Exam Revision

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SOFTENG 370 T7

Exam Info

Your exam will be short answer, not MCQ. That means the exam from 2012 - 2017 aren't very useful. 2018 had a different lecturer for the first $\frac{1}{2}$ so it's not super helpful either.

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Answer

An instruction running in the kernel of a guest operating system would report that it was running in user mode.

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Answer

Hardware memory protection, interrupt processing, privileged instructions.

Which of the following statements about files is FALSE?

- All Unix files are stored on secondary storage.
- With sparse files it is possible to have the size of a file larger than the device the file is stored on.
- Executable files have different structures specific to their particular operating systems.
- Moving a file does not necessarily mean that all of the data needs to be copied then the original file deleted.

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Answer

All Unix files are stored on secondary storage. Counterexample: `tmpfs`

Which of the following statements about NFS is TRUE?

- NFS only works in a homogeneous environment with all clients and servers running the same operating system.
- Servers in NFS are dedicated to acting as file servers and cannot be used for general operations.
- NFS mounts remote directories in a similar way to the method Unix mounts drives in the directory tree.
- Remote file directories in NFS can only be mounted when a machine is booted.

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Answer

NFS mounts remote directories in a similar way to the method Unix mounts drives in the directory tree. Recall that NFS maintains a mapping of directories to remote servers that they're mounted on.

Which of the following is NOT usually considered a requirement in a language used for operating system implementation?

- It is easy to produce fast and efficient code with the language.
- The language allows access to memory locations.
- The language is compiled.
- The language is dynamic and weakly typed

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Answer

The language is dynamic and weakly typed. Counterexample: We don't usually write OSes in Javascript lol

Which of the following best describes the Confused Deputy problem?

- A program with privileges is tricked into giving those privileges to another program.
- A program with privileges is tricked into misusing its authority.
- A program with privileges gets so many requests that it loses track of which request came from which source.
- A program with privileges mistakenly prevents access to a resource which should be available.

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Answer

A program with privileges is tricked into misusing its authority. i.e. You ask the deputy (say `passwd`) to do something for you that it shouldn't (change someone else's password) and it obliges.

Order these file block allocation techniques from most efficient to least efficient for random access to file information.

"Efficient" for this task relates to the number of different block reads necessary to access the file information

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- Contiguous allocation
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- Linked Allocation

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Answer

Contiguous allocation (trivial), single-level indexed allocation (access only one index block), multi-level indexed allocation (access multiple index block), linked allocation (linked-list like).

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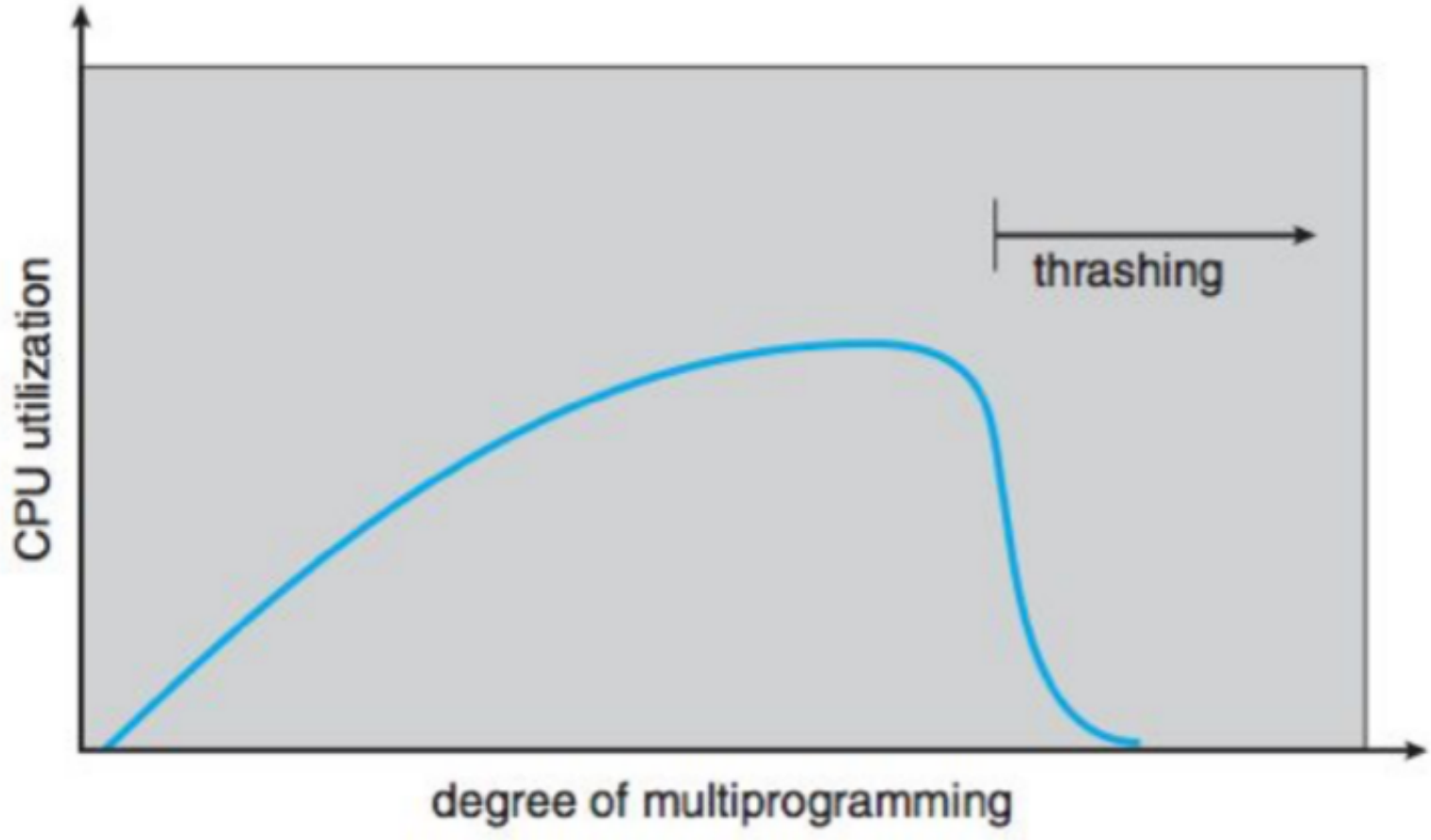
Answer

Many memory or file accesses in a small period of time are close together. This is important for the efficiency of virtual memory (loading in memory from swap), read-ahead in file data and in distributed file systems.

Which of the following statements best describes what is being depicted in the figure?



Cont.

- Running too many processes can cause thrashing in the virtual memory system which means that very little work can get done by any process.
- Increasing the amount of multiprogramming will increase the CPU utilization until the file system can no longer deal with the read/write requests and the hard drives crash.
- Increasing CPU utilization allows the number of processes to increase until a limit is reached and most of the processes finish.
- When thrashing begins the amount of free CPU time goes up dramatically this means that more processes can now be scheduled.
- All of the above.

Answer

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