CANADIAN COLLEGE OF MODERN TECHNOLOGY

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**ASSIGNMENT ONE**

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**DEPARTMENT:** COMPUTER SCIENCE

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Q1. A user arrives at a railway station that they has never visited before, carrying a PDA that is capable of wireless networking. Suggest how the user could be provided with Information about the local services and amenities at that station, without entering the station’s name or attributes. What technical challenges must be overcome?

**ANSWER**

The user must be able to acquire the address of locally relevant information as automatically as possible.

One method is for the local wireless network to provide the URLs (Universal Resource Locator) of web pages about the locality over a local wireless network.

For this to work:

1. The user must run a program on there devices that listens for the URLs, and which gives the user sufficient control that he/she is not swamped by unwanted URLs of the places he/she passes through.
2. The means of propagating the URL (e.g infrared or an 802.11 wireless LAN) should have a reach that corresponds to the physical spread of the place itself. Etc

Q2. Consider two communication services for use in asynchronous distributed systems. In service A, messages may be lost, duplicated or delayed and checksums apply only to headers. In service B, messages may be lost, delayed or delivered too fast for the recipient to handle them, but those that are delivered arrive with the correct contents. Describe the classes of failure exhibited by each service. Classify their failures according to their effects on the properties of validity and integrity. Can service B be described as a reliable communication service?

**Answer**

The classes of failure exhibited by each service are as follows:

1. **Service A:** Message loss (communication omission failure), and duplicate message arbitrary/Byzantine failure.

**Message delay:** in time-sensitive systems, this would be timing failure, but since we

are considering asynchronous systems, message delay does not matter as long as message

gets delivered and it is not considered a failure. If only message delay happens, and we

have the asynchronous system, delay will not cause drop of the message.

**Header checksum only:** this scenario can cause that the payload be corrupted during the communication, hence we may see arbitrary failure.

1. **Service B**: Message loss: communication omission failure.

Message delay : since we deal with asynchronous systems, delayed messages do not cause any failures.

**Too fast message delivery**: If the receiver drops the messages because they are delivered too fast, it would be communication omission failure.

So service B is not reliable, because message loss violates validity. Etc

Q3. Consider a pair of processes X and Y that use the communication service B from Question 2 to communicate with one another. Suppose that X is a client and Y a server and that an invocation consists of a request message from X to Y, followed by Y carrying out the request, followed by a reply message from Y to X. Describe the classes of failure that may be exhibited by an invocation.

**Answer**

From the question above, An invocation may suffer from the following failures:

Crash failure: here, X or Y may crash. Therefore an invocation may suffer from crash failure.

Also,

Omission failures (message loss) : AS, SB suffers from omission failures the reguest or reply message may be lost etc

Q4. Compare and contrast cloud computing with more traditional client-server computing? What is novel about cloud computing as a concept?

**Answer**

**Cloud computing:** Is a model of allowing ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort. Cloud computing has become a highly demanded service or utility due to the advantages of high computing power, cheap cost of services, high performance, scalability, accessibility as well as availability.

**Traditional client-server computing:** Client machine usually manages the front-end processes such as GUIs (Graphical User Interfaces), dispatch requests to server programs, validate data entered by the user and also manages the local resources that the user interacts with such as the monitor, keyboard, workstation, CPU and other peripherals. On the other hand, the server fulfills the client request by performing the service requested.

**Now let’s compare the two of them:**

Cloud computing is a type of environment where our software/hardware can be hosted.

a) In cloud computing we can host ‘N’ number client server kind of applications.

b) In client server computing the server is usually local. The employees access it over a private network. It is owned and operated by the employer and used exclusively by the employees

c) Cloud computing is the server accessed through the internet. The servers are owned by big companies like Google that run applications and many start-ups that provide data storage.

d) Cloud computing is not locally managed while client server computing is locally managed.

e) In client server computing, infrastructure is on site. This is not the case with cloud computing

**The Novel about cloud computing**

Clouds computing on the Internet is an important development application; the cloud serves the user without hardware master control power the user by the application service that the cloud service provides, processing and depositing material, for example, credit card, account dense, and personal preference profile, picture conduct calendar, finance and health, and other materials. Characteristics of cloud computing are to provide the service of data storage, processing, and platform use flow to global users, but the result of this material set will be material privacy protection, causing the common reason for the enterprise or individual not being willing to use the cloud service solution package. Furthermore, the security of cloud computing material still has many problems not yet solved, at present there is not a good and effective test method for cloud computing material of privacy right system [2], and different types of cloud computing service need a different data safety protection solution.

**References**

1. https://www.coursehero.com/file/p37us2d/Distributed-systems-ENG-211-0072012-EXERCISE--Compare-and-contrast-cloud/

2. B. R. Kandukuri, P. V. Ramakrishna, and A. Rakshit, “Cloud security issues,” in *Proceedings of the IEEE International Conference on Services Computing (SCC '09)*, pp. 517–520, September 2009.View at: [Publisher Site](https://doi.org/10.1109/SCC.2009.84) | [Google Scholar](https://scholar.google.com/scholar_lookup?title=Cloud%20security%20issues&author=B.%20R.%20Kandukuri&author=P.%20V.%20Ramakrishna&author=&author=A.%20Rakshit)

3. https://www.passeidireto.com/arquivo/44802018/distributed-systems-concepts-and-design-excercise-solutions

4. https://courses.engr.illinois.edu/cs425/fa2011/hw/hw1-sol.pdf