COSC2737 IT Infrastructure and Security

Assignment 2 (20%)

Task 1 (10 marks)

1. How can quality of the CRC checksums impact the performance of an IT service? What measures are taken to handle the errors to ensure optimal system performance? (3 marks)

2. Explain the processing that occurs within a router. How it determines whether a packet should be sent internally or externally to a (sub)network? (3 marks)

3. Referring to the figure below, explain how to separate the higher layer protocols and the lower layer protocols. (2 marks)

4. How the transport layer and network layer complements each other to provide data transmission between a service provider and the clients? (2 marks)
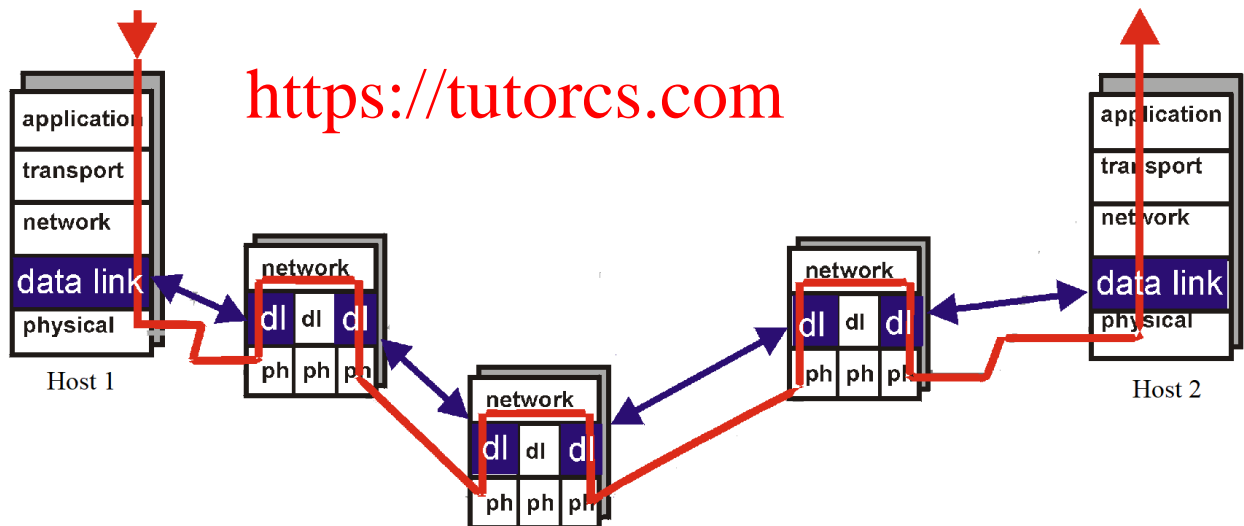

Figure 1 TCP/IP layered structure for data transmission

Task 2 (10 marks)

Optus customer database was hacked in September 2022, as a result, 10 million customers' data was stolen, including names, birthdates, home addresses, phone and email contacts, passport or driving licence numbers. Media says that payment details and account passwords are not compromised.

https://www.bbc.com/news/world-australia-63056838

Investigate the data from Optus customers, and discuss the following questions:

1. Discuss how a password can be hacked? Explain how a strong password works for prevention of identity fraud in online applications? What additional authentication methods do banks use to protect online payments? (3 marks)

2. Provide an example of the potential consequence of a phone and email being hacked? What advice can you give (other than a strong password) for preventing to be a victim of cyberattack. (2 marks)

3. When you register an account with Optus, names, birthdates, home addresses, phone and email contacts, passport or driving licence numbers will be stored in the backend server. Write an essay in less than 400 words to include: (5 marks)

   • Explain the process and list three technologies/protocols associated with user registration (start from clicking the registration page until the data being stored at the backend server).

   • How your identity is authenticated when you request a service? How a hacker may gain access to your account?

   • How the data from all the registered users is managed? What technology can help to prevent identity theft? How does this technology work?