# IQRA National University Peshawar

## Department of Computer Science

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**Course: Distributed Computing**

**MSCS 2017-18**

**Department of Computer Science**

# Important Instructions:

1) **Open this MS-Word document and start writing answers below each respective question given on page 2.**
2) **Answers the question in the same sequence in which they appear.**
3) **Provide to the point and concrete answers. Some of the questions are open ended and therefore must be answered using your own opinion and thoughts but backed with logical reasons.**
4) **First read the questions and understand what is required of you before writing the answer.**
5) **Attempt the paper yourself and do not copy from your friends or the Internet. Students with exactly similar answers or copy paste from the Internet will not get any marks for their assignment.**
6) **You can contact me for help if you have any doubt in the above instructions or the assignment questions.**
7) **All questions must be attempted.**
8) **Do not forget to write your name, university ID, class and section information.**
9) **Rename you answer file with your university ID# before uploading to SIC.**
10) **When you are finished with writing your answers and are ready to submit your answer, convert it to PDF and upload it to SIC unzipped, before the deadline mentioned on SIC.**

**Question1:** **Discuss how the MMOG's as a Distributed System solves certain challenges due to its distributed architecture.**                                   **(6)**
**Solution:**

**Distributing System:**
It is a collection of indefindent computer inter connected via network capable of collaborating on task.

**A massively multiplayer online game (MMOG's)**

A massively multiplayer online game (MMOG, or more commonly, MMO) is an online game with large numbers of players, often hundreds or thousands, on the same server. MMOs usually feature a huge, persistent open world, although some games differ. These games can be found for most network-capable platforms, including the personal computer, video game console, or smartphones and other mobile devices.

MMOs can enable players to cooperate and compete with each other on a large scale, and sometimes to interact meaningfully with people around the world. They include a variety of gameplay types, representing many video game genres.

## Distributed Architecture:

It deals with the organization of component across the network of the computer and their interrelationship.
We have different Architecture model
Client server model and pear to per server model.

## Major challenges of distributed system.

1. Heterogeneity  2. Transparency   3. Openness 4. Concurrency 5. Security 6. Scalability 7. Failure handling.

We can say that massively multiplayer online game project  is the main challenge of distributed system technology because it requires fast response time to maintain the user experience of the game.

And other challenges include spreading the event to many players in real time, and maintaining a consistent view of the shared world.

Clustered file systems can provide features like location-independent addressing and redundancy which improve reliability or reduce the complexity of the other parts of the cluster. Parallel file systems are a type of clustered file system that spread data across multiple storage nodes, usually for redundancy or performance. A clustered file system is a file system which is shared by being simultaneously mounted on multiple servers. There are several approaches to clustering, most of which do not employ a clustered file system (only direct attached storage for each node).

**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?                    (6)

## Solution:

**My opinion:** Smartphone, tablets, laptop, mobile and ubiquitous computing will be the most dominant feature because devise technology in wireless networking have led increasingly to the integration of small and portable computing devices into distributed systems. Nowadays people like to use small and smart and portable devises as compared to the large non portable devices.becuse of the space of particular and time consume also the main issue now a day.

**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?                                                                                (6)
## Solution:

**My opinion:** The Main is Security, Security is the biggest challenge of distributed system because most of the resources used by the users in distributed system are open and can be easily accessible to any end user which comes to the lack of security. To answer this issue a lot of security practice is required in order to overcome this security lap.

**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. (6)**

**Solution:**

**Physical Model:**

This model we watch such as, A physical model is a representation of the underlying hardware elements of a distributed system.
That abstracts from specific details of the computer and networking technologies employed.
Hardware and software components located at networked computers communicate and coordinate their actions only by passing messages
Very simple physical model of a distributed system

**Design of distributed systems:**

The Designing of Distributed Systems, Distributed systems enable different areas of a business to build specific applications to support their needs and drive insight and innovation. While great for the business, this new normal can result in development inefficiencies when the same systems are implemented multiple times.
System those are intendant for use in real world environment should be design to function correctly.

**Architectural Model:**

The Architecture model is based on Architectural style. The architecture model is varies hardware and software Architecture exit that are usually used for Distributed computing environment.
Lower level, we interconnect here multiple number of CPU.
Upper level, we interconnect proses running on those CPUs.

Example is the 3 tier Architecture, Tightly coupled Architecture, client server model and peer to peer model.it show how the system is implement and design.

**Fundamental model:**

The fundamental model is the model which deals with the communication that can effected by delays, failure in security attack some model.

Based on some fundamental property such as characteristics, failures, security.
Example of fundamental model is interaction mode-------→ Performance
Failures models-------→Specification of fault
 And security model-------→  possible threads.
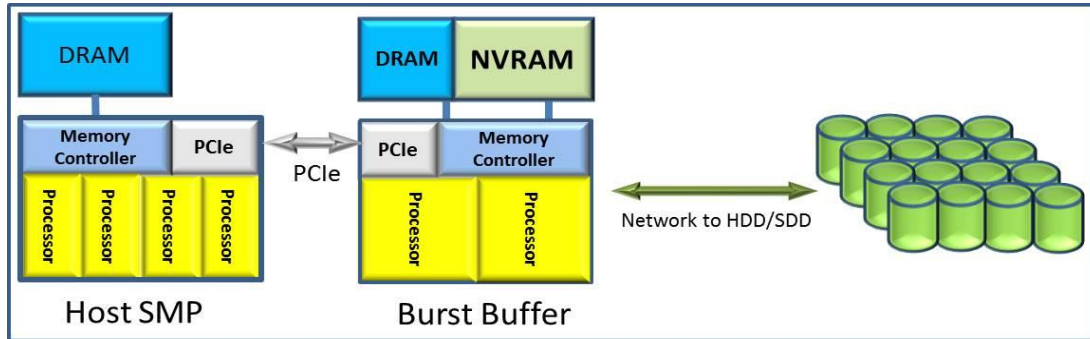


A tier of solid-state burst buffers is integrated into the storage system to absorb application I/O requests. This storage system is designed for use by large-scale HPC (high performance systems). Enhancements to the CODES of storage system simulator are done to enable burst buffer simulations.

**Question5:** For **the purpose of Inter Process Communication (IPC) in distributed systems, in what situation you will use UDP and TCP and why?**                (6)

**Solution:**
 **Inter Process Communication (IPC):**
It is the mechanism by which two or more process communicates with each other through message passing mechanism without using shared addressed space.
- IPC mean how two process are communicate each other .
- IPC can perform by 2 methods.
  1. Sharing of data (memory).
  2. Message of passing mechanism.

The process of exchanging the data between two or more independent process in a distributed environment is known as **Inter Process Communication (IPC)**. Inter Process communication on the internet provides both Datagram and stream communication. If we want to exchange an ordered sequence of messages over an unreliable channel that drops, duplicates and reorders messages, TCP is the best option for such situation, UDP is a very thin layer on top of IP, furthermore in UDP messages can be dropped and corrupted which is not good for distributed communication system. So for the above mentioned reason I will prefer to use TCP for my Distributed system.

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