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Agenda

Shadowbase Product Suite – Quick Refresher

Shadowbase Support for HPE Integrity NonStop X Systems

Shadowbase Product Suite Updates – Recently Released
- HPE NonStop Enscribe and SQL Enhancements
- New Features in Shadowbase for Migrating ACI BASE24 Environments
- Oracle Log Source Enhancements

Shadowbase Product Suites - Future
- IBM DB2 Log Source Introduction
- Enhanced Support for Sybase IQ and Teradata as a Target
- Shadowbase ZDL™: Synchronous Replication with Zero Data Loss

Shadowbase Support for HPE S-Series Systems

Shadowbase Software Product Release (SPR) Process

Summary

Questions? Please ask as we go along…
Shadowbase Product Suite

• A Quick Refresher
Featuring Shadowbase

- Available directly from HPE Sales
- Sophisticated data replication capabilities for business continuity
- Rich data and application integration options
- Available for NonStop and other servers (Unix, Linux, Windows)
- Numerous databases supported: NonStop SQL/MX, SQL/MP, Enscribe, IBM DB2, Oracle Enterprise, Oracle MySQL, SAP Sybase, Microsoft SQL Server
- Zero Downtime Migrations (ZDM) to migrate to a new platform or release
- Post replication database compare
- Management utilities
- Attractive Cost of Ownership (COO)
- Backed by premium HPE Support and Consulting Services
Shadowbase Portfolio
Best in class products for a nonstop world

Business Continuity
• Shadowbase Basic* Data Replication
• Shadowbase Advanced* Data Replication

Data & Application Integration
• Shadowbase Basic* Data and Application Integration
• Shadowbase Advanced* Data and Application Integration

Data Utilities
• Shadowbase Data Management Utilities
  • Audit Log
  • Audit Reader
  • Compare
  • Undo

Proven in the Market
• Large, worldwide, marquee customer base
• Shadowbase has been in the market for over 30 years

* Basic = Uni-directional / Advanced = Bi-directional
Shadowbase Supported Platforms & Databases

Homogeneous & Heterogeneous Uni/Bi-directional Data Replication

Source Database

- Enscribe
- SQL/MP
- SQL/MX
- HPE NonStop
- Oracle Enterprise
don Linux, Unix
- Microsoft SQL Server
- Microsoft Windows

Target Database

- Enscribe
- SQL/MP
- SQL/MX
- HPE NonStop
- SAP Sybase
- Oracle Enterprise
- Oracle MySQL
- IBM DB2
- Unix/Linux
- Microsoft SQL Server
- Microsoft Windows

Uni-directional Replication and Data Integration

Any ODBC Target Platform/Database (e.g., Teradata)

Shadowbase

Source/Target Database

- Enscribe
- SQL/MP
- SQL/MX
- HPE NonStop
- Oracle Enterprise
don Linux, Unix
- Microsoft SQL Server
- Microsoft Windows

Shadowbase

Bi-directional Replication and Data Integration

Source/Target Database

- Enscribe
- SQL/MP
- SQL/MX
- HPE NonStop
- Oracle Enterprise
don Linux, Unix
- Microsoft SQL Server
- Microsoft Windows
Shadowbase Support for HPE Integrity NonStop X Systems
Shadowbase Support for HPE Integrity NonStop X Systems

General Availability (GA) March, 2015

Deployed in Production Since March, 2015

This is a rolling (up to three years) Statement of Direction and is subject to change without notice.
Shadowbase Product Suite

- HPE NonStop Enscribe and SQL Enhancements
HPE Enscribe and SQL Enhancements

New features for Version 6.220_AAC, released April, 2016, includes support for:

- Larger IPC and TCP/IP messages (improves throughput)
- Long rows in SQL/MX tables and Enscribe key-sequenced files
- Long keys (greater than 255 bytes) in Enscribe key-sequenced files
- SYSKEY replication for SQL/MX tables:
  - Using the SQL/MX Executor, Shadowbase can now preserve the exact source SYSKEY value in the target’s SYSKEY column
  - Includes tables that use SYSKEYs as primary keys, and tables that use SYSKEYs as clustering keys within a primary key
- SYSKEY replication for SQL/MP tables:
  - Using the SQL/MX Executor, Shadowbase can now preserve the exact source SYSKEY value in the target’s SYSKEY column (when there are no additional indices on the target table)
  - Speak with Gravic Support for additional details
- SYSKEY replication for Enscribe QUEUE files:
  - Replicates Enscribe queue files while maintaining the exact SYSKEY values
  - Speak with Gravic Support for additional details

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Shadowbase Product Suite

• New Features for ACI BASE24 Environments
New Features for Migrating ACI BASE24 Environments

Released features for Version 6.220_AAC, released April, 2016, includes additional support for:

– Enhanced data mapping and data translation for cross-BASE24 version migrations
– Procedures for migrating a non-audited HPE NonStop BASE24 Classic environment into an audited (via AutoTMF) Shadowbase replication environment
– Enhanced HPE NonStop Enscribe BASE24 Classic to Oracle translation facilities for supporting Oracle target environments
– Working with HPE PS and partners on providing packaged services for assisting customers with BASE24 migration needs/requirements
  – BASE24 Classic and BASE24-eps environments
  – Non-audited to audited database files/tables for replication
  – Replacing your existing replication solution with Shadowbase
– Please speak with us about your specific configurations and needs

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Shadowbase Product Suite

- Oracle Log Source Enhancements
Oracle Log Source Enhancements

Released features for Version 6.220_AAC, released April, 2016, includes enhancements based upon feedback from customer usage, and include:

– Support for Oracle 12c as a source (target support previously available)
– Added “Archive Redo Log” reading support (to existing “Online Redo Log” reading)
– Bi-directional replication for Oracle Log Source collection
– Added end-range (SCN) for data collection
– Improved restartability after failure
– Improved handling of constraint violation errors during replay
– Improved handling of binary/non-character data in character fields

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Shadowbase Product Suite

- IBM DB2 Log Source Introduction
IBM DB2 Log Source Introduction

– Uni-directional DB2 source to any supported Shadowbase target
– DB2 source can be on any IBM source environment/platform
  – zOS, AIX, Linux, Windows, etc.
– Requires IBM InfoSphere Data Event Publisher (IDEP) to extract the transactional database changes from the DB2 journal and feed them into MQ
– Uses MQ on the source environment to deliver the source transactional database changes into Shadowbase
  – Shadowbase can run on any Shadowbase supported platform: AIX, Linux, Windows, etc. (NonStop?)
– Requires a client connection into the DB2 source database for Shadowbase to extract DB2 schema information
– Functionality largely complete and in customer testing

Note: With this new introduction, Shadowbase supports DB2 as a source, as well as DB2 as a target, uni-directionally. Bi-directional support under investigation.

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Shadowbase Product Suite

- Enhanced Support for Sybase IQ and Teradata as a Target (for Column-Oriented Databases)
- Enhanced Support for Array I/O Operations (for Row-Oriented Databases)
Enhanced Support for Sybase IQ and Teradata as a Target

– Shadowbase is adding new/special features for columnar databases as a target
  – These features will also enable array I/O operations against row-oriented databases

– These include:
  – Enhanced bulk loading for initial database synchronization
  – Improved transactional change data appliers to keep target synchronized to source
    – In-memory statement optimization
    – In-memory transactional reduction
    – Micro-batching for faster change data updating

– Initially available for SAP Sybase IQ and Teradata as targets (columnar databases)
  – Other columnar database targets to follow based upon customer demand
  – Future release will add in array operations for sql/mx target databases

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Shadowbase Product Suite

- Shadowbase ZDL™
  - Synchronous Replication with *Zero Data Loss*
  - Available for HPE NonStop
Shadowbase for Business Continuity – Synchronous Replication

For many applications, asynchronous replication meets the business continuity goals

- For some, Active/Passive (A/P) configurations (e.g. classic disaster recovery) are sufficient
- For others, Sizzling-Hot-Takeover (SZT) or Active/Active (A/A) configurations are required

But asynchronous replication has issues:

- Data loss (A/P, SZT, and A/A)
- Application/data partitioning requirements to avoid data collisions (A/A)
- Data collision detection and resolution if they cannot be avoided (A/A)

Asynchronous replication is not sufficient for the most critical applications, those for which any lost data or downtime will cost the business $$$$$

Shadowbase synchronous replication resolves these issues
Shadowbase Synchronous Replication

Resolves the key issues with asynchronous replication

- No data loss (RPO = 0)
  - Source transactions are only committed if the replicated data is also safe-stored (and/or applied) on the backup system
- No need for application/data partitioning
- Data collisions can be automatically avoided when running active/active

Enables Active/Active solutions for applications that were previously prohibited, due to either the inability to partition the application/data, or to avoid/resolve data collisions

- For some applications, requests or data cannot be partitioned to avoid data collisions
- For some applications, data collisions are unacceptable (e.g., stock trades and large EFT's)

Removes these restrictions, and enables the minimum possible outage and eliminates data loss, for the widest possible range of applications

Is the only choice for the most business-critical applications where even milliseconds of lost data or downtime potentially means $$$$ in costs
Shadowbase Business Continuity Continuum

1. Shadowbase Basic: Disaster Recovery (Async, A/P)
2. Shadowbase Advanced: Sizzling-Hot-Takeover (Async, SZT)
3. Shadowbase Advanced: Continuous Availability (Async, A/A)
4. **Future - Shadowbase ZDL: Disaster Recovery with No Data Loss (Sync, A/P)**
5. Future – **Shadowbase ZDL: Sizzling-Hot-Takeover and Continuous Availability (Sync, SZT, A/A)**
6. Future – **Shadowbase ZDL Plus SR: Active/Active with No Data Collisions** (Sync, A/P, SZT, A/A)

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Shadowbase Sync Release Staging (1 of 2)

*Shadowbase ZDL™ (Zero Data Loss)*

**Shadowbase ZDL Version 1 (“V1”)**

- V1: Active/Passive – Data Safe Stored on Target for Replay
- *Expected Availability for HPE NonStop platforms*
  - Controlled Availability (CA), requires application qualification
  - A special “Monitor Mode” is available to determine your Application Latency

**Shadowbase ZDL Version 2 (“V2”)**

- V2: Active/Active – Data Safe Stored on Target for Replay
  - Data Collisions are still possible (if an Route-Anywhere/Update-Anywhere model is being used)
  - However, Shadowbase Data Collision Identification & Resolution logic is available to resolve them
  - Development underway…
  - Beta Program to follow *Shadowbase ZDL V1* (Speak with Gravic)

*Specifications are subject to change without notice and delivery dates are not guaranteed…*
Shadowbase Sync Release Staging (2 of 2)

Shadowbase ZDL™ (Zero Data Loss)

Shadowbase ZDL Plus SR™

– Builds upon Shadowbase ZDL V2 to provide:
  – Zero Data Loss on failure
  – PLUS Collision Avoidance in Active/Active architectures
    – Even if a Route-Anywhere/Update-Anywhere model is used
    – No need for application/data partitioning
    – Data applied into target database before source transaction commits
  – Beta Program to follow Shadowbase ZDL V2

This is a rolling (up to three years) Statement of Direction and is subject to change without notice.
Shadowbase Support for HPE S-Series Systems
Shadowbase Support for HPE S-Series Systems

Shadowbase for S-Series systems is available directly from Gravic or from HPE via a SoW (Statement of Work), but not via the normal HPE SB software ordering systems (QMS)

– HPE termination of support for the S-Series:
  – HP.COM NonStop eServices Portal shows the HPML/SPML as follows: All S-Series h/w went EOSL (End of Support Life) 2014-12-31, all s/w went Obsolete 2015-12-31
  – Shadowbase version version 6.100 is the last Shadowbase release that supports S-Series systems

Gravic will continue to make critical fixes to version 6.100 for the S-Series

– On an as-needed basis for our customers (“as-needed” defined by Gravic!)
– Will not enhance the S-Series software beyond version 6.100
– The plan is to assist customers to MIGRATE OFF S-Series to a newer NonStop platform, not to add new replication environments to existing S-Series systems

This is a rolling (up to three years) Statement of Direction and is subject to change without notice.
Shadowbase Software Product Release (SPR) Process
– Gravic has standardized terminology and process for the Shadowbase software release model, to more closely align with the HPE process and usage
– Gravic Shadowbase versions are numbered numerically (e.g., N.MMM) in ascending order, with an attached “_xxx” suffix to match the corresponding HPE Shadowbase release. The “N” is the release major number, the “MMM” is the release minor number. For example:
  – v6.100, initial release, 2014-08-08, DVD
  – v6.101_AAA, released 2014-10-31, SCOUT
  – v6.200_AAB, released 2015-03-16, DVD
  – V6.220_AAC, released 2016-04-16, SCOUT
  – Etc.
These are the most important terms and acronyms used in the Shadowbase software release model:

– **SUT** and **IP** are the two ways all HPE NonStop software are initially delivered.

– **SUT** – the media, where the HPE NonStop O/S and a number of other products (both free and licensed) are delivered all together in a bundle. A SUT is custom-built for each customer, based on the software they have licensed. **HPE Shadowbase is not SUT-based.**

– **IP** (Independent Product) – A software product delivered separately via DVD, as opposed to being bundled on the SUT. **HPE Shadowbase is distributed by HPE as an IP.** Typically, you must order and receive a DVD for HPE Shadowbase before you are able to download more recent software product release versions (SPRs) from SCOUT. Keep this in mind as DVD shipments may take several days up to two weeks to order/deliver from HPE.

– **SCOUT** – HPE online tool for customers to download SPRs from the HPE website. [Note: The customer must already possess a valid product license in order to download any SPR from SCOUT.]

This typically means that HPE Shadowbase SPRs can be downloaded from Scout once you have previously received a DVD (very rarely will you use the ‘older’ version contained on the DVD!).
Shadowbase Software Product Release (SPR) Process (3 of 3)

These are the most important terms and acronyms used in the Shadowbase software release model (continued):

– **SPR** – a software update available from **SCOUT**, either a **TCD** or a **TCF**.

– **TCD** – a *restricted* software update delivered via an **SPR** downloadable from **SCOUT**. A **TCD** is an early version of a bug fix, intended for customer testing only (not production). A **TCD** by definition is restricted to certain customers. [Note: a “**Gravic TCD**” is delivered directly from Gravic, not via **SCOUT**, but otherwise has the same attributes.]

– **TCF** – a software update delivered via an **SPR** downloadable from **SCOUT**. A **TCF** is fully QA’ed and ready for production use. A **TCF** may be generally available (GA) or restricted to certain customers. [Note: a “**Gravic TCF**” is delivered directly from Gravic, not via **SCOUT**, but otherwise has the same attributes.]
Summary and Further Information
Why Choose Shadowbase?

Proven Technology
– Shadowbase is deployed at hundreds of sites, including many of the most-demanding NonStop sites

Flexible Solutions for Your Business Challenges
– Business Continuity, Data Integration & Synchronization, Data Warehouse Feeds, Application Integration, Real-time Business Intelligence

Global Sales Organization
• Global Reseller Presence from HPE Sales, and local time zone/language support from select regional resellers

Global 24x7 Support Organization
• Global Support Presence from the HPE GNSC, and local time zone/language support from select regional resellers

Affordable, and Committed to the NonStop Platform
• Improves TCO via Overall Cost Advantage and Features
  – “One Product, Many Solutions”
• We are partnering and investing with HPE in many innovative enhancements
  – “Only on NonStop”
For More Information

Breaking the Availability Barrier Book Series

Volume 1
Survivable Systems for Enterprise Computing

Volume 2
Achieving Century Uptimes with Active/Active

Volume 3
Active/Active Systems in Practice

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