

AST: Peer-to-Peer Systems

Supervisors' guide 2005

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These are notes for supervisors accompanying material for the 5 lectures on p2p in advanced systems topics, including the 2 example questions. There was no prior course, so we offer these as examples of the type of question that might get asked on this material - the nature of the p2p material at the moment is largely taxonomic, so obviously questions on it are more about knowledge and understanding than on applications of knowledge and skills.

The three example questions are in:

<http://www.cl.cam.ac.uk/Teaching/2002/AdvSysTopics/p2p-q.pdf>

plus there's the last 2 years' exam question:

<http://www.cl.cam.ac.uk/tripos/papers.html>

- q0** Linking all the parts of AST, we ask them to think about hashing, caching and concurrency in the context of p2p!
- q1** Decentralisation - the theme here is contrast with classic (e.g. client server) systems, and anonymity, routing and so on. The lack of a single point of failure, attack, charging, key distribution and so on are all plus points. The subtle point is that all the same things are minus points.
- q2** Structured and Unstructured P2P - How come most people use unstructured, despite the "better" performance of structured P2P? Need to understand what prime workload is (search rather than lookup, download throughput, rather than latency to start!).
- q3** Performance of self-organisation - the theme here is the oft-claimed scaling properties and emergent behaviour of p2p are not necessarily as good as classical systems. However, they need to be studied under dynamic use scenarios, rather than merely analysed.
- q4** SuperCAN, Hetero-Chord?

Take a look at the optimisations introduced into MS Pastry in the paper discussed in the final lecture, to reduce the costs of failure detection and route maintenance traffic.

Could similar algorithms be used in Chord or CAN?

<http://www.cl.cam.ac.uk/Teaching/2005/AdvSysTopics/>

background There's 2 papers linked from there which provide background reading on p2p. Also, I reference the book in the syllabus, although that is fairly out of date now.

See also "White Paper: A Survey of Peer-to-Peer File Sharing Technologies", Athens University of Economics and Business The eBusiness Centre:

http://www.eltrun.aueb.gr/whitepapers/p2p_2002.pdf