HP NonStop business continuity products and solutions update

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Agenda

- Introductions
- Theory into practice: “HP NonStop Integrity Disaster Proof” video
- Overview: safe, fast replication products
  - TMF 3.5
  - AutoTMF
  - AutoSYNC
  - RDF 1.8
- RDF strengths, interoperability and partner projects
- Q&A
Trusted Advisors

- Jim Willis
  - TMF dev lead
- Maruti Kamat
  - RDF dev lead
- Megan Fotter
  - Support Analysts, GMCSC
- Johanne Corbeil
  - AutoTMF, AutoSYNC support
- Marc Hopkins, Wing Chan
  - NonStop Disaster Proof team members
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 and other features
HP Integrity NonStop: Disaster Proof

- No lost transactions
- Fast Takeover ~30 seconds
- All HP systems performed as expected
  - All data protected on Storageworks XP 24000
  - All shared network gear (Procurve, Brocade, etc.)

- See our new video plus white paper at NonStop site:
  www.hp.com/go/nonstopcontinuity
2007 HP Disaster Proof Project

• S88004 (SCSI) to NS 16004 (FCDM-JBOD)
  – Different NonStop systems, robust application
  – ~ Half mile distance at the controlled test site
  – Fiber Channel to Storageworks XP for TMF audit trail
  – High transaction rate 550-800 tps – quite scalable

• Well-configured environment for fast Takeover
  – Various Wait and Abort Timers adjusted down
  – Monitoring network lines closely
  – Hot standby: target system files open for read, but not write
  – Event message triggered the automatic takeover
Integrated NonStop Server products

- **NonStop Transaction Management Facility (TMF)**
  - The foundation for transaction integrity and data protection

- **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
TMF 3.4 on Integrity NonStop H06.06

• Manageability improvements
  – SNOOP commands (8) supported in TMFCOM
  – New ALTER TMF options and display
  – Option values displayed by INFO TMF
  – TMF DDL version changed
  – Additional info displayed by STATUS TMF

• New default values and limits

• Moveable TMPs
  – Allows you to specify the order of CPUs where the TMP will automatically create a new backup process after a TMP CPU failure
    • Now able to run TMF in fault-tolerant mode after a CPU failure
TMF 3.4 on Integrity NonStop
H06.06

- Defaults changes:
  - NetSessionIdleTimer default: OFF
  - Tape Block Size defaults: 52K
  - Audit-Trail Type default: Format 2
  - Audit-Trail Format 1 File Size default: 1024 (1GB)
  - Some extended segment sizes

- Limits changes:
  - Extended segment sizes

- See the documentation or the ITUG 2006 TMF session (MEA-18) slides for more details on new features in 3.4
• **Goal:** Further increase overall performance
  – Applications with highest transaction rates see most potential benefit

• **Finer granularity for control of TMP Wait Timer**
  – Allows fine-tuning commit processing performance
  – Resolution is now in milliseconds rather than centiseconds
    • **TMFCOM command** takes values in microseconds (1 millisecond = 1000 microseconds)

• **Improved audit write performance for audit trails on HP Storageworks XP (DP2)**
  – Partial blocks can be written in parallel
TMF 3.5 commit time performance boost

• 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

• See the latest manuals at docs.hp.com: from “NonStop Technical Library” link to “TMF” and “H06.06+”
TMF Future Release Candidates

• Lock reinstatement
  – When a TMF recovery is in progress, only lock the records in questionable status rather than the entire database
  – Improves database availability

• APIs for partners

• No delete TMF required to upgrade

• SQL/MX ANSI names support

Disclaimer: Future product plans, dates, and functionality are subject to change without notice.
NonStop AutoTMF (IPM Scout TCF April ‘07)

G series and H series

- Option to STOP programs that encounter irrecoverable TMF error without creating save files
- Automatic transactions support for OSS Java programs for JEnscribe files
- Increased number of concurrent classes of programs traced from 8 to 32
- Allows up to 1000 traces of a program instance
- Fixed all reported defects
- Updates to User’s Guide 429952-009 available in docs.hp.com
NonStop AutoSYNC new release
G series and H series: Update 9

- 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
- Fixes for reported defects
- Updates to User's Guide 522580-009 are available in docs.hp.com
RDF Overview

- Focused on disaster tolerance: fast takeover
  - High-speed, low-latency replication
  - Uses low-level system interfaces
  - Peer-to-peer for NonStop servers only
- Zero Lost Transactions (ZLT) option using HP XP
- Excellent handling of mixed transaction profile with long running transactions
- Support for auxiliary audit trails
- Support for network transactions
Remote Database Facility Release 1.7
G series and H series in 2005

- Optional management of RDF by any Supergroup Userid, regardless of what Userid initialized it
- Optional management of RDF by any user (non SUPER group)
- Optional operation with one-way remote passwords (primary to backup)
- Faster file comparison tool
- Even faster takeover by a target system
Remote Database Facility Release 1.7
Faster takeover by a target system

- Single RDFCOM command to drain and apply all audit up to the time the command was issued
- New REVERSE option for the STOP RDF command
- Configurable triggers that are automatically executed after critical operations (e.g. Takeover and Stop RDF, reverse commands)
- New event issued when all updaters have stopped and replication is shut down
- Force takeover even if the Expand network line is up with the “!” option
- “NOW” option with INITTIME in INITIALIZE RDF command
RDF Release 1.8 just released
H series (subset available on G series)

• Performance improvement
  – Native code for select objects:
    • RDFMONO, RDFEXTTO, 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
RDF 1.7 SPR (ABO) just released
G series

• Flexibility in naming subvolumes
• Interoperability code for communicating with RDF 1.8 on H-series (H06.10)
• Some Event Message System improvements (RFE) and fixes
• General quality improvements
RDF and interoperability

- 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
  - Stay in this mode for short period until both nodes upgraded
- Always test takeover in both directions
  - Validate results before using in production
- Be aware of potential incompatibilities
  - 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
- GMCSC KnowledgeBase, via OnePoint, has Compatibility Charts
- If you have interoperability questions, contact the GMCSC
Recent RDF Version Compatibility

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

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NOTE: Only A07-**ABO** SPR is compatible with H08 version RDF
Support for partner solutions underway

- **Improved ODBC MX as active/active enabler**
  - Windows client ported to OSS
  - Target availability – by end of year

- **Limited customer access to select OpenTMF APIs**
  - Enabler for synchronous active/active
  - Target availability – first half of 2008
HP NonStop database replication, transformation and migration partners
• For more information:
  • [www.hp.com/go/nonstopcontinuity](http://www.hp.com/go/nonstopcontinuity)
  • [www.hp.com/go/disasterproof](http://www.hp.com/go/disasterproof)
  • robert.loftis@hp.com
• Back up slides
NonStop RDF topologies

- Simplex
  - Source: A-Z
  - Target/Backup: A-Z

- Centralized
  - Multiple duplicate sites

- Multiple duplicate sites
  - Target: doing other work as well

- Ring
  - Reciprocal/split workload
  - Active-active, no data collisions

- Network Transaction Replication

- Triple contingency
NonStop RDF topologies refined

Simplex

source target/backup

Reciprocal/ split workload

active-active, no data collisions

Network Transaction Replication

Target is doing other work as well
RDF Overview

- Application
- TMF Audit Trail
- Data vols
- Extractor
  - only sends audit changes
- Receiver
- RDF Image Trail
- Updater
- Purger
- Target Node
- Data vols

Primary Node
NonStop RDF/ZLT

- All asynchronous replication products can lose “in-flight” transactions
  - Transactions can commit on source system but not yet be replicated when a disruption occurs

- RDF/Zero Lost Transactions supports no loss of committed data in unplanned outages—with no application changes

- Controlled availability

- Requires HP Storageworks XP
RDF without Zero Lost Transactions

System A (source) → System B (NonStop RDF target)

NonStop RDF traffic - async

Expand over TCP/IP

Data
Audit-M
Audit-P

Data
RDF/ZLT has primary audit mirror at remote location or even between sites

In Disaster Proof, mirror was moved to target site

Requires HP StorageWorks XP at primary and target
Business Continuity at ETUG 2007

• HP booth
  – Stop by to talk
  – Visit our partners’ booths
• Business Continuity SIG – hope you were there!
• User and HP sessions