

# HPE Shadowbase Streams

## Integrate Data and Applications to Create New Solutions

Over time, the number of legacy applications developed to support an enterprise's operations grow significantly. Applications maintain databases of information, but the contents of these databases are typically not exposed for use to other applications that were independently developed.

As companies grow more reliant on their IT resources, it becomes apparent that many new value-add services can benefit from using data stored in the databases of the siloed legacy applications. In addition, as companies merge, it becomes necessary to somehow join their disparate databases into a common repository of knowledge for the newly formed corporation, often referred to as creating a *Single Version of the Truth*.



## The Value of Big Data

In addition to all these needs, there is *big data*. The amount of information being generated each year is exploding at an unprecedented rate. It is estimated that 90% of the world's data was generated in the last two years, and this rate is increasing. Social media such as Twitter and Facebook, articles and news stories posted online, blogs, emails, YouTube and other videos – they are all contributing to big data. In today's 24x7 online environment, having query access to a remote database is not sufficient. Querying for data is a lengthy and complex process, and applications must react far more quickly to data changes than periodic polling for query results allows.

A way is needed for one application to immediately have real-time access to the data created by another application, just as if the applications were integrated and that data were stored locally. Big data analytics engines require a large network of tens, hundreds, or even thousands of heterogeneous, purpose-built servers, each performing its own portion of the task. All of these systems must intercommunicate with each other in real-time. They must be integrated with a high-speed, flexible, and reliable data distribution and sharing backbone. HPE Shadowbase Streams for Data Integration (DI) and Application Integration (AI) solves these challenges.

## HPE Shadowbase Streams for Data Integration

HPE Shadowbase Streams for DI provides the means to integrate existing applications at the data or event-driven level in order to create new and powerful functionality. It seamlessly moves selected data in real-time from a source database to a target database where it can be used by a target application or data analytics engine. As changes are made to the source database (change data capture or CDC), they are immediately replicated to the target database to keep it synchronized with the source database. For this reason, "data integration" is also often called "data synchronization."

In the process, HPE Shadowbase Streams makes any necessary format changes (transformations) to the data in order to meet the needs of the target system. In addition, it can filter and discard changes that are of no interest to the target system. Upon delivery, the target application can then make use of this real-time data, enabling the implementation of new and valuable services to enhance competitiveness, to reduce costs or increase revenue, to satisfy regulatory requirements, and to generally improve the user experience. A major benefit is that data replication is transparent to both the source application and to the target application, and can be implemented without modifying either.

### HPE Shadowbase Streams for DI Provides the Following Capabilities:

- **Master Data Management**
  - Uni-directional and bi-directional data synchronization
  - Transformation, filtering, cleansing, and consolidation of data
  - Same (homogeneous) or different (heterogeneous) source and target databases and platforms
  - Offline and online loading/integration
  - CDC, trickle-feed, and batch refreshing to keep the target data fresh

- **Build Real-Time Event-Driven Applications**

- Rapid and reliable reformation and transference of large data amounts between heterogeneous databases and applications in real-time
- Data distribution backbone for a big data analytics system
- Elimination of middleware, adapters, and application modification

- **Synchronous Replication for Zero Data Loss (ZDL)\***

- Elimination of data loss in the event of an outage
- All database changes are verified to be safe-stored on the target before any source changes are made permanent (committed)
- Elimination of data collisions in active/active architectures

\*Check with [Gravic](#) for the availability of ZDL on various platforms.

## HPE Shadowbase Streams for Application Integration

Over time, the number of legacy applications developed to support an enterprise's operations grows significantly. Many of these applications are silo applications that recognize inputs from and deliver outputs to predetermined or hard-coded interfaces. The usual way to share information generated by such an application with another application is via sharing files, typically processing the data in batch mode, or through extensive rewrites to the application's interfaces. This mode of interoperation is risky and unacceptable in 24x7 online environments. Applications that were never intended to work with each other now must cooperate closely in real-time. For instance, a new online store application must have immediate access to inventory changes from an inventory program that was written long before online stores were even imagined.

HPE Shadowbase Streams for AI provides a solution for integrating existing (often legacy) applications with new applications that are being created. It provides the mechanism to expose events and data generated by a source application to a target application without software modification to either, which eliminates software risk and enables the rapid provision of powerful new functionality for the enterprise.

Of all the various technologies that could be used to deliver real-time application integration, data replication is by far the most flexible, least disruptive to existing applications, and easiest to implement. HPE Shadowbase Streams uses CDC technology to stream data generated by one application to other applications, enabling low-latency, real-time data distribution between heterogeneous systems and applications. Applications that once were isolated can now interoperate in an event-driven fashion in real-time. Critical data generated by one application is distributed and acted upon immediately by other applications.

### HPE Shadowbase Streams for AI Provides the Following Capabilities:

- **Supports Many Models for Data Distribution**

- Maintain a remote database of critical data
- Send critical data to client applications or servers directly via queuing products, inter-process messages, TCP/IP sessions, or client APIs
- Publish data to applications that have subscribed to the data
- Respond to poll queries from client applications

- **Is Extensible**

- Allow the user to embed custom processing logic into the data-processing path. It readily filters, transforms, and adapts data from one application into the protocol or format required by another application, all without requiring any changes to the existing application that is generating the data or the application that is consuming the data.

- **Modernizes Legacy Applications**

- Integrate diverse applications across the enterprise so that new and valuable services can be quickly created to meet market demands
- Enhance competitiveness
- Reduce costs and/or to increase revenue
- Satisfy regulatory requirements
- Create a single true version of the data

- **Supports Synchronous Replication for Zero Data Loss (ZDL)\***

- Elimination of data loss in the event of an outage
- Elimination of data collisions in active/active architectures

## HPE Shadowbase Data Transformation

Besides providing the distribution network to deliver change data in real-time to other databases and applications, HPE Shadowbase solutions include powerful capabilities to transform that data into whatever format is required by the target database or application. The data may be aggregated or disaggregated, normalized or de-normalized, filtered, and transformed. The following methods are available:

1. **DCR – DDL Command Replication** – Shadowbase supports replicating Enscribe file system DDL commands and SQL/MP DDL commands. When executed thru Shadowbase, these commands are automatically integrated into the Shadowbase data replication stream at the point in the stream that represents when they occurred on the source system. Use **SBFUP** to execute Enscribe DDL commands, and **SBSQLCI** to execute SQL/MP DDL commands via Shadowbase. SB DCR uses file or table name mapping between the source and target so that source system commands have the same result when applied to the target system. In particular, this utility helps HPE RDF customers who use RDF/SDR (RDF SQL DDL Replicator) to migrate to a HPE Shadowbase solution.
2. **SBMAP** – a scripting “language” that can be used to inform Shadowbase software how to transform source data into target data formats. SBMAP is powerful, sophisticated, and extensible.
3. **SBDDLUTL** – a utility that reads an HPE Enscribe DDL record definition and produces a “flattened” (normalized)DDL structure along with an SQL CREATE TABLE statement for the selected target SQL environment. This capability simplifies the replication of nonrelational Enscribe data into structured SQL databases. SBDDLUTL includes features to allow manipulation of the source fields when creating the target columns, including dropping and/or renaming fields, transforming field data, and normalizing the de-normalizing Enscribe data.
4. **User Exits** – enable the inclusion and execution of customized user logic (program code) at various points in the Shadowbase replication stream and provide capabilities that are more complex than the scripting language. User Exits are extremely flexible, enabling almost any kind of data transformation, and can also perform specific field/column-level encryption and data tokenization.
5. **DBS Mapping** – a scripting “language” for target-side Other Server platforms, including these example capabilities: drop all events for a target table; drop columns and/or certain events for a target table; convert updates to inserts; concatenate (text) columns; cleanse numeric and date/time fields; and reformat and convert/replace characters.

There are a number of parameter settings that can be set in Shadowbase software to assist with data transformation, (i.e., to convert non-printable binary data to spaces in a character field). However, these settings work on the data record at an aggregate level, and not at a field level. SBMAP and the other methods described above allow for a much finer level of granularity of data transformation.

## Summary

HPE Shadowbase Streams for application integration and for data integration provide the facilities for integrating existing applications, services, and/or database environments in order to create new functionalities for the enterprise, without the need to modify existing application code. Using HPE Shadowbase Streams, applications that once were isolated now can interoperate in real-time to provide services that were not possible before integration. Critical data generated by one application is distributed immediately to other applications or database environments. HPE Shadowbase Streams modernizes legacy applications enabling new and valuable business services to enhance competitiveness, reduce costs or increase revenue, and to satisfy regulatory requirements.

Hewlett Packard Enterprise globally sells and supports Shadowbase solutions under the name HPE Shadowbase. For more information, please contact your local HPE Shadowbase representative or visit our website. For additional information, please view our [Shadowbase solution videos](#).

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