NonStop SQL strategy and roadmap

All Modern, All Standard, All NonStop

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Your infrastructure with

HP NonStop Database Solution
for OLTP and Data Warehouse
database applications
Forward-looking statements

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This is a rolling (up to three year) Statement of Direction and is subject to change without notice.
Today’s agenda

NonStop SQL

• Value proposition
• Roadmap & releases
• What is new in SQL/MX 3.0?
• Partners & use cases
• Proof points
• Looking ahead
Value proposition
Overview

Databases are critical to your business

- Enterprise database hosts business critical information
- Databases support critical business functions
- Databases control all touch points of an enterprise
- DBAs are responsible for the wellness of business
The Database decision

Customers are looking for a database that

- Grows with your business without sacrificing performance
- Meets global business needs 24x7
- Provides information at the right time
- Avoids complexity of too many moving parts

Does not cripple IT budgets
The HP NonStop database solution
All modern, All standard, All nonstop

All modern
Integrated hardware and software
Out-of-the-box cluster aware
Virtualized data
Parallel query execution

All NonStop
24/7 application availability
Linear scalability
Mixed workload handling
Online manageability

All standard
ANSI 2003
JDBC 3.0
ODBC 3.5

Trusted HP expertise with comprehensive mission-critical services and world-class partnering
NonStop SQL
Roadmap & releases
NonStop SQL strategy

• Lead in mission critical enterprise applications market space

• Customer focused innovation
  – Invest in security, performance, and new features

• Acquire new applications and customers
  – Enable ports from other clustered databases
NonStop SQL/MX roadmap

SQL/MX 2.1.1 – G06.27 September 2005, mature and supported

SQL/MX 2.3 – H06.10 May ’07

SQL/MX 2.3.1 – H06.13/J06.03 Feb. ’08

SQL/MX 2.3.2 – H06.16/J06.05 Nov. ’08

SQL/MX 2.3.3 – H06.19/J06.08 Aug ’09

SQL/MX 2.3.4 – H06.20/J06.09 Feb ’10

SQL/MX 3.0 – H06.22/J06.11 Feb ’11

SQL/MX – Next Revision

SQL/MX – Future Revision

This is a rolling (up to three year) Statement of Direction and is subject to change without notice.
HP NonStop SQL 2.3.4
February 2010, H06.20, J06.09

All modern
- Embedded SQL in DLLs
- Cascaded updates and deletes

All NonStop
- Performance enhancements
- Quality improvements

All standard
- Thread aware OSS ODBC/MX Driver
HP NonStop SQL 3.0
February 2011, H06.22, J06.11

All modern
32k row limits
2k key limits
128 digits extended numeric precision

All NonStop
Optimizer enhancements
Executor performance improvements

All standard
64 bit Connectivity Drivers
HP NonStop SQL next revision

**All modern**
- Separation of duties,
- Change ownership
- Table rename
- Preprocessor enhancements
- MFC Support for ExecDirect
- 32k row size support for LOB/CLOB in JDBC Drivers
- NVL, Decode, Coalesce
- TRIM, LTRIM, RTRIM
- To_Char

**All NonStop**
Compiler and Connectivity performance improvements

**All standard**
- SSL Support in Connectivity Clients
- NSM/Web Firewall Access
- Caching query parameters with MFC

This is a rolling (up to three year) Statement of Direction and is subject to change without notice.
HP NonStop SQL future revision

**All modern**
- Sequence
- Extended numeric precision from embedded apps and MFC
- Allow sub-queries with AFTER TRIGGERS
- Materialized Views
- Improved connect/disconnect times

**All NonStop**
- MDAM enhancements
- SPJ Debug and Profiling
- HP Database Manager
- Remote mxci
- Enhanced DBA Tools

**All standard**
- ODBC/MX Driver for Linux
- 64 bit Support
- Backup/Restore DDL with >3000 characters

This is a rolling (up to three year) Statement of Direction and is subject to change without notice.
An introduction to SQL/MX 3.0
Large rows

- Large rows up to 32k for MX Tables, both range and hash partitioned tables
- Requires 32k Blocks support
- Error returned if you try to use 32k rows with 4k blocks
- System default stays at 4k blocks
- Metadata system and user tables use both 4k and 32k blocks
Large keys

- Large keys up to 2k for MX Tables only
  - Supports both range and hash partitioned tables
  - Limit reduced to 2032 (32k blocks) when Triggers are used
  - Limit with 4k blocks is 2010 only, or 1994 when triggers are used
- Applies to clustering keys of base tables, indexes and triggers
- For nonunique indexes, maximum length of the index reduced by the length of the clustering key of the underlying table
Extended numeric precision

- Numeric data type precision increased to 128 digits, for MX Tables only
- Support available only from dynamic SQL
- Support from embedded SQL coming in a future revision
- Pcode optimizations made to improve performance
Enhanced connectivity drivers

- 64 bit ODBC drivers for Windows
- 64 bit JDBC T4 drivers for JDK 1.5 or later
- Connectivity Services now support 32k blocks and 32k rows
Other changes

- Support new “fast rowcount” – Select Row Count From <table>
- Support EID Trace Points for better debugging and diagnostic analysis
- Support ISO88591, UCS2 and KSC5601 character sets for MX tables
- Metadata Upgrade utility to 3.0 format
- Fallback to pre R3.0 format available with certain restrictions
- Allow data movement from pre R3.0 system to 3.0 system using BR2 and RDF
- Application recompilation required in all cases
Partners & use cases
Attunity: Comprehensive NonStop SQL/MP connectivity

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<th>SQL Clients</th>
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<th>SQL/MP</th>
<th>SQL/MX with MP tables</th>
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Attunity: Proven integration with crystal reports

• Supported Crystal Reports versions:
  – Crystal Reports 8.5
  – Crystal Reports 9
  – Crystal Reports 10
  – Crystal Reports XI
  – Crystal Reports XI R2
  – Crystal Reports 2008

• Supported HP NonStop systems:
  – HP NonStop S-Series
  – HP NonStop NS-Series
  – HP NonStop Blade System

• For more information contact, Itamar Ankorion, itamar.ankorion@attunity.com
Cross-Platform data integration and reporting

Numerous reporting tools supported
SAP/Business Objects Crystal Reports,
IBM Cognos, Microsoft Excel and Reporting Services

Real time data access from multiple heterogeneous sources

HP NonStop Itanium

SQL Server
Oracle 11g

Attunity ODBC
Direct SQL access
Federated views

Attunity CONNECT
Attunity FEDERATE

SQL/MX

HP NonStop Itanium

Hundreds of files & tables

GE Healthcare
Centricity Enterprise

HP NonStop Itanium

GE Healthcare
Centricity Enterprise

SAP/Business Objects Crystal Reports,
IBM Cognos, Microsoft Excel and Reporting Services
Merlon database manageability

- SQLXpress – comprehensive database management software for NonStop SQL/MX with support for SQL/MP tables etc
- MARS – Merlon Auto Reload System for reload detection and execution of SQL and Enscribe files
- Discover – continuously predicts and corrects potential disk and file full problems before they can cause an outage including reloads
- Partner – partition analysis for SQL and Enscribe files
- MPPress – host based report writer for SQL/MP, SQL/MX and Enscribe databases

For more information, contact Rick Pettifer, Pettifer@merlon.com
NuWave XML Vault

- Store and retrieve XML documents
- Multiple criteria to retrieve the stored XML Document
- Document Store can be accessed via Web and Command Line interfaces
- Java APIs for storage and retrieval
- For more information, contact Ernie Guerrera eguerrera@nuwave-tech.com
Voltage SecureData

- Encrypt and Decrypt Database Columns using Format Preserving Encryption (FPE) algorithms
- Requires no changes to underlying data schemas
- Requires few changes to applications
- Centralized, automated key management
- Flexible options to integrate encryption in your environment

For more information, contact Mark Bower, Mark.Bower@Voltage.com
Voltage: Format-Preserving encryption (FPE)

- FPE allows direct encryption/masking of data, without loss of formatting

- Supports data of any format
  - Credit Card, Social Security, Bank Account, Generic Alphanumerics, Dates, etc.
  - Maintain rules such as credit card checksums

- Preserves referential integrity
  - Allows encrypted data to be used as database indices & foreign keys
  - Enables searching on encrypted data without performance impact

- Encrypt all or part of a value
  - For example, only encrypt middle digits of credit card
  - Allows for important data properties to be maintained even when data is masked

1298 7328 4318 5403 FPE
U2FsdGVkX1+ybFtu2oLMeycPGkwEZ9lHmTsit5lhP… AES
Voltage persistent data protection
Encrypting credit card numbers

- Only encrypted CC#'s in persistent storage
  - In-place encryption
- At billing time, temporarily decrypt CC# and pass to app

Customer Services or Web Application

Billing App

Encrypt

Decrypt

4391471208007120

1298732843184033

1298732843184033
Voltage SecureData

Key Servers

SD Encryption Toolkit SDK for NonStop

Authentication & Permissions Repository (e.g. LDAP)

SD SecureData CL

SD SOA Server

Business Applications (Others)

NonStop SQL & Enscribe

Business Applications (HP NonStop)

Management Console

SSL

Application integration

Database or Application Data

Voltage SecureData Component
Ispirer SQLWays

- Ispirer SQLWays automates database migration to NonStop SQL
- SQLWays converts DDL, DML, Scripts, and application business logic
- Recent customer POC achieved 100% automated conversion from Oracle PL/SQL to NonStop SQL
- Converted code is readable and maintainable
- No extraneous library or middleware required at run-time
- For more information, contact Dmitry Tolpeko, dmtolpeko@ispirer.com
Proof points
NonStop SQL handles critical business needs

Customer realizes TCO and performance benefits of NonStop SQL

- A major Financial Solutions provider in Americas evaluates NonStop SQL
- Dissatisfied with pricing and TCO of Oracle database solutions
- Evaluated NonStop SQL for equivalent functionality and eXtreme performance
- Application migration automated using SQLWays tool, low cost of migration, accelerated migration timeline
- Sustained peak performance achieved is 11.4 Million business transactions/hour
- Customer impressed with performance, all-inclusive NonStop SQL pricing and TCO

![Business Transactions (in Millions) per Hour](chart)

- **Oracle/Linux**
- **Oracle/Unix**
- **NonStop SQL/NonStop Blade servers**
NonStop SQL handles critical business needs
Customers realize scalability benefits of NonStop SQL …

• A major international supermarkets store evaluates NonStop SQL to handle growth in business

• Needs capability to add twice as many stores

• Twice as much assortment

• Double the forecast period

• And be always available
NonStop SQL handles critical business needs

Customers realize availability benefits of NonStop SQL

- A securities company moves to NonStop SQL for its superior availability and TCO
- Objective is to manage the trading activities with no unplanned downtime
- Performing at 2000 tps, driving 20,000 sql statements from 10,000 concurrent users over 2000 JDBC connections
NonStop SQL handles critical business needs

Customers realize scalability and availability benefits of NonStop SQL

- An internet service provider uses NonStop SQL to manage Petabytes of database
- Drives 100,000+ tps
- No outage since going live in 1995
- Managed with 2 DBAs
NonStop SQL handles critical business needs

Customers realize mixed workload benefits of NonStop SQL

• An intelligence agency deploys NonStop SQL to manage 250++TB of database

• Driving mixed-workload consisting of 39,000 ingests per second concurrently with >5000 ad-hoc and OLAP queries

• Executing concurrent database maintenance activities
NonStop SQL handles critical business needs

Customers realize benefits of modern NonStop SQL

- Brand new Fraud Prevention application using SPJs deployed on NS SQL/MX
- New app maintaining schematics and parts lists developed using NS SQL/MX
- New ISV Solution maintaining single source code for both NonStop and Unix platforms developed using NS SQL/MX
- New customer solution completes a six week planned migration activity in one week using NS SQL/MX
Did you know?
NonStop customers enjoy lower operational costs

NonStop SQL is out-of-the-box cluster aware

- It takes 5 DBAs to manage few Gigabytes of an Oracle database at a Spanish Healthcare Center
  - It takes 2 DBAs to manage several Petabytes of NonStop SQL database at an Internet Service Provider

- It takes 208 steps to install an Oracle RAC database instance
  - It takes 19 steps to install a NonStop SQL/MX instance and perform database upgrade
NonStop customers enjoy lower operational costs
NonStop SQL takes away the complexity of clustered databases

- Adding a node in an Oracle RAC cluster requires:
  - You need to provision the new node, install CRS, install RAC software, add a LISTENER to the new node, add the Oracle 11g software, add an ASM instance, add a database test instance…
  - Next you would look at your database application and make it cluster-aware in order for it to leverage performance benefits of a RAC cluster

- Adding a node to an existing NonStop cluster can be done online
NonStop customers can start small and scale

NonStop SQL enables flexible configuration options

- Smallest Oracle Exadata X2 offering is 6TB making it too large and expensive for some use cases
  - You can start small with a NonStop database – 146 GB user data
  - And grow to several Petabytes
NonStop customers enjoy flexible configurations

NonStop SQL comes with flexible scaling options

• Oracle is prescriptive about scaling out your Exadata X2 configurations
  – Customers can only order a quarter rack, half rack, or multiples of full racks
  – Adding processing hardware requires additional storage servers
  – Increased license fees to run the Exadata software, which comes at $10,000 per disk (and there are 12 disks per server)
  – Plus 22% maintenance

• NonStop offers flexible scale-out options
  – Add nodes and/or add storage capacity as you need it
  – With no prescriptive constraints
Looking ahead
Optimize your database environment
With HP NonStop SQL scalability

NonStop SQL throughput scales linearly (98-100%)

- As more processing capacity (nodes) is added to a cluster (X-axis)
- As #concurrent sessions are increased (Z-axis)
- No performance penalty for clustered database apps

![NonStop SQL scalability graph]

- Throughput (tps)
- Number of nodes in the cluster
- Number of concurrent sessions
Optimize your database environment

With out of the box clustered HP NonStop SQL

• No complex cluster configurations required to create a clustered database
  
  – NonStop SQL is delivered as an “out-of-the-box” clustered database

  – NonStop SQL deploys as a single clustered database image spread across the entire cluster, keeping operational costs low
Optimize your database environment

Provide information in real time

• NonStop SQL has industry’s most elegant mixed workload handling
• NonStop SQL engine executes concurrent database updates, queries and batch operations
• No add-on licensing or configuration
• No need for application partitioning
• No need to replicate data to Reporting servers
• NonStop customers always have current view of the state of the enterprise
Optimize your database environment

Low TCO means more for saving money with NonStop SQL

• All DBA productivity tools are included with the base SQL license with no additional costs
• No additional Partitioning Software licenses required
• Diagnostic, Tuning, Management packs are all included in the base license
• NonStop has fewer moving parts and less complexity, leading to lower operational costs
Independent Oracle users group (IOUG) survey on high availability trends

NonStop customers experience superior availability

- 90% surveyed customers report significant Oracle database induced unplanned outages in a year
- 25% Oracle outages lasted longer than 10 hours, some lasted more than 24 hours
- What are your experiences with Oracle database availability?
## NonStop SQL vs. Oracle Pricing

### All inclusive vs. add-ons

<table>
<thead>
<tr>
<th>Feature/Function</th>
<th>NonStop SQL</th>
<th>Oracle</th>
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<td>Active Data Guard</td>
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<td>Add-on</td>
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<td>Real Application Testing</td>
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<td>Advanced Compression</td>
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<td>Advanced Security</td>
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<td>Configuration Management Pack</td>
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<td>Add-on</td>
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- **Advanced Compression**: Not required with its optimized index management.
HP NonStop vs. Oracle Exadata X2 Pricing

• Cost comparisons are based on similar HW configurations (# of cores, memory & user data storage)
• Software stack includes OS and SW for clustered database engine, no middleware included
• Cost to own include:
  • Hardware US list prices for a given configuration
  • Support costs of hardware
  • 5 year software licensing list price
  • Support costs of software
HP NonStop vs. Oracle Exadata X2 2 Quarter Rack

NonStop beats Oracle by a factor of >1.5x in Cost to Own

5-Year Cost of Ownership Comparison (US $ List Price)
Equivalent Exadata X2 2 Quarter Rack and NB54000c Configuration

H/W  S/W (TLC5)  5-Year Support

NB54000c 6p, 24c, 192GB Memory, 11TB User Data

Exadata X2-2 Qtr Rack, 24c, 192GB Memory, 9.25TB User Data
HP NonStop vs. Oracle Exadata X2 2 Half Rack

NonStop beats Oracle by a factor of >1.63x in Cost to Own

5-Year Cost of Ownership Comparison (US $ List Price)
Equivalent Exadata X2 2 Half Rack and NB54000c Configuration

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HP NonStop vs. Oracle Exadata X2 2 Full Rack

NonStop beats Oracle by a factor of >1.60x in Cost to Own

5-Year Cost of Ownership Comparison (US $ List Price)
Equivalent Exadata X2 2 Full Rack and NB54000c Configuration
HP NonStop vs. Oracle Exadata X2 8 Full Rack

NonStop beats Oracle by a factor of >2.64x in Cost to Own

5-Year Cost of Ownership Comparison (US $ List Price)
Equivalent Exadata X2 8 Full Rack and NB54000c Configuration

H/W  S/W (TLC5)  5-Year Support
HP NonStop vs. Oracle/Sun System – Cost to Own

NonStop beats Oracle by a factor of >2x

- Cost comparisons are based on similar HW configurations (# of cores, memory & storage), both single node and clustered configuration
- Software stack includes OS and SW for clustered database engine, no middleware included
- Cost to own include:
  - Hardware list prices for a given configuration
  - Support costs of hardware
  - 5 year software licensing list price
  - Support costs of software
Take the next step with HP

Perform a health check of your system

Let us show you how HP NonStop SQL can:

• Scale your application
• Maximize availability
• Optimize TCO

Let us help migrate and open-up your database applications
Summary & call to action

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**All modern**
- Integrated hardware and software
- Out-of-the-box cluster aware
- Virtualized data
- Parallel query execution

**All NonStop**
- 24/7 application availability
- Linear scalability
- Mixed workload handling
- Online manageability

**All standard**
- ANSI 2003
- JDBC 3.0
- ODBC 3.5
THANK YOU

AJAYA.GUMMADI@HP.COM
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