Tutorial 1

Question 1.1: Give five types of hardware resource and five types of data or software resource that can usefully be shared. Give examples of their sharing as it occurs in practice in distributed systems.

Answer:

* Five types of hardware resource:

+ Printer: takes electronic data stored on a computer or other device and generates a hared copy of it.

+ Screen network windows system: allow processes in remote computers to update the content of the local windows.

+ CPU: multiple computers can share their CPU processing power to collectively handle large-scale computations.

+ Memory: sharing involves multiple machines pooling their memory resources to provide a larger virtual memory space. This is utilized in distributed caching systems, where data is cached in memory across multiple nodes to improve data access and reduce latency.

+ Network bandwidth: share network bandwidth to optimize communication between nodes.

* Five types of data/software resource:

+ Database: share data across multiple nodes, providing improved data availability and fault tolerance.

+ Web page: the website uses a CDN (Content delivery networks) to distribute its content across multiple servers located in different geographical regions.

+ Object: There are unlimited possibilities to sare objects in distributed systems.

+ Distributed file system: share data across multiple machines, providing a unified file storage interface, like Hadoop HDFS and GlusterFS.

+ Virtual Machines (VMs): allow the sharing of computing resources and software dependencies. This aids in isolating applications and services while efficiently using hardware resources.