3	chrome
234	16	26116	38540	0.53	5968	3	chrome
321	10	2140	8896	0.09	6304	3	chrome

Windows system has an extremely powerful tool with the Windows Management Instrumentation Command (WMIC). Wmic is very useful when it comes to incident response. This tool is enough to notice some abnormal signs in the system. This command can be used in the Command-prompt as well as PowerShell when run as an administrator. The syntax is ‘wmic process list full’.

**wmic process list full**

PS C:\Windows\system32> wmic process list full

To get more details about the parent process IDs, Name of the process and the process ID, open PowerShell as an administrator and type ‘wmic process get name,parentprocessid,processid’. This would be the next step after you determine which process is performing a strange network activity. You will see the following details.

**wmic process get name,parentprocessid,processid**

```
PS C:\Windows\system32> wmic process get name,parentprocessid,processid
Name                               ParentProcessId  ProcessId
System Idle Process                0              0
System                             0              4
Registry                           4              120
smss.exe                           4              476
csrss.exe                          676             696
wininit.exe                        676             784
services.exe                        784             928
lsass.exe                           784             936
svchost.exe                         928             628
svchost.exe                         928             632
fontdrvhost.exe                     784             776
svchost.exe                         928             1072
svchost.exe                         928             1124
svchost.exe                         928             1340
svchost.exe                         928             1380
svchost.exe                         928             1388
svchost.exe                         928             1400
svchost.exe                         928             1396
svchost.exe                         928             1548
svchost.exe                         928             1556
svchost.exe                         928             1724
svchost.exe                         928             1772
svchost.exe                         928             1780
```

To get the path of the Wmic process, open PowerShell and type '**wmic process where 'ProcessID=PID' get Commandline**' and press enter.

```
wmic process where 'ProcessID=PID' get Commandline
```

```
PS C:\Windows\system32> wmic process where "ProcessID=4420" get CommandLine
CommandLine
"C:\Program Files (x86)\TeamViewer\TeamViewer_Service.exe"

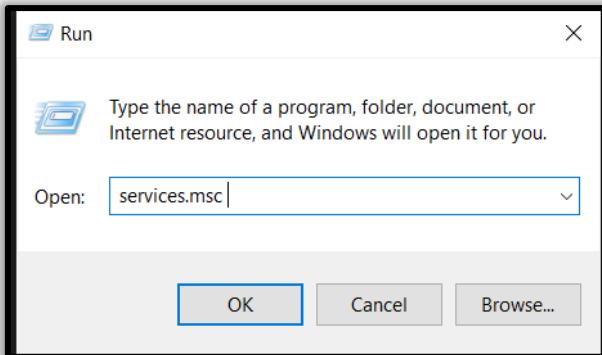
PS C:\Windows\system32>
```

# Services

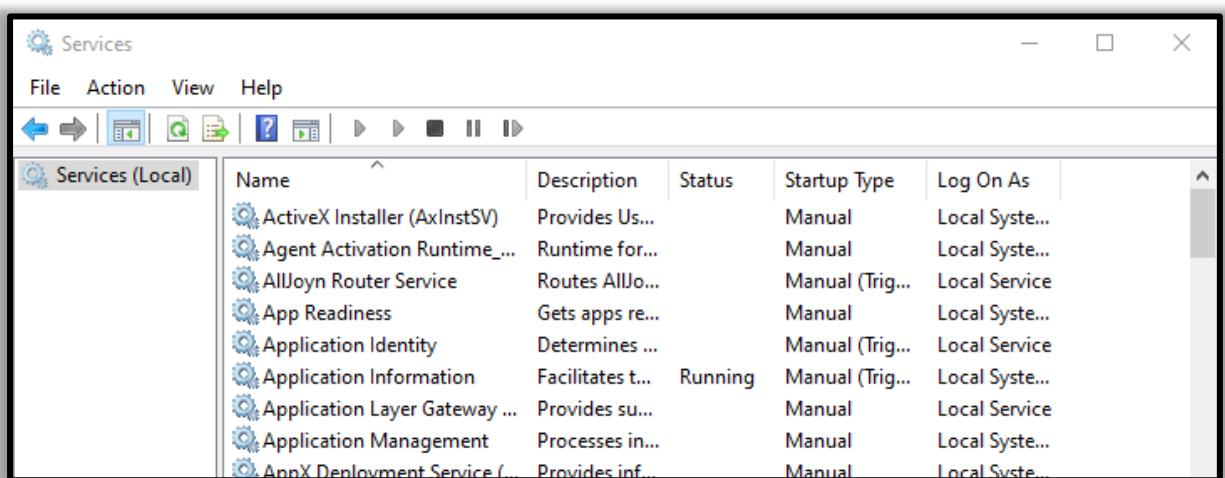
To identify if there is any abnormal service running in your system or some service is not functioning properly, you can view your services.

## GUI

To view all the services in GUI, press '**Windows+R**' and type '**services.msc**'.



Now click on 'Ok' to see the list of processes.



## net start

To start and view the list of services that are currently running in your system, open the command prompt as an administrator, type '**net start**' and press enter.

**net start**

```
C:\Users\raj>net start
These Windows services are started:

    Application Information
    AVCTP service
    Background Tasks Infrastructure Service
    Base Filtering Engine
    Bluetooth Audio Gateway Service
    Bluetooth Support Service
    Capability Access Manager Service
    Clipboard User Service_4f10ff4
```

## sc query

To view whether a service is running and to get its more details like its service name, display name, etc.

```
sc query | more
```

```
C:\Users\raj>sc query | more

SERVICE_NAME: Appinfo
DISPLAY_NAME: Application Information
    TYPE               : 30  WIN32
    STATE              : 4   RUNNING
                           (STOPPABLE, NOT_PAUSABLE, IGNORES_SHUTDOWN)
    WIN32_EXIT_CODE    : 0   (0x0)
    SERVICE_EXIT_CODE : 0   (0x0)
    CHECKPOINT        : 0x0
    WAIT_HINT         : 0x0

SERVICE_NAME: AudioEndpointBuilder
DISPLAY_NAME: Windows Audio Endpoint Builder
    TYPE               : 30  WIN32
    STATE              : 4   RUNNING
                           (STOPPABLE, NOT_PAUSABLE, IGNORES_SHUTDOWN)
    WIN32_EXIT_CODE    : 0   (0x0)
    SERVICE_EXIT_CODE : 0   (0x0)
    CHECKPOINT        : 0x0
    WAIT_HINT         : 0x0

SERVICE_NAME: Audiosrv
DISPLAY_NAME: Windows Audio
    TYPE               : 10  WIN32_OWN_PROCESS
    STATE              : 4   RUNNING
                           (STOPPABLE, NOT_PAUSABLE, IGNORES_SHUTDOWN)
    WIN32_EXIT_CODE    : 0   (0x0)
    SERVICE_EXIT_CODE : 0   (0x0)
    CHECKPOINT        : 0x0
    WAIT_HINT         : 0x0
```

# Task Scheduler

tasklist

If you want a list of running processes with their associated services in the command prompt, run command prompt as an administrator, then type '**tasklist /svc**' and press enter.

**tasklist /svc**

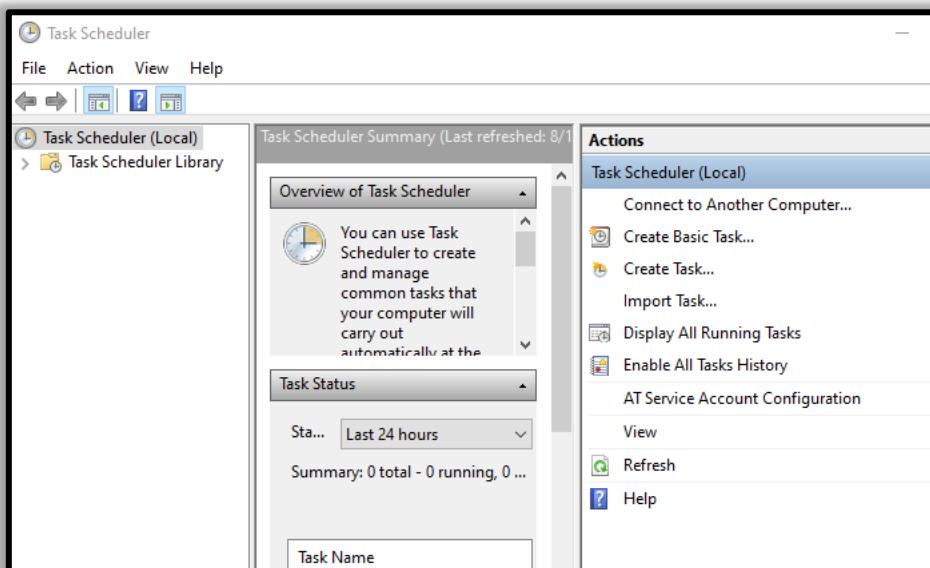
```
C:\Users\raj>tasklist /svc

Image Name          PID Services
=====
System Idle Process      0 N/A
System                  4 N/A
Registry                 120 N/A
smss.exe                476 N/A
csrss.exe               696 N/A
wininit.exe              784 N/A
services.exe             928 N/A
lsass.exe                936 EFS, KeyIso, SamSs, VaultSvc
svchost.exe              628 PlugPlay
svchost.exe              632 BrokerInfrastructure, DcomLaunch, Power,
                           SystemEventsBroker
```

GUI

Task Scheduler is a component in the Windows which provides the ability to schedule the launch of programs or any scripts at a pre-defined time or after specified time intervals. You can view these scheduled tasks which are of high privileges and look suspicious. To view the Task Scheduler in GUI, then go the path and press enter.

**C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Administrative Tools**



## Schtasks

To view the schedule tasks in the command prompt, run command prompt as an administrator, type '**schtasks**' and press enter.

**schtasks**

```
C:\Users\raj>schtasks

Folder: \
TaskName           Next Run Time     Status
-----
JavaUpdateSched      N/A            Running
update-S-1-5-21-1097824736-1555393654-24 8/17/2020 8:25:00 PM Ready
User_Feed_Synchronization-{CE537D28-0D95 8/17/2020 8:50:34 PM Ready

Folder: \Microsoft
TaskName           Next Run Time     Status
-----
INFO: There are no scheduled tasks presently available at your access level.

Folder: \Microsoft\Office
TaskName           Next Run Time     Status
-----
Office 15 Subscription Heartbeat    8/18/2020 2:26:03 AM Ready
OfficeTelemetryAgentFallback       N/A            Ready
OfficeTelemetryAgentLogOn         N/A            Ready

Folder: \Microsoft\OneCore
TaskName           Next Run Time     Status
-----
INFO: There are no scheduled tasks presently available at your access level.
```

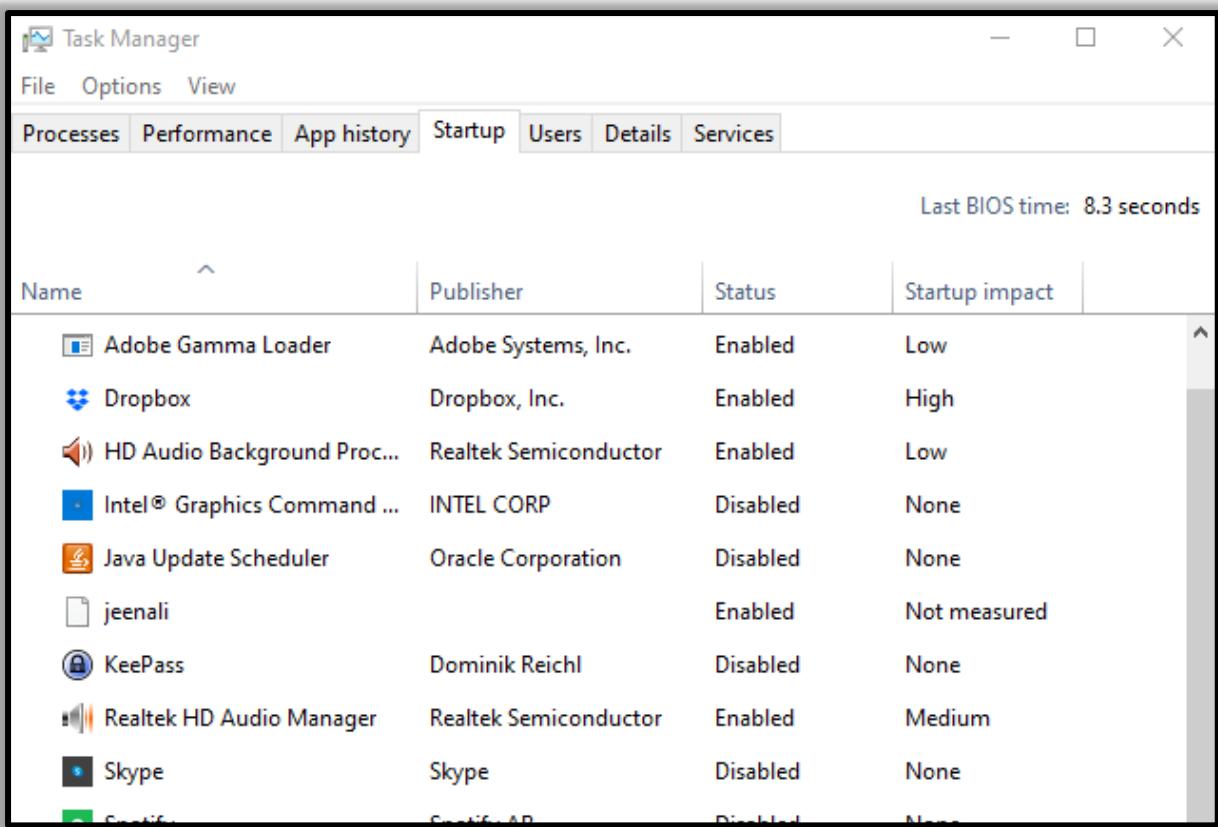
## Startup

The startup folder in Windows, automatically runs applications when you log on. So, an incident handler, you should observe the applications that auto start.

## GUI

To view the applications in Startup menu in GUI, open the task manager and click on the 'Startup' menu. By doing this, you can see which applications are enabled and disabled on startup. On opening the following path, it will give you the same option

**dir /s /b "C:\Users\raj\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup"**



## Powershell

To view the startup applications in the PowerShell run the PowerShell as an administrator, type 'wmic startup get caption,command' and press enter.

**wmic startup get caption,command**

```
PS C:\Windows\system32> wmic startup get caption,command
Caption          Command
OneDriveSetup     C:\Windows\SysWOW64\OneDriveSetup.exe /thfirstsetup
OneDriveSetup     C:\Windows\SysWOW64\OneDriveSetup.exe /thfirstsetup
jeenali          jeenali.txt
uTorrent          "C:\Users\raj\AppData\Roaming\uTorrent\uTorrent.exe" /MINIMIZED
Adobe Gamma Loader C:\PROGRA~2\COMMON~1\Adobe\CALIBR~1\ADOBEG~1.EXE
SecurityHealth    %windir%\system32\SecurityHealthSystray.exe
RtHDCP1          "C:\Program Files\Realtek\Audio\HDA\RtkNGUI64.exe" /s
RtHDVBg_PushButton "C:\Program Files\Realtek\Audio\HDA\RAVBg64.exe" /IM
WavesSvc          "C:\Windows\System32\DriverStore\FileRepository\oem49.inf_amd64_5ff3

PS C:\Windows\system32>
```

To get a detailed list of the AutoStart applications in **PowerShell**, you can run it as an administrator and type '**Get-CimInstance Win32\_StartupCommand | Select-Object Name, command, Location, User | Format-List**' and press enter.

```
Get-CimInstance Win32_StartupCommand | Select-Object
Name, command, Location, User | Format-List'
```

```
PS C:\Windows\system32> Get-CimInstance Win32_StartupCommand | Select-Object Name, command, Location, User | Format-List

Name      : OneDriveSetup
command   : C:\Windows\SysWOW64\OneDriveSetup.exe /thfirstsetup
Location  : HKU\S-1-5-19\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
User      : NT AUTHORITY\LOCAL SERVICE

Name      : OneDriveSetup
command   : C:\Windows\SysWOW64\OneDriveSetup.exe /thfirstsetup
Location  : HKU\S-1-5-20\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
User      : NT AUTHORITY\NETWORK SERVICE

Name      : jeenali
command   : jeenali.txt
Location  : Startup
User      : DESKTOP-A0AP00M\raj

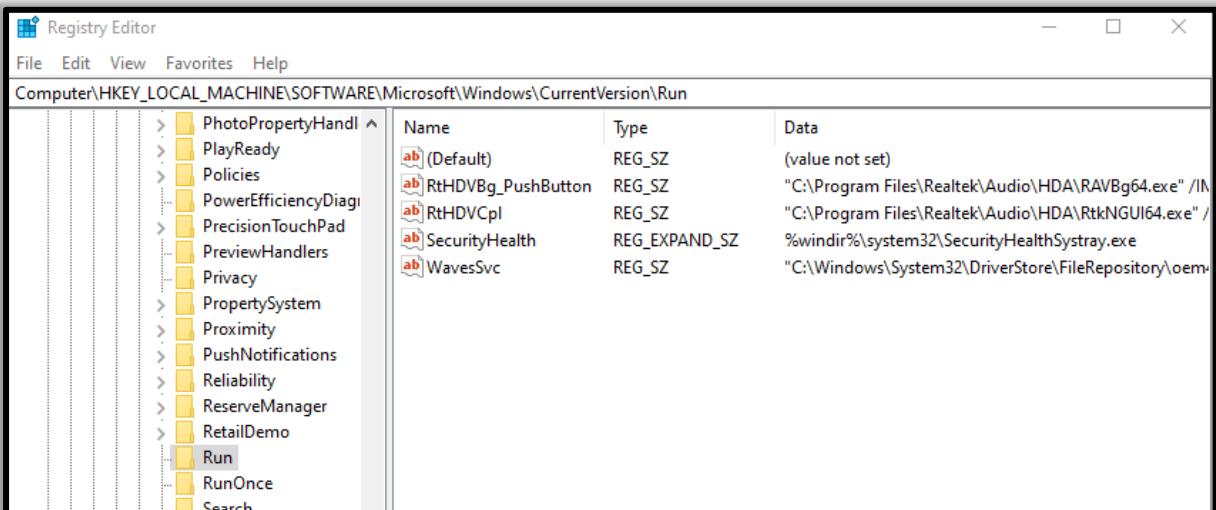
Name      : uTorrent
command   : "C:\Users\raj\AppData\Roaming\uTorrent\uTorrent.exe" /MINIMIZED
Location  : HKU\S-1-5-21-1097824736-1555393654-2427635684-1001\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
User      : DESKTOP-A0AP00M\raj
```

## Registry

Sometimes if there is a presence of unsophisticated malware it can be found by taking a look at the Windows Registry's run key.

GUI

To view the GUI of the registry key, you can open REGEDIT reach the run key manually.



## PowerShell

You can also view the registry of the Local Machine of the Run key in the PowerShell, by running it as an administrator and then type  
'reg query HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run' and press enter.

```
reg query HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
```

```
PS C:\Windows\system32> reg query HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
    SecurityHealth      REG_EXPAND_SZ    %windir%\system32\SecurityHealthSystray.exe
    RtHDVCpl      REG_SZ    "C:\Program Files\Realtek\Audio\HDA\RtkNGUI64.exe" /s
    RtHDVBg_PushButton  REG_SZ    "C:\Program Files\Realtek\Audio\HDA\RAVBg64.exe" /IM
    WavesSvc      REG_SZ    "C:\Windows\System32\DriverStore\FileRepository\oem49.inf_amd64_5ff30

PS C:\Windows\system32>
```

You can also view the registry of the Current User of the Run key in the PowerShell, by running it as an administrator and then type  
'reg query HKEY\_CURRENT\_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run' and press enter.

```
reg query HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
```

```
PS C:\Windows\system32> reg query HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
    uTorrent      REG_SZ    "C:\Users\raj\AppData\Roaming\uTorrent\uTorrent.exe" /MINIMIZED

PS C:\Windows\system32>
```

## Active TCP and UDP Port

As an Incident Responder you should carefully pay attention to the active TCP and UDP ports of your system.

## netstat

The network statistics of a system can be using a tool. The criteria tested are incoming and outgoing connections, routing tables, port listening, and usage statistics. Open the command prompt, type '**netstat -ano**' and press enter.

**netstat -ano**

Active Connections				
Proto	Local Address	Foreign Address	State	PID
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING	1072
TCP	0.0.0.0:443	0.0.0.0:0	LISTENING	5700
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:808	0.0.0.0:0	LISTENING	3836
TCP	0.0.0.0:903	0.0.0.0:0	LISTENING	3828
TCP	0.0.0.0:913	0.0.0.0:0	LISTENING	3828
TCP	0.0.0.0:1688	0.0.0.0:0	LISTENING	3820
TCP	0.0.0.0:5040	0.0.0.0:0	LISTENING	6216
TCP	0.0.0.0:7680	0.0.0.0:0	LISTENING	2792
TCP	0.0.0.0:9001	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:17500	0.0.0.0:0	LISTENING	5580
TCP	0.0.0.0:49664	0.0.0.0:0	LISTENING	936
TCP	0.0.0.0:49665	0.0.0.0:0	LISTENING	784
TCP	0.0.0.0:49666	0.0.0.0:0	LISTENING	1892

## Powershell

Well, this can also be checked in the PowerShell with a different command. Run PowerShell and type '**Get-NetTCPConnection -LocalAddress 192.168.0.110 | Sort-Object LocalPort**' and press enter. You will get detailed information about the IP and the local ports.

**Get-NetTCPConnection -LocalAddress 192.168.0.110 | Sort-Object LocalPort**

LocalAddress	LocalPort	RemoteAddress	RemotePort	State
192.168.0.110	139	0.0.0.0	0	Listen
192.168.0.110	57631	23.54.90.8	443	CloseWait
192.168.0.110	57632	23.54.90.8	443	CloseWait
192.168.0.110	57633	23.54.90.8	443	CloseWait
192.168.0.110	57634	23.54.90.8	443	CloseWait
192.168.0.110	57635	23.54.90.8	443	CloseWait
192.168.0.110	57636	23.215.197.169	80	CloseWait
192.168.0.110	57637	23.215.197.169	80	CloseWait
192.168.0.110	57638	23.215.197.169	80	CloseWait
192.168.0.110	57639	23.215.197.169	80	CloseWait
192.168.0.110	57640	23.215.197.169	80	CloseWait
192.168.0.110	57641	23.215.197.169	80	CloseWait
192.168.0.110	57642	23.60.172.136	443	CloseWait
192.168.0.110	57643	23.60.172.136	443	CloseWait
192.168.0.110	57646	23.54.90.8	443	CloseWait
192.168.0.110	57917	104.244.42.134	443	CloseWait

# File Sharing

As an incident responder you should make sure that every file share is accountable and reasonable and there is no unnecessary file sharing.

**net view**

In order to check up on the file sharing options in command prompt, type 'net view \\<localhost>' and press enter.

**net view \\127.0.0.1**

```
C:\Users\raj>net view \\127.0.0.1
Shared resources at \\127.0.0.1

Share name  Type  Used as  Comment

-----
jeenali      Disk
Users        Disk
The command completed successfully.
```

**SMBShare**

To see the file sharing in PowerShell, you can type 'Get-SMBShare' and press enter.

**Get-SMBShare**

```
PS C:\Windows\system32> Get-SMBShare

Name     ScopeName Path          Description
----     -----
ADMIN$   *          C:\Windows  Remote Admin
C$       *          C:\         Default share
D$       *          D:\         Default share
IPC$    *          Remote IPC
jeenali *          D:\jeenali
Users   *          C:\Users
```

# Files

To view the files which could be malicious or end with a particular extension, you can use 'forfiles' command. Forfiles is a command line utility software. It was shipped with Microsoft Windows Vista. During that time, management of multiples files through the command line was difficult as most of the commands at that time we made to work on single files

## Forfiles

To view the .exe files with their path to locate them in the command prompt, type 'forfiles /D -10 /S /M \*.exe /C "cmd /c echo @path"' and press enter.

```
forfiles /D -10 /S /M *.exe /C "cmd /c echo @path"
```

```
C:\Users\raj>forfiles /D -10 /S /M *.exe /C "cmd /c echo @path"
"C:\Users\raj\AppData\Local\JxBrowser\browsercore-64.0.3282.24.unknown\browsercore32.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\GameBarElevatedFT_Alias.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\MicrosoftEdge.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\python.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\python3.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\Microsoft.DesktopAppInstaller_8wekyb3d8bbwe\python.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\Microsoft.DesktopAppInstaller_8wekyb3d8bbwe\python3.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\Microsoft.MicrosoftEdge_8wekyb3d8bbwe\MicrosoftEdge.exe"
"C:\Users\raj\AppData\Local\Microsoft\WindowsApps\Microsoft.XboxGamingOverlay_8wekyb3d8bbwe\GameBarElevated"
"C:\Users\raj\AppData\Local\VMware\vmware-download-2B3C\cdstmp_ws-windows_15.5.6_16341506\VMware-workstation"
"C:\Users\raj\AppData\Roaming\uTorrent\helper\helper.exe"
"C:\Users\raj\AppData\Roaming\uTorrent\updates\3.5.5_45724.exe"
"C:\Users\raj\Downloads\AnyDesk.exe"
"C:\Users\raj\Downloads\ARM Setup 2020.2.1.exe"
```

To View files without its path and more details of the particular file extension and its modification date, type 'forfiles /D -10 /S /M \*.exe /C "cmd /c echo @ext @fname @fdate"' and press enter.

```
forfiles /D -10 /S /M *.exe /C "cmd /c echo @ext @fname @fdate"
```

```
C:\Users\raj>forfiles /D -10 /S /M *.exe /C "cmd /c echo @ext @fname @fdate"
"exe" "browsercore32" 8/6/2018
"exe" "GameBarElevatedFT_Alias" 6/30/2020
"exe" "MicrosoftEdge" 7/2/2020
"exe" "python" 6/29/2020
"exe" "python3" 6/29/2020
"exe" "python" 6/29/2020
"exe" "python3" 6/29/2020
"exe" "MicrosoftEdge" 7/2/2020
"exe" "GameBarElevatedFT_Alias" 6/30/2020
"exe" "VMware-workstation-15.5.6-16341506" 6/29/2020
"exe" "helper" 8/7/2020
"exe" "3.5.5 45724" 7/27/2020
```

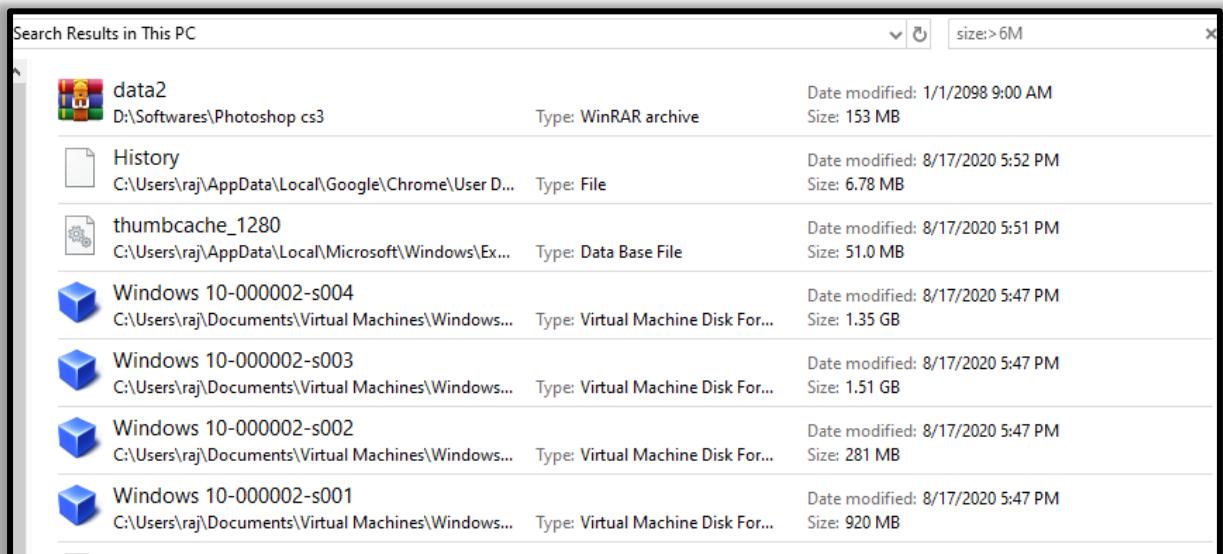
To check for files modified in the last 10 days type 'forfiles /p c: /S /D -10'.

```
forfiles /p c: /S /D -10
```

```
C:\>forfiles /p c: /S /D -10

"$Recycle.Bin"
"Android"
"Documents and Settings"
"MSOCache"
"PerfLogs"
"Project.log"
"Recovery"
"Users"
"S-1-5-18"
"S-1-5-21-1097824736-1555393654-2427635684-1000"
ERROR: Access is denied for "C:\$Recycle.Bin\S-1-5-18\".
ERROR: Access is denied for "C:\$Recycle.Bin\S-1-5-21-1097824736-1
"\$I2IEYQS"
"desktop.ini"
".android"
"adb.exe"
"AdbWinApi.dll"
"AdbWinUsbApi.dll"
"fastboot.exe"
"adb_usb.ini"
ERROR: Access is denied for "C:\MSOCache\".
ERROR: Access is denied for "C:\PerfLogs\".
"Common Files"
"desktop.ini"
```

To check for file size below 6MB, you can use the file explorer's search box and enter "size:>6M"



# Firewall Settings

The incident responder should pay attention to the firewall configurations and settings and should maintain it regularly.

To view the firewall configurations in the command prompt, type 'netsh firewall show config' and press enter to view the inbound and outbound traffic.

**netsh firewall show config**

```
C:\>netsh firewall show config

Domain profile configuration:
-----
Operational mode          = Enable
Exception mode            = Enable
Multicast/broadcast response mode = Enable
Notification mode         = Enable

Allowed programs configuration for Domain profile:
Mode    Traffic direction   Name / Program
-----
Enable   Inbound           μTorrent (TCP-In) / C:\Users\raj\AppData\Roaming\uTo

Port configuration for Domain profile:
Port    Protocol Mode     Traffic direction   Name
-----
Standard profile configuration (current):
-----
Operational mode          = Enable
Exception mode            = Enable
Multicast/broadcast response mode = Enable
Notification mode         = Enable

Service configuration for Standard profile:
Mode    Customized Name
-----
Enable   No                Network Discovery

Allowed programs configuration for Standard profile:
Mode    Traffic direction   Name / Program
-----
Enable   Inbound           μTorrent (TCP-In) / C:\Users\raj\AppData\Roaming\uTo
Enable   Inbound           Firefox (C:\Program Files\Mozilla Firefox) / C:\Prog

Port configuration for Standard profile:
Port    Protocol Mode     Traffic direction   Name
-----
Log configuration:
-----
File location  = C:\Windows\system32\LogFiles\Firewall\pfirewall.log
Max file size  = 4096 KB
Dropped packets = Disable
Connections    = Disable
```

To view the firewall settings of the current profile in the command prompt, type 'netsh advfirewall show currentprofile' and press enter.

**netsh advfirewall show currentprofile**

```
C:\>netsh advfirewall show currentprofile

Public Profile Settings:
-----
State                                ON
Firewall Policy                      BlockInbound,AllowOutbound
LocalFirewallRules                   N/A (GPO-store only)
LocalConSecRules                     N/A (GPO-store only)
InboundUserNotification              Enable
RemoteManagement                     Disable
UnicastResponseToMulticast          Enable

Logging:
LogAllowedConnections               Disable
LogDroppedConnections              Disable
FileName                           %systemroot%\system32\LogFiles\Firewall\pfirewall.log
MaxFileSize                         4096

Ok.
```

## Sessions with other system

To check the session details that are created with other systems, you can type 'net use' in command prompt and press enter.

**net use**

```
Microsoft Windows [Version 10.0.18362.1016]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\raj>net use
New connections will be remembered.

Status      Local      Remote           Network
-----
OK          \\192.168.0.106\IPC$    Microsoft Windows Network
The command completed successfully.

C:\Users\raj>
```

## Open Sessions

You can type ‘net session’ in the command prompt and press enter to see any open sessions of your system. It gives you the details about the duration of the session.

net session

```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net session

Computer           User name           Client Type       Opens Idle time

-----          administrator         

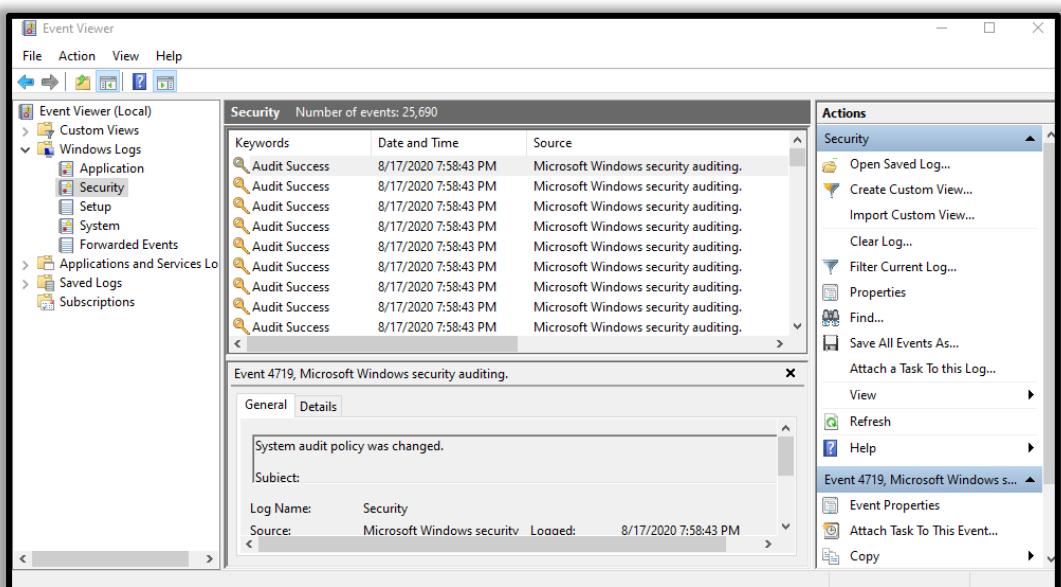
\\192.168.0.110      administrator          0 00:02:31
The command completed successfully.

C:\Users\Administrator>
```

## Log Entries

To view the log entries in GUI you can open the event viewer and see the logs. Press ‘Windows+R’ and type ‘eventvwr.msc’ and press ‘OK’.

### Event Viewer



**Cmd**

To export certain logs of a particular event in command prompt type 'wevtutil qe security' and press enter.

**wevtutil qe security**

```
C:\Windows\system32>wevtutil qe security
```

**PowerShell**

To get the event log list in the PowerShell, type 'Get-EventLog -list' and type the particular event in the supply value and you will get event details of that particular event.

**Get-Eventlog -List**

```
PS C:\Users\raj> Get-EventLog -List

Max(K) Retain OverflowAction      Entries Log
----- ----- -----
20,480    0 OverwriteAsNeeded    12,676 Application
20,480    0 OverwriteAsNeeded    0 HardwareEvents
      512    7 OverwriteOlder      0 Internet Explorer
20,480    0 OverwriteAsNeeded    0 Key Management Service
     128    0 OverwriteAsNeeded   128 OAlerts
      512    7 OverwriteOlder      2 OneApp_IGCC
                                         Security
20,480    0 OverwriteAsNeeded    7,887 System
15,360    0 OverwriteAsNeeded    422 Windows PowerShell

PS C:\Users\raj> Get-EventLog

cmdlet Get-EventLog at command pipeline position 1
Supply values for the following parameters:
LogName: OAlerts

Index Time          EntryType  Source           InstanceID Message
----- ----- -----
  128 Aug 16 12:55 Information Microsoft Office ...      300 Microsoft Word...
  127 Aug 16 02:22 Information Microsoft Office ...      300 Microsoft Word...
```

# Conclusion

Hence, one can make use of these commands as an incident responder and keep their systems away from threat.

# References

- <https://www.hackingarticles.in/incident-response-linux-cheatsheet/>
- <https://www.hackingarticles.in/incident-response-windows-cheatsheet/>

# About Us

*"Simple training makes Deep Learning"*

"IGNITE" is a worldwide name in the IT field. As we provide high-quality cybersecurity training and consulting services that fulfil students, government and corporate requirements.

We are working towards the vision to "Develop India as a Cyber Secured Country". With an outreach to over eighty thousand students and over a thousand major colleges, Ignite Technologies stood out to be a trusted brand in the Education and Information Security structure.

We provide training and education in the field of Ethical Hacking & Information Security to the students of schools and colleges along with the corporate world. The training can be provided at the client's location or even at Ignite's Training Center.

We have trained over 10,000 + individuals across the globe, ranging from students to security experts from different fields. Our trainers are acknowledged as Security Researcher by the Top Companies like - Facebook, Google, Microsoft, Adobe, Nokia, Paypal, Blackberry, AT&T and many more. Even the trained students are placed into several top MNC's all around the globe. Over with this, we are having International experience of training more than 400+ individuals.

The two brands, Ignite Technologies & Hacking Articles have been collaboratively working for the past 10+ years with more than 100+ security researchers, who themselves have been recognized by several research paper publishing organizations, The Big 4 companies, Bug Bounty research programs and many more.

Along with all these things, all the major certification organizations recommend Ignite's training for its resources and guidance.

Ignite's research had been a part of several global Institutes and colleges, and even a multitude of research papers shares Ignite's researchers in their reference.

# What We Offer



## Ethical Hacking

The Ethical Hacking course has been structured in such a way that a technical or a non-technical applicant can easily absorb its features and indulge his/her career in the field of IT security.



## Bug Bounty 2.0

A bug bounty program is a pact offered by many websites and web developers by which folks can receive appreciation and reimbursement for reporting bugs, especially those affecting to exploits and vulnerabilities.

Over with this training, an individual is thus able to determine and report bugs to the authorized before the general public is aware of them, preventing incidents of widespread abuse.



## Network Penetration Testing 2.0

The Network Penetration Testing training will build up the basic as well advance skills of an individual with the concept of Network Security & Organizational Infrastructure. Thereby this course will make the individual stand out of the crowd within just 45 days.



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This training will make you think like an "Adversary" with its systematic structure & real Environment Practice that contains more than 75 practicals on Windows Server 2016 & Windows 10. This course is especially designed for the professionals to enhance their Cyber Security Skills



## CTF 2.0

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