SQLskills Online Immersion Event

IEVLT: Very Large Tables
Optimizing Performance and Availability through Partitioning

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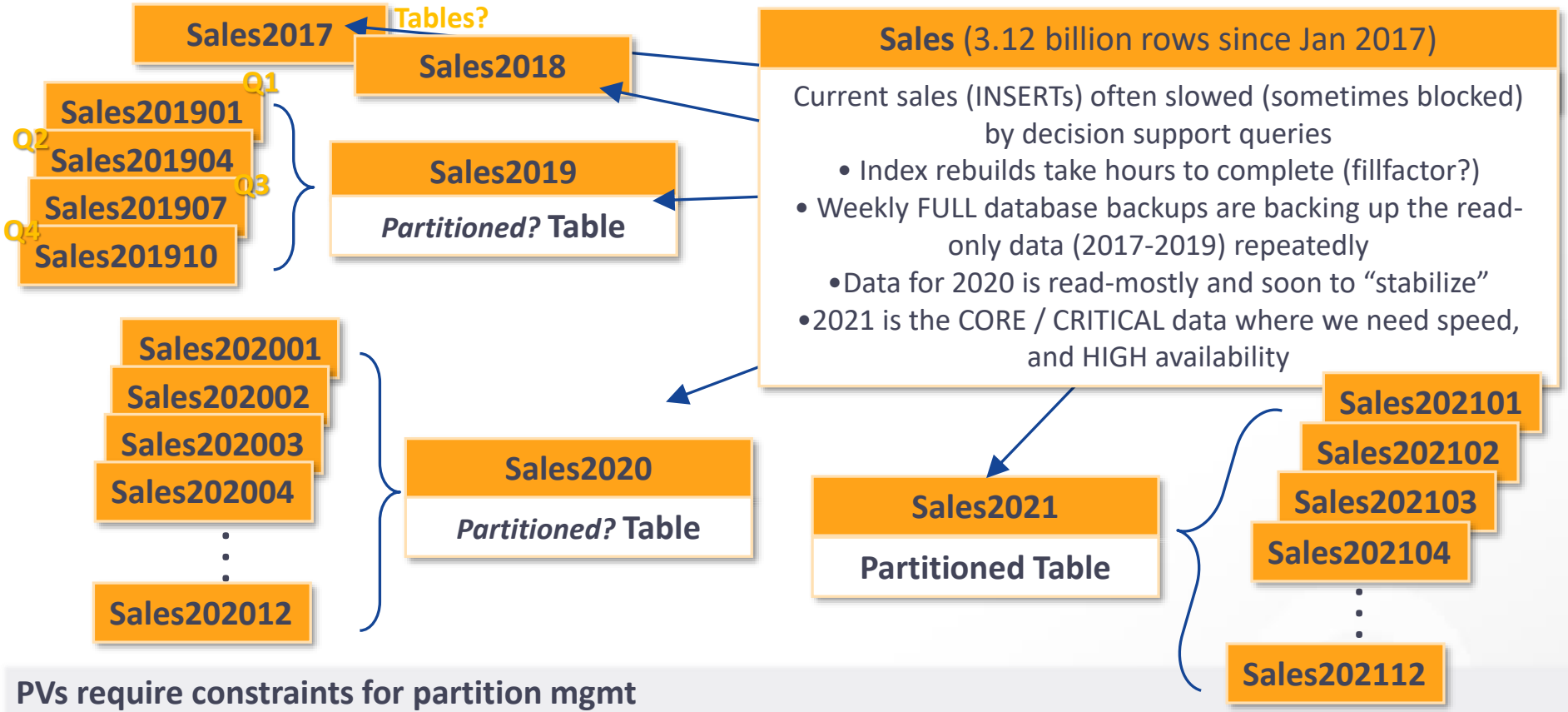
Added for review

Horizontal Partitioning (PVs or PTs)



PVs require constraints for partition mgmt

```
CHECK ([SalesDate] >= '20210101'
       AND [SalesDate] < '20210201')
```

PTs require a partition function and a partition scheme for partition management

Compatibility Model and Cardinality Estimation Models (2 of 2)

- **From SQL Server BOL:**
  ALTER DATABASE (Transact-SQL) Compatibility Level

Product	Database Engine Version	Default Compatibility Level Designation	Supported Compatibility Levels
SQL Server 2019 (15.x)	15	150	150, 140, 130, 120, 110, 100
SQL Server 2017 (14.x)	14	140	140, 130, 120, 110, 100
Azure SQL Database	12	150	150, 140, 130, 120, 110, 100
Azure SQL Database Managed Instance	12	150	150, 140, 130, 120, 110, 100
SQL Server 2016 (13.x)	13	130	130, 120, 110, 100
SQL Server 2014 (12.x)	12	120	120, 110, 100
SQL Server 2012 (11.x)	11	110	110, 100, 90
SQL Server 2008 R2	10.5	100	100, 90, 80
SQL Server 2008	10	100	100, 90, 80
SQL Server 2005 (9.x)	9	90	90, 80
SQL Server 2000 (8.x)	8	80	80

Database Scoped Configurations

- **SQL Server 2016 introduced "scoped configurations"**

```
ALTER DATABASE SCOPED CONFIGURATION
LEGACY_CARDINALITY_ESTIMATION = { ON | OFF | PRIMARY }
```

- **Creates confusion because now there's more than one place to look**
  - Compatibility mode can be set to the NEW cardinality estimation model
  - Database can still run the legacy CE using the scoped configuration
- **Compatibility mode confusion:**
  - Meant to allow time for syntax changes after upgrade (time for you to fix code but still upgrade)
  - Optimizer fixes as of RTM
    - Post-RTM fixes can be enabled with the scoped configuration option QUERY_OPTIMIZER_HOTFIXES
  - Prior to 2014 that was it… in 2014 the compatibility model also changes to the new CE if set to 120 or higher and to get the optimizer hotfixes you'd turn on trace flag 4199
  - SQL Server 2016 adds the scoped configuration to separate these:
    - Your database compatibility mode can be in 130, 140, or 150 – so you get optimizer fixes/enhancements (not related to cardinality)
    - You can enable the "legacy CE"
    - IMPORTANT: If you need to downgrade your compatibility mode to get something to "work" (outside of CE) then the SQL team considers that to very likely be a bug!

Trace Flags vs. Query Hints

- **Trace flags are meant more for administrative use**
  - Some are "global" only and do nothing at the session level
    - See BOL under: scope "global only"
    - Using DBCC TRACEON (#, -1) sets a trace flag globally but only until next restart
    - Set as a startup option (-T #) if you want this set for each service restart
  - Check FIRST to see if there's a better way to set these AND re-check on each SP / upgrade
- **Query hints are a MUCH better way of enabling these behaviors:**
  - OPTION clause for your query
  - SELECT …
    OPTION (USE HINT ('query_hint', 'query_hint')
  - Example – instead of using trace flag 9481

```
SELECT …
FROM …
OPTION (USE HINT ('FORCE_LEGACY_CARDINALITY_ESTIMATION'))
```