

Practical - 8

Aim: Design and Create cube by identifying measures and dimensions for Design storage for cube using storage mode MOLAP, ROLAP and HOALP.

Partition Storage (SSAS)

Physical storage options affect the performance, storage requirements, and storage locations of partitions and their parent measure groups and cubes. A partition can have one of three basic storage modes:

- Multidimensional OLAP (MOLAP)
- Relational OLAP (ROLAP)
- Hybrid OLAP (HOLAP)

Microsoft SQL Server 2005 Analysis Services (SSAS) supports all three basic storage modes. It also supports proactive caching, which enables you to combine the characteristics of ROLAP and MOLAP storage for both immediacy of data and query performance. You can configure the storage mode and proactive caching options in one of three ways.

Storage Configuration Method	Description
Storage Settings dialog	You can configure storage settings for a partition or configure default storage settings for a measure group.
Storage Design Wizard	You can configure storage settings for a partition at the same time that you design aggregations.
Usage-Based Optimization Wizard	You can also define a filter to restrict the source data that is read into the partition using any of the three storage modes. You can select a storage mode and optimize aggregation design based on queries that have been sent to the cube.

MOLAP

The MOLAP storage mode causes the aggregations of the partition and a copy of its source data to be stored in a multidimensional structure in Analysis Services, which structure is highly optimized to maximize query performance. This can be storage on the computer where the partition is defined or on another Analysis Services computer. Storing data on the computer where the partition is defined creates a local partition. Storing data on another Analysis Services computer creates a remote partition. The multidimensional structure

that stores the partition's data is located in a subfolder of the Data folder of the Analysis Services program files or another location specified during setup of Analysis Services.

Because a copy of the source data resides in the Analysis Services data folder, queries can be resolved without accessing the partition's source data even when the results cannot be obtained from the partition's aggregations. The MOLAP storage mode provides the most rapid query response times, even without aggregations, but which can be improved substantially through the use of aggregations.

As the source data changes, objects in MOLAP storage must be processed periodically to incorporate those changes. The time between one processing and the next creates a latency period during which data in OLAP objects may not match the current data. You can incrementally update objects in MOLAP storage without downtime. However, there may be some downtime required to process certain changes to OLAP objects, such as structural changes. You can minimize the downtime required to update MOLAP storage by updating and processing cubes on a staging server and using database synchronization to copy the processed objects to the production server. You can also use proactive caching to minimize latency and maximize availability while retaining much of the performance advantage of MOLAP storage.

ROLAP

The ROLAP storage mode causes the aggregations of the partition to be stored in tables in the relational database specified in the partition's data source. Unlike the MOLAP storage mode, ROLAP does not cause a copy of the source data to be stored in the Analysis Services data folders. When results cannot be derived from the aggregations or query cache, the fact table in the data source is accessed to answer queries. With the ROLAP storage mode, query response is generally slower than that available with the other MOLAP or HOLAP storage modes. Processing time is also typically slower. Realtime ROLAP is typically used when clients need to see changes immediately. No aggregations are stored with real-time ROLAP. ROLAP is also used to save storage space for large datasets that are infrequently queried, such as purely historical data.

Note: When using ROLAP, Analysis Services may return incorrect information related to the unknown member if a join is combined with a group by, which eliminates relational integrity errors rather than returning the unknown member value.

If a partition uses the ROLAP storage mode and its source data is stored in SQL Server 2005 Analysis Services (SSAS), Analysis Services attempts to create indexed views to contain aggregations of the partition. If Analysis Services cannot create indexed views, it does not create aggregation tables. While Analysis Services handles the session requirements for creating indexed views on SQL Server 2005 Analysis Services (SSAS), the creation and use of indexed views for aggregations requires the following conditions to be met by the ROLAP partition and the tables in its schema:

- The partition cannot contain measures that use the **Min** or **Max** aggregate functions.
- Each table in the schema of the ROLAP partition must be used only once. For example, the schema cannot contain "dbo"."address" AS "Customer Address" and "dbo"."address" AS "SalesRep Address".
- Each table must be a table, not a view.
- All table names in the partition's schema must be qualified with the owner name, for example, "dbo"."customer".
- All tables in the partition's schema must have the same owner; for example, you cannot have a FromClause like : "tk"."customer", "john"."store", or "dave"."sales_fact_2004".
- The source columns of the partition's measures must not be nullable.
- All tables used in the view must have been created with the following options set to ON:
 - o ANSI_NULLS
 - o QUOTED_IDENTIFIER
- The total size of the index key, in SQL Server 2005, cannot exceed 900 bytes. SQL Server 2005 will assert this condition based on the fixed length key columns when the CREATE INDEX statement is processed. However, if there are variable length columns in the index key, SQL Server 2005 will also assert this condition for every update to the base tables. Because different aggregations have different view definitions, ROLAP processing using indexed views can succeed or fail depending on the aggregation design.
- The session creating the indexed view must have the following options on: ARITHABORT, CONCAT_NULL_YIELDS_NULL, QUOTED_IDENTIFIER, ANSI_NULLS, ANSI_PADDING, and ANSI_WARNING. This setting can be made in SQL Server Management Studio.
- The session creating the indexed view must have the following option off: NUMERIC_ROUNDABORT. This setting can be made in SQL Server Management Studio.

HOLAP

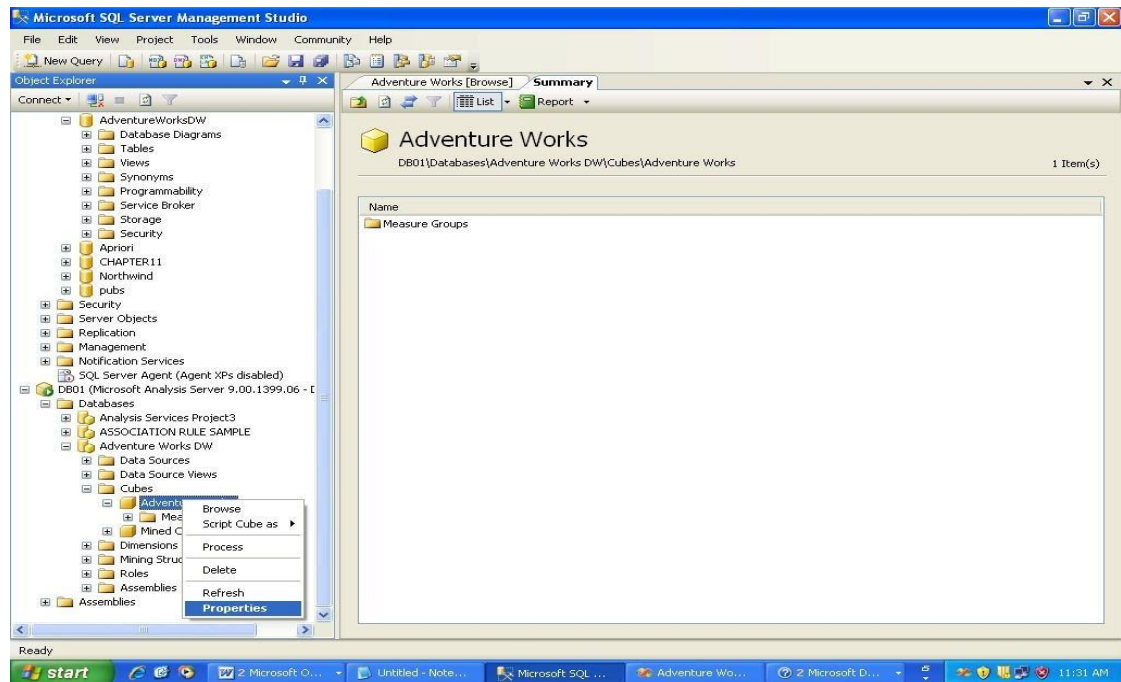
The HOLAP storage mode combines attributes of both MOLAP and ROLAP. Like MOLAP, HOLAP causes the aggregations of the partition to be stored in a multidimensional structure on an Analysis Services server computer. HOLAP does not cause a copy of the source data to be stored. For queries that access only summary data contained in the aggregations of a partition, HOLAP is the equivalent of MOLAP. Queries that access source data, such as a drilldown to an atomic cube cell for which there is no aggregation data, must retrieve data from the relational database and will not be as fast as if the source data were stored in the MOLAP structure.

Partitions stored as HOLAP are smaller than equivalent MOLAP partitions and respond faster than ROLAP partitions for queries involving summary data. HOLAP storage mode is generally suitable for partitions in cubes that require

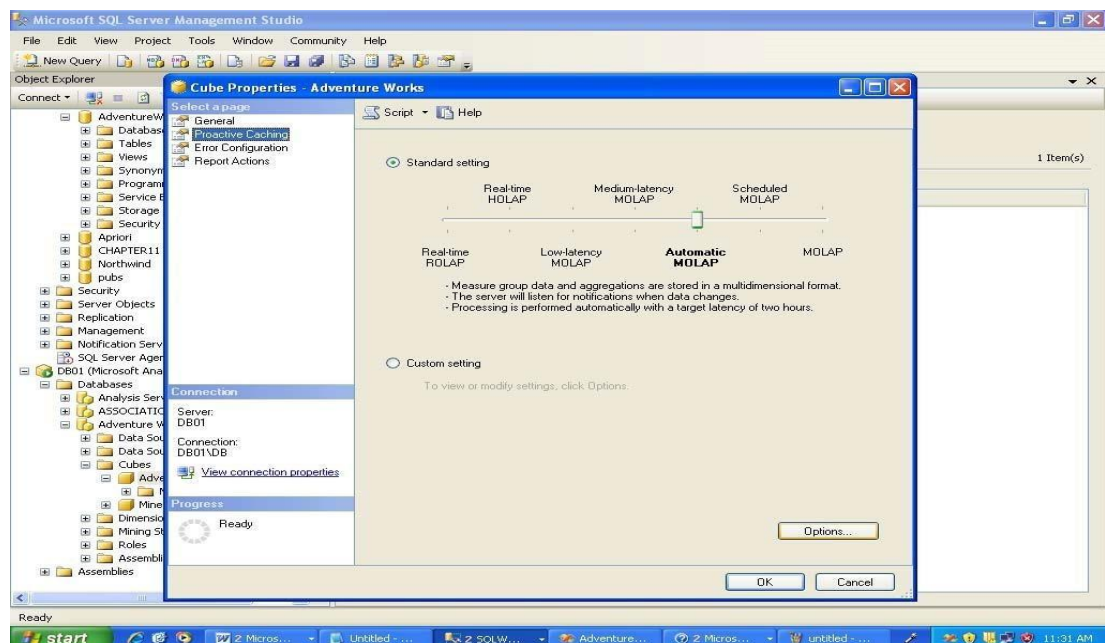
rapid query response for summaries based on a large amount of source data. However, where users generate queries that must touch leaf level data, such as for calculating median values, MOLAP is generally a better choice.

Steps:

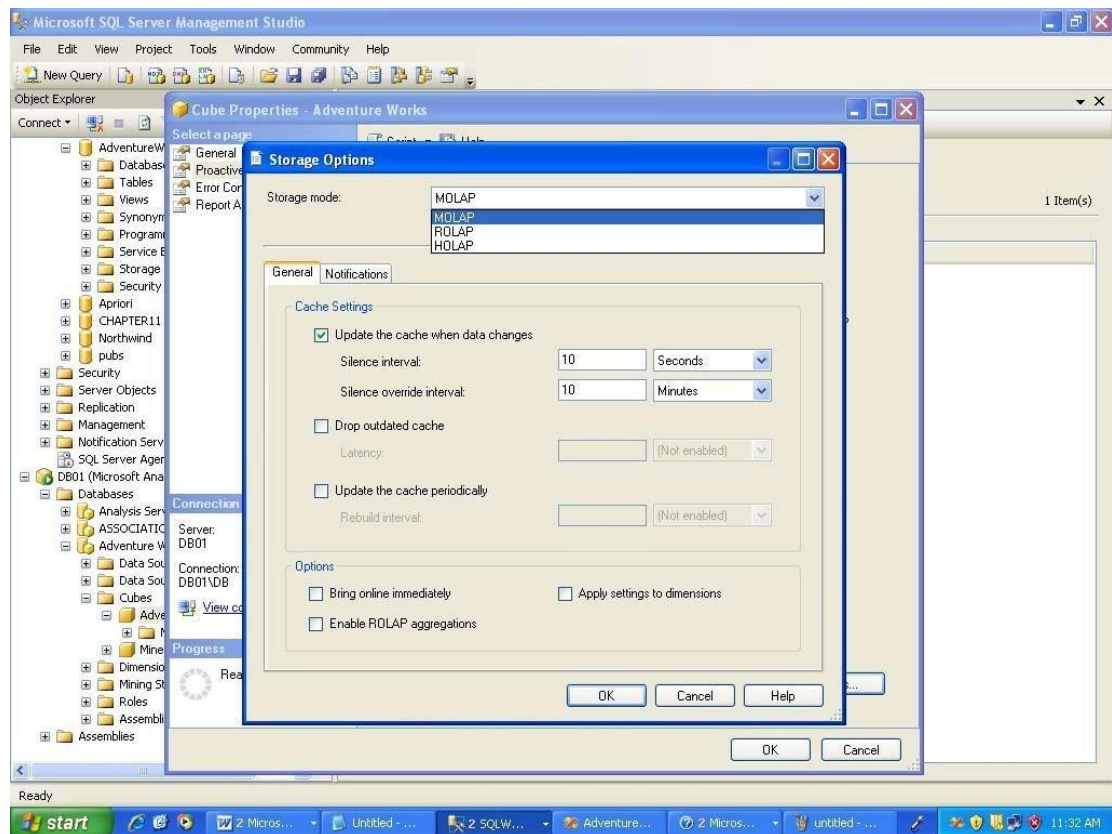
1. In the Analysis service object explorer tree pane, expand the Cubes folder, rightclick the created cube, and then click **Property**.



2. In the property wizard, select **proactive caching** and then select **option button**.



3. Select MOLAP/HOLAP/ROLAP as your data storage type, and then click **Next**.



4. After setting required parameters, **click ok button**.
5. After that right click on created cube and then select **Process**.

Application: -- To analyze data for decision making.