

DPBS(PG) College, Anoopshahr

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OLAP

ROLAP, MOLAP & HOLAP

OLAP is a specialized tool that creates a multidimensional view of data for the user to do the analysis. There are two models of OLAP:

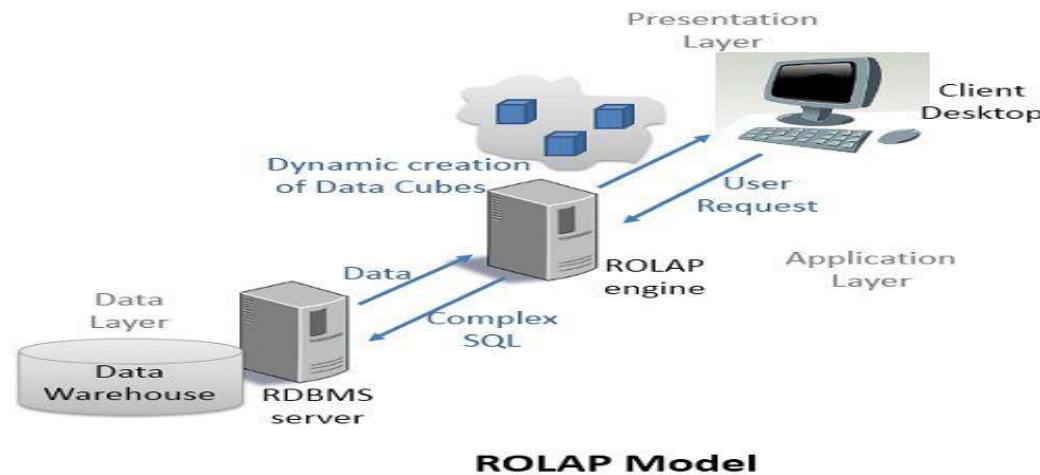
1. **ROLAP**
2. **MOLAP**
3. **HOLAP**

ROLAP is **Relational Online Analytical Processing** model, where the data is stored as in relational database i.e. **rows and columns** in the data warehouse. In the ROLAP model data is present in the front of the user in the **multidimensional** form. To display the data, in a multidimensional view, a **semantic layer of metadata** is created that maps dimension to the relational tables. Metadata also supports **aggregation** of the data.

Whenever the ROLAP engine in analytical server issues a complex query, it fetches data from the main warehouse and **dynamically** creates a multidimensional view of data for the user. Here, it

differs from MOLAP because MOLAP already has a static multidimensional view of data stored in proprietary databases MDDBs.

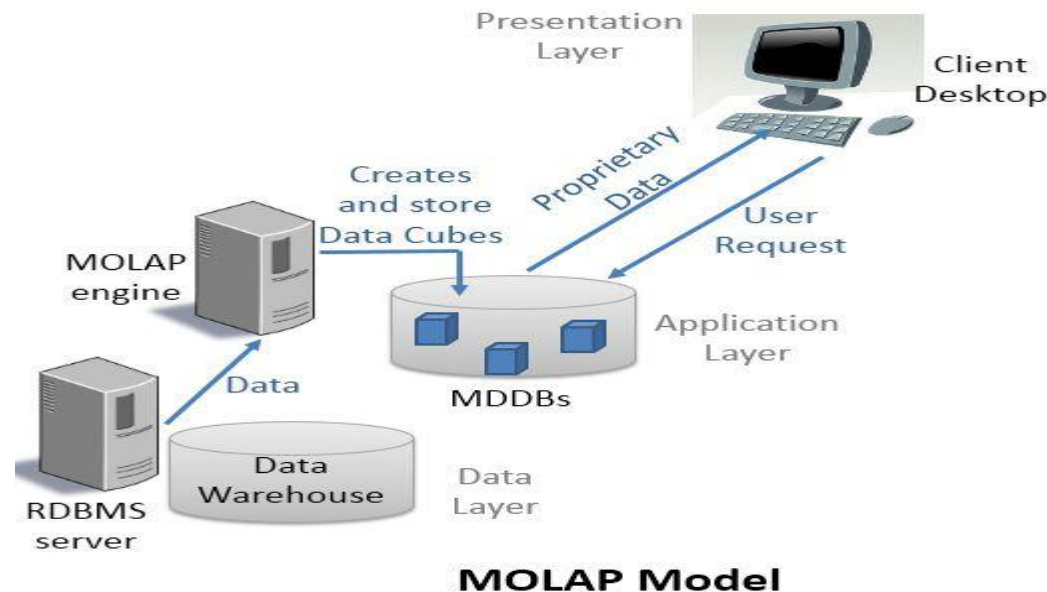
As the multidimensional view of data is created dynamically it processes **slower** in comparison to MOLAP. ROLAP engine deals with **large volumes** of data.



MOLAP is a **Multidimensional Online Analytical Processing** model. The data used for analysis is stored in specialized **multidimensional databases (MDDBs)**. The multidimensional database management systems are **proprietary software systems**.

These multidimensional databases are formed from the large multidimensional **array**. The cells or data cubes of this multidimensional databases carry **precalculated** and **prefabricated** data. Proprietary software systems create this precalculated and fabricated data, while the data is loaded to MDDBs from the main databases.

Now, it is the work of MOLAP engine, which reside there in the application layer, provide the multidimensional view of data from MDDBs to the user. Thus when a user request for the data, no time is wasted in calculating the data and the system responses fast.



HOLAP is a **Hybrid Online Analytical Processing** model. This model uses the properties of both the ROLAP & MOLAP. All the features of ROLAP & MOLAP are combined at single place then this new model becomes HOLAP.

Difference between ROLAP & MOLAP

BASIS FOR COMPARISON	ROLAP	MOLAP
Full Form	ROLAP stands for Relational Online Analytical Processing.	MOLAP stands for Multidimensional Online Analytical Processing.
Storage & Fetched	Data is stored and fetched from the main data warehouse.	Data is Stored and fetched from the Proprietary database MDDBs.
Data Form	Data is stored in the form of relational tables.	Data is Stored in the large multidimensional array made of data cubes.
Data volumes	Large data volumes.	Limited summaries data is kept in MDDBs.
Technology	Uses Complex SQL queries to fetch data from the main warehouse.	MOLAP engine created a precalculated and prefabricated data cubes for multidimensional data views. Sparse matrix technology is used to manage data sparsity.
View	ROLAP creates a multidimensional view of data dynamically.	MOLAP already stores the static multidimensional view of data in MDDBs.
Access	Slow access.	Faster access.

Key Differences Between ROLAP and MOLAP

1. ROLAP stands for Relational Online Analytical Processing whereas; MOLAP stands for Multidimensional Online Analytical Processing.

2. In both the cases, ROLAP and MOLAP data is stored in the main warehouse. In ROLAP data is directly fetched from the main warehouse whereas, in MOLAP data is fetched from the proprietary databases MDDBs.
3. In ROLAP, data is stored in the form of relational tables but, in MOLAP data is stored in the form of a multidimensional array made of data cubes.
4. ROLAP deals with large volumes of data whereas, MOLAP deals with limited data summaries kept in MDDBs.
5. ROLAP engines use complex SQL to fetch data from the data warehouse. However, MOLAP engine creates prefabricated and precalculated datacubes to present multidimensional view of data to a user and to manage data sparsity in data cubes, MOLAP uses Sparse matrix technology.
6. ROLAP engine creates a multidimensional view of data dynamically whereas, MOLAP statically stores multidimensional view of data in proprietary databases MDDBs for a user to view it from there.
7. As ROLAP creates a multidimensional view of data dynamically, it is slower than MOLAP which do not waste time in creating a multidimensional view of data.

Conclusion

Which one to opt between ROLAP and MOLAP depends upon the performance and complexity of the query. MOLAP becomes the choice of a user if it wants the faster response.