

Solution to the Fifth COSC 6360 Quiz for Fall 2013

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First question

- What is the purpose of allocating several randomly selected *virtual nodes* to each FAWN node?

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 - *To spread the workload of a failed physical node among the successors of each virtual node.*

Second question

- FAWN in-memory hash tables only contain 15 bits of each 160-bit key.
- What is the *main advantage* of this approach?
- What is its *main disadvantage*?

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- FAWN in-memory hash tables only contain 15 bits of each 160-bit key.
- What is the *main advantage* of this approach?
 - *Hash tables occupy less RAM.*
- What is its *main disadvantage*?
 - *False matches will cause extra accesses to the data store.*

Third question

- How does FARSITE prevent a *single malevolent user* from destroying *all replicas* of someone else's file?

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- How does FARSITE prevent a *single malevolent user* from destroying *all replicas* of someone else's file?
 - *FARSITE ensures that file replicas are stored on computers controlled by all least two different users.*

Fourth question

- What do the authors of Zyzyva mean when they state that their system uses *speculation*? (10 points)

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- What do the authors of Zyzyva mean when they state that their system uses *speculation*?
 - *Zyzyva performs some operations on the expectation they will soon be validated and can otherwise be undone.*

Fifth question

- How does the *paravirtualization* approach used by Xen differ from other virtualization approaches?
- According to Xen's authors, what is the main advantage of the approach?
- What is its main disadvantage?

Fifth question

- ❑ *Xen exports a virtual machine interface that requires virtual machines not to contain instructions that can be executed in both privileged and user mode and produce different results*
- ❑ *It is much faster.*
- ❑ *It requires modifying the kernel of the guest OS.*

Sixth question

- What is the purpose of *dynamic subtree partitioning* in the Ceph metadata cluster?

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- What is the purpose of *dynamic subtree partitioning* in the Ceph metadata cluster?
 - *Dynamic subtree partitioning dynamically distributes the metadata workload among the metadata servers.*

Seventh question

- How does FARSITE implement *read access controls*?

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- How does FARSITE implement *read access controls*?
 - *FARSITE encrypts all its data file with file-specific key.*
 - *It controls read access by providing authorized users by the encryption key of the file they want to access.*