**Arab Academy For Science and Technology & Maritime Transport**

**College of Engineering & Technology**

**Computer Engineering Department**

**EXAMINATION PAPER – Week 7**

Course Title: Distributed and Parallel Systems

Course Code: CC529

Date: Thurs. Nov, 12-2015 Lecturer: Dr. Manal Helal

Time allowed: 90 mins Start Time: 10:30 a.m.

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| --- | --- |
| Student's name: | Reg.#: |

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| **Question #** | **Marks** | |
| **Available** | **Actual** |
| DS Architecture | 5 |  |
| Process | 5 |  |
| Communication | 5 |  |
| **Total** | **20** |  |
| **Lecturer** | Name: Dr. Manal Helal | |
| Signature: | |
| Date: | |

ALL MCQ are worth 1 mark each.

**MPC6/1-1**

**DS Architecture [6 points]**

**1) Discuss Distributed Systems Goals and the various architecture styles.**

Ans:

Any valid Discussion for the four goals:

1. Making Resources Accessible

2. Distribution Transparency

3. Openness

4 Scalability

**Process [4 points]**

**2) What is the basic difference between kernels managed threads and a user space managed threads?**

Ans:

Any discussion that include these basic differences:

|  |  |  |
| --- | --- | --- |
|  | User-Space | Kernel |
| External Event Handling | Kernel will block the process | Kernel will block the thread and schedule another thread probably from the same process |
| Efficiency | Extremely Efficient | Low Efficiency |

**3) Discuss methods to achieve distribution transparency in a client/server interaction.**

Ans:

Location Transparency requires a convenient naming system and name resolution and rebinding mechanisms. Examples are:

* Binding using a daemon or a super-server as a single access point. The switch will become a bottleneck. Use TCP handoff as a solution.
* Several Access points using DNS to resolve to each one. But failure will not be transparent, and multiple attempts by the client will be required.
* Use mobility support for IP version 6 (MIPv6), to have a home address for a server that is stored at the client that routes to the home agent.

**Communication [10 points]**

**4) What are the basic differences between RPCs and MPI?**

Ans:

Mainly RPCs are blocking, and MPI provide several levels for blocking, from fully blocking to non-blocking at all. Both require transient communications.

**5) Discuss how Message Queueing solves RPCs communication limitation.**

Ans:

RPCs are transient, and Message Queueing is Persistent, a discussion of the requirements for Persistent is required, such as message queues, basic functions: Put, Get, Pull, Notify, and sending methods.

**6) Why is stream communication different from discrete communication? What are the extra specifications this type of communication requires?**

Ans:

The basic difference is that timing plays a crucial role in stream communication, and temporal relationships between data items are fundamental. The extra specification to exchange time-dependent information such as audio and video streams are:

* maximum end-to-end delay in discrete communication and we need a maximum and minimum end-to-end delay for stream communication
* For a complex stream, we need multiplexing and De-multiplexing routines.

Timing (and other nonfunctional) requirements are generally expressed as

Quality of Service (QoS) requirements.