

SAMPLE UIUC SYSNET QUAL QUESTIONS

Note: this list is intended to give you a rough idea of what the questions would be like. It is by no mean comprehensive; in fact after reading this list you will see that your Qual committee could ask you almost anything (one guy I know was asked how to measure time in a space shuttle). The best way to prepare, in my opinion, is to get familiar with basic concepts and ideas before spending time for more technical and implementation related details. It might be ok to not know how to implement A, but it is very bad to not know what A is or why A even exists. Also, remember to pay more attention to the papers which belong to specialized areas of your committee members.

Good luck with your exam. It is painful for sure, but I learnt a lot from the preparation process (and I made a lot of friends too). You will pass; you just have to try hard enough!

- Compare EDF and RM.
- Between EDF and RM, which one is simpler to implement?
- Provide an example of imprecise computation.
- What is a DHT?
- In Chord, how are nodes organized?
- What is the cost of lookup?
- How is the reading list paper on DTN different from the paper you presented? What experimental setup they use? Do they use the same bus-network?
- How can you get consensus?
- What is DTN? what are they method(Redundancy)?
- What is a DTN?
- Give an example of a DTN?
- How does a DTN work?
- What is trusted computing?
- How does Chord distribute the keys among the nodes?
- Describe what is Xen?
- What is a shadow table?
- Why do we need logical time stamps but not physical time?
- What is safety and liveness?
- Can predicate checking detect all bugs?
- Why do we need pages in Operating Systems?
- What is the difference between authentication and authorization?
- What is TCP friendliness?
- What is causality?
- What is snapshot?
- How to find global snapshot?
- What if process fail while calculating global snapshot?
- What is message lost?
- What is delay capacity tradeoff?
- Do you know what will be capacity bound if according to gupta-kumar, we exercise power control [from reference papaer]
- What is the capacity bound if no power exercise?
- What is VMM?
- What is microkernel?
- Compare VMM and Microkernel
- What is Exokernel?

- What is TVA? Define TVA?
- What is capability and its characteristics?
- Define imprecise computation.
- Is there an implicit assumption in their objective function?
- How would you adapt the algorithm to relax this assumption?
- Describe what the authors mean by Compositional Real-Time Guarantees.
- What is RM and EDF?
- How do each assign the priorities?
- Describe the Happen Before relationship.
- What is compositional real-time guarantee?
- Why do we need composition?
- What is distributed scheduling?
- What is focused, bidding, random, flexibility algorithm?
- Which one performs better in which case?
- What does "epidemic routing" mean?
- How is "epidemic routing" done?
- What are the goals of "epidemic routing"?
- When can you use "epidemic routing"?
- When can you not use "epidemic routing"?
- Design a chord network.
- What are the problems with chord?
- How can we solve the problems of Chord?
- Chord?
- Inode?
- Draw a Chord ring.
- How to measure the End-to-End available bandwidth?
- What is a DTN?
- What is Anycast? What is AODV?
- Where do you want to use AODV?
- What is BGP?
- What is in the BGP update packet?
- How does BGP prevent loops?
- What is link state?
- How link state prevent loops?
- When we use TTL?
- What is stress-factor of chord? How to improve it?
- How to incorporate locality in chord?
- Why do we want to use chord?
- Compare chord routing with internet routing.
- How to calculate end-to-end bandwidth?
- Does it calculate path bandwidth or link bandwidth?
- How can you calculate link bandwidth? [have you read one of the references of this paper]
- Describe consensus.
- Describe byzantine fault.
- Describe source selectable route scalability.
- How can we use the result of end-to-end bandwidth result?
- Use of end-to-end bandwidth?
- How to make OS reliable? Is it possible.
- Can you make the Operating System more reliable?
- What changes would Asbestos make to your 2 papers.
- Can you make OS reliable and secure?
- What is RM and EDF? Difference? Which is more practical?

- Define reliability.
- Define robustness
- What is software reliability?
- What is hardware reliability?
- Define robustness
- Define reliability?
- How are Robustness/Reliability related?
- Can a system be robust and not reliable or vice-versa?
- Explain DoS limiting network architecture.
- What is Model checking?
- When is Model Checking good?
- When shouldn't you use Model Checking?
- What is the main idea of Asbestos?
- What are they trying to do in Asbestos?
- What is event process in Asbestos?
- Does Asbestos need hardware?
- I-node
- What happens when a node joins in Chord?
- How does a node get its ID in Chord?
- In Chord, what happens when someone leaves?
- In TVA, what happens when someone captures the capabilities?
- What security assumption does TVA relax?
- What is role based access control?
- How to manage RBAC (domain)?
- What is imprecise computation?
- What are they trying to do with imprecise computation?
- How are they doing the imprecise computation?
- Explain the TVA protocol.
- What if the return packet from the receiver follows a path (to the sender) that is different from the path that the request packet takes?
- Lamport clock?
- DoS attack in JFK?
- Who introduced the concept of virtual machine and when?
- In Terra, what is trusted computing?
- How does Terra provide trusted computing?
- What is the basic support Terra requires?
- Can you describe how JFK makes the three properties: efficient, DoS resistant and secure?