SQL in Microsoft Fabric: A Unified Approach to Data Engineering, Modelling, and Intelligence

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Why SQL in Microsoft Fabric

- Unified experience across **Lakehouse, Warehouse, Pipelines**
- SQL powers **data engineering, modeling, BI**
- Familiar syntax → **fast adoption**
- Today: **Retail Sales Analytics demo-first**

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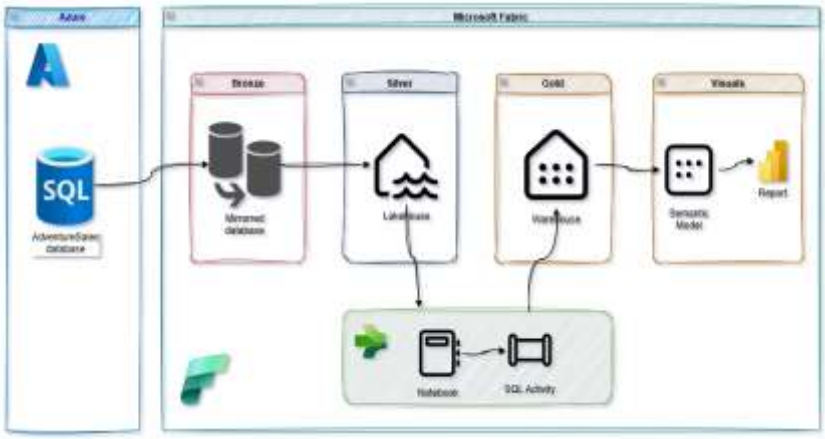
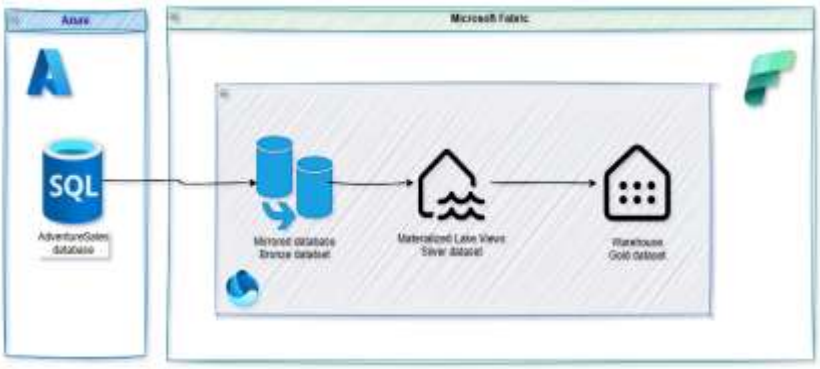
Solution Architecture

Bronze: Raw data
Silver: Curated data
Gold: Analytics-ready data
Power BI: Direct Lake mode for instant visuals



Data Flow

Bronze: Automatic replication
Silver: Refresh MLVs from a Notebook
Gold: Incremental load by a pipeline
Power BI: automatic refresh via Direct Lake mode



How the Demo Works

- Examine Fabric items starting with Power BI report, Semantic model, Warehouse, Lakehouse and Mirrored database.
- Simulate data update
- Trigger the data refresh in Fabric and observe flow of changes
- Confirm the data refresh

How Incremental Load Works

1. Source tables need **ModifiedDate** column for change capture.
2. Maintain a metadata table to track refresh **watermarks**.
3. When MLVs refresh they capture **ModifiedDate** values from the source tables.
4. When Warehouse loaders execute, they filter rows by > **ModifiedDate.**
5. Update **watermark** value in the control table after load.

```
-- 1) Read watermark
DECLARE @w DATETIME2 =
  (SELECT last_watermark FROM etl.watermark WHERE src = 'sales');

-- 2) Upsert only changed rows
MERGE gold.fact_sales AS t
USING (
  SELECT SalesOrderID, SalesOrderDetailID, TotalDue, ModifiedDate
  FROM silver.mlv_sales
  WHERE ModifiedDate > @w
) AS s
ON (t.SalesOrderID = s.SalesOrderID AND t.SalesOrderDetailID = s.SalesOrderDetailID)
WHEN MATCHED THEN
  UPDATE SET t.TotalDue = s.TotalDue, t.ModifiedDate = s.ModifiedDate
WHEN NOT MATCHED THEN
  INSERT (SalesOrderID, SalesOrderDetailID, TotalDue, ModifiedDate)
  VALUES (s.SalesOrderID, s.SalesOrderDetailID, s.TotalDue, s.ModifiedDate);

-- 3) Advance watermark
UPDATE etl.watermark
SET last_watermark = (SELECT MAX(ModifiedDate) FROM silver.mlv_sales)
WHERE src = 'sales';
```

Thank You!

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