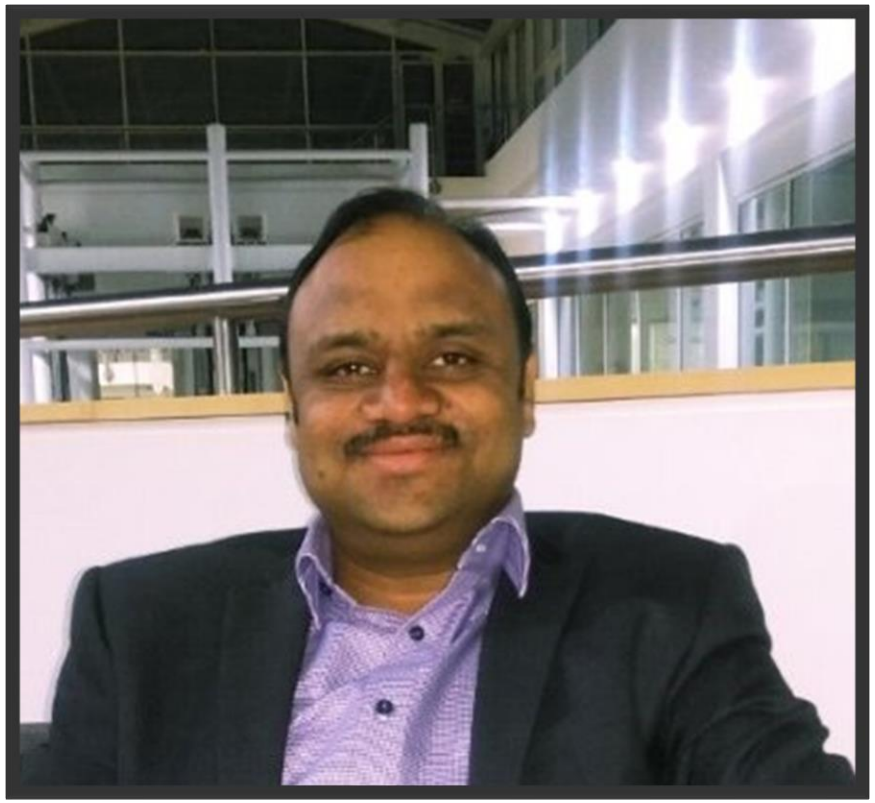
Microsoft Azure

Mastering Intelligent Query Processing in 20 mins

2017 – 2022 Journey and More..

Meet the Speakers



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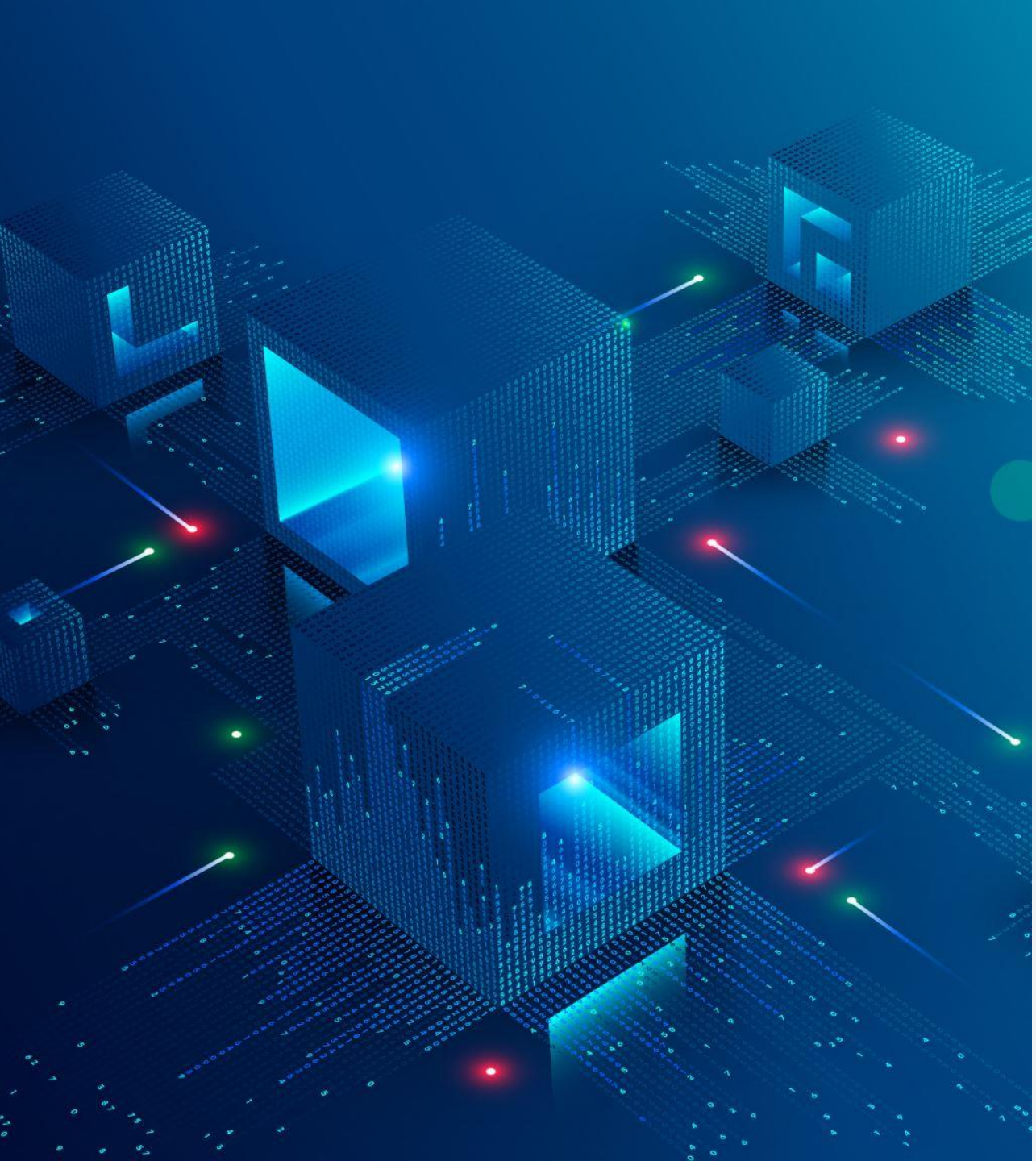


OVERALL AGENDA

- Introduction to Intelligent Query Processing (IQP)
- Exploration of IQP Suite of Features
- Overview of Key Features in SQL 2017 wave
- Overview of Enhanced Features in SQL 2017 wave
- Introduction to Latest Features introduced in SQL 2022 wave

Intelligent Query Processing

Intelligent Query Processing (IQP) overview

- IQP is a SQL Engine feature and is supported by SQL Managed Instance , Azure SQL DB and SQL Server.
- IQP features improve performance of existing workloads with minimal implementation effort to adopt.
- Advanced techniques and algorithms for query optimization
- Learns from your workload
- Ability to adapt to changing data distributions and workload patterns

Key Objectives :

- Enhancing query performance
- Improving database efficiency
- Providing a seamless user experience
- Reducing resource utilization
- Maximizing the throughput of database systems
- Improving overall stability and reliability of query execution
- Ensuring consistent performance across varying workloads

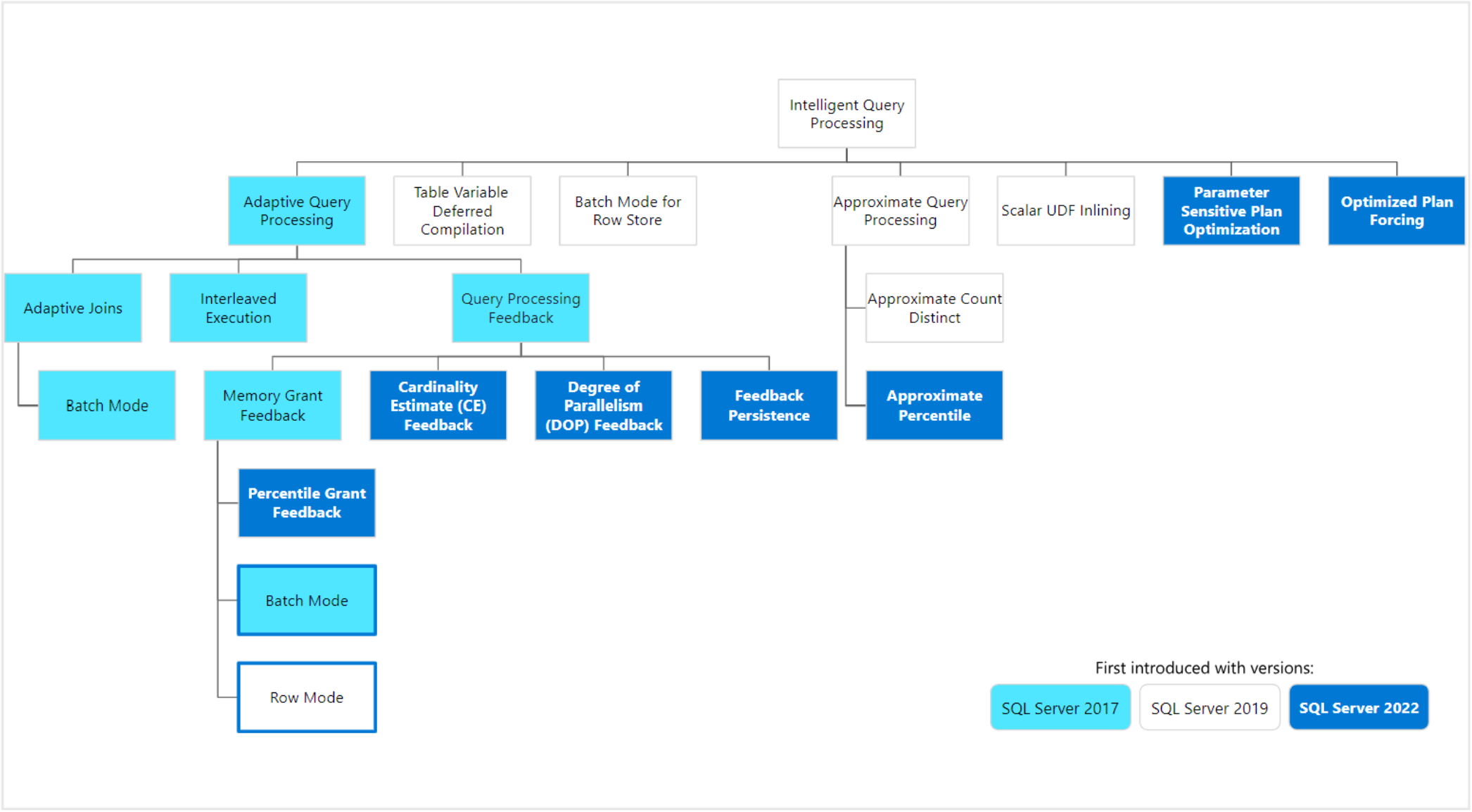
Query Store and Intelligent Query Processing

- Query Store on by default for new databases
- Query Store support for read replicas from availability groups*
- Query Store hints to shape plans with no code changes
- New IQP scenarios enabled through better together capabilities

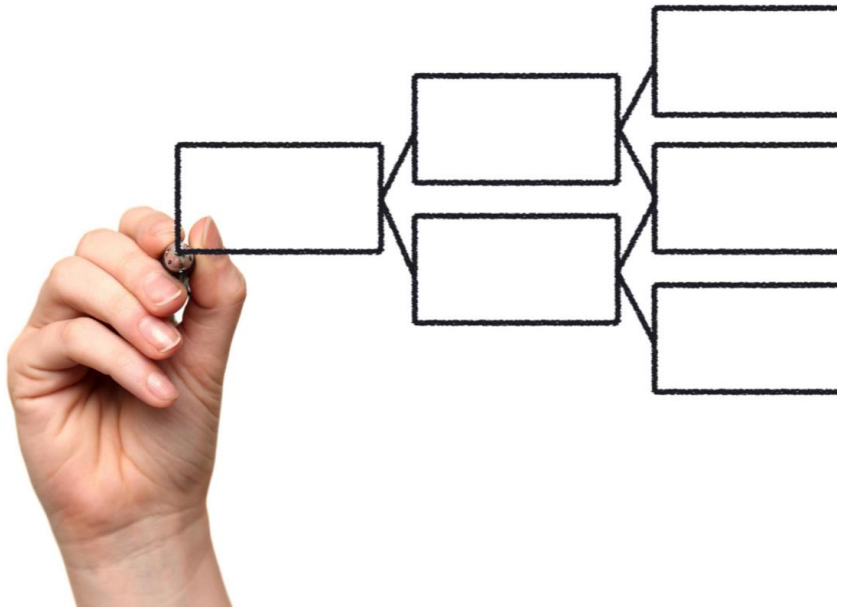
Intelligent Query Processing (IQP)
Next Generation

Query Store

IQP Suite of Features

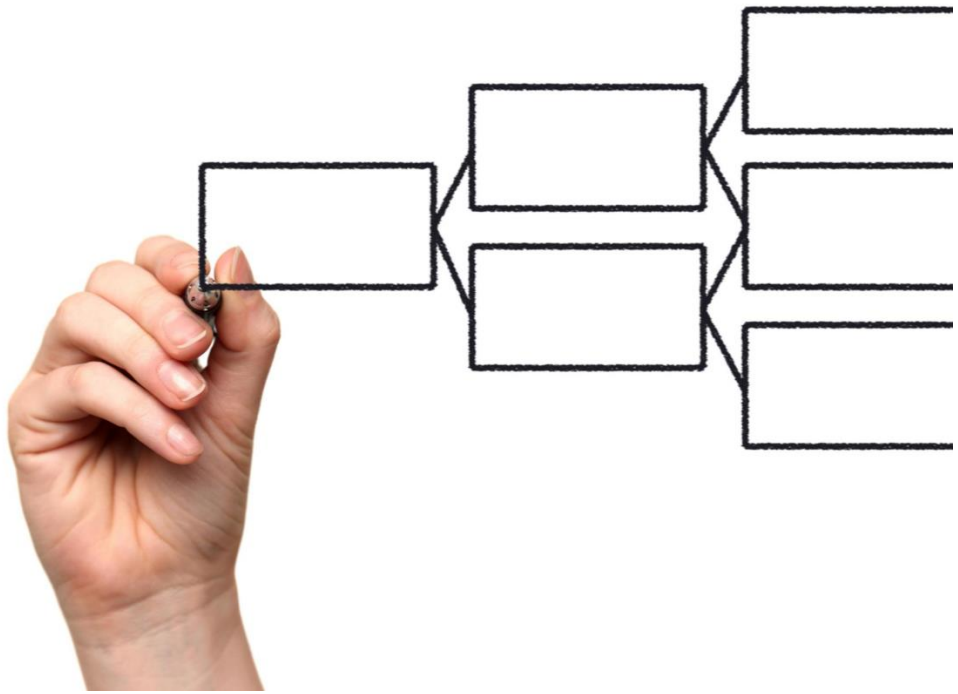


Intelligent Query Processing – 2017 Wave Features



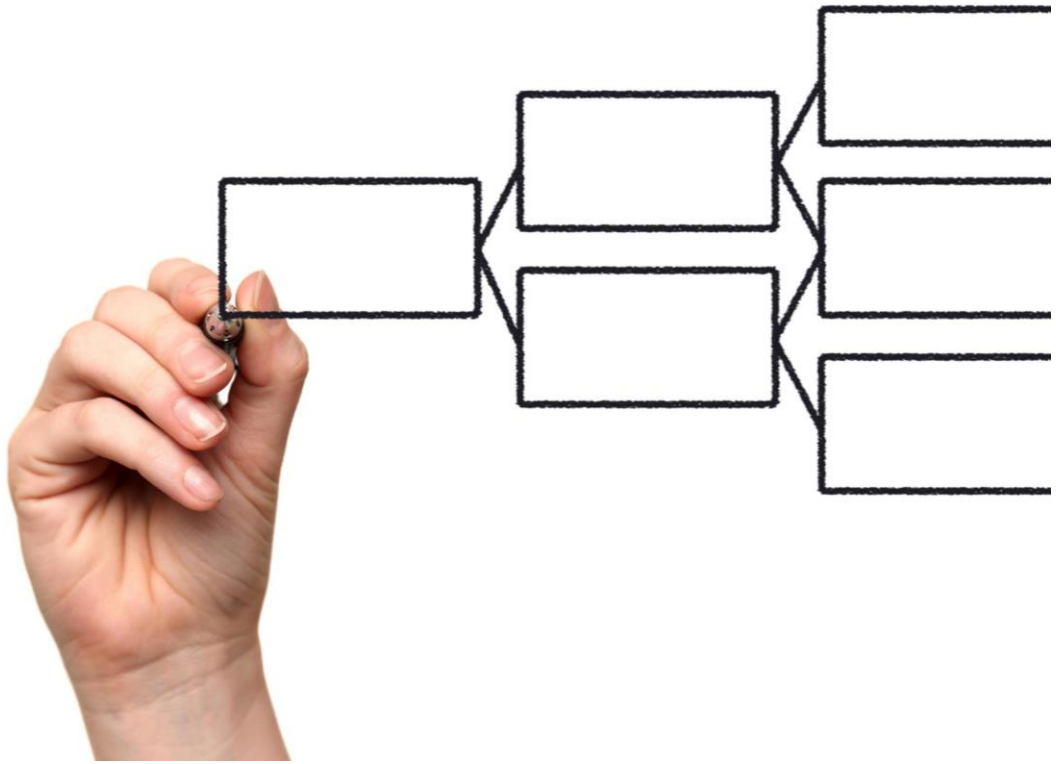
- **Batch Mode Adaptive Joins :** Dynamically adjust join strategies based on runtime data distribution for optimal query performance.
- **Batch Mode Memory Grant Feedback :** optimizes memory allocation for queries in batch mode, enhancing performance by adjusting memory grants based on actual usage
- **Interleaved Execution :** Optimizes performance by simultaneously executing multiple statements within table-valued functions, enhancing query processing efficiency

Intelligent Query Processing - 2019 Wave Features



- **Table Variable Deferred Compilation:** Improves the performance of queries that use table variables
- **Batch Mode for Row Store:** Optimizes query performance on large datasets with batch processing
- **Approximate Query processing:** Generates approximate results for queries with large data sets
- **Scalar UDF Inlining:** Inlines scalar user-defined functions (UDFs) to improve performance
- **Row Mode Memory Grant Feedback :**

Intelligent Query Processing – 2022 Wave Features

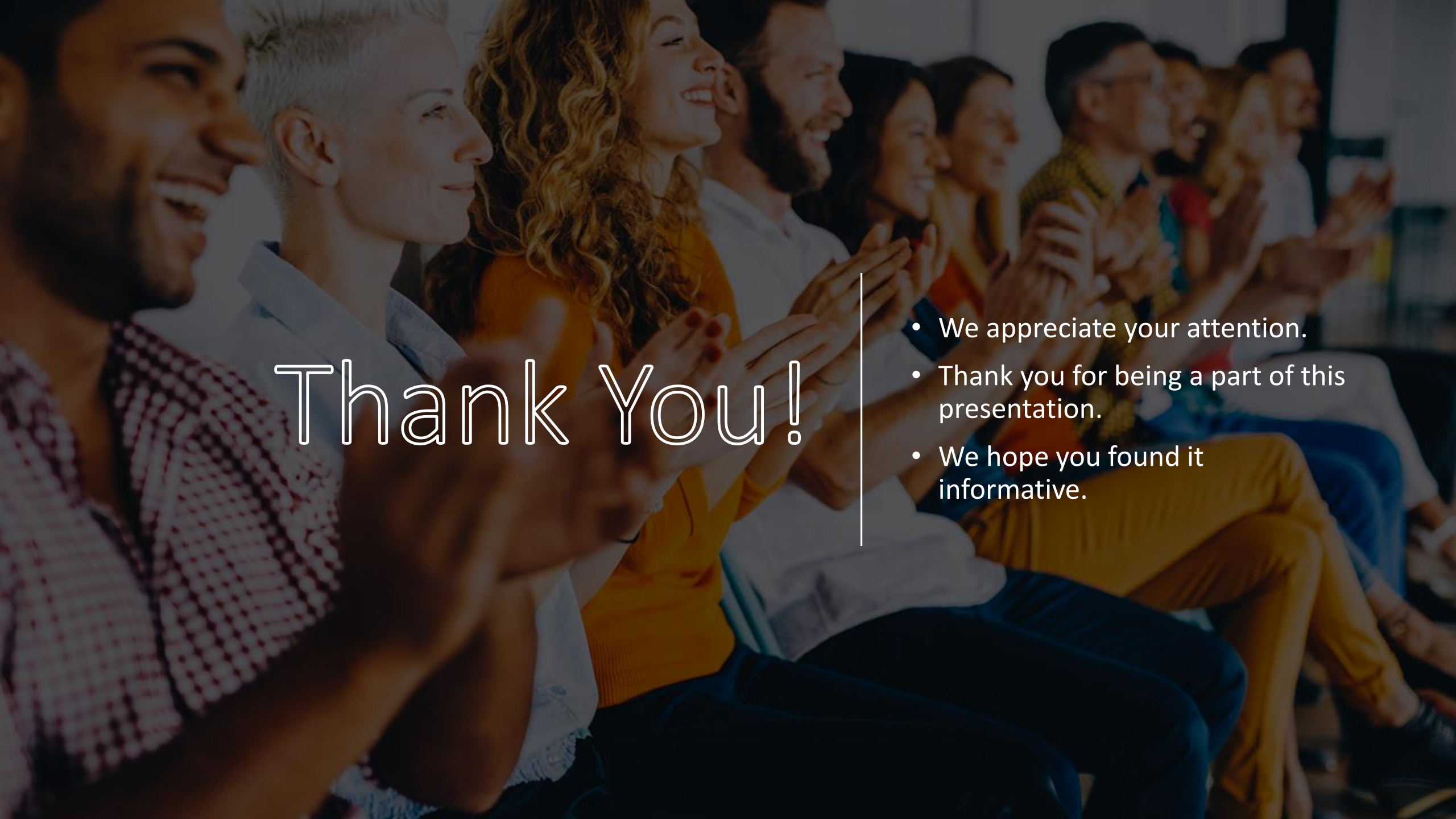


- **Parameter Sensitive Plan Optimization:** Produces the optimal execution plan for queries based on parameter values
- **Optimized Plan Forcing:** Forces specific query execution plans to improve performance
- **Memory Grant Feedback**
  - **Percentile Grant Feedback**

  Optimizes memory allocation for queries, enhancing performance by adjusting memory grants based on percentile usage.
- **Query Processing Feedback**
  - **Cardinality Estimate Feedback** - A feature that provides feedback on cardinality estimates to improve query performance.
  - **Degree of Parallelism (DOP) Feedback :**
  - **Feedback Persistence :** Ensures feedback is persisted and used to improve future query performance
- **Approximate Query Processing**
  - **Approximate Percentile**

  A feature of Approximate Query Processing that generates approximate percentiles for queries with large data sets.


Questions?



Thank You!

- We appreciate your attention.
- Thank you for being a part of this presentation.
- We hope you found it informative.