

# Linux-Troubleshooting-Scenarios

It is always crucial to understand the issue. There should be the right approach or a step-by-step process to be followed to troubleshoot the issues. Doesn't matter you are a Software Developer or DevOps Engineer or an Architect, Unix./Linux is used widely and you should be aware with the issues and correct approach to resolve it.

Let's discuss on the few of them :

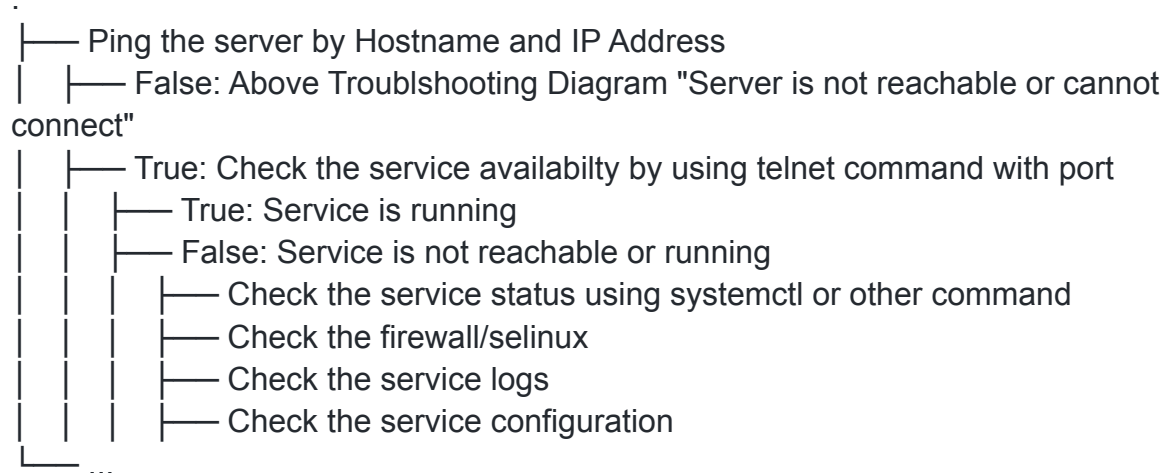
## Issue 1 : Server is not reachable or unable to connect

### Approach / Solution :

- Ping the server by Hostname and IP Address
  - Hostname/IP Address is pingable
    - Issue might be on the client side as server is reachable
  - Hostname is not pingable but IP Address is pingable
    - Could be the DNS issue
      - check /etc/hosts
      - check /etc/resolv.conf
      - check /etc/nsswitch.conf
      - (Optional) DNS can also be defined in the /etc/sysconfig/network-scripts/ifcfg-<interface>
  - Hostname/IP Address both are not pingable
    - Check the other server on its same network to see if there is Network side access issue or other overall something bad
      - False: Issue is not overall network side but its with that host/server
      - True: Might be overall network side issue
    - Logged into server by Virtual Console, if the server is PoweredON. Check the uptime
      - Check if the server has the IP, and has UP status of Network interface
      - (Optional) Also check IP related information from /etc/sysconfig/network-scripts/ifcfg-<interface>
    - Ping the gateway, also check routes
    - Check Selinux, Firewall rules
    - Check physical cable conn

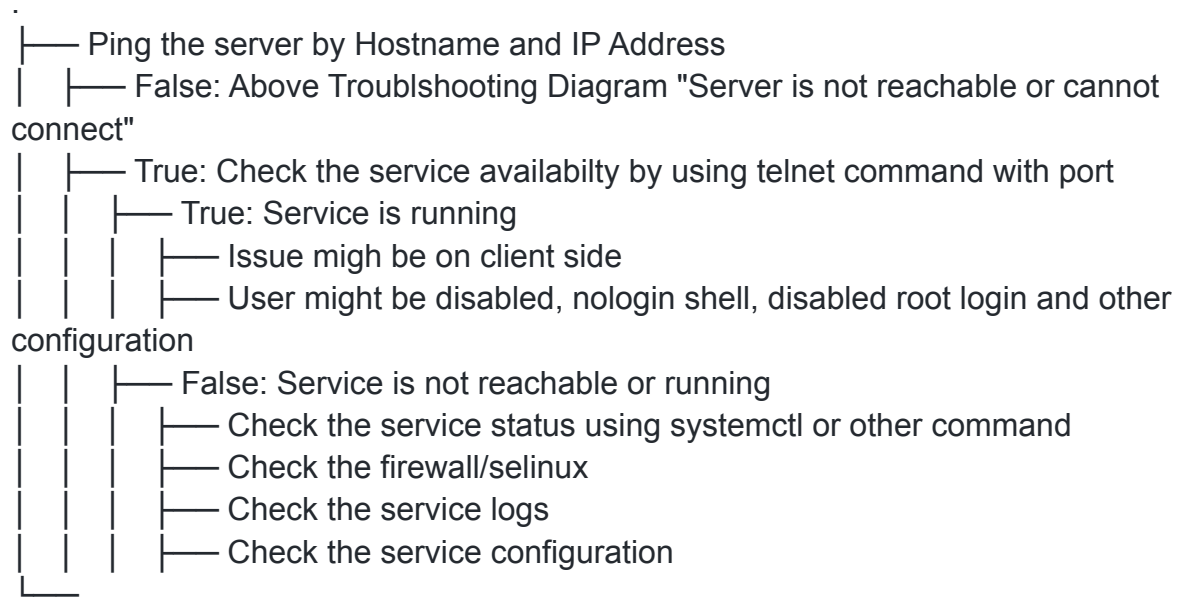
## Issue 2 : Unable to connect to website or an application

### Approach / Solution :



## Issue 3 : Unable to ssh as root or any other user.

### Approach / Solution :



## Issue 4 : Disk Space is full issue or add/extend disk space

### Approach / Solution :

- System Performance degradation detection
    - Application getting slow/unresponsive
    - Commands are not running (For Example: as / disk space is full)
    - Cannot do logging and other etc
  - Analyse the issue
    - df command to find the problematic filesystem space issue
  - Action
    - After finding the specific filesystem, use du command in that filesystem to get which files/directories are large
      - Compress/remove big files
      - Move the items to another partition/server
      - Check the health status of the disks using badblocks command (For Example: #badblocks -v /dev/sda)
    - Check which process is IO Bound (using iostat)
    - Create a link to file/dir
  - New disk addition
    - Simple partition
      - Add disk to VM
      - Check the new disk with df/lblk command
      - fdisk to create partition. Better to have LVM partition
      - Create filesystem and mount it
      - fstab entry for persistent
    - LVM Partition
      - Add disk to VM
      - Check the new disk with df/lblk command
      - fdisk to create LVM partition
      - PV, VG, LV
      - Create filesystem and mount it
      - fstab entry for persistent
    - Extend LVM partition
      - Add disk, and create LVM partition
      - Add LVM partition (PV) in existing VG
      - Extend LV and resize filesystem
- ...

## Issue 5 : Filesystem corrupted

Approach / Solution :

- One of the error that cause the system unable to BOOT UP
- Check /var/log/messages, dmesg and other log files
- If we have a badsector logs, we have to run fsck
  - True:
    - reboot the system into rescue mode as booting it from CDROM by applying ISO
    - proceed with option 1, which mount the original root filesystem under /mnt/sysimage
    - edit fstab entries or create a new file with the help of blkid and reboot
    - ...

### Issue 6 : fstab file missing or bad entry

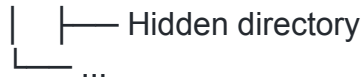
#### Approach / Solution :

- One of the error that cause the system unable to BOOT UP
- Check /var/log/messages, dmesg and other log files
- If we have a badsector logs, we have to run fsck
  - True:
    - reboot the system into rescue mode as booting it from CDROM by applying ISO
    - proceed with option 1, which mount the original root filesystem under /mnt/sysimage
    - edit fstab entries or create a new file with the help of blkid and reboot
    - ...

### Issue 7 : Can't cd to the directory even if user has sudo privileges

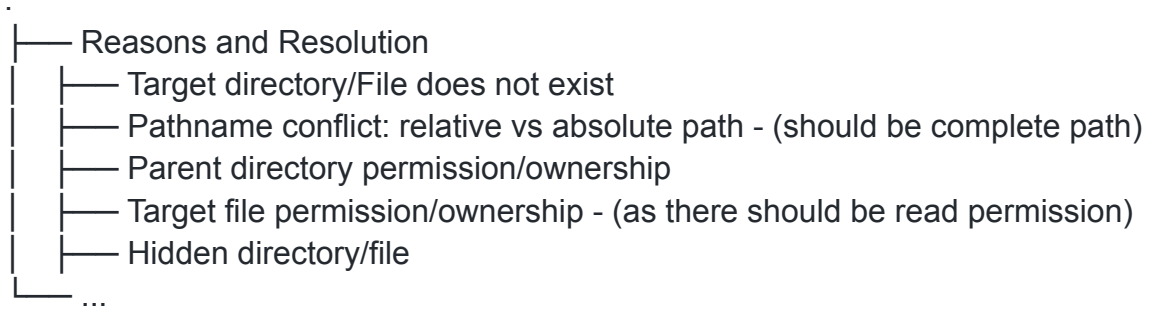
#### Approach / Solution :

- Reasons and Resolution
  - Directory does not exist
  - Pathname conflict: relative vs absolute path
  - Parent directory permission/ownership
  - Doesn't have executable permission on target directory



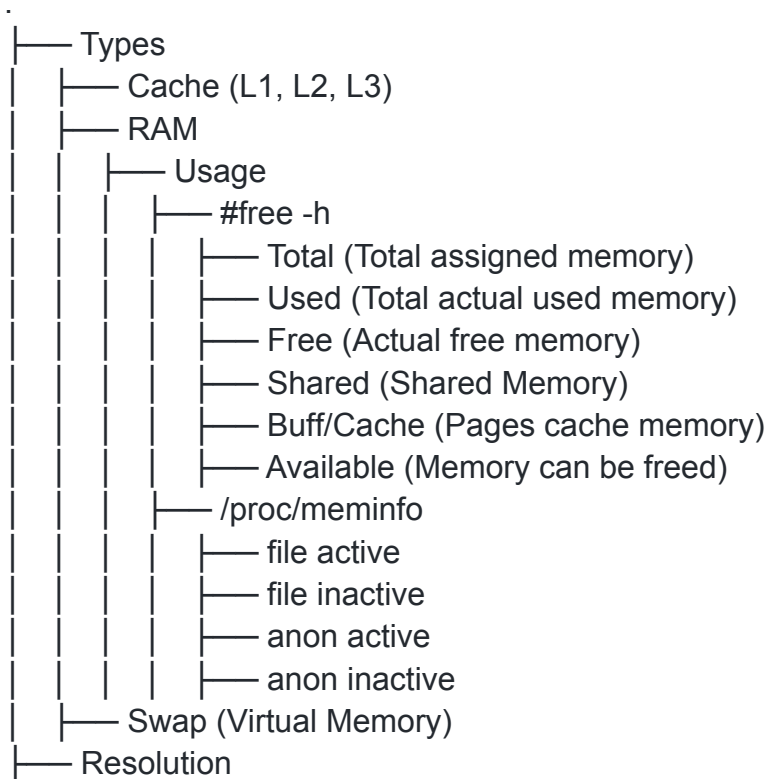
### Issue 8 : Can't Create Links

#### Approach / Solution :



### Issue 9 : Running Out of Memory

#### Approach / Solution :



- | |— Identify the processes that are using high memory using top, htop, ps etc.
- | |— Check the OOM in logs and also check if there is a memory commitment in sysctl.conf
- | |— Kill or restart the process/service
- | |— prioritize the process using nice
- | |— Add/Extend the swap space
- | |— Add more physical more RAM
- | ...

## Issue 10 : Add/ Extend the Swap Space

### Approach / Solution :

- |— Due to running out of memory, we would need to add more swap space
- | |— Create a file with #dd, as it will reserve the blocks of disk for swap file
- | |— Set permission 600 and give root ownership
- | |— #mkswap
- | |— Now Turned swap on #swapon
- | |— fstab entry for persistent
- | ...

## Issue 11 : Unable to Run Certain Commands

### Approach / Solution :

- |— Troubleshooting and Resolution
- | |— command
- | | |— Could be the system related command which non root user does not have the access
- | | |— Could be the user defined script/command
- | |— Troubleshooting
- | | |— permission/ownership of the command/script
- | | |— sudo permission
- | | |— absolute/relative path of command/script
- | | |— not defined in user \$PATH variable
- | | |— command is not installed

- | | | — command library is missing or deleted
- | | | ...

## Issue 12 : System Unexpectedly reboot and process restart ?

### Approach / Solution :

- | — Troubleshooting and Resolution
  - | | — System reboot/crash reasons
    - | | | — CPU stress
    - | | | — RAM stress
    - | | | — Kernel fault
    - | | | — Hardware fault
  - | | — Process restart
    - | | | — System reboot
    - | | | — Restart itself
    - | | | — Watchdog application
      - | | | | — To prevent high stress on system resources
      - | | | | — If application causing stress, so it will restart or terminate
  - | | — Troubleshooting
    - | | | — After logged in, check the status by using commands like uptime, top, dmesg, journalctl, iostat -xz 1
    - | | | — syslog.log, boot.log, dmesg, messages.log etc
    - | | | — custom log path of applicatoin
    - | | | — if not completely accessible, so take the virutal console like from ILO, IDRAC etc
    - | | | — open a case and reach out a vendor
    - | | | ...

## Issue 13 : Unable to get IP Address

### Approach / Solution :

- | — IP Assignment Methods
  - | | — DHCP
  - | | — Fixed Allocation

- | | | — Dynamic Allocation
- | | — Static
- | — Troubleshooting
- | | — check network setting from virtualization environment like VMware, VirtualBox or etc
- | | — check the IP address is assigned or not
- | | — check the NIC status from host side using #lspci, #nmcli etc
- | | — restart network service
- | — ...

## Issue 14 : Backup and Restore File Permissions in Linux

### Approach / Solutions :

- | — Troubleshooting
- | | — The best option is to create the ACL file of Dir/Files before changing the permissions in bulk
- | | | — Create the acl file before changing the permission (or backup the file permission): ~\$ getfacl -R <dir> > permissions.acl
- | | | — Restore File Permissions: ~\$ setfacl --restore=permissions.acl
- | | — Restore from the VM Snapshot (But not always a good option for production)
- | | — Rebuild the VM (this option is safe for future)
- | — ...

### Useful Tip Related Disk Partition :

- | — Tips
- | | — After adding/attaching a new disk to a VM, we can get its status from lsblk command by doing ~\$echo 1 > /sys/block/sda/device/rescan
- | | — If we increase disk size of existing disk than the additional space get appended to the existing disk without affecting the already existed FileSystem and Partition
- | | — We can also recreate the filesystem on block device as it will automatically format the old one
- | | — If we have a disk(with created partition/FS) we can share the .vmdk to other VM. So after mounting we would have a same data as it was on previous one.
- | — ...



