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**BATCH-5(AI&ML)**

**ADBMS ASSIGNMENT 2**

1. What is redundant array of inexpensive disk? How it has improved reliability and performance?

Ans. RAID is termed as the arrangement of two or more than two multiple hard-drives that work as a single unit in the particular computer system. According to the use, the arrangements of the disks may vary, but it is used to provide high-availability installation.

Disk mirroring improved reliability as it losses a disk without an outage.

RAID 0 improves performance as it divides data into blocks and spreading the data into multiple disks so that multiple disks can assess the file resulting in faster read/write speeds.

1. Give an overview of terminology used in object oriented database.

Ans. In OODBMS, the data in a database is stored in the form of objects which are instances of the class, and the combination of both is known as object-oriented database management systems.

It is mainly made up of three components:

1. OBJECT STRUCTURE: It refers to properties of which objects are made up of and those are known as attributes. An object combines the entire data into a single unit which is useful in data abstraction that is hiding the useful information for the user.
2. OBJECT CLASSES: In this, we define a class and then create various objects which may differ in values but they share the same class definition.
3. OBJECT-IDENTITY: In these objects can contain or refer to other objects also.
4. Explain the different RAID organization and level.

Ans. There are 9 levels of RAID( Redundant Array of Inexpensive Disks )

* 1. RAID 0  
     This level strips the info into multiple available drives equally giving a really high read and write performance but offering no fault tolerance or redundancy. This level doesn't provides any of the RAID factor and can't be considered in a corporation trying to find redundancy instead it's preferred where high performance is required.
  2. RAID 1  
     This level performs mirroring of knowledge in drive 1 to drive 2. It offers 100% redundancy as the array will continue to work even if either disk fails. So organizations looking for better redundancy can opt for this solution but again cost can become a factor.
  3. RAID 2

This level uses bit-level data stripping instead of block level. To be ready to use RAID 2 confirm the disk selected has no self hardware error checking mechanism as this level uses external Hamming code for error detection. This is one among the rationale RAID isn't within the existence in real IT world as most of the disks used lately accompany self error detection. It uses an additional disk for storing all the parity information

Calculation:

Formula: n-1 where n is the no. of disk

* 1. RAID 3

This level uses byte level stripping along side parity. One dedicated drive is employed to store the parity information and just in case of any drive failure the parity is restored using this extra drive. But in case the parity drive crashes then the redundancy gets affected again so not much considered in organizations.

Calculation:

Formula: n-1 where n is the no. of disk

* 1. RAID 4

This level is extremely much almost like RAID 3 aside from the feature where RAID 4 uses block level stripping instead of byte level.

Calculation:

Formula: n-1 where n is the no. of disk

* 1. RAID 5

It uses block-level stripping and with this level distributed parity concept came into the image leaving the normal dedicated parity as utilized in RAID 3 and RAID 5. Parity information is written to a special disk within the array for every stripe. In the case of single disk failure, data can be recovered with the help of distributed parity without affecting the operation and other read-write operations.

Calculation:

Formula: n-1 where n is the no. of disk

* 1. RAID 6

This level is an enhanced version of RAID 5 adding extra advantage of dual parity. This level uses block level stripping with DUAL distributed parity. So now you can get extra redundancy. Imagine you're using RAID 5 and 1 of your disk fails so you would like to hurry to exchange the failed disk because if simultaneously another disk fails then you won’t be ready to recover any of the info so for those situations RAID 6 plays its part where you'll survive 2 concurrent disk failures before you run out of options.

Calculation:

Formula: n-2 where n is the no. of disk

* 1. RAID 0+1

This level uses RAID 0 and RAID 1 for providing redundancy. Stripping of data is performed before Mirroring. In this level the general capacity of usable drives is reduced as compared to other RAID levels. You can sustain quite one drive failure as long as they're not within the same mirrored set.

NOTE: The no. of drives to be created should always be in the multiple of 2

Calculation:

Formula: n/2 \* size of disk (where n is that the no. of disk)

* 1. RAID 1+0 (RAID 10)

This level performs Mirroring of data prior to stripping which makes it much more efficient and redundant as compared to RAID 0+1. This level can survive multiple simultaneous drive failures. This can be utilized in organizations where high performance and security are required. In terms of fault Tolerance and rebuild performance, it's better than RAID 0+1.

NOTE: The no. of drives to be created should be within the multiple of two

Calculation:

Formula: n/2 \* size of the disk (where n is the no. of the disk)

1. What is distributed database system? How it is different from non-distributed database system? Also discuss its advantages and limitations.

Ans. The distributed management system contains the info in multiple locations. That can be in several systems within the same place or across different geographical locations.

In a non-distributed (or co-located) system, all the parts of the system are in the same physical location. In a distributed system, parts of the system exist in separate locations.

Advantages of DDBMS

* The database is simpler to expand because it is already spread across multiple systems and it's not too complicated to feature a system.
* The distributed database can have the info arranged consistent with different levels of transparency i.e data with different transparency levels are often stored at different locations.
* The database are often stored consistent with the departmental information in a corporation . In that case, it is easier for organizational hierarchical access.
* there was a natural catastrophe such as fire or an earthquake all the data would not be destroyed it is stored at different locations.
* It is cheaper to make a network of systems containing a neighborhood of the database. This database also can be easily increased or decreased.
* Even if a number of the info nodes go offline, the remainder of the database can continue its normal functions.

Disadvantages of DDBMS

* The distributed database is sort of complex and it's difficult to form sure that a user gets a consistent view of the database because it's spread across multiple locations.
* This database is more expensive as it is complex and hence, difficult to maintain.
* It is difficult to supply security during a distributed database because the database must be secured in the least the locations it's stored. Moreover, the infrastructure connecting all the nodes during a distributed database also must be secured.
* It is difficult to take care of data integrity within the distributed database due to its nature. There also can be data redundancy within the database because it is stored at multiple locations.
* The distributed database is complicated and it's difficult to seek out people with the required experience who can manage and maintain it.