Distributed Systems Unassessed Tutorial 6

Peer to Peer Networking

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1) What are the main guarantees that users expect conventional servers to offer?

2) The guarantees offered by conventional servers may be violated by:
   a) physical damage to the host;
   b) errors or inconsistencies by system administrators or their managers;
   c) successful attacks on the security of the system software;
   d) hardware or software errors.

   Give two examples of possible incidents for each type of violation. Which of them could be described as a breach of trust or a criminal act? Would they be breaches of trust if they occurred on a personal computer that was contributing some resources to a peer-to-peer service? Why is this relevant for peer-to-peer systems?

3) Explain how the use of the secure hash of an object to identify and route messages to it ensures that it is tamper-proof. What properties are required of the hash function? How can integrity be maintained even if a substantial proportion of peer nodes are subverted?

4) It is often argued that peer-to-peer systems can offer anonymity for (a) clients accessing resources and (b) the hosts providing access to resources. Discuss each of these propositions. Suggest a way in which the resistance to attacks on anonymity might be improved.