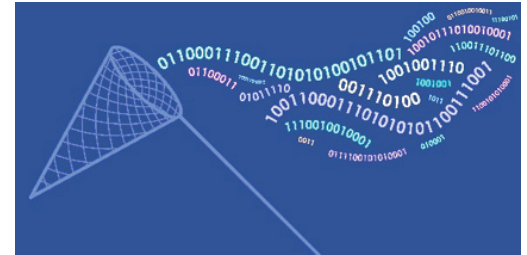


Shadowbase Zero Data Loss (ZDL)

One of the most significant IT costs following catastrophic failure is data loss. With most business continuity replication technologies, there is the possibility of data loss when an unplanned outage occurs: the data loss is caused by application database changes made on a source system that have not yet been replicated to the target (backup) system before the source system fails. Such data loss can cost a company millions of dollars, including other significant impacts, such as loss of customer confidence, negative publicity, regulatory violations, and even threats to human health and safety.



Reduce Outage Costs with Zero Data Loss

With Shadowbase ZDL software, all of these concerns are now in the past – Shadowbase ZDL saves a company from all of the costly impacts of data loss. Using unique and patented synchronous replication technology, Shadowbase ZDL ensures that all database changes made on a source system are successfully replicated to the target system before the source application is allowed to commit (make permanent) those changes. Thus, if the source system fails, no committed changes made to the source database will be lost; they will be present on the backup system and applied to the backup database. Unlike some synchronous replication products, Shadowbase ZDL does not require any specific disk technology (e.g., an HPE XP array is not required), and there are no imposed distance hardware limitations between source and target systems.

The Best Business Continuity Solution – Synchronous Replication

Shadowbase ZDL uses patented synchronous data replication technology. What is the difference versus other replication methods? There are two main business continuity data replication technologies: asynchronous and synchronous.

The primary attributes of asynchronous replication are:

- Replication activity is decoupled from the application making database changes on the source system.
 - The application on the source does work and commits the database changes.
 - The data changes are read after-the-fact and replicated to the target database.
- Thus, there can be application data updates committed on the source which are not yet replicated to the backup (this time delay is called “replication latency”), and this data can be lost if the source system fails (in technical terms, the Recovery Point Objective (RPO) > 0).
- Data collisions¹ are possible with active/active architectures; such collisions must either be avoided (e.g., by application or data *partitioning*), or identified and resolved if they occur.

The primary attributes of Shadowbase ZDL synchronous replication are:

- Replication activity is synchronized with the application making database changes on the source system.
 - The application does work and calls to commit the transaction.
 - The data changes are not committed on the source system until those changes have been replicated to the backup system.
- Thus, there cannot be application data changes committed on the source which are not yet replicated to the backup, and no data is lost if the source system fails (the RPO = 0).
- Data collisions are *not* possible with active/active architectures; data collisions become transaction deadlocks, which are much less serious and are handled internally by the data replication engine.

Therefore, asynchronous replication is insufficient for many critical applications – those for which *any* lost data will incur unacceptable levels of business cost. For such applications, Shadowbase ZDL with synchronous replication resolves these issues:

- Zero data loss (the RPO = 0)
- No possibility of data collisions (in an active/active architecture)
- No need for application/data partitioning (in active/active mode) because data collisions are avoided

¹Data collisions occur in asynchronous active/active architectures when the same database record is changed simultaneously during the replication latency window on two or more systems in the configuration. The changes are then replicated to the other system(s), overwriting the original changes. Thus all database copies are made inconsistent and incorrect. Data collisions only occur with active/active architectures and not with active/passive architectures.

Shadowbase Synchronous Replication – Product Rollout

Shadowbase synchronous replication features are planned for incremental release as follows:²

- Shadowbase ZDL R1²**
 - Under development
 - Supports zero data loss for active/passive system architectures (uni-directional)
 - Built on the tested and trusted Shadowbase asynchronous technology platform
 - Sizzling-Hot-Takeover (SZT) and active/active (bi-directional) architectures are not supported
- Shadowbase ZDL R2²**
 - Future release
 - Adds support for zero data loss for SZT and active/active architectures
 - Data collisions will still be possible in active/active environments; existing Shadowbase data collision identification and resolution solutions can be used (if needed)
- Shadowbase ZDL+²**
 - Future release
 - Supports zero data loss for active/passive, SZT, and active/active architectures
 - Adds support for automatic data collision elimination in active/active architectures

	Shadowbase ZDL R1	Shadowbase ZDL R2	Shadowbase ZDL+
Zero data loss?	A/P: Yes SZT: Not supported A/A: Not supported	A/P: Yes SZT: Yes A/A: Yes	A/P: Yes SZT: Yes A/A: Yes
Are data collisions possible in an active/active environment?	N/A	Yes	No

Shadowbase Synchronous Replication Features by Release

Summary

The Shadowbase ZDL business continuity replication solution is for those applications where no data loss can be tolerated. In the future, the Shadowbase ZDL+ solution will extend this capability for those applications that previously could not run in an active/active configuration (because partitioning was not possible and data collisions could not be tolerated or resolved). Shadowbase synchronous replication is the only choice for the most business critical applications where even milliseconds of lost data are unacceptable. Shadowbase ZDL and Shadowbase ZDL+ provide unique, differentiating product capabilities for the HPE NonStop market.

²Shadowbase ZDL requires that HPE NonStop TMF SPR prerequisites are met, requires application prequalification, and is not available for all databases or platforms. (Please check with Gravic for specific environment availability.) Specifications are subject to change without notice, and delivery dates/timeframes are not guaranteed. Purchasing decisions should not be made based on this material.

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