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Delivery mode	ILT, VILT	
Course length	5 days	
HPE course number	U8617S	

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# HPE NonStop SQL/MX Database Management U8617S

This course introduces tasks used by database administrators or system managers to manage and protect a NonStop SQL/MX database and applications that access the database.

#### Audience

- Database administrators
- System managers
- Personnel responsible for the availability of NonStop SQL/MX databases and applications.

### Prerequisites

- NonStop SQL/MX Basics (U4184S)
- NonStop SQL/MX Quick Start (U4185S)

### **Course Objectives**

- Describe HP NonStop SQL/MX architecture
- Install SQL/MX and upgrade SQL/MX metadata to current release
- Create, alter, and drop SQL/MX database objects (catalogs, schemas, tables, constraints, indexes, views, and triggers)
- Grant and revoke access privileges to

SQL/MX database objects

- Import data into SQL/MX non-partitioned and range and hash partitioned tables
- Protect and recover SQL/MX database objects with HP NonStop Transaction Management Facility
- Use the MODIFY utility to add, split, merge, and drop SQL/MX range and hash partitioned tables
- Describe and use the SQL/MX utilities (DUP, import, migrate, MODIFY, mxtool, mxexportddl, MXGNAMES, POPULATE INDEX, and PURGEDATA)
- Describe the SQL.MX distributed database architecture

### **Benefits to you**

- Become familiar with the SQL/MX architecture using SQL/MX native tables
- Create and manage SQL/MX database objects

\*Realize Technology Value with Training, IDC Infographic 2037, Sponsored by Hewlett Packard Enterprise, 2019

## **Detailed course outline**

Module 1: Overview of SQL/MX Architecture	<ul> <li>SQL/MX logical structure, catalogs, schemas, and objects</li> <li>SQL/MX physical structure: SMD volumes, schema subvolumes, data forks and resource forks</li> <li>SQL/MX processes and utilities</li> <li>Lab exercise: Overview of SQL/MX Architecture</li> </ul>	<ul> <li>Identify the system catalog, schemas, and objects</li> <li>Identify user catalogs, schemas, and objects</li> <li>Locate the underlying files for SQL/MX objects</li> <li>Metadata basics</li> </ul>
Module 2: SQL/MX Installation	<ul> <li>Hardware and software requirements for installing SQL/MX</li> <li>Installing SQL/MX with the InstallSqlmx utility</li> <li>Verifying the SQL/MX Installation</li> </ul>	<ul> <li>Create the SQL/MX sample database</li> <li>Lab exercise: Perform a post-installation check for SQL/MX.</li> </ul>
Module 3: Metadata Migration to SQL/MX R3.0	<ul><li>Migrating considerations</li><li>Post upgrade scenarios</li></ul>	<ul><li>FIXRCB operation</li><li>UPGRADE utility</li></ul>
Module 4: Creating SQL/MX Objects	<ul> <li>Creating catalogs, schemas, tables, constraints, indexes, and views</li> <li>Viewing object metadata</li> </ul>	<ul> <li>Lab exercise: Creating SQL/MX Objects with mxci or NSM/web</li> </ul>
Module 5: Referential Integrity Constraints	<ul> <li>Referential Integrity</li> <li>Creating referential integrity constraints as column or table constraints</li> </ul>	Lab exercise: Creating Referential Integrity constraints with mxci or NSM/web
Module 6: Creating SQL/MX Partitioned Tables and Indexes	<ul> <li>Range and hash partitioned tables</li> <li>Creating range and hash partitioned tables and indexes</li> <li>Advantages and Disadvantages of each type of partitioning.</li> </ul>	<ul> <li>Decoupled keys, co-partitioned tables, and co-located partitions</li> <li>Lab exercise: Creating range and hash partitioned tables with mxci or NSM/web</li> </ul>
Module 7: Creating SQL/MX Triggers	<ul><li>Trigger terminology</li><li>Creating BEFORE and AFTER triggers</li></ul>	<ul><li>Cascading and conflicting triggers</li><li>Lab exercise: Creating SQL/MX Triggers</li></ul>
Module 8: SQL/MX Security	<ul><li>Object ownership and security rules</li><li>Object Privileges</li><li>Use of Security Administrator's Group</li></ul>	<ul> <li>Change object ownership</li> <li>SQL/MX GRANT and REVOKE commands</li> <li>Lab exercise: Granting and Revoking Privileges with mxci or NSM/web</li> </ul>
Module 9: Import and Populate Index Utilities	<ul><li>Importing fixed and delimited data with the import utility</li><li>Importing data in parallel</li></ul>	<ul> <li>Populating (loading) indexes</li> <li>Lab exercise: Importing Data into Range and Hash Partitioned Tables and Indexes</li> </ul>
Module 10: Reorganizing SQL/MX Tables and Indexes	<ul><li>Reorganizing data</li><li>Determining file fragmentation</li></ul>	<ul><li>FUP RELOAD and INFO commands</li><li>Lab exercise: Reorganizing Data</li></ul>
Module 11: Updating Statistics	<ul><li>Histogram Statistics and histogram metadata tables</li><li>Generating single column and multicolumn statistics</li></ul>	<ul><li>Using sampling with the update statistics utility</li><li>Lab exercise: Updating and Viewing Statistics</li></ul>
Module 12: Database Protection and Recovery with TMF	<ul><li>TMF Protection and Recovery Strategies</li><li>MXGNAMES Utility</li><li>Performing Online Dumps</li></ul>	<ul> <li>Recovering dropped SQL/MX Objects</li> <li>Lab exercise: SQL/MX Protection and Recovery Using TMF</li> </ul>
Module 13: Compiling SQL/MX Programs in the OSS Environment	<ul> <li>Compiling SQL/MX Programs!Preprocessing source files for SQL/MX</li> <li>Language compiling SQL/MX annotated source files</li> <li>SQL/MX compiling module definition files</li> </ul>	<ul> <li>Global or local module files</li> <li>Defining search paths for module files</li> <li>Lab exercise: Compiling Embedded SOL/MX C or COBOL Programs in the OSS environment</li> </ul>
Module 14: PURGEDATA Command and MODIFY Utility	<ul> <li>Purging data from range and hash partitioned tables</li> <li>Adding, splitting, merging, and dropping range partitions</li> </ul>	<ul> <li>Adding and dropping hash partitions</li> <li>Lab exercise: PURGEDATA Command and MODIFY Utility</li> </ul>
Module 15: SQL/MX Utilities	<ul><li>DUP tables, indexes, and constraints</li><li>RECOVER utility</li></ul>	<ul> <li>mxtool (INFO, VERIFY, FIXUP, and GOAWAY) utility</li> <li>Lab exercise: SQL/MX Utilities</li> </ul>
Module 16: NonStop MXDM	<ul><li>Features and requirements of MXDM</li><li>Installing and uninstalling</li></ul>	Example screens

Module 17: Managing SQL/MX Applications	Name references in programs	Automatic recompilation
	Compile time and late name resolution	Methods for moving SQL/MX applications
	Similarity checking	Lab exercise: Managing Embedded SQL/MX Programs
Module 18: SQL/MX Distributed Databases	Distributed databases	REGISTER and UNREGISTER CATALOG commands
	<ul> <li>Transparency, visibility, and availability</li> </ul>	Lab exercise: SQL/MX Distributed Database
	ANSI name translation for local and remote objects	Demonstration
Module 19: Adding, Altering, and Dropping SQL/MX Objects	<ul> <li>Authorization for adding, altering, and dropping SQL/MX objects</li> </ul>	Dropping SQL/MX objects
		• Lab exercise: Altering and dropping SQL/MX objects
	<ul> <li>Adding SQL/MX objects</li> </ul>	
	Altering SQL/MX objects	
Module 20: Open Source Tools	Overview of open source tools available for SQL/MX usage	Overview of use of DBVisualizer to access SQL/MX
	Describe usage of Eclipse to access SQL.MX	

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