Tuning OLTP vs. DSS Patterns

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Module Introduction

- OLTP and DSS application workload types have different resource-usage patterns and often require different query tuning and database design techniques

- In this demo-centric module we'll walk through query performance problems and associated query tuning solutions for situations where the query and/or design is inappropriate for the workload type
- We'll also cover problems that are common to specific OLTP or DSS data tiers

Defining OLTP and DSS

- **Defining OLTP**
  - "Online Transaction Processing"
  - Defined as supporting a high volume of transactions
  - Transaction boundaries are typically defined as short (small)
  - Examples: banking, stock trade execution, data-entry applications

- **DSS defined**
  - "Decision Support System"
  - May be described as "reporting databases", "relational data warehouses", "data marts", or used in conjunction with OLAP / SSAS
  - Potentially lower volume of transactions, but higher resource demand per query and touching many rows
  - Examples: sales reporting, analytics, trends, aggregation

OLTP Common Characteristics

- Short-duration transactions
- High concurrency
- High throughput
- Smaller number of objects accessed per operation
- Minimum-required number of supporting indexes
- Seek bias
- Serial execution
- Re-usable plans (minimizing compilation activity)
- Minimal memory-grant requirements
- Granular locking

DSS Common Characteristics

- Often benefits from parallelism
- Fast I/O-throughput requirements
- Ample memory needed for cached data pages and high memory grant sizes
- Indexed to support critical workloads
- Scans against large tables are expected
- May leverage de-normalization
- Star and snowflake schema designs
- May benefit from partitioning
- May require manual statistics management

Module Summary

- In this module we walked through query performance problems and associated query tuning solutions for situations where the query and/or design is inappropriate for the workload-type
- We also covered problems that are common to specific OLTP or DSS data tiers

- In the next module we'll cover a variety of advanced query tuning patterns