SOLUTIONS TO THE THIRD 6360 QUIZ

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Fall 2016

First question

- A system of physical clocks consists of two clocks, namely, one that is ***fast*** and gains ***one minute every hour*** and another that is neither fast nor slow.
- Assuming that the clocks are managed by Lamport's physical clock protocol, what will be the time marked by each clock at ***4 pm*** given that:
  - Both clocks indicated the correct time at ***noon***
  - The processors on which the clocks resides stopped exchanging messages at ***3pm***
  - Message transmission delays are negligible.

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noon	12:00 pm	12:00 pm

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1:00 pm	1:01 pm	1:01 pm
2:00 pm	2:02 pm	2:02 pm
3:00 pm	3:03 pm	3:03 pm

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noon	12:00 pm	12:00 pm
1:00 pm	1:01 pm	1:01 pm
2:00 pm	2:02 pm	2:02 pm
3:00 pm	3:03 pm	3:03 pm
4:00pm	**4:04 pm**	**4:03 pm**

Second question

- For what purpose does SSH use HMAC-SHA?

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  - ***To verify the integrity of messages***
    - ***SHA guarantees that any message tampering will affect the SHA***

Third question

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- What do we mean by that?
  - ***Only the leader can issue log updates***

Fourth question

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  - ***It will sometimes leave the service in a state where the loss of one server will result in a data loss***

Fifth question

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  - The best chunk selection policy is ***rarest first***

Sixth question

- Consider a RAID level 5 array with 10 disks per parity stripe.
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  - ***TEN percent of the array will be occupied by parity data.***

Seventh question

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  - ***TWO disk accesses per write operation.***

Eighth question

- Why can log-structured file systems ***recover faster*** after a crash than traditional file systems?
  - ***Since all recently modified blocks are at the tail end of the log, we do not need to check whole file system for inconsistencies***

Ninth question

- In a journaling file system, when can log entries be ***purged*** from the log?

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- In a journaling file system, when can log entries be ***purged*** from the log?
  - ***Log entries can be purged from log as soon as the buffer blocks they have modified are written back to disk.***

Tenth question

- What kind of ***dependency information*** does ***soft updates*** maintain?

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- ***They keep track of which i-node blocks must be written before or after which directory entry.***