410 Report2

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3. Using dmesg

Command: dmesg | less

Linux kernel version: 4.15.0-43

[0.000000] Linux version 4.15.0-43-generic (buildd@lgw01-amd64-001) (gcc version 7.3.0 (Ubuntu 7.3.0-16ubuntu3)) #46-Ubuntu SMP Thu Dec 6 14:45:28 UTC 2018 (Ubuntu 4.15.0-43.46-generic 4.15.18)

Command: dmesg | grep Memory

Available Memory: 3978508k

```
[    0.000000] Memory: 3978508K/4193848K available (12300K kernel code, 2472K rwdata,
4252K rodata, 2408K init, 2416K bss, 215340K reserved, 0K cma-reserved)
[    0.024000] x86/mm: Memory block size: 128MB
```

Command: dmesg | grep sda

Hard drives in the system:

```
[    2.026745] sd 2:0:0:0: [sda] 1048576000 512-byte logical blocks: (537 GB/500 GiB)
[    2.027083] sd 2:0:0:0: [sda] Write Protect is off
[    2.027409] sd 2:0:0:0: [sda] Mode Sense: 00 3a 00 00
[    2.027417] sd 2:0:0:0: [sda] Write cache: enabled, read cache: enabled, doesn't
support DPO or FUA
[    2.032921]  sda: sda1 sda2 sda3 sda4 sda5
[    2.033705] sd 2:0:0:0: [sda] Attached SCSI disk
[    3.611778] EXT4-fs (sda2): INFO: recovery required on readonly filesystem
[    3.612076] EXT4-fs (sda2): write access will be enabled during recovery
[    4.008880] EXT4-fs (sda2): orphan cleanup on readonly fs
[    4.014933] EXT4-fs (sda2): 19 orphan inodes deleted
[    4.015231] EXT4-fs (sda2): recovery complete
[    4.018204] EXT4-fs (sda2): mounted filesystem with ordered data mode. Opts: (null)
[    4.635847] EXT4-fs (sda2): re-mounted. Opts: (null)
[    8.225814] EXT4-fs (sda3): recovery complete
[    8.226535] EXT4-fs (sda3): mounted filesystem with ordered data mode. Opts: (null)
[    8.271021] Adding 6291452k swap on /dev/sda4.  Priority:-2 extents:1 across:
6291452k FS
[    8.326486] EXT4-fs (sda5): recovery complete
[    8.326942] EXT4-fs (sda5): mounted filesystem with ordered data mode. Opts: (null)
```

Command: dmesg | grep eth

Status of ethernet link

```
[    1.694609] e1000 0000:00:03.0 eth0: (PCI:33MHz:32-bit) 08:00:27:25:2c:15
[    1.694836] e1000 0000:00:03.0 eth0: Intel(R) PRO/1000 Network Connection
[    1.699656] e1000 0000:00:03.0 enp0s3: renamed from eth0
```

Command: dmesg | grep -i usb

Numbers of USB ports: 2

```
[    0.956797] usb usb1: New USB device found, idVendor=1d6b, idProduct=0001
[    0.957071] usb usb1: New USB device strings: Mfr=3, Product=2, SerialNumber=1

[    1.424922] usb 1-1: new full-speed USB device number 2 using ohci-pci
[    1.752491] usb 1-1: New USB device found, idVendor=80ee, idProduct=0021
```

4. Using systemctl

4.1:
systemctl list-units -all
systemctl list-units —type=service
All of them are active

```
UNIT                                LOAD   ACTIVE SUB     DESCRIPTION
accounts-daemon.service             loaded active running Accounts Service
apparmor.service                    loaded active exited  AppArmor initialization
apport.service                      loaded active exited  LSB: automatic crash report generation
atd.service                         loaded active running Deferred execution scheduler
blk-availability.service            loaded active exited  Availability of block devices
cloud-config.service                loaded active exited  Apply the settings specified in cloud-config
cloud-final.service                 loaded active exited  Execute cloud user/final scripts
cloud-init-local.service            loaded active exited  Initial cloud-init job (pre-networking)
cloud-init.service                  loaded active exited  Initial cloud-init job (metadata service crawler)
console-setup.service               loaded active exited  Set console font and keymap
cron.service                        loaded active running Regular background program processing daemon
dbus.service                        loaded active running D-Bus System Message Bus
ebtables.service                    loaded active exited  ebtables ruleset management
getty@tty1.service                  loaded active running Getty on tty1
grub-common.service                 loaded active exited  LSB: Record successful boot for GRUB
iscsid.service                      loaded active running iSCSI initiator daemon (iscsid)
keyboard-setup.service              loaded active exited  Set the console keyboard layout
kmod-static-nodes.service           loaded active exited  Create list of required static device nodes for the curre
lvm2-lvmetad.service                loaded active running LVM2 metadata daemon
lvm2-monitor.service                loaded active exited  Monitoring of LVM2 mirrors, snapshots etc. using dmeventd
lxcfs.service                       loaded active running FUSE filesystem for LXC
lxd-containers.service              loaded active exited  LXD - container startup/shutdown
networkd-dispatcher.service         loaded active running Dispatcher daemon for systemd-networkd
polkit.service                      loaded active running Authorization Manager
rpcbind.service                     loaded active running RPC bind portmap service
rsyslog.service                     loaded active running System Logging Service
setvtrgb.service                    loaded active exited  Set console scheme
snapd.seeded.service                loaded active exited  Wait until snapd is fully seeded
snapd.service                       loaded active running Snappy daemon
ssh.service                         loaded active running OpenBSD Secure Shell server
```

```
UNIT                                                                                                LOAD   ACTIVE SUB       DESCRIPTION
proc-sys-fs-binfmt_misc.automount                                                                   loaded active waiting   Arbitrary Executable File Formats File System Automount Po
sys-devices-pci0000:00-0000:00:01.1-ata2-host1-target1:0:0-1:0:0:0-block-sr0.device                 loaded active plugged   VBOX_CD-ROM
sys-devices-pci0000:00-0000:00:03.0-net-enp0s3.device                                               loaded active plugged   82540EM Gigabit Ethernet Controller (PRO/1000 MT Desktop A
sys-devices-pci0000:00-0000:00:05.0-sound-card0.device                                              loaded active plugged   82801AA AC'97 Audio Controller
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda1.device            loaded active plugged   VBOX_HARDDISK 1
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda2.device            loaded active plugged   VBOX_HARDDISK 2
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda3.device            loaded active plugged   VBOX_HARDDISK 3
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda4.device            loaded active plugged   VBOX_HARDDISK 4
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda5.device            loaded active plugged   VBOX_HARDDISK 5
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda.device                 loaded active plugged   VBOX_HARDDISK
sys-devices-pci0000:00-0000:00:0d.0-ata4-host3-target3:0:0-3:0:0:0-block-sdb-sdb1.device            loaded active plugged   VBOX_HARDDISK 1
sys-devices-pci0000:00-0000:00:0d.0-ata4-host3-target3:0:0-3:0:0:0-block-sdb-sdb2.device            loaded active plugged   VBOX_HARDDISK 2
sys-devices-pci0000:00-0000:00:0d.0-ata4-host3-target3:0:0-3:0:0:0-block-sdb.device                 loaded active plugged   VBOX_HARDDISK
sys-devices-pci0000:00-0000:00:0d.0-ata5-host4-target4:0:0-4:0:0:0-block-sdc-sdc1.device            loaded active plugged   VBOX_HARDDISK 1
sys-devices-pci0000:00-0000:00:0d.0-ata5-host4-target4:0:0-4:0:0:0-block-sdc-sdc2.device            loaded active plugged   VBOX_HARDDISK 2
sys-devices-pci0000:00-0000:00:0d.0-ata5-host4-target4:0:0-4:0:0:0-block-sdc.device                 loaded active plugged   VBOX_HARDDISK
sys-devices-platform-serial8250-tty-ttyS0.device                                                    loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS0
sys-devices-platform-serial8250-tty-ttyS1.device                                                    loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS1
sys-devices-platform-serial8250-tty-ttyS10.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS10
sys-devices-platform-serial8250-tty-ttyS11.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS11
sys-devices-platform-serial8250-tty-ttyS12.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS12
sys-devices-platform-serial8250-tty-ttyS13.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS13
sys-devices-platform-serial8250-tty-ttyS14.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS14
sys-devices-platform-serial8250-tty-ttyS15.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS15
sys-devices-platform-serial8250-tty-ttyS16.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS16
sys-devices-platform-serial8250-tty-ttyS17.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS17
sys-devices-platform-serial8250-tty-ttyS18.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS18
sys-devices-platform-serial8250-tty-ttyS19.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS19
sys-devices-platform-serial8250-tty-ttyS2.device                                                    loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS2
sys-devices-platform-serial8250-tty-ttyS20.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS20
sys-devices-platform-serial8250-tty-ttyS21.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS21
sys-devices-platform-serial8250-tty-ttyS22.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS22
sys-devices-platform-serial8250-tty-ttyS23.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS23
sys-devices-platform-serial8250-tty-ttyS24.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS24
sys-devices-platform-serial8250-tty-ttyS25.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS25
sys-devices-platform-serial8250-tty-ttyS26.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS26
sys-devices-platform-serial8250-tty-ttyS27.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS27
sys-devices-platform-serial8250-tty-ttyS28.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS28
sys-devices-platform-serial8250-tty-ttyS29.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS29
sys-devices-platform-serial8250-tty-ttyS3.device                                                    loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS3
sys-devices-platform-serial8250-tty-ttyS30.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS30
sys-devices-platform-serial8250-tty-ttyS31.device                                                   loaded active plugged   /sys/devices/platform/serial8250/tty/ttyS31
lines 1-43
```

4.2:
systemctl show devcdrom.device
systemctl show atd,service

```
Id=devcdrom.device
Names=devcdrom.device
Description=devcdrom.device
LoadState=loaded
ActiveState=inactive
SubState=dead
StateChangeTimestampMonotonic=0
InactiveExitTimestampMonotonic=0
ActiveEnterTimestampMonotonic=0
ActiveExitTimestampMonotonic=0
InactiveEnterTimestampMonotonic=0
CanStart=no
CanStop=no
CanReload=no
CanIsolate=no
StopWhenUnneeded=no
RefuseManualStart=no
RefuseManualStop=no
AllowIsolate=no
DefaultDependencies=yes
OnFailureJobMode=replace
IgnoreOnIsolate=yes
NeedDaemonReload=no
JobTimeoutUSec=infinity
JobRunningTimeoutUSec=1min 30s
JobTimeoutAction=none
ConditionResult=no
AssertResult=no
ConditionTimestampMonotonic=0
AssertTimestampMonotonic=0
Transient=no
Perpetual=no
StartLimitIntervalUSec=10s
StartLimitBurst=5
StartLimitAction=none
FailureAction=none
SuccessAction=none
CollectMode=inactive
```

```
osboxes@osboxes:~$ systemctl show atd.service
Type=simple
Restart=no
NotifyAccess=none
RestartUSec=100ms
TimeoutStartUSec=1min 30s
TimeoutStopUSec=1min 30s
RuntimeMaxUSec=infinity
WatchdogUSec=0
WatchdogTimestamp=Fri 2019-01-25 23:08:47 UTC
WatchdogTimestampMonotonic=11056585
PermissionsStartOnly=no
RootDirectoryStartOnly=no
RemainAfterExit=no
GuessMainPID=yes
MainPID=867
ControlPID=0
FileDescriptorStoreMax=0
NFileDescriptorStore=0
StatusErrno=0
Result=success
UID=[not set]
GID=[not set]
NRestarts=0
ExecMainStartTimestamp=Fri 2019-01-25 23:08:47 UTC
ExecMainStartTimestampMonotonic=11056445
ExecMainExitTimestampMonotonic=0
ExecMainPID=867
ExecMainCode=0
ExecMainStatus=0
ExecStart={ path=/usr/sbin/atd ; argv[]=/usr/sbin/atd -f ; ignore_errors=no ; start_time=[Fri 2019-01-25 23:08:47 UT
Slice=system.slice
```

4.3:

Commands:

systemctl list-unit-files —type=service

```
systemctl stop apparmor.service
systemctl start apparmor.service
```

```
osboxes@osboxes:~$ systemctl stop apparmor.service
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to stop 'apparmor.service'.
Authenticating as: osboxes.org (osboxes)
Password:
==== AUTHENTICATION COMPLETE ===
osboxes@osboxes:~$ systemctl start apparmor.service
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to start 'apparmor.service'.
Authenticating as: osboxes.org (osboxes)
Password:
==== AUTHENTICATION COMPLETE ===
```

4.4

Commands:

```
systemctl list-units –state==inactive
systemctl list-units –state==failed
```

```
osboxes@osboxes:~$ systemctl list-units --state==inactive
0 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
osboxes@osboxes:~$ systemctl list-units --state==failed
0 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
```

The VM shows there are no inactive files.

5.Adding a Program to the Boot Process

```
datetest.service                                    enabled
[osboxes@osboxes:~$ sudo systemctl status datetest.service
● datetest.service - human readable description of service
   Loaded: loaded (/etc/systemd/system/datetest.service; enabled; vendor preset: enabled)
   Active: inactive (dead) since Fri 2019-01-25 08:27:11 UTC; 6s ago
  Process: 1502 ExecStart=/home/osboxes/date.sh (code=exited, status=0/SUCCESS)
 Main PID: 1502 (code=exited, status=0/SUCCESS)

Jan 25 08:27:11 osboxes systemd[1]: Started human readable description of service.
```

Summary: I met the problem below:

```
● datetest.service - human readable description of service
   Loaded: loaded (/etc/systemd/system/datetest.service; enabled; vendor preset: enabled)
   Active: failed (Result: exit-code) since Fri 2019-01-25 08:24:00 UTC; 9s ago
  Process: 1411 ExecStart=/home/osboxes/.scripts/date.sh (code=exited, status=203/EXEC)
 Main PID: 1411 (code=exited, status=203/EXEC)

Jan 25 08:24:00 osboxes systemd[1]: Started human readable description of service.
Jan 25 08:24:00 osboxes systemd[1411]: datetest.service: Failed to execute command: No such file
or directory
Jan 25 08:24:00 osboxes systemd[1411]: datetest.service: Failed at step EXEC spawning /home/
osboxes/.scripts/date.sh
Jan 25 08:24:00 osboxes systemd[1]: datetest.service: Main process exited, code=exited,
status=203/EXEC
Jan 25 08:24:00 osboxes systemd[1]: datetest.service: Failed with result 'exit-code'.
```

The failed service is because the .sh file deny the permission.
Solution: chmod +x filename.sh

6.
6.1:
Command: systemd-analyze blame

```
[osboxes@osboxes:~$ systemd-analyze blame
          3.740s dev-sda2.device
          2.074s systemd-networkd-wait-online.service
          1.758s cloud-init-local.service
          1.609s cloud-config.service
          1.418s snapd.service
           743ms networkd-dispatcher.service
           691ms cloud-init.service
           673ms dev-loop0.device
           646ms dev-loop1.device
           618ms lxd-containers.service
```

6.2:

Command: systemd-analyze critical-chain

```
The time after the unit is active or started is printed after the "@" character.
The time the unit takes to start is printed after the "+" character.

graphical.target @8.806s
└─datetest.service @8.804s
  └─multi-user.target @8.803s
    └─snapd.seeded.service @8.749s +52ms
      └─snapd.service @7.329s +1.418s
        └─basic.target @7.241s
          └─sockets.target @7.239s
            └─snapd.socket @7.224s +14ms
              └─sysinit.target @7.207s
                └─cloud-init.service @6.515s +691ms
                  └─systemd-networkd-wait-online.service @4.439s +2.074s
                    └─systemd-networkd.service @4.405s +32ms
                      └─network-pre.target @4.404s
                        └─ebtables.service @4.215s +188ms
                          └─local-fs.target @4.211s
                            └─var-lib-lxcfs.mount @7.362s
                              └─local-fs-pre.target @886ms
                                └─lvm2-monitor.service @390ms +494ms
                                  └─lvm2-lvmetad.service @661ms
                                    └─systemd-journald.socket @386ms
                                      └─system.slice @377ms
                                        └─.slice @374ms
```

Because there is no tree for the longest-time unit **dev-sda2.device**,

```
osboxes@osboxes:~$ systemd-analyze critical-chain dev-sda2.device
The time after the unit is active or started is printed after the "@" character.
The time the unit takes to start is printed after the "+" character.

dev-sda2.device +3.740s
```

Therefor I looked for the second longest-time unit **systemd-networkd-wait-online.service:**

```
osboxes@osboxes:~$ systemd-analyze critical-chain systemd-networkd-wait-online.service
The time after the unit is active or started is printed after the "@" character.
The time the unit takes to start is printed after the "+" character.

systemd-networkd-wait-online.service +2.074s
└─systemd-networkd.service @4.405s +32ms
  └─network-pre.target @4.404s
    └─ebtables.service @4.215s +188ms
      └─local-fs.target @4.211s
        └─var-lib-lxcfs.mount @7.362s
          └─local-fs-pre.target @886ms
            └─lvm2-monitor.service @390ms +494ms
              └─lvm2-lvmetad.service @661ms
                └─systemd-journald.socket @386ms
                  └─system.slice @377ms
                    └─.slice @374ms
```