T-110.5111 Computer Networks II - Advanced Features

Exam 17.02.2015
No auxiliary material (books, notes, computers, etc.) allowed
Each question is worth 2 points
Keep your answers brief and to the point and justify your answers.
Duration 3h
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1. What are the main advantages of Software Defined Networking over "traditional" networking?

2. Any wireless communication technology needs to somehow avoid co-channel interference caused by several transmitters sharing same spectrum in same area. Let us call such a solution *channel access*. How does channel access differ between Wi-Fi and cellular networks (3G and/or LTE)? Just outline the main difference(s).

3. Give two examples of how currently used Internet applications try to improve the quality of experience that they provide to the user.

4. Your boss tells you to design and deploy a Wi-Fi network for the company's office. Which are the most important things (give at least two) that you need to consider and why?

5. What happens (and why) when you run a file sharing application that downloads and uploads data over several simultaneous TCP connections, such as BitTorrent, and you browse the web at the same time using the same computer? Assume that all the applications use TCP Reno. How could the situation be improved (besides by closing the file sharing application)?

6. Explain the fundamentals of the congestion control in the Internet, i.e., where it is done and how (no protocol details, just the main principles).

7. Discuss at least two major technical aspects of IEEE 802.15.4 and compare them with those of Bluetooth.

8. Describe (at least) one thing that a mobile app developer (note: you cannot change the underlying system) can do to reduce the smartphone's energy consumption caused by wireless communication. Explain also why and when (if not always) that technique reduces the energy consumption.

9. What is bufferbloat and how could it be avoided (describe at least one way)?

10. You are hired as consultant to design a datacenter network for a company. Name and justify three factors that you consider to be the most important ones when making design decisions.