

# HP NonStop SQL/MX Release 2.0 Database

Data sheet



HP NonStop SQL Software is the database of choice for today's large mission-critical business intelligence, operational data store (ODS) applications, very large databases, real-time data warehouses, and emerging zero latency enterprise (ZLE) solutions. NonStop SQL Software has delivered the highest levels of availability, database integrity, and massive scalability to HP enterprise customers for years.

HP NonStop SQL/MX Release 2.0 Software introduces a new dimension of openness to add flexibility, standards support, and portability to this highly regarded software platform. HP customers continue to have the choice of using NonStop SQL/MP Software for their existing applications. The earlier release of NonStop SQL/MX Software provided the ability to add new applications against the existing NonStop SQL/MP data using ANSI/ISO/IEC 9075 Core SQL:1999 compliant Data Manipulation Language (DML). With NonStop SQL/MX Release 2.0, it is now possible to also extend the database with new data using Core SQL:1999 Data Definition Language (DDL) and create new applications that support the Core SQL:1999 standard DML.

## Key features and benefits

- ANSI SQL compliance
- Hash partitioning
- Removing limits
- Manageability
- Interoperability and coexistence with NonStop SQL/MP Software
- Connectivity
- Software partners supporting NonStop SQL/MX Database

NonStop SQL/MX Release 2.0 Database combines the highest levels of availability, database integrity, and massive scalability with the ability to build open systems.

NonStop SQL Software is widely used for “mission-critical” online transaction processing (OLTP) and decision support system (DSS) applications running on HP Integrity NonStop servers and also on HP NonStop S-series servers, where securities trading, stock exchanges, retail, and manufacturing businesses rely on NonStop SQL Software to manage their daily businesses. Parallel query capabilities and ease of online management have made NonStop SQL/MP Software the preferred database for large ZLE and ODS applications.

With the introduction of NonStop SQL/MX Software, HP has added the ANSI SQL standard (1999) features that allow you to create applications for open systems. It generally supports the ANSI/ISO/IEC 9075 Core SQL:1999 standard, and ISO/IEC 9579-2:1993, commonly known as Open Database Connectivity (ODBC) 3.5, as well as the latest standards support in Java™ (4.0) technology.

Taking advantage of HP’s heritage in parallel processing and high availability, NonStop SQL/MX Software provides

- High performance by employing parallelism, a data-flow execution architecture, and advanced query optimization techniques to achieve outstanding response times in complex query environments such as ZLE, ODS, and OLTP
- Scalability by supporting databases that can grow to multiple petabytes of data while retaining full manageability
- Extensibility through an object-oriented architecture that can easily support new access methods
- Around-the-clock availability and data integrity through online management and industry-leading reliability
- Application portability through support of industry standards for database access
- Lower cost of ownership through industry-leading manageability features

NonStop SQL/MX Software is optimized for clustered environments:

- Linear scalability across the CPUs in a single node, as well as across nodes in an HP ServerNet cluster. As you add processors to a node or add systems to a cluster, the database scales linearly.
- Instead of needing an idle machine to provide fault tolerance, each of the processors in the node shares in the database task. Should one processor fail, database requests and transactions are automatically and transparently moved to another processor in the node. Using a patented process-pair technology, the database remains available, even if a processor or disk fails or if there is a fault in the application software.
- Even though database access takes place on separate processors in the server, you manage NonStop SQL/MX Software as if you were managing a single database on a single system. This concept extends to ServerNet clusters so that a database spread across a cluster is still managed as a single database.
- NonStop SQL/MX Software uses HP NonStop Transaction Management Facility (NonStop TMF) Software to provide a single, easy-to-manage parallel log that tracks all transactions no matter how large the node. NonStop TMF Software is the highest-performance distributed transaction manager in the industry and can support distributed transaction processing environments that can scale to thousands of Integrity NonStop server processors and disks.

## Latest features for customer advantage

NonStop SQL/MX Release 2.0 continues to provide all the features introduced in the earlier NonStop SQL/MX Releases. In addition, it introduces NonStop SQL/MX tables that support ANSI/ISO/IEC 9075 Core SQL:1999 DDL as well as DML. Some of the most popular new features include

- Full support for logical three-part ANSI names
- Referential Integrity
- Triggers
- Support for Grant and Revoke operations
- Hash partitions, in addition to the traditional range partitions
- Web-based graphical interface for managing NonStop SQL/MX objects
- Continued interoperability between NonStop SQL/MP and NonStop SQL/MX Software, including the ability to have single query access data from both NonStop SQL/MP and NonStop SQL/MX tables
- Support for the popular BEA WebLogic Server/WebLogic Integration application server environment
- NonStop software partners supporting NonStop SQL/MX Software

NonStop SQL/MX Release 2.0 continues support for popular features already introduced in the earlier NonStop SQL/MX Releases, including

- Publish/subscribe—event-driven applications
- Higher-performance ODBC and MX Connectivity Services—included with NonStop SQL/MX Software
- Accessing NonStop SQL/MX data from HP Guardian programs
- Java Database Connectivity (JDBC): Type 2 and Type 4 drivers
- Java features in NonStop SQL/MX Software, including Stored Procedures in Java and no-wait support for JDBC

### ANSI SQL compliance

NonStop SQL/MX Release 2.0 is generally compliant with the ANSI/ISO/IEC 9075 Core SQL:1999 standard. NonStop SQL/MX Software also contains features beyond the Core SQL:1999 standard, such as support for triggers, natural joins, cross-joins, and isolation levels, other than SERIALIZABLE.

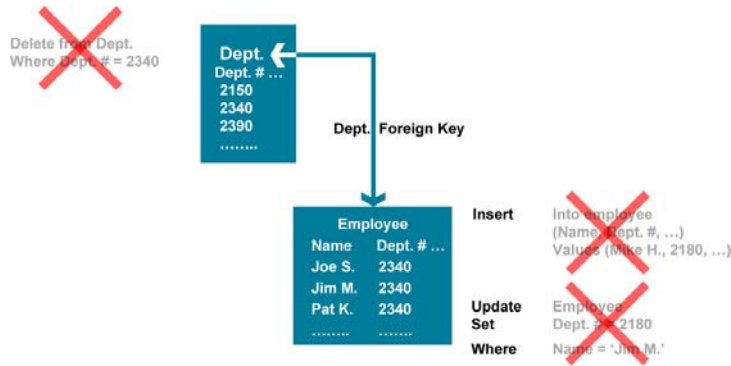
Standardization lays the foundation for HP's Adaptive Enterprise strategy. Supporting the prevailing ANSI standards enables better connectivity and interoperability for customer applications; use of standard features provides for more portability of applications.

Referential Integrity provides the ability to define relationships, such as parent-child relationships, and have the database, instead of the application, enforce the relationship when changes are made to the data (see figure 1).

Triggers provide the ability to define actions to be taken when values in the database are changed (inserted, updated, or deleted). Support for all standard data types is provided, including IEEE Floating Point and Unicode (UCS2 character set). Support for Grant and Revoke operations provides additional control of privileges that can be assigned for tables, columns in tables, views, and stored procedures.

**Figure 1**

Using Referential Integrity in NonStop SQL/MX Software.



### Hash partitioning

NonStop SQL Software has always provided support for range partitioning. In this type of partitioning, rows of the table are partitioned according to a range of column values. Range partitioning is useful when data has logical ranges and boundaries into which it can be subdivided and distributed (for example, months of the year). Range partitioning is optimal when the data is evenly distributed across the range.

NonStop SQL/MX Software, with NonStop SQL/MX tables, introduces hash partitioning. This partitioning method evenly distributes data across a specified number of partitions. Rows are mapped into partitions based on a hash value of the partitioning or clustering key. Hash partitioning becomes very useful when the data does not fit into any logical range. Hash partitioning automatically provides balanced and even distribution of data across available disks, helping to prevent skewing. Adding or dropping partitions in a hash-partitioned table also rebalances the data across the partitions automatically.

### Removing limits

NonStop SQL Software is used today by many customers for very large databases and very large application environments. It was first shipped in 1987, long before the demands of the Internet and the needs of e-business emerged. One of the new design principles for NonStop SQL/MX Software is to address the following customer needs:

- No restriction on the number of partitions for a table or index
- Multiple partitions of the same table can reside on the same disk volume
- Identifiers (object names) can be up to 128 bytes
- No restriction on the number of indexes per table
- View text (the text of the statement defining a view) can be unlimited
- A table can have an unlimited number of referential constraints
- No restriction on the number of tables referenced in a SQL query
- No limit is placed on the number of columns in a GROUP BY clause or the number of sort specifications in an ORDER BY clause
- String literals can be up to 4,000 bytes
- Up to 32 way joins are supported

## Manageability

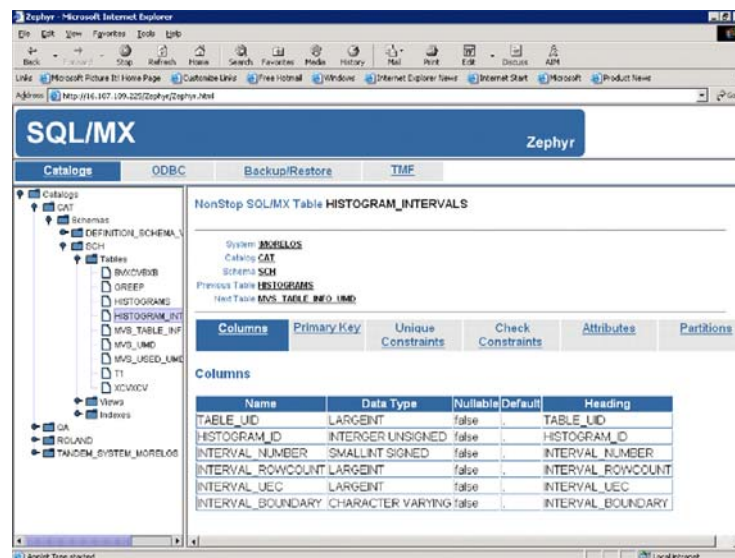
NonStop SQL Software sets a high standard for manageability and availability. All of the standard HP Guardian and Open System Services (OSS) utilities that operate against files will operate against NonStop SQL/MX tables, just as they do against NonStop SQL/MP tables. NonStop TMF and NonStop Remote Database Facility (NonStop RDF) Software, as well as the new Backup/Restore, support NonStop SQL/MX objects.

The popular online database reorganization capabilities introduced with NonStop SQL/MP Software can operate against NonStop SQL/MX tables. This includes operations such as online partition moving, partition splitting, and row redistribution, as well as parallel table reorganization. All of these features improve the availability of the database.

Figure 2 shows NSM/web, a Web-based graphical interface that supports management operations for NonStop SQL/MX objects. It also supports configuration and management of the NonStop SQL/MX Connectivity Service (MXCS), which supports HP connectivity products such as NonStop ODBC/MX and JDBC/MX Software.

**Figure 2**

The Web-based graphical interface of NSM/web.

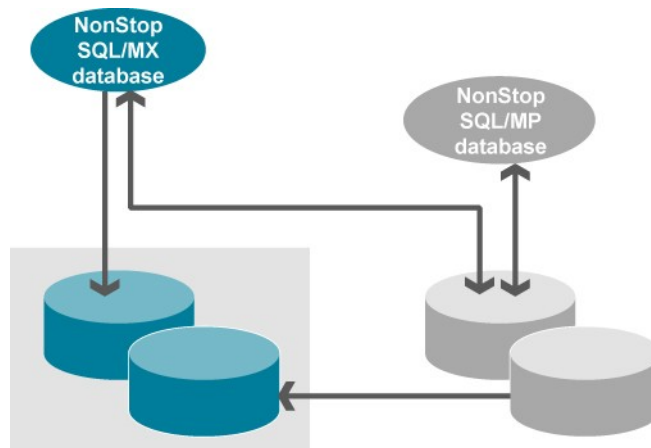


## Interoperability and coexistence with NonStop SQL/MP Software

HP recognizes the importance of NonStop SQL/MP Software and will continue its support. To allow our existing customers the flexibility of maintaining their current, stable applications and adding new, state-of-the-art applications against the same data, the NonStop SQL/MX engine will continue to provide access to NonStop SQL/MP data. In addition, customers can add new data that takes advantage of the features provided in NonStop SQL/MX tables—NonStop SQL/MP and NonStop SQL/MX metadata, data, and engines can both be present on the same system and be in use at the same time. With the advent of NonStop SQL/MX tables, it is also possible for a single query to access both NonStop SQL/MP and NonStop SQL/MX data (see figure 3).

**Figure 3**

Interoperability between NonStop SQL/MX and NonStop SQL/MP data.



Can have joins between  
NonStop SQL/MX and  
NonStop SQL/MP software

Two popular NonStop SQL/MP features that add value to customer applications and provide a stable, fault-tolerant transaction environment are also included in the NonStop SQL/MX engine. It is possible to prevent another transaction from updating a row that has been read but not yet released within a transaction, for row-at-a-time operations (similar to “stable access” in NonStop SQL/MP Software). It is also possible to either ignore or abort a failed update instead of having the transaction aborted automatically on a failed update.

### Connectivity

NonStop SQL/MX Software is supplemented with enhanced connectivity products that provide it with on-platform and off-platform connectivity. NonStop ODBC/MX Software has been enhanced to provide multiple nonblocking connections in the same application and row-set support for improved performance, and is also compliant with ODBC 3.5 standards. For a tighter integration with Java, a type 2 JDBC driver is provided, both for MP and MX table types. In order to enable NonStop systems as a key player in hybrid environments, enhancements include

- A direct connectivity layer to NonStop SQL/MX Software called MX Connectivity Services (MXCS) and an application program interface (API) that can enable partners and products to connect directly to NonStop SQL/MX Software. This software is bundled with NonStop SQL/MX Software.
- Sequelink for NonStop SQL/MX, an Independent Product (SR80V1), provides bi-directional connectivity to and from NonStop systems to various platforms and databases using ODBC, JDBC, and ActiveX Data Objects (ADO) drivers for connectivity to and from the HP NonStop S-series servers. A faster version based on the newer technology will be available for the HP Integrity NonStop NS-series servers.
- A new production-ready JDBC type 4 driver, an Independent Product (SJ82V1), provides direct connectivity to NonStop SQL/MX Software.

## Software partners supporting NonStop SQL/MX Software

Market-leading software partners have products that either take advantage of NonStop SQL/MX Software or are proven tools for the software. These partners provide software for data replication, data mining, database manageability, hybrid connectivity to other platforms and databases, rules engines, report writers, data cleansing, business continuity, campaign management, extract/transform/load, and online analytical processing (OLAP).

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## Technical specifications

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### System requirements

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#### Hardware

Integrity NonStop NS-series servers or NonStop S72000 (or later) S-series servers

(Note: NonStop S70000 and S700B servers from the NonStop S-series server family are not supported, as they do not contain the IEEE Floating Point feature, a requirement of NonStop SQL/MX Release 2.0.)

For Integrity NonStop NS-series and NonStop S-series servers, a minimum of 2 GB memory per CPU is needed

#### Software

OSS

HP NonStop operating system, Mission Critical Operating Environment, Release Version Update G06 or later is required for NonStop S-series and H06.03 is required for Integrity NonStop NS-series servers. (Contact HP's Global Customer Support Center for any recommended SPRs.)

## Ordering information

Part number	Description
<b>HP Integrity NonStop NS-series servers</b>	
HSR90	<p>NonStop SQL Software (per CPU) is a distributed relational database management system that uses the ANSI standard SQL to describe and manipulate data. NonStop SQL Software offers conversational and programmatic SQL access to the database. NonStop operating system, Mission Critical Operating Environment, that includes OSS, DP2, and NonStop TMF Software, is required. This product includes the NonStop SQL/MP engine and tables and the NonStop SQL/MX engine that is compliant with the ANSI/ISO/IEC 9075 Core SQL:1999 standard at the DML level.</p> <p>Note: HSR90-MXT is an optional product, described below, that can be added to HSR90 at no additional cost to add the ANSI/ISO/IEC9075 Core SQL:1999 standard at the DDL level.</p>
HSR92	<p>NonStop SQL/MX Software (per CPU) is a distributed relational database management system that uses the ANSI-standard SQL to describe and manipulate data. NonStop SQL/MX Software offers conversational and programmatic SQL access to the database. NonStop operating system, Mission Critical Operating Environment, that includes OSS, DP2, and NonStop TMF Software, is required. This version of NonStop SQL/MX Software is compliant with the ANSI/ISO/IEC 9075 Core SQL:1999 standard at the DML and DDL level and provides the most fault-tolerant, available, and scalable database that is also standards based. This package does not include the NonStop SQL/MP engine or provide support for NonStop SQL/MP tables.</p>
HSR90-MXT	<p>This add-on NonStop SQL/MX tables package provides the license to use NonStop SQL/MX tables for users that are licensed for HSR90. It is licensed on a per-system basis on Integrity NonStop NS-series systems. This package can only be used in conjunction with HSR90 and cannot be ordered otherwise.</p>
<b>HP NonStop S-series servers</b>	
SR90	<p>NonStop SQL Software (per CPU, 1–4; for CPU, 5–16, order SR91) is a distributed relational database management system that uses the ANSI-standard SQL to describe and manipulate data. NonStop SQL Software offers conversational and programmatic SQL access to the database. It includes an active data dictionary and supports logical views of data. It includes a report writer for end users. NonStop operating system, Mission Critical Operating Environment, that includes DP2, and NonStop TMF Software, is required.</p> <p>Note: SR90-MXT is an optional product, described below, that can be added to SR90 at no additional cost.</p>
SR94	<p>NonStop SQL Runtime Software (per CPU, 1–4; for CPU, 5–16, order SR95) provides runtime libraries for NonStop SQL Software. It is licensed on a per-CPU basis on NonStop S-series systems.</p> <p>Note: SR98, the NonStop SQL/MP Parallel Query Option (per CPU, 1–4; for CPU, 5–16, order SR99), may be added to NonStop SQL runtime (SR94) to provide support for parallel query execution with the NonStop SQL/MP runtime engine. Parallel query execution using the NonStop SQL/MX engine is already included in SR94. Parallel query option is also already included in full licenses SR90 and SR92.</p>

SR92	<p>NonStop SQL/MX Software (per CPU, 1–4; for CPU, 5–16, order SR93) is a distributed relational database management system that uses the ANSI standard SQL to describe and manipulate data. NonStop SQL/MX Software offers conversational and programmatic SQL access to the database. It includes an active data dictionary and supports logical views of data. It includes a report writer for end users. NonStop operating system, Mission Critical Operating Environment, that includes OSS, DP2, and NonStop TMF Software, is required. This version of NonStop SQL/MX Software is compliant with the ANSI/ISO/IEC 9075 Core SQL:1999 standard at the DML and DDL level and provides the most fault-tolerant, available, and scalable database that is also standards based, open, and enables portability of applications. This package is for newer applications and, as such, does not include the NonStop SQL/MP engine or support for NonStop SQL/MP tables. It does include the NonStop SQL/MX engine and support for NonStop SQL/MX tables.</p>
SR90-MXT	<p>This add-on NonStop SQL/MX tables package provides the license to use NonStop SQL/MX tables for users that are licensed for SR90-91. It is licensed on a per-system basis on NonStop S-series systems. This package can only be used in conjunction with SR90-91 and cannot be ordered otherwise.</p>

Notes

- 1 Customers can choose a different option, depending on features of the latest release they want to use.
  - A) If a customer wants the latest enhanced functions and NonStop SQL/MX and NonStop SQL/MP engines for NonStop SQL/MP tables, they must order SR90 (full) or SR94 (runtime).
  - B) If a customer chooses to add NonStop SQL/MX tables to SR90 or SR94, they must order SR90-MXT.
  - C) If a customer wants only the NonStop SQL/MX engine and NonStop SQL/MX tables, they must order SR92.
  
- 2 NonStop SQL/MX Release 2.0 relational database management system is not available for K-series or earlier systems nor does it operate on NonStop S70000 or S700B systems due to hardware limitations in the floating-point hardware of those older models.

## For more information

For more information about HP NonStop SQL/MX Release 2.0 Database, visit [www.hp.com/go/nonstop](http://www.hp.com/go/nonstop).

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05/2005

