

# Oracle GoldenGate 18c

To succeed in today's competitive environment, you need real-time information. This requires a platform that can unite information from disparate systems across your enterprise without compromising availability and performance. Oracle GoldenGate 18c is a high-performance software application for real-time transactional change data capture, transformation and delivery, offering unidirectional, bidirectional, and multi-master data replication. The application enables you to ensure that your critical systems are operational 24/7, and the associated data is distributed across the enterprise to optimize decision-making.

## REAL-TIME ACCESS TO REAL-TIME INFORMATION

Business-critical systems must offer the highest availability, ensure fast and easy access to the right data, and quickly adapt to changing business and IT demands. With transaction volume increasing at an exponential rate as more and more business processes are conducted online, many organizations need a better solution to collect and deliver immediate access to the tremendous amount of enterprise data.

Oracle GoldenGate 18c provides real-time capture, transformation, routing, and delivery of database transactions across heterogeneous systems. The software facilitates high performance, low-impact data movement with low latency to a wide variety of databases and platforms while maintaining transaction integrity.

## Key Features

- High-performance data replication
- Optimized for Oracle Cloud
- High Performance Parallel Delivery for all targets
- Support Heterogeneous sources and targets
- Automatic Conflict, Detection, and Resolution
- Enhanced Security and support for SSL and Data Encryption
- Flexible Topology Support
- ETL and JMS integration
- Automated Memory Management
- Advanced Support for Big Data Integration
- Out-of-Box Native Spark Based Stream Analytics Platform

## WHAT'S NEW IN ORACLE GOLDENGATE 18C (18.1.0)

Oracle GoldenGate 18c offers tighter integration with the Oracle Database and technologies, support for additional heterogeneous systems, and improved performance. Oracle GoldenGate 18c's new features include:

- **Oracle Database 18c Support**  
Capture and Delivery support for Oracle Database 18c, cloud and on-premises.
- **Autonomous Data Warehouse Cloud (ADWC) and Autonomous Transaction Processing (ATP) Support**  
Easily connect to ADWC and ATP to deliver transactions.
- **Identity Column Support**  
Simplified support for handling identity columns in the Oracle Database.
- **Auto CDR Improvements for Oracle Database**  
Support for tables with unique keys (UK).
- **Oracle Database Composite Sharding**  
Support for multiple shardspaces of data using consistent partitioning.
- **In-Database Row Archival Support**  
Oracle Database support for compressed invisible rows.
- **MySQL Remote Capture Support**  
Capture MySQL DML transactions from a remote Linux hub. Use for remote capture against MySQL, Amazon RDS for MySQL, and Amazon Aurora MySQL Database.
- **DB2, MariaDB, and Teradata**  
DB2 12.1 for z/OS, DB2 LUW on pureScale, MariaDB 10.2, and Teradata 16.20 are all now supported with Oracle GoldenGate 18.1.

## ORACLE DATABASE 18C SUPPORT

Oracle Database 18c has many advance features that make it the most robust database on the market. Oracle GoldenGate 18c provides capture and delivery support for many of these features.

## AUTONOMOUS DATA WAREHOUSE CLOUD (ADWC) AND AUTONOMOUS TRANSACTION PROCESSING (ATP) SUPPORT

Oracle GoldenGate 18c can ensure your data is populated to the Autonomous Data Warehouse Cloud and Autonomous Transaction Processing in a timely manner. Using a Remote, Non-Integrated Replicat, transactions can be applied to ADWC and ATP.

## IDENTITY COLUMN SUPPORT

Identity Columns provide an automated way to increment primary keys and sequences within the Oracle Database. Oracle GoldenGate 18c provides support for these types of columns.

## AUTO CDR IMPROVEMENTS

Automatic Conflict, Detection, and Resolution (CDR) was introduced and usable with tables that have primary keys in a previous release. As of Oracle GoldenGate 18c, Automatic Conflict, Detection and Resolutions can be use with Unique Keys (UK) for Conflict, Detection and Resolution purposes.

## Key Benefits

- Enhance decision-making with real-time data
- Access mission-critical applications without disruption
- Increase IT flexibility with heterogeneous infrastructure support
- Enable high-performance data replication with minimal impact on production system
- Ensure transactional integrity across heterogeneous source and target systems

## Related Products

The following products enable organizations to more completely optimize their solutions for access to real-time information:

- Oracle GoldenGate for Big Data
- Oracle GoldenGate Foundation Suite (Veridata, Management Pack, Studio)
- Management Pack for Oracle GoldenGate
- Oracle GoldenGate Application Adapters
- Oracle Data Integrator Enterprise Edition
- Oracle Active Data Guard
- Oracle SOA Suite
- Oracle Stream Analytics

## COMPOSITE SHARDING

Composite Sharding allows for different subsets of data in a table to be partitioned by consistent hash. Oracle GoldenGate 18c now supports the replication of these shardspaces.

## IN-DATABASE ROW ARCHIVAL SUPPORT

Oracle Database In-Database Row Archival allows for hiding of specific rows from an application. Oracle GoldenGate 18c provide functionality to ensure corresponding rows between source and target are hidden from the application.

Using Oracle GoldenGate 18c customers can reduce IT costs and risk, while achieving a faster time to value for operational and analytical systems. Oracle GoldenGate 18c leverages a microservices-based architecture to help companies address the continuous availability and real-time integration demands of enterprise systems. To learn more about the new release please review our free resources.

## MAINTAIN CONTINUOUS AVAILABILITY OF CRITICAL SYSTEMS

Oracle GoldenGate 18c helps organizations eliminate the downtime caused by both unplanned and planned outages; and improve system performance and scalability. The software can be configured to support the following scenarios:

- **Zero-downtime operations.** Enable uninterrupted business operations during system upgrade, migration, and maintenance activities.
- **Disaster recovery and data protection.** Create and maintain an immediate failover with up-to-the-minute data to minimize recovery time for mission-critical systems—deploy with Oracle Database across database versions or operating systems, or in non-Oracle environments.
- **Data distribution.** Synchronize data for distributed applications in real time across geographies for reliable access to timely data.
- **Query offloading.** Ensure high performance for production systems while still supporting necessary read-only activities by replicating data between heterogeneous sources and targets.

## ENABLE REAL-TIME DATA INTEGRATION ACROSS THE ENTERPRISE

Oracle GoldenGate 18c captures and delivers real-time change data to data warehouses, operational data stores, reporting systems, and other online transaction processing (OLTP) databases with minimal performance impact. This access to real-time information enables improved business insight.

- **Real-Time Data Warehouse.** Provide continuous, real-time capture and delivery of the most recent change data between OLTP systems and the data warehouse. Oracle GoldenGate 18c integrates easily with Oracle Data Integrator 18c Enterprise Edition and other extract, transform, and load (ETL) solutions. Oracle GoldenGate 18c is certified to capture from and deliver to Oracle Exadata to enable real-time data warehousing or data consolidation solutions.
- **Operational Reporting.** Offload reporting activity from production databases to lower cost secondary systems with current data for real-time reporting.
- **Operational data integration.** Integrate operational data between OLTP systems in real-time. Enable service-oriented architectures, including Oracle SOA Suite, to operate with real-time data by publishing changed data via Java Message Service (JMS) using Oracle GoldenGate Application Adapters.
- **Big Data Integration.** Streaming ingest support for Big Data targets.

## ROBUST SERVICE-BASED ARCHITECTURE

The Oracle GoldenGate 18c software architecture is comprised of three primary components: Capture, Trail Files, and Delivery. This modular approach allows each component to perform its tasks independently of the others, accelerating the data replication and ensuring data integrity. These primary components are encapsulated in a service-based architecture which allows for remote administration of the Oracle GoldenGate 18c for Oracle environments through RESTful API endpoints.

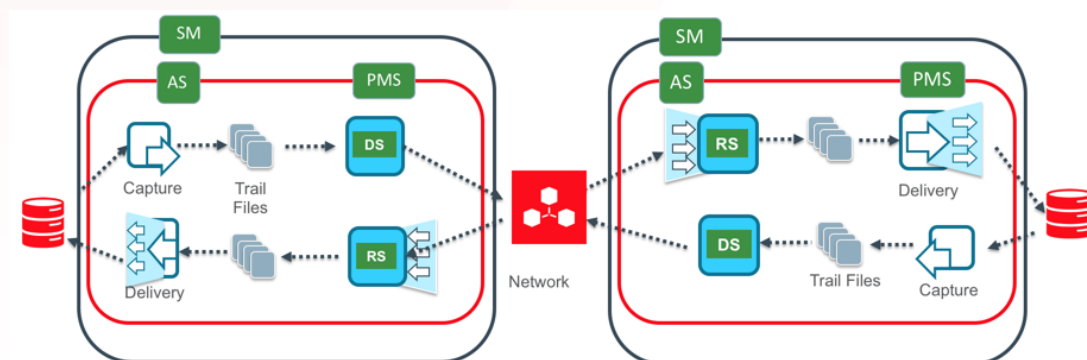


Figure 1: Oracle GoldenGate 18c for Oracle leverages a service-based, component-based architecture to optimize real-time information access and availability.

## CAPTURE

Oracle GoldenGate's Capture module works with the source database and looks for new transactional activity. The Capture module is available as a stand-alone component for non-Oracle platforms and as an Integrated option for the Oracle database. Capture reads the result of insert, update, and delete operations by directly accessing the database transaction (redo) logs, and then immediately captures new and changed data for distribution.

The Capture module only moves committed transactions—filtering out intermediate activities and rolled-back operations—which not only reduces infrastructure load but also eliminates potential data inconsistencies. Further optimization is achieved through transaction grouping and optional compression features.

## TRAIL FILES

Oracle GoldenGate's Trail Files contain the database operations for the changed data in a transportable, platform-independent data format. Trail Files are a critical component within Oracle GoldenGate's optimized queuing mechanism. They reside on the source and/or target server but exist outside of the database to ensure heterogeneity, improved reliability, and minimal data loss. This architecture minimizes impact to the source system because no additional tables or queries to the database are required to support the data capture process. The Capture module reads once, and then immediately moves the captured data to the external Trail File for delivery to the target(s).

In the event of an outage at the source and/or target, the Trail Files contain the most-recent data up to the point of the outage, and the data is applied once the systems are online again.

## DELIVERY

Oracle GoldenGate's Delivery module takes changed transactional data that has been placed in a Trail File and immediately applies it to the target database. The Delivery module applies each transaction in the same order as it was committed and within the same transactional context as at the

source, enabling consistency and referential integrity at the target. Through the use of Oracle GoldenGate Application Adapters, Oracle GoldenGate also has the capability to publish changed data to a messaging system in XML or other formats, as well as provide data in flat files for third-party products, such as an ETL system.

### SERVICEMANAGER (SM)

Oracle GoldenGate's ServiceManager is the watch dog process that runs at the operating system level and provides over-sight for all deployments that are running on the host machine. ServiceManager runs in three modes that can be leverage for different requirements. These modes are manual, daemon, and integrated with Oracle Real Application Cluster Read Services (CRS).

### ADMINISTRATION SERVICE (AM)

Oracle GoldenGate's Administration Service is the management interface that provides access to capture and delivery processes, and security framework.

### DISTRIBUTION SERVICE (DM)

Oracle GoldenGate's Distribution Service is the routing services that provides transports for the trail files. Distribution Service support four different protocols that enable replication over distribution paths. These protocols are Secure Web Sockets (WSS), Web Sockets (WS), Universal Data Transfer (UDT), and Oracle GoldenGate (OGG).

### RECEIVER SERVICE (RS)

Oracle GoldenGate's Receiver Service is the service that intakes trail files on the target side of the replication architecture.

### PERFORMANCE METRICS SERVICE (PMS)

Oracle GoldenGate's Performance Metric Service is the low-level performance monitoring tool to monitor performance of capture and delivery processes at the deployment level.

## KEY FEATURES AND BENEFITS

Oracle GoldenGate 18c provides the following features and benefits that enable you to achieve real-time data integration and continuous availability for mission-critical systems:

- **Real-Time Data.** Immediately captures, routes, transforms, and delivers transactional data to other systems with sub-second latency. Improves organizational decision-making through enterprise-wide visibility into accurate, up-to-date information.
- **Reliability.** Delivers all committed records to the target, even in the event of network outages. Moves data without requiring system interruption or outage windows.
- **High Performance with Low Impact.** Moves thousands of transactions per second with negligible impact on source and target systems. Enables access to critical information in real-time without bogging down production systems.
- **Transaction Integrity.** Maintains transaction commit boundaries and atomicity, consistency, isolation, and durability (ACID) properties as transactions are moved between source and target systems. Ensures data consistency and referential integrity across multiple masters, back-up systems, and reporting databases.
- **Integration.** Integrates with Oracle Data Integrator Enterprise Edition and complements other ETL solutions. Via Oracle GoldenGate Application Adapters, it allows to capture from, or deliver to, Java Message Service–based messaging solutions such as Oracle WebLogic and provides the means to send changed data to Oracle Coherence in real-time.
- **Flexible Topology Support.** Moves data in one-source-to-one-target, one-to-many, many-to-one, many-to-many, cascading, and bidirectional configurations.

- **Automatic Conflict Detection and Resolution.** Enables conflict detection and resolution in multi-master configurations where two or more systems can modify separate instances of the same table.
- **Event Based Infrastructure.** Triggers immediate actions based on specific database operations captured and stored in Trail Files.
- **Routing and Compression.** Utilizes TCP/IP to send data and eliminate geographical distance constraints. Applies additional compression to the data as it is routed.
- **Password Encryption.** Securely store passwords in the Oracle Credential Store with no need to explicitly specify encryption keys.
- **Automated Memory Management.** Automatically adjusts transaction memory based on the size and number of transactions being captured.
- **Bounded Recovery.** Persists uncommitted operations to disk to enable fast and simple data recovery for long running transactions in the event that the replication process is paused or interrupted.
- **Parallel Apply.** Apply large transactions in faster time by breaking transaction loads down into independent, manageable, transaction threads

## CONCLUSION

Oracle GoldenGate 18c helps organizations harness the value of their IT investments and improve business operations by providing continuous access to mission-critical information in real time. With support for a wide array of continuous availability, disaster tolerance, and data integration scenarios, the software provides a modular foundation that easily scales to address the high-volume, low-impact data integration and replication challenges faced by enterprises today.

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