TLT-2626 "P2P networks": examination questions

14.12.2010
Dmitri Moltchanov
No calculators allowed.
Please, answer in order of questions.

1. What is an overlay network? Does it include routers? What are the edges in the overlay?
2. List at least four different applications that are naturally suitable for P2P architectures.
3. What is the difference between pure and hybrid P2P systems? Give examples of pure and hybrid P2P files sharing systems.
4. Explain how Napster works. Is it a pure or hybrid P2P system?
5. What are the key features of Freenet compared to traditional P2P file sharing systems like Napster, Gnutella, eDonkey2000, and BitTorrent?
6. What are the benefits of using swarming techniques for content distribution?
7. What is the difference between unstructured and structured overlays? Give examples.
8. What DHT algorithms do you know? What structures (geometries) do they use?
9. Consider a DHT with a mesh overlay topology (that is, every peer tracks all peers in the system). What are the advantages and disadvantages of such a design?
10. Consider a circular DHT topology (with no shortcuts). What are the advantages and disadvantages of such a design?
11. In BitTorrent, suppose that Alice provides chunks to Bob throughout a 30-second interval. Will Bob also necessarily return the favor and provide also chunks to Alice in this same interval? Why or why not?
12. Consider a new peer Alice that joins BitTorrent without possessing any chunks. Without any chunks, she cannot become a top-four uploader for any of the other peers, since she has nothing to upload. How then will Alice get her first chunk?
13. List at least three P2P streaming systems that are based on mesh-based overlay and are using chunk-based stream partitioning. What is the main weak point in these systems?
14. In case of firewall blocking of direct UDP in Skype how packets are exchanged?
15. What is the principal difference between 2nd and 3rd generations of VoIP systems?
16. What are the main strategies for managing P2P traffic?
17. Why do we need Deep Packet Inspection (DPI)?
18. Why P2P technology can be beneficial for social networking services?