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Linux Directory Commands

PWD Command - Print work directory

Command is used to display the location of the current work directory.

mkdir Command :- Make Directory

Command is used to create a new directory under any directory.

rmdir Command :- Remove directory

Command is used to delete a directory

LS Command - List

Command is used to display a list of content of directory

cd Command - change directory

Command is used to change the current directory

Linux File Commands

touch command :-

Touch command is used to create empty file. we can create multiple empty files by executing it once

cat Command :- Cat command is a multiple purpose utility in the linux system. It can be used to create a file, display content of the file, copy the content of one file to another file and more.

rm command :- rm Command is used to remove a file

CP Command :- CP cmd is used to copy a file directory

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<10> mv Command :- mv Command is used to move a file or a directory from one location to another location.

<11> rename Command :- rename cmd is used to rename files. It is useful for a renaming a large group of files.

*. Linux file content commands :-

<12> head command :- head cmd is used to display the content of a file. It displays the first 10 lines of a file.

13) tail command :- tail command is similar to the head command. The difference between both commands is that it displays the last ten lines of the file content. It is useful for reading the error message.

<14> tac Command :- tac cmd is the reverse of cat Commad, as its name specified. it displays the file content in reverse order (from the last line).

<15> more command :- more cmd is quite similar to the cat cmd, as it is used to display the file content in the same way that the cat command does. The only difference between both commands is that, in case of larges files, the more Commands displays screenful output at a time.

<16> less Commands :- less cmd is similar to the more cmd. It also includes some extra features such as 'adjustment in width and height of the terminal. "comparitively, the more Command cuts the output in the width of the terminal.

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*. Linux Users Commands

<17> Su Commands :- Su Commands provides adminstrative access to another use. In other words, it allows access of the linux shell to another user.

<18> id command :- id cmd is used to display the user ID (UID) and group ID (GID).

<19> Useradd Command :- Cmd is used to add or remove a users on a linux server.

<20> Passwd command :- Passwd Cmd is used to create and change the password from a user.

<21> groupadd command :- Command is used to create a users group

* Linux filter Commands :-

<22> cat Command :- cat cmd is also used as a filter. To filter a file, it is used inside pipes.

<23> cut Command :- cut cmd is used to select a specific column of a file. The '-d' option is used as a delimeter and it can be a space(' '), a slash(/), a hyphen(-), or anything else. And the '-f' option is used to specify a column number

<24> grep Command :- grep cmd is the most powerful and used filter in a linux system. The 'grep' stands for "global regular expression print". It is useful for searching the content from a file. Generally, it is used with the pipe.

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(25) comm command :- Command is used to compare two files or streams. By default, it displays three columns, first displays non-matching items of the first file, second indicates the non-matching item of the second file, and the third column displays the matching items of both files.

(26) sed command :- Command is also known as stream editor. It is used to edit files using a regular expression. It does not permanently edit files, instead, the edited content remains only on display. It does not affect the actual file.

(27) tee command :- Command is quite similar to the cat cmd, The only difference between both filters is that it puts standard input on standard output and also writes them into a file.

(28) tr Command :- Command is used to translate the file content like from lower case to upper case.

(29) Uniq Command :- uniq cmd is used to form a sorted list in which every word will occur only once.

(30) wc Command :- wc cmd is used to count the lines, words, and characters in a file.

(31) od Command :- od cmd is used to display the content of a file in different s, such as hexadecimal, octal, and Ascii characters.

(32) Sort Command :- Command is used to sort files in alphabetical order.

(33) gzip Command :- Cmd is used to truncate the file size. It is a compressing tool. It replaces the original file by the compressed file having '.gz' extension.

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*. File Commands

<1> ls - Directory Listing

<2> ls -al - Formatted listing with hidden files

<3> ls -lt - Sorting the Formatted listing by time modification

<4> cd dir - change directory to dir

<5> cd - Change to home directory

<6> pwd - Show current working directory

<7> mkdir dir - Creating a directory dir

<8> cat > file - places the standard input into the file

<9> more file - Output the contents of the file

<10> head file - Output the first 10 lines of the file

<11> tail file - Output the last 10 lines of the file

<12> tail -f file - Output the contents of file as it grows, starting with last 10 lines

<13> touch file - Create or update file

<14> rm file - Deleting the file

<15> rm -r dir - Deleting the directory

<16> rm -f file - Force to remove the file

<17> rm -rf dir - Force to remove the directory dir

<18> cp file1 file2 - Copy the contents of file1 to file2

<19> cp -r dir1 dir2 - Copy dir1 to dir2; Create dir2 if not present

<20> mv file1 file2 - Rename or move file1 to file2, if file2 is an existing directory.

<21> ln -s file link - Create symbolic link link to file

*. Process management :-

<1> PS - To display the currently working processes

<2> top - Display all running process

<3> kill pid - Kill the process with given Pid

<4> pkill pattern - will kill all processes matching the pattern.

<5> bg - list stopped or background jobs, resume a stopped job in the background

<6> killall proc - kill all the process named proc

<7> fg - Brings the most recent job to foreground.

<8> fg n - Brings job n to the foreground.

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*. File Permission

(1) chmod octal file - Change the permission of file to octal, which can be found separately for user, group, world by adding:
- 4 - read(r)
- 2 - write(w)
- 1 - execute(x)

*. Searching :-

<1> grep Pattern file :- Search for pattern in file
<2> grep -r pattern dir :- Search recursively for pattern in dir
<3> Command | grep pattern :- Search pattern in the o/p of a command
(4) locate file :- Find all instance of file
<5> find . -name filename :- Searches in the current directory (represented by a period) and below it, for files and directories with names starting with filename
(6) Pgrep pattern :- Searches for all the named processes, that matches with the pattern and, by default, returns their ID.

*. System Info :-

(1) date :- Show the current date & time
(2) cal :- Show this month's calender
(3) uptime :- Show current uptime
(4) w :- Display who is online
(5) whoami :- who you are logged in as
(6) finger user :- Display information about user
(7) uname -a :- Show kernel information
(8) cat/proc/cpuinfo :- CPU information
(9) cat/proc/meminfo :- Memory information
(10) man command :- Show the manual for command
(11) df :- Show the disk usage
(12) du :- Show directory space usage
(13) free :- Show memory and swap usage
(14) whereis app :- Show possible locations of app
(15) which app :- show which applications will be run by default.

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<34> gunzip Command :- Commands is used to decompress a file. It is a revesse opesation of gzip Command.

* Linux Utility Commands :-

<35> find command :- cmd is used to find a particular file within a directory. It also supports various options to find a file such as by name, by type, by date, and more

<36> locate command :- Command is used to search a file by file name. It is quite similar to find command; the difference is that is a background process. It searches the file in the database, whereas the find command searches in the file system. It is faster than the find command. To find the file with the locates command, keep your database updated.

<37> date Command :- cmd is used to display date, time, timezone, and more.

<38> cal Command :- Command is used to display the current month's calender with the current date highlighted.

<39> sleep command :- cmd is used to hold the terminal by the specified amount of time. By default, it takes time in seconds.

<40> time Command :- Cmd is used to display the time to execute a command.

<41> zcat Comnad :- Comnad is used to displayed the compressed files.

<42> df command :- command is used to display the disk space used in the file system. It displays the o/p as in the numbes of used blocks, available blocks, and the mounted directory.

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mount Command :- Command is used to connect an external device file system to the system's file system.

exit Command :- Command is used to exit from the current shell. It takes a parameter as a number and exists the shell with a return of status number.

Clear Command :- Clear Command is used to clear the termind screen.

Linux Network Commands :-

ip Command :- ip Command is an updated version of the ipconfig cmd. It is used to assign an ip address, initialize an interface, disable an interface.

. ssh Command :- ssh command is used to create a remote connection through the ssh protocol.

mail Command :- Command is used to send emails from the command line.

Ping Command :- Cmd is used to check the connectivity between two nodes, that is whether the server is connected. It is a short form of "Packet Internet Groper".

host Command :- host Command is used to display the IP address for a given domain name and vice versa. It performs the DNS lookups for the DNS Query.

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*. Compression :-

(1) tar cf file.tar file :- Create tar named file.tar containing file.
(2) tar xf file.tar :- Extract the files from file.tar
(3) tar czf file.tar.gz files :- Create a tar with Gzip Compression
(4) tar xzf file.tar.gz :- Extract a tar using Gzip
(5) tar cjf file.tar.bz2 :- Create tar with Bzip2 Compression
(6) tar xjf file.tar.bz2 :- Extract a tar using Bzip2
(7) gzip file :- Compresses file and renames it to file.gz
(8) gzip -d file.gz :- Decompresses file.gz back to file.

*. Network

(1) Ping host :- Ping host and output results
(2) Whois domain :- Get whois information for domains
(3) dig domain :- Get DNS information for domain
(4) dig -x host :- Reverse lookup host
(5) Wget file :- Download file
(6) wget -c file :- Continue a stopped download

*. Shortcuts

(1) Ctrl+c :- Halts the current command
(2) ctrl+z :- Stops the current command, resume with fg in the foreground or bg in the background.
(3) Ctrl+d :- Logout the current session, similar to exit
(4) Ctrl+w :- Erases one word in the current line
(5) Ctrl+u :- Erases the whole line
(6) Ctrl+r :- Type to bring up a recent command
(7) !! :- Repeats the last command
(8) exit :- Logout the current session.

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Linux :- Linux is an open-source Operating system. It is like Windows, Mac, Android etc.

- Linux is an open-source multi-tasking, multiuser OS. It was initially developed by Linus Torvalds in 1991. Linux OS is widely used in desktops, mobiles and mainframes etc.

Unix :- Unix is also an OS like Linux. It is an Commercial OS. It consists of three parts ① Kernel ② Shell and ③ Programs. Most of the Unix and Linux commands are similar in nature.

- Unix is a multitasking, multi-user OS but is not free to use and is not open source. It was developed by AT & T Bells Labs in 1969. By Ken Thompson.

Linux Some Variants

① CentOS ② Ubuntu ③ Redhat ④ Debian
⑤ fedora ⑥ Kali Linux

Why Linux is Better than Windows:-

① Linux is free, windows is a product of Microsoft and it requires a license key for installation. Sure you can Crack

② Linux is open source. The Linux operating system is the biggest open source project released under the GNU General public license

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*. Difference Between Linux and Windows

	Linux	Windows
(1)	Linux is open source and is free to use	(1) Window is not open source it is not use free to use
(2)	Linux file system is case sensitive	(2) Windows file system is case in sensitive
(3)	Linux uses monolithic kernel	(3) Windows uses micro kernel.
(4)	Linux is more efficient in operation as compared to windows	(4) Windows is less efficient in operations
(5)	Linux uses forward slash as path separator between directories	(5) windows uses backward slash as a path seperator
(6)	Linux is highly secure as compared to windows	(6) Windows provides less security as compared to Linux

*. Difference Between Linux and Unix

	Linux	Unix
(1)	Linux is open source and is developed by Linux community of developers	(1) Unix was not open source is developed by AT&T Bells Labs and is not open source.
(2)	Linux is free to use	(2) Unix is licensed OS.
(3)	Linux uses KDE and GNome. other GUI supported are LXDE, XFCE, Unity Mate	(3) Unix was initially a Command based os. Most of the Unix distribution now have Gnome.
(4)	Linux is used in wide varities from desktop servers, smartphones to main frames	(4) Unix is mostly used on servers work stations or PCs.
(5)	Bash (Bourne Again shell) is default shell for linux.	(5) Bourne shell is default shell for Unix
6	Ubuntu, Debian GNU, kalilinux etc.	(6) SUN OS, Solaris, SCO UNIX etc.

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* What is Linux Kernal :-

Ans Linux Kernal is low level system Software. It is used to manage the H/w resources for the User. It provides an interface for User-level interaction.

* Define shell :- It is an interpreter in Linux

* What is Bash ?

Ans BASH is a short form of Bourne Again Shell. It was replacement to the original Bourne shell written by Steve Bourne.

* Bash	DOS
① BASH Commands are Case Sensitive	① DOS Command are not case sensitive
② '/' Character used as directory Separator	② '/' Character serves as Command argument delimeter
③ '\' Character acts as an escape Character	③ '\' character server as a directory Separator.

* What is GUI

Ans GUI stands for Graphical User interface. It uses the images and the icons which are clicked by the user to Communicate with the system. It is more attractive and User friendly because of the use of the images and icons.

* What is virtual desktop :

Ans Virtual desktop is used as an alternative to minimizing and maximizing different windows on the current desktop. Virtual desktop facilitates you to open one or more programs on a clean state rather than minimizing or restoring all the needed programs.

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TOP 50 Linux Commands For DevOps Engineer

1. LS → The most frequently used command in Linux to list [List directories]
2. Pwd → Print working directories
3. cd → Change to Home directory
4. MKdir → Make directory
5. mv → Move or Rename Files
6. cp → Copy a File directory
7. touch → Create or Update files
8. cat → Display file Contents on the terminal
9. clear → Clear the terminal display
10. echo → Print any text that follows the Command
11. less → Linux command to display pages outputs in the terminal.
12. man → Access manual pages for all Linux Commands
13. Uname → Linux command to get basic information about the OS.
14. Whoami → Get the active username
15. tar → command to extract and compress file on Linux.
16. grep → Search for a String with an Output
17. head → Return the specified no. of lines from the top
18. tail → Return the Specified no. of lines from the bottom.
19. diff → Find the difference two files.
20. cmp → Allows you to check if two files are identical.
21. comm → Combines the functionality of diff and cmp.
22. Sort → To Sort the Content of a file while outputting.
23. export → Export environment variables on Linux.
24. zip → Zip files in Linux
25. Unzip → Unzip files in Linux.
26. ssh → Secure Shell Command on Linux
27. Service → Linux Command to start and Stop Services.
28. PS → Display or active process
29. Kill and Kill all → Kill active processes by process ID or name.

<30> df → Display disk file system information
<31> mount → Mount File System on linux
<32> chmod → Command to change File Permissions
<33> chown → Command for granting ownership of files or Folders
<34> ifconfig → Display network interfaces and IP addresses
<35> traceroute → Trace all the network hops to reach the destination.
<36> wget → Direct download files from the Internet
<37> UFW → Firewall Command
<38> iptables → Base Firewall for all other firewall utilities to interface with
<39> Sudo → Command to escalate Privileges on Linux
<40> apt, Pacman, yum, rpm → Package managers depending on the distro
<41> alias → Create custom shortcuts for your regularly used Commands.
<42> Cal → View a command line calender
<43> dd → Majorly used for creating bootable USB sticks.
<44> whereis → Locate the binary, source, and manual Pages for a command.
<45> top → view active Processes live with their System usage.
<46> Useradd and Usermod → Add new Users or change existing Users data
<47> passwd → Create or update password for existing users.
<48> whatis → find what a command is used for.
<49> init → Initialization

* **Keys** :- Key is used to uniquely any record or row of data from the table. It is also used to identify relationship between Tables.
ex:- ID is used as a key in the student Table because it is unique for each student. In the Person Table, Passport-No., License No. SSN are keys since they are unique for each person.

* Types of keys :-

(1) **Primary key** :- The PK is an attribute in a table that can uniquely identify each record in a Table. It is compulsory for every Table.

(2) **candidate key** :- The CK is an attribute or set of an attribute which can uniquely identify a Tuple. The PK can be selected from these attributes

(3) **Super key** :- The SK is a set of attribute which can uniquely identify a tuple. Super key is a superset of the candidate key

(4) **Foreign Key** :- The FK is a primary key from one Table, which has a relationship with another Table. It acts as a cross reference b/w Tables.

(5) **Alternate key** :- AK are those CK which are not the primary key. There can be only one PK for a Table. Therfore all the remaining CK are known as alternate or secondy key.

(6) **Composite key** :- A PK having two or more attributes is called composite key. It is a combination of two or more columns.

(7) **Artificial key** : An Artificial key is an extra attribute added to the Table that is seen by the users. It doesnot exist in the external reality but can be verified for syntax or check digits inside itself

* **Normalization** :- It is the technique of dividing the data into multiple tables to reduce data redundancy and inconsistency and to achieve data integrity.

* **Denormalization** :- It is the technique of combining the data into a single Table to make data retrieval faster.

* **Specialization** :- It is a top-down approach in which a higher level entity is divided into multiple specialized lower-level entities.
• It is used to identify the subset of an entity set that shares some distinguishing characters.

* **Generalization** : It is bottom-up approach in which multiple lower level entities are combined to form a single higher-level entity. Generalisation is usually used to find common attributes among entities to form a generalized entity. It can also be thought of as the opposite of Specialization

* **Aggregation** : Aggregation refers to the process by which entities are combined to form a single meaningful entity.

* **Normalization Types** :
① First Normal Form ② 2NF ③ 3NF ④ Boyce code NF

① Difference between Truncate and Delete :.
→ **Delete** :- It is a SQL commands that removes one or multiples rows from a table using conditions. It is used in DDL commands.
→ **Truncate** :- It is a SQL cmd. that removes all the rows from a Table without using any condition. It is used in DML commands.

*. Join:- A Join statement is used to combine data ... from two or more tables based on a common field between them

⇒ TYPES OF Joins :- ① Inner Join ② Left Join ③ Right Join ④ Full Join

① Inner Join : Its Return records that have matching values in both tables

② Left Join : Its Return all records from the left Table, and the matched records from the right Table

③ Right Join : Its Return all records from the right Table, and the matched records from the left Table.

④ Full Join : Returns all record when there is a match in either left or right table.

* 2-Tier Architecture :- The 2-Tier architecture is the same as basic client Server. In two-tier architecture, applications on the client and can directly communicate with the database at the server side.

* 3-Tier Architecture :- The 3-Tier architecture is the most popular client server architecture in which the development and maintenence of functional Processes, logic, data access, data Storage, and User interface is done independently as separate modules.

*. ACID Properties :- ACid properties are some basic rules which has to be satisfied by every transaction to preserve the integrity. These properties are:

- A → Atomicity is more generally known as all or nothing rule. which implies all are considered as one unit, and they either run to Completion or not executed at all.
- C → Consistency refers to the uniformly of the data. Consistency implies that the database is consistent before and after the transaction
- I → Isolation :- This property states that the number of the transaction can be executed Concurrently without leading to the inconsistency of the database State.
- D → Durability :- This property ensures that once the transaction is Commited it will be stored in the non-volatile memory and system Crash can also not affect it anymore.

*. Database : A database is an organized collection of Structured info or data, typically stored electronically in a Computer system. A DB is usually controlled by DBMS.

* DBMS : It is a software for storing and retrieving users' data while considering appropriate security measures. It consists of a group of programs which manipulates the database. DBMS helps users and other 3rd Party software to store and retrieve data.

* RDBMS : The software used to store, manage, query and retrieve data stored in a relational database is called a relational database management system. The RDBMS provides an interface between users and applications and the database, as well as administrative functions for managing data storage access and performance.

*. How many types of database languages are :-
Ans A DBMS has appropriate languages and interfaces to express database queries and updates. Database language can be used to read, store and update the data in the database.
⇒ Types of Database Languages :-
① DDL ② DCL ③ DML ④ TCL ⑤ DQL
① Data Definition Language [DDL] :- eg :- Create, Alter, drop, Truncate, Rename etc. All these commands are used for updating the data that's why they are known as DDL.
② Data Manipulation Language [DML] : eg :- Select, Update, Insert, delete etc These commands are used for the manipulation of already updated data that's why they are the part of DML.
③ Data Control Language [DCL] : eg :- Grant and Revoke. These commands are used for giving and removing the user access on the database. So they are part of DCL.
④ Transaction Control Language [TCL] :- eg :- Commit, Rollback, Savepoint. These are the commands used for managing transactions in the database. TCL is used for managing the changes made by DML in the database.
⑤ DQL [Data Query Language] :- DQL is used to fetch the data from the database. It uses only one command [Select]
* Select :- It is used to retrieve data from the database.
*. What are Subset of SQL
Ans The following are the four significant subsets of the SQL
① Data definition Language (DDL) :- It defines the data structure that consists of commands like Create, Alter, Drop etc
② Data Manipulation Language (DML) :- It is used to manipulate existing data in the database. The commands in this category include commands are Select, Update, Insert, etc.
③ Data Control Language (DCL) :- It controls access to the data stored in the database. The Commands in this category include Grant and Revoke.
④ Transaction Control Language (TCL) :- It is used to deal with the transaction operations in the database. The commands in this category are Commit, Rollback, Set, Transaction, savepoint etc.
* Difference between Delete and Truncate :-
Ans Delete :- The delete statement removes single or multiple rows from an existing Table depending on the specified conditions
Truncate :- The truncate commands deletes the whole contents of an existing table without the table itself. It preserves the table structure or schema.

* Functional dependency: It is the starting point of normalisation. It exists between when a relation between two attributes allow you to determine the corresponding attributes value uniquely. The functional dependency is also known as database dependency and defines as the relationship which occurs when one attribute in a relation uniquely determines another attribute. It is written as $A \rightarrow B$ which means B is functionally dependent on A.

* What are some common clauses used with select query in SQL.

Ans Some common SQL clauses used in conjunction with a select query.

- Where clause: In SQL is used to filter records that are necessary based on specific conditions.
- Order by clause: In SQL is used to sort the records based on some field(s) in ascending (ASC) or descending order (DES).
- Group By clause: In SQL is used to group records with identical data and can be used in conjunction with some aggregation function to produce summarized results from the database.
- Having clause: In SQL is used to filter records in combination with the group by clause. It is different from where, since the where clause cannot filter aggregated records.

* Schedule:- A series of operation from one transaction to another transaction is known as schedule. It is used to preserve the order of the operation in each of the individual Transaction.

* Types of Schedules: (1) Serial schedule (2) Non Serial schedule (3) Serializable schedule

(1) Serial schedule:- The serial schedule is a type of schedule where one Transaction is executed completely before starting another Transaction. In the serial schedule when the first transaction completes its cycle then the Transaction is executed

(2) Non serial-schedule:- A non-Serial-schedule which is not Serializable is is called as non-Serializable schedule. Non-Serial scheduling to verify whether the scheduling will lead to any inconsistency or not

(3) Serializable Schedule: This is used to maintain the consistency of the database. It is mainly used in the Non-Serial scheduling to verify whether the scheduling will lead to any inconsistency or not.

* Indexing:- Indexing is used to optimize the performance of a database by minimizing the no. of disk accesses required when a query processed. The index is a type of data structure. It is used to locate and access the data in a database table quickly.

* Index Structure:- (1) search key (2) Data reference

* Indexing Methods or Types

(1) Order indices
(2) Primary index — Dense index, Sparse index
(3) Clustering index
(4) Secondary index

*what is SQL:-

Ans> SQL stands for structured Query Language. It is used for storing and managing data in relational dbms. It is standard lang for RDBMS. It enables a user to create, read, update & delete relational dbs and tables