Name - PRABHAKAR KUMAR

Roll - IRM2017008

MDM Assignment

Questions :-

Q1). Discuss the effect of weak and intermittent conn., broadcast facility and tariffs in Wireless Medium.

Q2) Discuss types of Mobility. The movement of mobile unit makes the job of the coord. diff. and require coordinating exec. and movement of Mobile unit correctly. Explain the scenarios.

Q3) Explain with example the case of data rep. where within a area there are temporal replicas of location dependent data.

Q4) The selection of data distribution scheme depends on large no. of sys. and appl. parameters. Considering imp. of the local availibility of data, explain diff. types of database partition schemes

Q5) What is Distributed Database Management Tech. in Wireless Sensor Net.?

Q6) Differentiate with example :- location Dependent, Location Independent & Location free queries.

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MDM Assignment 1

Q1. Weak connectivity is when a client is though connected over the network but does not enjoy enough bitrate of data transfer for the services to be availed at the best. In such a case, due to varying signal strength, policies like selective servicing of cache miss, migration of server, lazy reintegration can be followed. In case of web pages, weak connectivity can be handled by prioritizing the data items, to avail data with higher information to the user.

Intermittent connectivity is when connection of a client with the network is lost periodically without any notice. In such situations pre-fetching of data and caching of relevant data in a pipeline can be an effective policy to be followed.

Broadcast is a controlled message or request sent over a network such that it is intended to be received by all connected peers. Broadcasting though

has high energy requirement but is useful in cases when a peer needs all other connected devices to know of its states. It is better than flooding because it is a controlled message, unlike flooding which is uncontrolled.

Tariff refers to the charges that a network provider charges the clients, based on the network usage, speed and connectivity. Hosts provide higher bitrate and greater bandwidth to the users over higher dro tariff rates.

(Q2) Mobility in literature refers to the ability to move freely and easily, and in case of net wireless connectivity it refers to the ease that connected devices can move from one place to other, one region to another, without any substantial loss in connectivity.

The types of mobility can be as follows :—

i) Terminal Mobility, allows terminals to change location.

ii) Component Mobility, allows components of a terminal to change location while maintaining all services

iii) Personal Mobility, allows access to all services independently.

iv) Role Mobility allowing switching of roles

v) Session Mobility, allowing migration over sessions

vi) Service Mobility, allowing relocation of software entity over terminals

Mobility makes the job of coordinating execution for the coordinator difficult, because change in position, state or session may lead to change in available or possible data-rate. Change in application may need to change in requirements of the network and the coordinator even can not be assured of the duration and strength, since the mobility pattern is neither deterministic nor stochastic, but rather random.

Q3.

Data replication where within a given area there may be temporal replicas of location dependent data, may be inferred as a case of selective caching of most-relevant data at the client System.

A mixed example can be a cluster of ATMs in a region that thought may need data about bank accounts of users outside the region, but most request would be for those within the region. Hence temporal data of bank details of accounts corresponding to that region can be cached at the given ATMs.

The major advantages hence received is the faster response and the reduction in communication cost for request servicing. But the updation of date items becomes a major issues since the changes thus made would needed to be reflected in all the replicas of the data items.

This issue is addressed with the likes of policies like locks and Semaphores of use of primary and secondary copies of the date. Still data replication is a useful strategy only when there is large number of queries involving only the retrieval of data and low number of updation.

(Q4) Data partitioning is an application based scheme which can be studied under two types :-

1) Horizontal Partitioning
2) Vertical Partitioning
3) Mixed Partitioning.

In Horizontal Partitioning all columns of selective records are partitioned, and this strategy is useful only when the database queries require queries involving only slected records.

In Vertical Partitioning the partitioning is done in such a manner that only

selected columns of all the records are kept at sites. It is used when queries at a site involve only selected columns only.

In mixed partitioning scheme the data is partitioned using both horizontal and vertical partition schemes.

Q5 In wireless sensor network, a number of wireless devices are connected over a network such that they share information over the network with others. Each device may have a cache memory where it can locally store the data.

Since the capability of ~~wire~~ wireless Sensor Network is bottlenecked by the capabilities of the network, hence we need an efficient strategy to reduce communication cost. Hence the data is distributed over different nodes such that they need to communicate over network to other

Sites involving only a selective part of the data, instead of the whole data.

Furthermore variation of signal strength and network disconnection is also an issue and hoarding must be done in case of disconnection to ensure that the devices work even when they lack connection. Efficient strategies for data hoarding is also a part of the Distributed Database Management strategies.

Q6

Location Dependent queries involves specific query over attributes such that the output may change with a change in the location of the devices. Ex:-

1) Humidity around a particular device
2) Time at a particular device

Location-independent query involve queries over attributes such that the attribute can be location dependent but the query is such

that the output would not change with change in location of the devices. Ex:-

1) GMT time at a device, since time is location specific, but GMT value makes it location independent.
2) Number of deaths due to Corona-virus so far, over the globe

On the other hand if the attribute itself is location independent then no matter what the query is, it would always result in same value at all location. Such queries over a location independent attribute is called location free query. Ex:-

1) Value of pi
2) Number of hours in a day.