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Operating System Assignment.

Ques. 1. How to use virtual memory and file management in linux?

→. In linux, virtual memory is a critical feature that extends the physical memory (RAM) of your system by using disk space, enabling of your system to run more applications simultaneously. Here's how virtual memory works in linux and how to manage it.

Key features of Virtual Memory.

1. Swap Space.

Swap is a space on the disk that is used when RAM is full. when more memory is needed that what is available in RAM, inactive memory pages are moved to swap space to free up RAM for active processes.

2. Pagging

Paging is the process of moving data between RAM

and swap space.

3. Swappiness.

A system parameter that control the tendency of the kernel to more processess out of RAM and into swap space. The value ranges from 0 to 100 with higher values meaning more aggressive use of swap.

4. Checking swap usage.

Use swapon - show to see active swap areas. use free -h to check total RAM and swap usage.

5. Adding swap space.

Create a swap file: Allocate space on disk.

Format it: Sudo mkswap/ swapfile

Enable it: Sudo swapon/ swapfile.

6. Permanent swap:

Add the swap file to /etc/fstab to make it persist across reboots.

7. Performance Impact: &

Swap is much slower than RAM, excessive swapping can slow down the system. Optimizing swappiness and managing RAM usage can improve performance.

8. Monitoring

Regularly monitor swap usage to ensure there's enough memory for system stability. Use tools like top or htop for detailed memory monitoring.

File management in Linux.

File management in Linux includes organizing, creating, modifying, moving, deleting files and directories; managing permissions and monitoring disk storage.
Here's a comprensive guide on essential file management commands and concepts.

1. Navigation and viewing files.
   List files : ls, ls-l, ls-a, ls-lh.
   Change directory: cd / path/to directory, cd...
   (up one level), cd ~ (home directory)
   Print current directory: pwd.

2. Creating and Deleting files and directories.
   Create Directory: mkdir new-directory, mkdir- p/path/to/dir.
   Remove Directory: rmdir-empty directory, rm-r directory-home

3. Copying and moving files.

Copy files: cp soune destination.

Copy Directory: cp -r soune - directory destination - directory

move/ Rename files: mv soune destination.

4. Disk usage and monitoring.

Disk usage by Filesystem: df -h.

Disk usage of Directory: du -sh *.

5. Finding and searching files.

Create files by Name: find / path_name "filename".

6. Compression and Archiving.

Create compressed Archive: tar - czvf archive.
tar.gz / path / to / folder

Extract Archive: tar - xzvf archive for .gz.

7. Linking files.

Create sysmbolic Link: In -s / path / to / orginal / path / to / link.

Create Hard Link : In / path / to original / path / to / link.

In linux, virtual memory and file management are essential components for efficient system operation and organization together, virtual memory and robust file management capabilities give linux users a stable and flexible environment capabili allowing for efficient resource allocation, data organization, and system stability mastery of these features is key to optimizing linux system performance and working workflow.