Mid Semester Assignment
Course: - Distributed Computing

Deadline: - Mentioned on SIC   **Marks: - 30**

Program: - MS (CS)   **Dated: 20 April 2020**

Student Name: <u>Aqeel Khan</u>   **Student ID#:**   <u>5953</u>

Class and Section: <u>MS CS</u>

Question1: Provide an example of a modern Distributed System not discussed in the course; discuss how this system solves certain challenges by employing distributed architecture.   **(5)**

Ans :   <u>**Example of a modern Distributed System:**</u>

- Intranets, Internet, WWW, email.
- Telecommunication networks: Telephone networks and Cellular networks.
- Electronic banking,

   <u>**Challenges by employing in distributed architecture.**</u>

- The distributed computing architecture is the method of communicating and coordinating work among concurrent processes. Through various message passing protocols, processes may communicate directly with one another, typically in a master/slave relationship.

Question2: Among the trends of Distributed Systems discussed in C1-Lec2, which trend in your opinion will be most dominant in the future and why?   **(4)**

Ans :   The trends of Distributed Systems which are will be most dominant in the future is Pervasive networking and the modern Internet coz Internet Service Providers (ISPs) are companies that provide broadband links and other types of connection to individual users and small organizations, enabling them to access services anywhere in the Internet.

Question3: **Among the challenges of Distributed Systems discussed in C1-Lec2, which problem in your opinion will accompany distributed systems into the future and why?**   **(3)**

Ans :   The problem found in distributed system are:

- Communication synchronization
- Deadlock problem
- Power failure
- And the opinion will accompany distributed systems into the future is to provide a range of cloud services, including high-performance computing capabilities, mass storage (data centres), and richer application services such as web search.

Question4: **The design of distributed systems can be described and discussed in three ways i.e Physical Model, Architectural Model and Fundamental Model. Describe the example of distributed system in Question1 with respect to these three models.**
                                                                                      (5)

Ans: **Example in term of Fundamental Model:**

Description of properties that are present in all **distributed** architectures. Issues dealing with the. interaction of process such as performance and timing. of events.

Example in term of Physical Model:

It is a representation of the underlying hardware elements of a distributed system that abstracts from specific details of the computer and networking technologies employed.

Example in term of Architectural Model:

Its distributed system is concerned with the placement of its parts and the relationships between them**.**

Question5: **What is the purpose of Inter Process Communication (IPC) in distributed systems? Given the choice which protocol out of UDP and TCP will you use for your own distributed system and why?**   **(5)**

Ans: **Inter Process Communication (IPC) in distributed systems**

Inter-process communication or inter process communication (IPC) refers specifically to the mechanisms an operating system provides to allow the processes to manage shared data. Many applications are both clients and servers, as commonly seen in distributed computing.

- Used TCP in distributed system because transmission control protocol (TCP) distributed systems services (DSSs) on ClearPath MCP systems and to use the TCP services provided by the DSS. It include File Transfer Protocol (FTP), Telnet, Domain Name Services (DNS), and Time Synchronization.

Question6: **The following are some of the threats and attacks on Distributed Systems. Provide potential solutions as how may be these threats and attacks be mitigated?** **(8)**

1. **Leakage**
2. **Tampering**
3. **Vandalism**
4. **Eavesdropping.**

Ans: **Leakage:**

Leakage occurs in different components of the system including transmission and distribution mains, service connection lines, valves, joints, and fire hydrants. They provide an overall picture of the distribution system efficiency and water losses and identify areas of the system experiencing excessive leakage.

Tampering:

Tamper detection apparatus for an electric meter installed at a facility supplied power through an electrical distribution system comprising an electric meter monitoring electricity usage at the facility and including connection means for connecting the meter into a receptacle installed at the facility.

Vandalism:

Vandalism means destructive action. It is a hateful and deliberate defacement/destruction of somebody else's property or national assets like the high-voltage transmission power lines, transmission towers and distribution transformers, etc.

Eavesdropping:

An eavesdropping attack, which are also known as a sniffing or snooping attack, is an incursion where someone tries to steal information that computers, smart phones, or other devices transmit over a network.