This course analyzes a variety of SQL/MX query plans and their features, such as the data flow architecture, process boundaries, query plan parallelism, and executor functionality in DP2. Topics also include how rowsets, compound statements, Referential Integrity (RI) constraints, and triggers are implemented in a query plan. Learn to display and analyze query plans and the methods for forcing (changing) query plans. The 5-day course is 60 percent lecture and 40 percent hands-on labs using HP servers.

Audience
- Anyone responsible for SQL/MX query analysis, tuning, and programming

Prerequisites
- NonStop SQL/MX Basics (U4184S) or
- NonStop SQL/MX Database for SQL/MP Users (U4185S)

Course objective
- Understand and use tools to analyze a variety of SQL/MX query plans
- Learn the methods to influence or modify SQL/MX query plans with Control Query Default and Control Query Shape statements
- Understand some of the opportunities for tuning SQL/MX queries in the following areas: query design, application design, and database design
• Become familiar with SQL/MX query plan fundamentals, such as query compilation phases, query tree operators functions, data flow architecture, process boundaries, and parallel execution of a query plan

Benefits to you
• Analyze a variety of SQL/MX query plans: the operators, data flow, and parallelism
• Utilize query analysis tools: Visual Query Planner, Explain function, and Display_Explain statement
• Modify query plans using Control Query Defaults and Control Query Shape

Why education services from HP?
• Focus on job-specific skills
• Hands-on practice
• Experienced and best-in-the-field HP instructors
• Comprehensive student materials
• Customized on-site delivery
• More than 80 training locations worldwide

Detailed course outline

Module 1 - SQL/MX Query Fundamentals
• NonStop SQL/MX process architecture
• SQL/MX compilation phases
• Branch and bound optimization
• Query tree data flow model
• SQL/MX executor and its data flow model
• Forms of parallel execution used in SQL/MX query plans

Module 2 - Viewing Database Object Definitions
• SQL/MX database object characteristics
• Primary and clustering keys
• Range and hash partitioning
• Referential Integrity (RI)
• Triggers
• Utilities to display database definitions
• Lab: viewing database object definitions

Module 3 - Viewing SQL/MX Query Plans
• Visual Query Planner
• Explain function and Explain command
• Lab: viewing SQL/MX query plans

Module 4 - File Scan and Exchange Operators
• Basic operators that form a query plan: root operator, file scan operators, and exchange operators
• Statement atomicity
• Exchange operators and process boundaries
• Lab: analyzing basic query plans

Module 5 - Index Scan Operators and MDAM
• Index scan operators and their tokens
• Alternate index access path
• OR optimization
• MultiDimensional Access Method (MDAM)
• Forcing an access path to a table or index
• Lab: analyzing queries that use index scan operators and MDAM

Module 6 - SQL/MX Delete Operators
• Delete operators and their tokens
• Query plans that use delete operators to delete rows in a table with and without indexes
• Lab: analyzing delete queries

Module 7 - Update Operators
• Update operators and their tokens
• Query plans that use update operators to update rows in a table with and without indexes
• Lab: analyzing update queries

Module 8 - Insert Operators
• Insert operators and their tokens
• Query plans that use insert operators to insert rows in a table with and without indexes
• Lab: analyzing insert queries

Module 9 - Nonparallel Joins
• Join operators (nested join, merge join, ordered hash join, and hash join) and their tokens
• Query plans that use join operators
• System defaults for controlling joins
• Control Query Shape statement for joins
• Lab: analyzing nonparallel join queries
Module 10 - Parallel Joins
• Type 1 parallel joins: matching partitions, logical partition grouping, logical sub partitioning, range repartitioning, and hash repartitioning
• Type 2 parallel joins: replicate no broadcast and replicate via broadcast
• System defaults for controlling ESP parallelism
• Lab: analyzing parallel join queries

Module 11 - Subquery Operators
• Semi join and anti semi join operators and their tokens
• Query plans that use the semi join and anti semi join operators
• Lab: analyzing subqueries

Module 12 - Sorting and Grouping Operators
• Sort, sort groupby, hash groupby operators and their tokens
• Sort partial aggr, sort scalar aggr, and shortcut scalar aggr operators and their tokens
• Query plans that use the sort and groupby operators
• Lab: analyzing queries that use sorting and grouping operators

Module 13 - Rowsets and Compound Statements
• Rowset operators and tokens
• Compound statements
• Query plans that use input and output rowset arrays and compound statements
• Labs: rowsets operators and compound statements

Module 14 - Referential Integrity and Triggers
• Referential Integrity (RI)
• Triggers
• Insert, update, and delete queries on tables that have referential integrity constraints and triggers
• Labs: referential integrity and triggers

Module 15 - Forcing Query Plans
• Analyzing query plans
• Changing and modifying query plans
• Forcing query plans
• Lab: forcing query plans

Module 16 - Tuning
• Properties and costs
• TP queries and OLT optimizations
• Basic query, application, and database design for better performance

Onsite Delivery Equipment Requirements
• HP NonStop Integrity Server or later that supports 1 GB of memory and IEEE floating point
• H06.22 or later operating system with SQL/MX 3.0+ and DDL licensing product T0394
• Student desktop software:
  • Access to NonStop lab server using a terminal emulator such as MrWin6530 or OutsideView
  • Visual Query Planner
  • NonStop ODBC MX 3.0+ Administrator.

© Copyright 2012 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

ver D.00, Jan 2012

To review course schedules and to register for a course, visit www.hp.com/learn/nonstop and select your country from the drop down menu.