Innopolis University | Distributed Systems | Fall 2016

Reading Questions 3 | Due: Nov 4, 2016

Readings:

- **[DS]** Chapter 4. Distributed systems: principles and paradigms, Andrew S. Tanenbaum, Maarten Van Steen

Questions:

1. How are the OSI model layers mapped to the adapted (middleware-centric) reference model? Discuss in terms of functionality.
2. Give some examples of general-purpose protocols, which belong to the middleware layer. What types of distribution transparency do they provide?
3. Give some examples of systems evolving from combining persistent/transient, synchronous/asynchronous and discrete/streaming communication. Which combination corresponds to RPC?
4. Can we simply use pointers as parameters in RPC calls without extra care? Why?
5. In multicast RPC, should the client wait for all responses? Why?
6. Consider implementing an application using RPC on top of streams (TCP) and datagrams (UDP) sockets, respectively. What would be your main challenge?
7. What are the differences between ZeroMQ and Berkeley (traditional) sockets? What is the side effect of asynchronous connection-oriented communication? What are the main communication patterns supported by ZeroMQ?
8. What is the role of the message brokers? Why/when are they needed?