

**can you format the text properly into sections and commands listed properly so that it will be easy for chatbot to read and grasp / detect information?**

Certainly! Below is a **well-structured, sectioned, and command-focused summary** of the contents from your attached Linux notes. The formatting is optimized for chatbot reading and easy command extraction.

**Linux Notes for Professionals – Structured Reference**

**1. Getting Started with GNU/Linux**

**1.1 Useful Shortcuts (Terminal/Bash)**

* **Open terminal:**  
  Ctrl + Alt + T or Super + T
* **Cursor movement:**
  + Ctrl + A: Start of line
  + Ctrl + E: End of line
  + Alt + F: Forward one word
  + Alt + B: Backward one word
  + Ctrl + F: Forward one character
  + Ctrl + B: Backward one character
* **Text manipulation:**
  + Ctrl + U: Cut to start of line
  + Ctrl + K: Cut to end of line
  + Ctrl + W: Delete previous word
  + Ctrl + Y: Paste last cut
  + Alt + T: Swap last two words
  + Alt + L/U/C: Lowercase/Uppercase/Capitalize to end of word
  + Alt + D: Delete to end of word
  + Ctrl + T: Swap last two characters
* **History access:**
  + Ctrl + R: Search history
  + Ctrl + P/N: Previous/Next command
  + Alt + R: Revert command edits
* **Terminal control:**
  + Ctrl + L: Clear screen
  + Ctrl + S/Q: Stop/Resume output
  + Ctrl + C: End current process
  + Ctrl + D: Logout/EOF
  + Ctrl + Z: Suspend process
  + Tab: Autocomplete
* **Special characters:**
  + Ctrl + H: Backspace
  + Ctrl + J/M: Return
  + Ctrl + I: Tab
  + Ctrl + G: Bell
  + Ctrl + @: Null

**1.2 File Management Commands**

**Directory Navigation**

|  |  |
| --- | --- |
| Command | Description |
| pwd | Print working directory |
| cd - | Go to previous directory |
| cd ~ or cd | Go to home directory |
| cd .. | Go to parent directory |

**Listing Files**

|  |  |
| --- | --- |
| Command | Description |
| ls -l | List files/directories in long format |
| ls -ld dir | List info about directory itself |
| ls -a | List all files, including hidden |
| ls -F | Append symbol to indicate file type |
| ls -lt | Sort by modification time |
| ls -lh | Human-readable file sizes |
| ls -lR | Recursive list |
| tree | Tree representation of filesystem |

**File/Directory Create, Copy, Remove**

|  |  |
| --- | --- |
| Command | Description |
| cp -p src dest | Copy file, preserve attributes |
| cp -R src\_dir dest\_dir | Copy directory recursively |
| mv file1 file2 | Move/rename file |
| rm -i filename | Remove file with confirmation |
| rm -R dir | Remove directory recursively |
| rm -rf dir | Force remove directory recursively |
| rmdir dir | Remove empty directory |
| mkdir dir | Create directory |
| mkdir -p dir1/dir2 | Create directory hierarchy |
| touch filename | Create file or update timestamp |

**Permissions and Groups**

|  |  |
| --- | --- |
| Command | Description |
| chmod <spec> filename | Change file permissions |
| chmod -R <spec> dir | Change permissions recursively |
| chown owner filename | Change file owner |
| chgrp group filename | Change file group |
| chgrp -R group dir | Change group recursively |

**1.3 Hello World**

echo "Hello World"

**1.4 Basic Linux Utilities**

**Getting Help**

|  |  |
| --- | --- |
| Command | Description |
| man <name> | Manual page |
| man -k <keyword> | Search man pages |
| apropos <keyword> | Search command descriptions |
| help | List Bash commands |
| help <name> | Info about a Bash command |
| info <name> | Info about a command |
| <command> --help | Command usage |

**User Identification**

|  |  |
| --- | --- |
| Command | Description |
| hostname | System hostname |
| whoami | Current user |
| who | List logged in users |
| w | System status, users |
| last | Recent logins |
| lastb | Bad login attempts |

**Process Information**

|  |  |
| --- | --- |
| Command | Description |
| top | Live process view |
| ps | List running processes |
| ps aux | All processes |

**1.5 Searching for Files/Contents**

* **Find by name:**  
  find /path -name '\*.css'
* **Find by content:**  
  grep font /path/to/file
* **Recursive grep:**  
  grep -R font /path

**1.6 File Manipulation**

|  |  |
| --- | --- |
| Task | Command |
| Create file | touch myFile |
| Rename file | mv myFile myFirstFile |
| View file | cat myFirstFile |
| View with pager | less myFirstFile |
| View first lines | head myFirstFile |
| View last lines | tail myFirstFile |
| Edit file | vi myFirstFile |
| List files | ls |
| Create directory | mkdir myFirstDirectory |
| Create nested directories | mkdir -p src/myFirstDirectory |
| Move file to directory | mv myFirstFile myFirstDirectory/ |
| Change directory | cd myFirstDirectory |
| Delete file | rm myFirstFile |
| Move to parent directory | cd .. |
| Delete empty directory | rmdir myFirstDirectory |
| Delete non-empty directory | rm -rf myFirstDirectory |

**1.7 File/Directory Details**

* **Long format:**  
  ls -l
* **Human-readable sizes:**  
  ls -lh
* **Show hidden files:**  
  ls -a
* **Directory size:**  
  ls -s
* **Recursive:**  
  ls -R
* **Change permissions:**  
  chmod 755 test
* **Example permissions:**  
  drwxr-xr-x (directory, user rwx, group r-x, others r-x)

**2. Detecting Linux Distribution Name and Version**

* **Debian-based:**  
  lsb\_release -a  
  or  
  cat /etc/issue
* **Systemd-based:**  
  cat /etc/os-release  
  or  
  source /etc/os-release && echo "$PRETTY\_NAME"
* **RHEL/CentOS/Fedora:**  
  cat /etc/redhat-release
* **Kernel/system info:**  
  uname -a
* **Find OS version (generic):**  
  cat /etc/\*release

**3. Getting Information on a Running Linux Kernel**

* **Kernel info:**  
  uname -a
* **Options:**
  + -s: kernel name
  + -r: kernel release
  + -v: kernel version
  + -m: machine hardware
  + -o: operating system

**4. Shell**

**4.1 Changing Default Shell**

* **List shells:**  
  chsh -l or cat /etc/shells
* **Change shell:**  
  chsh -s /usr/bin/fish
* **Check current shell:**  
  echo $SHELL

**4.2 Basic Shell Utilities**

* **Customize prompt:**  
  PS1='\w $ '
* **Common shortcuts:**
  + Ctrl-k: Cut/kill line
  + Ctrl-y: Paste
  + Ctrl-a: Start of line
  + Ctrl-e: End of line
  + Ctrl-d: Delete character
  + Ctrl-l: Clear screen
  + Ctrl-u: Clear line
  + Ctrl-c: Interrupt
  + Ctrl-r: Reverse search
  + history: Show command history

**4.3 Command Alias**

* **Create alias:**  
  alias install='sudo apt-get -y install'

**4.4 Locate a File**

* **Locate file:**  
  locate mykey.pem
* **Update locate database:**  
  updatedb
* **Fallback:**  
  find / -name mykey.pem -print

**5. Check Disk Space**

**5.1 Investigate Directories for Disk Usage**

* **Disk usage per directory:**  
  du -sh \*
* **Include hidden files:**  
  du -sh .[!.]\* \*
* **Total usage:**  
  du -sch .[!.]\* \*
* **Threshold filter:**  
  sudo du --threshold=1G -ch /.[!.]\* /\*

**5.2 Checking Disk Space**

* **Check partitions:**  
  df -h

**6. Getting System Information**

**6.1 CPU, Memory, Network, Disk Stats**

* **CPU:**  
  mpstat 2 10
* **Memory:**  
  vmstat 2 10
* **Disk:**  
  iostat -kx 2
* **Network:**  
  netstat -ntlp (TCP), sudo iftop
* **Overall (dstat):**  
  dstat

**6.2 Hardware Info**

* **CPU info:**  
  lscpu
* **Detailed hardware:**  
  sudo lshw | less
* **PCI info:**  
  lspci -tv
* **USB info:**  
  lsusb -tv
* **BIOS info:**  
  dmidecode -q | less
* **Disk info:**  
  hdparm -i /dev/sda
* **Disk power-on hours:**  
  smartctl -A /dev/sda | grep Power\_On\_Hours
* **Disk speed test:**  
  hdparm -tT /dev/sda
* **Bad blocks:**  
  badblocks -s /dev/sda

**6.4 CPU Model/Speed**

* **CPU info:**  
  cat /proc/cpuinfo
* **Count processors:**  
  grep -c processor /proc/cpuinfo

**6.5 Process Monitoring**

* **Static:**  
  ps -e -o pid,args --forest  
  ps -e -o pcpu,cpu,nice,state,cputime,args --sort pcpu | sed '/^ 0.0 /d'  
  ps -e -orss=,args= | sort -b -k1,1n | pr -TW$COLUMNS  
  ps -C firefox-bin -L -o pid,tid,pcpu,state
* **Open files by process:**  
  lsof -p $$
* **Processes with open path:**  
  lsof ~
* **Interactive:**  
  top, htop, atop, iotop, iftop

**7. ls Command**

**7.1 Options**

* ls -a: All files
* ls --color: Colored output
* ls -d: List directories
* ls -F: Append symbol
* ls -i: Inode number
* ls -l: Long format
* ls -lh: Human readable
* ls -r: Reverse order
* ls -R: Recursive
* ls -s: File size
* ls -S: Sort by size
* ls -t: Sort by time
* ls -X: Sort by extension

**7.2 Examples**

* ls
* ls -a
* ls -F
* ls -l
* ls -lh

**8. File Compression with 'tar' Command**

**Common Options**

* -c: Create archive
* -x: Extract archive
* -t: List contents
* -f: File
* -v: Verbose
* -z: gzip
* -j: bzip2
* -J: xz

**Examples**

* **Compress folder:**  
  tar -czf my-archive.tar.gz my-folder/
* **Extract archive:**  
  tar -xf archive.tar.gz
* **Extract to directory:**  
  tar -xf archive.tar -C ./dest
* **List contents:**  
  tar -tf archive.tar.gz
* **Exclude folder:**  
  tar -cf archive.tar ./my-folder/ --exclude="my-folder/sub1"
* **Strip components:**  
  tar -xf --strip-components=1 archive.tar

**9. Services**

**9.1 List Running Services (Ubuntu)**

* service --status-all
* sudo initctl list (Upstart)

**9.2 Systemd Service Management**

* systemctl (list)
* systemctl --failed
* systemctl get-default
* systemctl set-default <target>
* systemctl start/stop/restart/reload/status [service]
* systemctl is-enabled/is-active [service]
* systemctl enable/disable [service]
* systemctl mask/unmask [service]
* systemctl daemon-reload

**10. Managing Services**

* **Diagnose service:**  
  systemctl status [service]  
  journalctl -xe  
  journalctl -f -t [service]  
  journalctl -p err -S yesterday  
  tail -f /var/log/messages  
  tail -f /var/log/secure
* **Start/Stop (SysV):**  
  service <service> start/stop
* **Start/Stop (systemd):**  
  systemctl <service> start/stop
* **Status (SysV):**  
  service <service> status
* **Status (systemd):**  
  systemctl status <service>

**11. Modifying Users**

* **Set password:**  
  passwd
* **Set another user's password:**  
  passwd username
* **Add user:**  
  useradd username
* **Remove user:**  
  userdel username
* **Remove user & home:**  
  userdel -r username
* **List groups (current):**  
  groups
* **List groups (user):**  
  groups username

**12. LAMP Stack**

**12.1 Install LAMP on Arch Linux**

pacman -Syu apache php php-apache mariadb

* Edit /etc/httpd/conf/httpd.conf as needed.
* Set permissions:  
  chmod 755 /home  
  chmod 755 /home/username  
  chmod 755 /home/username/public\_html
* Start MySQL:  
  systemctl enable mysqld  
  systemctl start mysqld
* Secure MySQL:  
  sh /usr/bin/mysql\_secure\_installation

**12.2 Install LAMP on Ubuntu**

sudo apt-get install apache2  
sudo apt-get install mysql-server  
sudo apt-get install php5 libapache2-mod-php5  
sudo systemctl restart apache2  
php -r 'echo "\n\nYour PHP installation is working fine.\n\n\n";'

**12.3 Install LAMP on CentOS**

sudo yum -y install httpd  
sudo systemctl enable --now httpd  
sudo yum -y install mariadb-server  
sudo systemctl enable --now mariadb  
sudo yum -y install php php-common  
sudo systemctl restart httpd  
php --version

**13. tee Command**

* **Write to stdout and file:**  
  ls | tee file
* **Write to multiple files:**  
  ls | tee file1 file2
* **Append to file:**  
  ls | tee -a file
* **Pipe and write:**  
  crontab -l | tee crontab-backup.txt | sed 's/old/new/' | crontab –

**14. SSH**

* **Connect to server:**  
  ssh -p port user@server-address
* **ProxyJump:**  
  ssh -J user@host1:port user@host2 -p port2
* **Install OpenSSH:**  
  apt-get install openssh (Debian), pacman -S openssh (Arch), yum install openssh (Yum)
* **Configure SSH server:**  
  Edit /etc/ssh/sshd\_config
* **Passwordless connection:**  
  ssh-keygen -t rsa -b 4096 -C "email"  
  ssh user@host 'cat >> ~/.ssh/authorized\_keys' < id\_rsa.pub
* **Disable SSH service:**  
  sudo service ssh stop  
  sudo systemctl disable sshd.service

**15. SCP**

* **Copy local to remote:**  
  scp file user@host:/path/
* **Copy remote to local:**  
  scp user@host:/path/file ./
* **Copy directory:**  
  scp -r user@host:~/project/\* ./workspace/
* **Use key file:**  
  scp -i my\_key.pem file user@host:/path/

**16. GnuPG (GPG)**

* **Export public key:**  
  gpg --armor --export EMAIL > public\_key.asc
* **Send key to server:**  
  gpg --send-keys PRIMARY\_ID
* **Generate key:**  
  gpg --gen-key
* **List keys:**  
  gpg --list-keys

**17. Network Configuration**

* **Local DNS:**  
  Edit /etc/hosts
* **DNS servers:**  
  Edit /etc/resolv.conf
* **Routing (route):**  
  route, route -n, route add -host x.x.x.x eth1, route add -net 2.2.2.0/24 eth0, route add default gw 2.2.2.1 eth0
* **Routing (ip):**  
  ip route show, ip route add default via 1.2.3.254
* **Configure hostname:**  
  Edit /etc/hosts or ~/.hosts
* **Network interfaces:**  
  ifconfig -a, ifconfig eth0
* **Interface settings:**  
  ethtool eth0
* **IP address:**  
  ip addr show, ip addr add 1.2.3.4/24 brd + dev eth0
* **DHCP:**  
  dhclient <interface>
* **Static config:**  
  Edit /etc/network/interfaces
* **Temporary static IP:**  
  ifconfig eth0 10.10.50.100/16 up

**18. Midnight Commander**

* **Browsing mode function keys:**
  + F1: Help
  + F2: User menu
  + F3: View file
  + F4: Edit file
  + F5: Copy
  + F6: Move
  + F7: New directory
  + F8: Delete
  + F9: Main menu
  + F10: Exit
* **Edit mode function keys:**
  + F2: Save
  + F3: Start selection
  + F4: Search/replace
  + F5: Copy selection
  + F6: Move selection
  + F7: Search
  + F8: Delete selection
  + F10: Exit

**19. Change Root (chroot)**

* **Requirements:**  
  Root privileges, matching architectures, necessary modules loaded
* **Steps:**

cd /location/of/new/root  
mount -t proc proc proc/  
mount --rbind /sys sys/  
mount --rbind /dev dev/  
mount --rbind /run run/  
cp /etc/resolv.conf etc/resolv.conf  
chroot /location/of/new/root /bin/bash  
source /etc/profile  
source ~/.bashrc  
export PS1="(chroot) $PS1"  
exit  
cd /  
umount --recursive /location/of/new/root

**20. Package Managers**

* **apt (Debian):**  
  sudo apt-get update  
  sudo apt-get upgrade  
  sudo apt-get dist-upgrade
* **pacman (Arch):**  
  pacman -Ss string  
  sudo pacman -S package  
  sudo pacman -Syu
* **yum (RHEL/CentOS):**  
  yum search <query>  
  sudo yum install <package>  
  sudo yum update

**21. Compiling the Linux Kernel (Ubuntu)**

* **Install build dependencies:**  
  sudo apt-get build-dep linux-image-\uname -r``
* **Download source:**  
  tar xf linux-\*.tar.xz && cd linux-\*
* **Configure:**  
  make menuconfig
* **Build:**  
  make
* **Result:**  
  arch/[arch]/boot/bzImage

**End of Structured Linux Command Notes**

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