**ITMD: 511 Application Development Methodologies**

**Chapter 17:** Distributed SWE

**Exercises**

17.1 What do you understand by “scalability”? Discuss the differences between scaling up and scaling out and explain when these different approaches to scalability may be used.

17.2. Explain why distributed software systems are more complex than centralized software systems, where all of the system functionality is implemented on a single computer.

17.3. Using an example of a remote procedure call, explain how middleware coordinates the interaction of computers in a distributed system.

17.4. What are the different logical layers in an application with a distributed client–server architecture?

17.5. You have been asked to design a secure system that requires strong authentication and authorization. The system must be designed so that communications between parts of the system cannot be intercepted and read by an attacker. Suggest the most appropriate client-server architecture for this system and, giving the reasons for your answer, propose how functionality should be distributed between the client and the server systems.

17.6. Your customer wants to develop a system for stock information where dealers can access information about companies and evaluate various investment scenarios using a simulation system. Each dealer uses this simulation in a different way, according to his or her experience and the type of stocks in question. Suggest a client–server architecture for this system that shows where functionality is located. Justify the client–server system model that you have chosen.

17.7. Using a distributed component approach, propose an architecture for a national theater booking system. Users can check seat availability and book seats at a group of theaters. The system should support ticket returns so that people may return their tickets for last-minute resale to other customers.

17.8. What is the fundamental problem with a two-tier client–server approach? Define how a multitier client–server approach overcomes this.

17.9. List the benefits that a distributed component model has when used for implementing distributed systems.

17.10. Your company wishes to move from using desktop applications to accessing the same functionality remotely as services. Identify three risks that might arise and suggest how these risks may be reduced.

**References**