Business Continuity Products Update

Bob Loftis
HP NonStop Product Management
May 15, 2008

Future product plans, dates, and functionality are subject to change without notice
Guest Speakers

- Jim Willis, TMF development
- Johanne Corbeil, Carr Scott Software Support
Agenda

• Overview
• TMF Update - Jim
• AutoTMF, AutoSYNC – Johanne
• SDR Preview – Johanne
• RDF Update
• Active/active Update
NonStop Business Continuity Strategy

Provide high performance, reliable, NonStop to NonStop database replication products that:

• Allow smooth migration and upgrade
• Support no lost business in disaster events
• Provide zero lost transactions where required

Provide access to our partners who offer heterogeneous data transformation, and options for active/active
Integrated HP NonStop Server products

- **NonStop Transaction Management Facility (TMF)**
  - The foundation for transaction integrity and data protection for fault tolerance
  - Simple for application programmers, business transaction can span multiple database updates
  - Whole transaction completes with associated updates or nothing completes – you know where you are!
  - Committed changes are written serially to an audit trail – improves transaction performance through buffered “writes”

- **NonStop AutoTMF**
  - Automatically invokes NonStop TMF protection for non audited databases

- **NonStop AutoSYNC**
  - Synchronizes non database files

- **NonStop Remote Database Facility (RDF)**
  - High-performance database replication

*An integrated product set providing business continuity without specialist programming knowledge*
HP business continuity software direction

- **H1 2008 – Partner active/active support, ease of use**
  - Add requested improvements, quality fixes for AutoTMF, AutoSYNC
  - Ship new ODBC/MX driver on OSS for partner active/active replication solutions

- **H2 2008 – More manageable replication**
  - SQL DDL Replicator (SDR), September (for MP)
  - RDF 1.9, October: manageability, availability, performance
  - TMF 3.6, July back-port Neoview features, led by Transaction Typing
  - AutoSYNC enhancements based on customer requests, November
  - New APIs to encourage partners’ synchronous active/active replication

- **2009, Future – More cost effective solutions**
  - Investigate SDR support for SQL MX
  - Increased manageability, performance for TMF, RDF, SDR, AutoTMF, AutoSYNC
  - Updates and new functionality for ODBC/MX on OSS
Look for us at HP TF/ITUG 2008

- New HP Solution for Replicating NonStop SQL DDL: SDR
  - Tues June 17th 1:30 pm Session 1803
- NonStop Server Business Continuity Update
  - Wed June 18th 8 am Session 1802
- Business Continuity SIG plus many partner and consultant sessions on availability issues
- Education is key to best practices/new advances
- Stop by the HP and partner booths!
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All transactions captured in one audit log

Industry-standard APIs

- NonStop SOAP
- SOA services
- IBM WebSphere
- iTP WebServer
- NonStop SQL or Enscribe
- NonStop TMF
- NonStop OS

Web clients

Applications

Traditional clients

Transaction Management Facility

middleware

Reliable transaction protection
TMF 3.5 on Integrity NonStop
H06.10 - May 2007

• Finer granularity for control of TMP Wait Timer
  – Allows fine-tuning commit processing performance
  – Resolution is now in milliseconds rather than centiseconds
  – Applications with highest transaction rate will see the most benefit

• Improved audit write performance for audit trails on HP Storageworks XP (DP2)
  – Partial blocks can be written in parallel
  – Used to be parallel writes only on full 4KB blocks

• Disk Process (DP2) now encourages smaller, faster I/O with smart “convenience writes”
  – Audit that does not have to be forced to disk gets shipped to Audit Disk Process
  – Disk Process attempts to write to audit trail immediately (avoiding multiple I/Os at TMP commit time)
  – Prior to H06.10, convenience writes were deferred until 128KB of data was queued up
  – Now convenience writes occur at 64KB if no active write underway to audit trail
NonStop TMF 3.6 - Summer 2008

Enhancements

- ANSI names for SQL MX objects
- manually abort (long running) transactions, with caution
- faster audit trail release
  - pin from first write position, not txn start time
- enable network transaction joins
- support different transaction types

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Transaction typing support

BeginTransaction API supports 2 additional parameters

- 64 bit transaction attribute variable
  - Attributes apply only to this transaction
  - Attributes retrieved during life of transaction
  - Attributes written in transaction state records
  - Contains 8 bit field for application data
- 32 bit Transaction Timeout
  - Timeout overrides generic AutoAbort time

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More TMF 3.6 features

• ANSI names for SQL MX objects
  – Current dump and restore requires Guardian names
  – Will allow dump and restore of SQL/MX objects using ANSI names
  – Wild cards supported

• Manual abort of (long running) transactions, with caution
  – Designed for long running table loads

• Pin Audit Trails from first write position, not txn start time
  – Reduces the number of audit trails pinned

• Enable network transaction joins
  – Allows application running on multiple nodes to participate in txns

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Recent TMF support

ArLib2 support for non-SQL/MX systems

- ArLib upgraded to ArLib2 to support large (> 2gb) audit trails and SQL/MX
- ArLib2 required special SQL/MX CLIPDLL library only distributed to SQL/MX customers
- New CLIPDLL ‘stubs’ library now available to customers and partners so ArLib2 works on non-SQL/MX systems
- Released in SQL/MX version T1051H22^AEI (H06.10)
- Support Note in final editing
TMF support for synchronous active/active

- Limited customer access to select OpenTMF APIs
  - Enabler for synchronous active/active from partners
  - Working to support partner’s first implementation
  - Target availability – first half of 2009

- Enabler product to be licensed from HP
  - Only called by partner application
  - Reasonably priced by system/processor

- Based on safe participation in TMF commit process

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TMF commit voting process

- Allows Resource Manager (RM) process to be involved in 2 phase protocol
- RM notified of txn ending and votes on commit or abort
- Allows RM to coordinate with 'foreign' system, even if it is another NonStop system

Any TMF questions?
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NonStop AutoTMF
IPM Scout TCF Apr 07

- Option to STOP programs that encounter irrecoverable TMF error without creating save files
- Support for OSS Java programs for JEnscribe files
- Increased number of concurrent classes of programs traced from 8 to 32
- Allow up to 1000 traces of a program instance
- Updates to User's Guide in docs.hp.com
NonStop AutoTMF  (New)
Update 8 May 2008

- AutoCommit feature enabled by default (added safety net)
- NOWARNLONGTX safely suppresses unneeded long running txn EMS warnings
- flexibility to do commands (COPY for ex) under user txn rather than command interpreter-generated txn
- option to list commands used to change global default values
- Updates to User’s Guide in docs.hp.com
NonStop AutoSYNC
Update 9 Nov 07

- EXCLUDE support for OSS files/directories
- FROMOWNER option to synchronize only files that are owned by a specific user
- NOSAFEGUARD option to preclude propagation of Safeguard file setting
- PURGE support for OSS files/directories
- OPENUPDATE support for SQL tables OSS files/directories
- SYSTEM option for displaying status information for a specific node only
- Updates to User's Guide in docs.hp.com

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NonStop AutoSYNC  (Soon)

Update 10 June 2008

- USEBINDERTIME allows object files to be synchronized based on binder or linker timestamp differences
- TRIGGERONFILESET executes trigger commands after replication of entire file set
- option to list commands that were used to change global default values
- Updates to User’s Guide in docs.hp.com

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Future Releases

• For both AutoTMF and AutoSYNC
  – Yearly or as needed, depending on customer requests
  – We’re listening!
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NonStop SQL DDL Replicator (SDR)

• Captures, replicates and applies NS SQL/MP DDL operations to backup tables
• Companion to RDF
• DDL operations replicated:
  – ALTER, COMMENT, CREATE, DROP operations
  – ALTER TABLE and ALTER INDEX (including split and merge partitions)
  – Can even be configured to replicate DDL operations on non-audited tables
• No impact on performance or operations of applications on primary

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NonStop SQL DDL Replicator (con’t)

• Easy to install, easy to use
  – User interface is like RDFCOM
  – Once installed, just leave SDR running
• Must be deployed on primary and target
• Requires SUPER group to configure and control
• Captures DDL on primary system
  – Independent of RDF and like TMF-RDF, can be configured after SQL DDL capture
• Executes DDL on backup
  – Works closely with RDF to ensure DDL operations execute in correct sequence

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SDR – general product information

• Marketing ID: (H)SA47V1
• Product ID: T2828H01
• Same product file set runs on all supported NonStop servers (G, H)
• Compatible with RDF IMP and IMP/X - back to T0346 AAJ (mid-2000)
  – with the exception of RDF SPRs ABJ, ABO and base release T0346H08
• Targeted for release end of summer 2008
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NonStop Remote Database Facility

- High throughput and low CPU utilization
- Exceptional multi-node transaction support
- Focused on data integrity (nodes in sync)
- Active/active split reciprocal
- Designed for easy installation and maintenance – but test!
- Oct 2008: 11 enhancements - availability, performance, manageability

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RDF Release 1.8  Fall 2008
H series - subset available on G series

• Performance improvement
  – Large 56KB buffer transfers for Extractor/Receiver and Updaters
  – Native code for select objects:
    • RDFMONO, RDFEXTO, RDFRCVO, RDFPRGO, RDFUPDO, RDFNETO, MD5CHEK, MD5SRVO, RDFSNOOP

• Manageability
  – SQL/MX - MX tables: ANSI names in event messages
  – Quality fixes for EMS
  – More flexibility in naming volumes on target system
    • Subvolume naming can be different on target system than source though a mapfile
RDF 1.7 SPR (ABO)  Fall 2007
G series

• Flexibility in naming subvolumes
• Interoperability code for communicating with RDF 1.8 on H-series (H06.10)
  – Recommended: when migrating to the NS series, migrate the target system first and run with the S Series as primary and NS Series as target
  – Prior to RDF 1.8, compatible versions have same features
  – RDF 1.8 introduces variation - Ex: ANSI names in EMS events not available in A07^ABO, but available on the H series

• Some Event Message System improvements (RFE) and fixes
• General quality improvements
Recent RDF version compatibility

- RDF A06 or A07 versions on S Series
- RDF H06 or H07 versions on NS Series

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<thead>
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<th>S-series</th>
<th>NS-series</th>
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<tbody>
<tr>
<td>T0346-A06-ABB</td>
<td>T0346-H06 (base)</td>
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</tr>
<tr>
<td>T0346-A07-ABO</td>
<td>T0346-H08</td>
</tr>
</tbody>
</table>

**NOTE:** Only A07- **ABO** SPR is compatible with H08 version RDF

**Note:** Will be updated for SDR
RDF 1.9 enhancements planned

• Performance
  – improved performance of shared access DDL: suspending updaters, instead of stopping them (Start Update still required to activate updaters)
  – faster access to updater-replicated data via new FASTUPDATEMODE (more reliable queries)

• Availability
  – alter updater mode online, from protected to shared (and back), without full start and stop of updaters
    • makes it easier to do online dumps on target (best practice)
  – more guidelines for faster Switchover/Takeover configurations

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RDF 1.9 enhancements planned (con’t)

- Manageability (customer requests)
  - enter one command to affect many RDF/IMP(X) environments
    - such as START or STOP RDF
    - assists in configuration for efficient Takeovers
  - access to a file level replicate purge option
    - now only a global binary on/off; useful with MQ Series
  - display SQL MX table names in Shared Access DDL ops
    - instead of only Guardian internal name
  - extra identifiers with longer process/volume names
    - volume names full 8 characters and process names full 6 char
  - issue Takeover in an obey file
  - see subvolume name in Error Messages
    - when RDF cannot initialize because control files present
  - option to purge existing control file(s) with special command

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Getting a fast RDF Takeover

- Know what is involved for your Takeover
  - document all DR plan steps: define primary “failure”
  - who decides? Know the protocol
  - test the process: Takeover/switchover, then stay
- RDF provides “!” option on Takeover
  - eliminates RDF safety check and Takeover prompt
  - good for using in an overall DR script
- For typical SQL requestor-server environment
  - start servers on both sides, but keep work on primary only
  - start Pathway servers, but freeze them on target
  - if possible, consider one app for query only, and another for read/write
  - when just one app, must be read-only for target, then change to read/write at Takeover
Getting a fast RDF Takeover (con’t)

Automate script execution with RDF Takeover trigger

- automate comm lines switch ("primary 1" to "primary 2")
- update statistics for SQL tables
- to recompile SQL apps (consider AutoSYNC)
- ensure command/control files reflect h/w and s/w on target
- handle file opens so apps have read/write access
- user-specific tasks, example: Base24 change of IP addresses for ATMs/SWITCH providers
- if Pathway servers frozen, thaw
- route work to servers on target
HP supports active/active education

- RDF has a safe, limited form, as do partners
- Partners have a variety of asynchronous methods
- Understand practical requirements
  - Is your environment ready? (power, comms, sizing etc.)
  - How much must you customize your app?
  - What successful model will you follow?
  - How will you handle collisions?
  - How frequently will you switchover to test?
  - What range of product + service costs can you accept?
    - POC may be required
About synchronous replication

• It’s established technology, successfully used today
• Has substantially same characteristics as asynchronous, except for application latency
  – throughput roughly the same
  – failure characteristics similar
  – use for unplanned downtime essentially the same
• Downside: application latency - can extend response time of transactions, waiting for remote systems’ responses
• Upside: eliminates data collisions and data loss following node failure
Many active/active sessions at ITUG, and before:

**ff² the Availability Digest**

Volume 3 Issue 5

achieving 100% uptime

Bill Highleyman

May 2008

**GoldenGate**

**Gravic**

**Network Technologies International**

And by NonStop users!

NonStop database replication, transformation and migration partners
HP NonStop Business Continuity: Be ready

Thank you. Questions?
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