

Operating systems L2

3. Protection and security

- protection mechanism for controlling access
- security: defense against internal and external attacks
- User mode, kernel mode
 - Kernel mode has a higher privilege.
 - Privilege escalation
 - You can give additional permissions to the user

4. Virtualization

- Make limited resources available to multiple programs
- not to be confused with emulation - anything treated as a single entity, can be accessed by many user. Eg. VirtualBox, kernel virtual machines
 - Host OS, on top of which Virtual machines run Virtual machines with OSs called Guest OSs.

The screenshot shows a Google Meet window with a presentation titled "Computing environments- virtualization". The presentation content includes two diagrams, (a) and (b), illustrating virtualization concepts. Diagram (a) shows a single process running on a kernel, which runs on hardware. Diagram (b) shows multiple processes running on separate kernels (VM1, VM2, VM3), which are managed by a virtual machine manager (VMM) running on hardware. A "programming interface" is shown between the process and the kernel in both diagrams. The Meet interface includes a "Meeting details" sidebar on the right with a chat window showing messages from participants like SHUBH MISHRA, DIVYANSHU AGRAWAL, and RAHUL MEHNDIRATTA. The bottom of the screen shows a taskbar with various applications like CSF372T3 - Dolphin, Linux cheatsheet.pdf, and L2.md - CSF372 - Visual Stu...

5. Distributed Systems

- Network Operating systems
 - Client-Server architecture used etc.
 - Peer - to - Peer , all users have same significance
 - Cloud computing
- Software as a service (SAaS)(google), Platform As a service (PAaS)(amazon)

Web based systems

- Load Balancers

Doubts

1. How frequently should we clear the cache?

Cache is smaller in size than main memory, so we need to selectively map main memory to cache, so we need to clear it multiple circumstances.

- eg. cache is full would mean that you need to clear it. This is performed by cache algorithms such as cache block algorithms

2. What is an example of spooling?

Multiple tasks can be gathered and executed in a certain order, based on the scheduling algorithms

3. Could you please explain privilege escalation?

generally done by an attacker e.g. execute a file given only read access, by using some unfair means.

Preventing this is the major jobs of the OS.

4. With regards to cache coherency why would the value of an integer vary between different caches?

each processor is having its own cache.

- a bigger problem is sliced into smaller problems for each problems
- multiple processes might access the same memory,
- so depending on the cache, it views the memory differently, so you need coherence.

5. How does the OS verify if the cache is valid?

Later studied, there's a valid bit preserved in the data, by looking at the "valid bit".

1 - valid

0 - invalid

6. What's the difference between multithreading and multiprocessing?

- I. if we are greedy for performance and we want to slice the process into several finer execution units, we make it multithreading
- II. Multiprocessing is more hardware-oriented, if the architecture has more processors

7. Are P2P systems fully interconnected

Nah

Quiz

1. c) kernel
2. d) middleware
3. c) interrupt
4. b) Systemcall
5. a) ROM
6. c) Caching
7. a) DMA
8. c) virtual memory - processes not completely in memory
9. a) 1
10. d) Firm RTOS