

Dedicated Real-time Reporting Instances for Oracle Applications using Oracle GoldenGate

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Introduction

Oracle GoldenGate's flexible architecture supports operational reporting for Oracle Applications by replicating business data from an Oracle Siebel CRM, Peoplesoft, E-Business Suite or JDEdwards database to a secondary system dedicated to running read-intensive operations such as reporting.

Operational reporting offers benefits that are not possible with a single instance:

- **Resource Off-Loading:** Rather than all users having to execute reports and business-critical transactions against a single system, organizations can allocate operations to systems optimized for a particular role.
- **Optimization:** Transactional and reporting systems operate more efficiently if they are tuned specifically for the expected usage. For example, performance of a reporting system will generally benefit from large sort areas, suitable partitions, and different types of indexing.
- **Full Use of Reporting Instance:** Oracle GoldenGate does not limit the type of operations that can be executed on the reporting system. Reporting needs that include the creation of temporary tables or other processes to prepare data for reporting can be run on the reporting instance without potentially impacting business-critical systems.

Right-time Reports

Many organizations would like to take advantage of reporting on real-time data from business-critical systems but are concerned about the impact to the end user community of those applications. For example, with Oracle E-Business Suite Financials, end of quarter activities for organizations can be very busy and in some cases, very stressful as organizations attempt to close the books. Users executing reports to view open or completed contracts, while the contracts are being updated, have the potential to slow the process down.

A good solution to reduce the load on the operational systems is to offload the report generation from the primary system to a dedicated reporting instance. This requires a regular data synchronization of the reporting instance with the primary system. Yet, traditional data extraction processes tend to create themselves resource spikes that can actually drive up resource usage to the point where application response times to end users are adversely affected. Many solve this by running batch extracts during off-hours but as a result these processes then create data that is out of time with the rest of the organization.

Now the implementation of operational reporting solutions for Oracle Applications gets certified support by Oracle GoldenGate which enables access to Oracle Applications real-time data with minimal impact on the performance of the source application.

Data Synchronisation with Oracle GoldenGate

Oracle GoldenGate provides guaranteed capture, routing, transformation, and delivery of data across applications and environments in real time. The software leverages a decoupled architecture to move high volumes of changed data between heterogeneous databases with sub-second latency while preserving transaction integrity.

As shown in the diagram below, the Oracle GoldenGate architecture consists of three distinct modules Capture, Trail Files, and Delivery, each of which can perform its tasks independently to facilitate rapid, seamless data replication, which is critical to support the coexistence of multiple instances of an application.

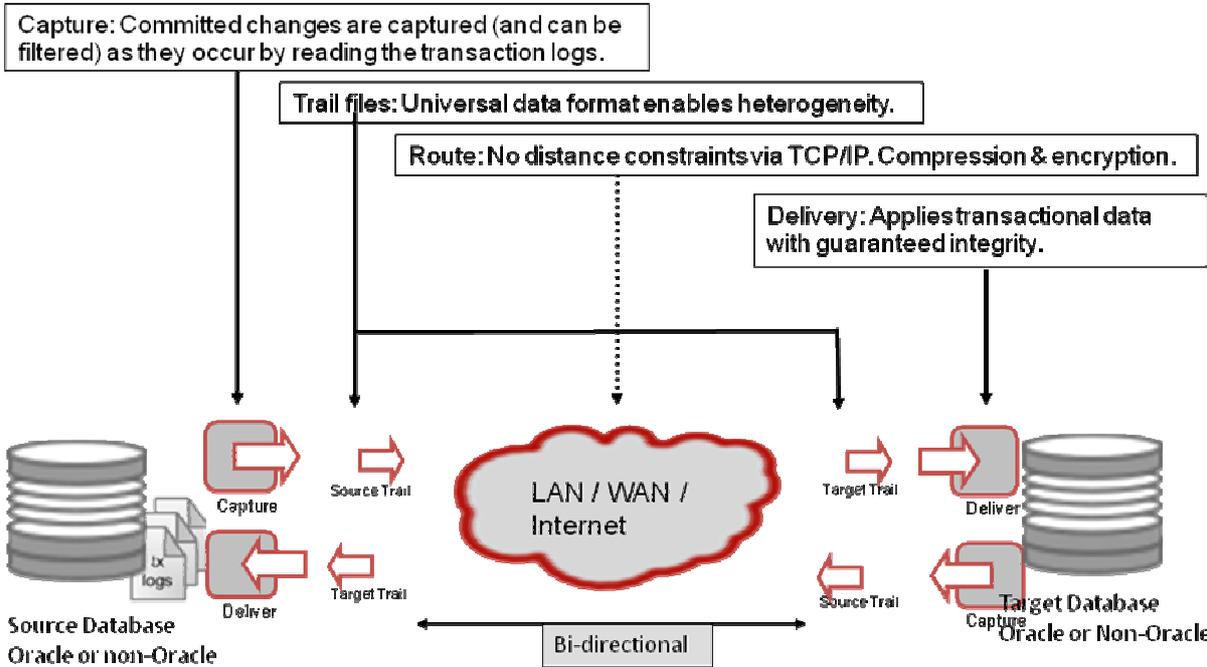


Fig. 1: Oracle GoldenGate Architecture

Oracle GoldenGate Capture

The Oracle GoldenGate Capture module resides with the source database and looks for new transactional activity by monitoring database transaction (redo) logs for the results of insert, update, and delete operations. When a change is detected, it is immediately captured for distribution and optionally compared with a configurable filter. Capture supports a wide range of database versions including Oracle Database, Microsoft SQL Server, IBM DB2 mainframe and LUW, Sybase, Enscribe, SQL/MP, SQL/ MX, and Teradata.

The Oracle GoldenGate Capture module moves only committed transactions—intermediate activities and rolled-back operations are filtered out—which not only reduces infrastructure load but also eliminates potential data inconsistencies.

Oracle GoldenGate Trail Files

Trail Files, an integral part of Oracle GoldenGate's proprietary queuing mechanism, store the changed data in a transportable, platform-independent universal data format. Trail Files reside on the source and target server but exist outside of the databases to ensure heterogeneity, improve reliability, and minimize data loss. This architecture reduces the impact on the source system because no additional tables or multiple queries to the database are required to support the capture processes. The Capture module reads once and immediately moves the captured data to the external Trail File for delivery to the target(s).

Oracle GoldenGate Delivery

The Oracle GoldenGate Delivery module takes the data transactions from the latest Trail File and applies that data to the target using the native SQL for that relational database management system. The Delivery module applies each transaction in the same order as it was committed and within the same transactional context as at the source. Delivery uses a number of techniques to optimize the application of data to the target, for example it can reduce the commit rate at the target through transaction grouping. Delivery, too, supports a wide range of database versions. In addition Oracle GoldenGate can format text in any way, including, but not limited to XML and delimited formats, to be published to enterprise messaging systems.

Benefits of Oracle GoldenGate in Operational Reporting Solutions

Oracle GoldenGate offers the following benefits that are not possible with running operational reporting on the production system:

❖ Workload and Resource Utilization

Rather than all users generating reports and resource intensive operations against the single primary system, organizations can split operations to systems optimized for each type of use case.

❖ Optimization

Reporting systems operate more efficiently if they are tuned specifically for the usage. Large sort areas, partitions, and different types of indexing are better suited for reporting versus transactional systems.

❖ Full Use of the Reporting Instance

Oracle GoldenGate does not limit the type of operations that can be executed on the reporting instance. Reporting needs that include the creation of temporary tables or other processes to prepare data for reporting can be run on the reporting instance without impacting primary business systems.

❖ Expansion Options

Operational Reporting solutions are by design read-only and tend to be deployed unidirectional (i.e. data flows from the source transactional system to the reporting instance, where reports are executed), but by using Oracle GoldenGate the option exists to include bi-directional replication for key system tables or for entire sets of data.

❖ Reporting Solution Options

Operational Reporting using Oracle GoldenGate software platform for data integration provides organizations with the option to use either reporting tools such as Oracle's BI-Publisher or tools provided in Oracle's applications.

❖ Certified by Oracle

Oracle GoldenGate is tested and certified on major Oracle applications including E-Business Suite, JD Edwards, PeopleSoft and Siebel CRM. Development teams for these applications validated that Oracle GoldenGate does not adversely impact or risk the deployments of those Oracle applications.

Operational Reporting for Oracle Applications

As highlighted above, Oracle GoldenGate's flexible architecture is certified to support operational reporting, by replicating business data to a secondary system which would be used to execute read-intensive operations, such as reporting. Oracle GoldenGate reads changed data from database transaction logs rather than from the database tables themselves. Because it requires minimal modifications to the applications, this solution provides organizations with a compact, non-intrusive, and easily configured method for providing access to real-time data for reporting purposes.

Organizations can replicate data to create highly optimized reporting solutions. Taking advantage of its flexibility, Oracle GoldenGate can be configured to support the needs of Oracle Applications to provide the means to move data bi-directionally. That allows for seamless integration of the built-in reporting tools to use the reporting instance.

Operational Reporting for Oracle E-Business Suite

The figure below is a conceptual illustration of a typical operational reporting solution for Oracle E-Business Suite. The solution replicates transactional data from the E-Business Suite database to a reporting instance with sub-second latency, which would be used to execute read intensive real-time reporting. Additional details can be found in Knowledge Document 1112325.1 on Oracle Support.

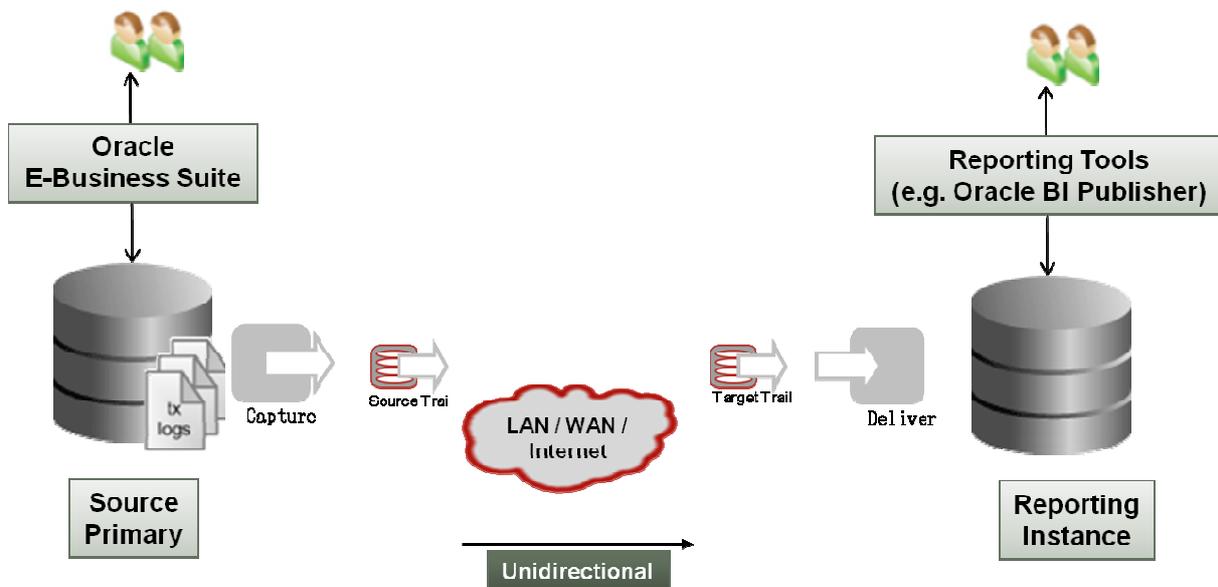


Fig. 2: Operational Reporting for Oracle E-Business Suite

Operational Reporting for Oracle PeopleSoft

Operational reporting for Oracle PeopleSoft is designed for all of the tables within application schemas for the purpose of off-loading reporting functions to a secondary / non-OLTP reporting instance. As with E-Business Suite, reports can be created to run locally against the target or via the PeopleSoft Process Scheduler, which is configured to point to the reporting instance.

Reports that are executed via Process Scheduler should be read-only, but can create temporary tables if needed. In order for Process Scheduler to work seamlessly, configuration of Oracle GoldenGate to include key tables for bi-directional replication is required along with configuration changes to the set-up of the Process Scheduler. Additional details can be found in Knowledge Document 1114746.1 on Oracle Support.

The figure below is a conceptual illustration of a typical operational reporting solution for Oracle PeopleSoft.

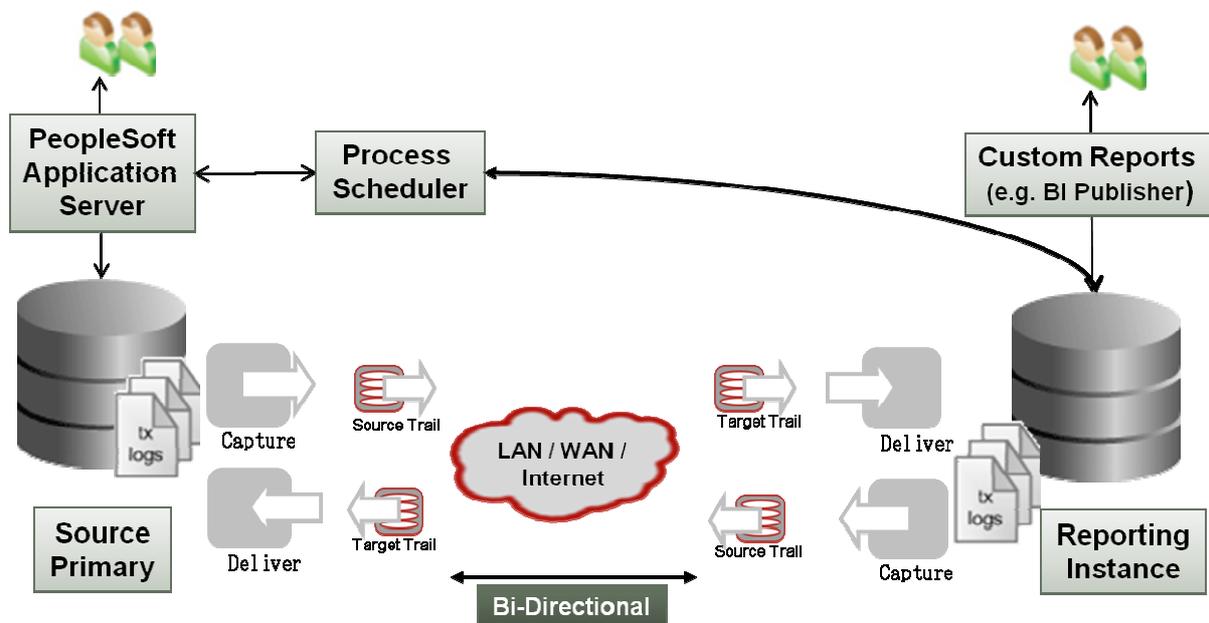


Fig. 3: Operational Reporting for Oracle PeopleSoft

Operational Reporting für Oracle JD Edwards

Operational reporting for JD Edwards replicates all tables from the primary JDE database unidirectionally to a reporting instance. Using a second JD Edwards application server, users can access the reporting instance to generate resource intensive reports. The key limitation with this type of configuration is that users should not create data in the reporting instance, as doing so would create an out-of-sync situation between the source and target databases, which would require the reporting instance to be re-initialized.

As JD Edwards has the ability to run on other relational databases, such as Microsoft's SQL Server, organizations can take advantage of the heterogeneous capabilities of Oracle GoldenGate to deploy the

operational reporting solutions using Oracle databases as the target. Additional details can be found in Knowledge Document 1112406.1 on Oracle Support.

Below is an example shown of how Oracle GoldenGate can compliment JD Edwards.

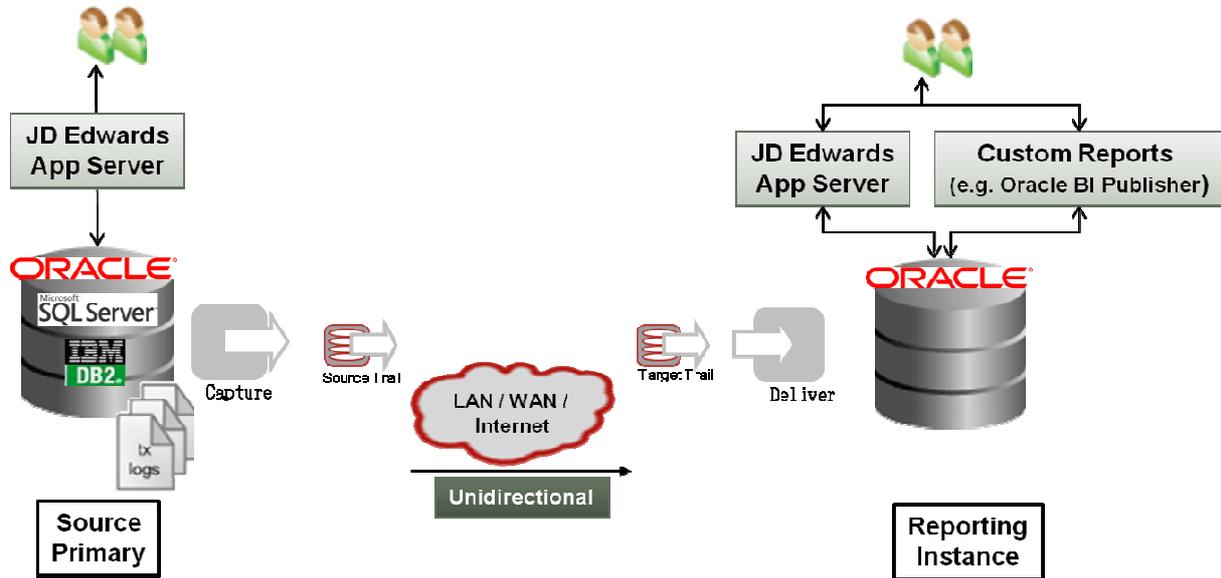


Fig.4: Operational Reporting for Oracle JD Edwards

Operational Reporting Using BI Publisher on an Oracle Siebel CRM Reporting Instance

Operational reporting using Oracle GoldenGate is flexible enough to allow reporting tools, such as Oracle's BI Publisher, to be run against the reporting instance. There are very few limitations on what tools can be used to query data from the reporting instance, yet typically the biggest hurdle for business users is to make sense of the complex application schema well enough to construct custom reports.

Oracle GoldenGate provides the means to remap data from the source system to different but like schemas that may be more easily understood by business users. For example, Oracle Siebel CRM stores account details in a group of entities but primarily in a table called S_ORG_EXT. Using the flexible configuration options of Oracle GoldenGate, data from S_ORG_EXT could be remapped to a table in the reporting instance called ACCOUNTS. Add in remapping of columns from S_ORG_EXT to the new ACCOUNTS tables and business users could more easily navigate the schema for creating custom reports. Additional details can be found in Knowledge Document 1112403.1 on Oracle Support.

Below is a conceptual model of using Oracle BI Publisher for reporting against real-time data from Siebel CRM.

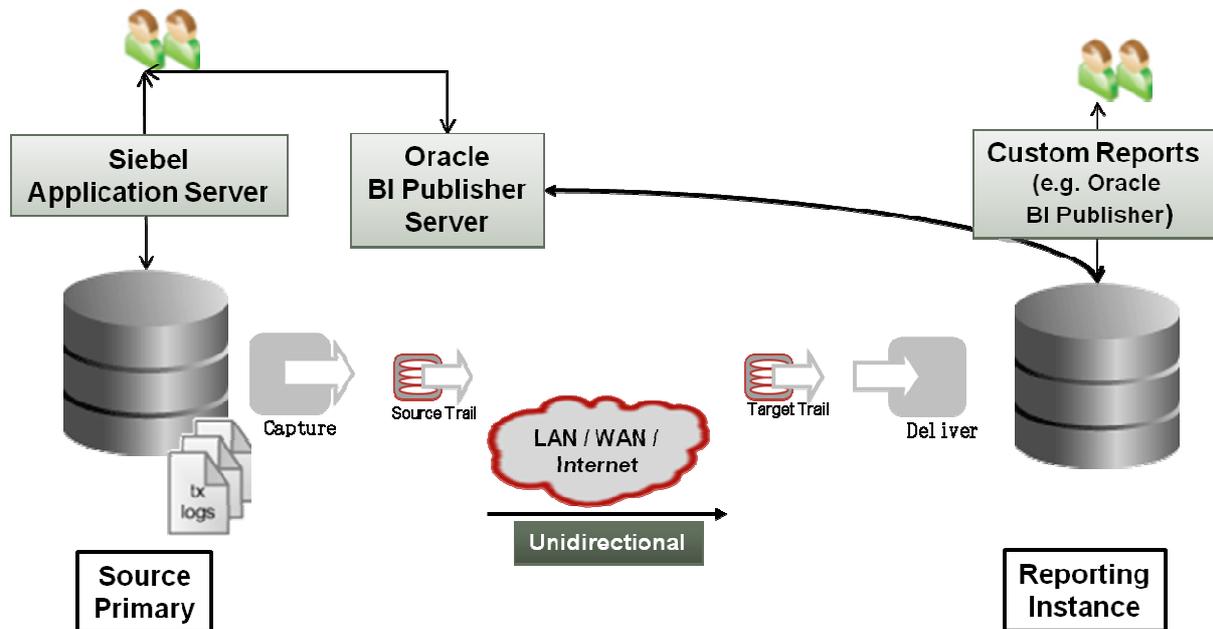


Fig.5: Operational Reporting for Oracle Siebel CRM

Summary

Utilizing the flexible architecture of Oracle GoldenGate, organizations can deploy certified solutions for real-time, low-impact, and nonintrusive replication of data from Oracle Applications to systems designed exclusively for reporting. It can also send that data to other systems within the organization that require realtime access to application data locally. Using the certified operational reporting solution with Oracle GoldenGate, companies can use up-to-the-second transactional data from their Oracle applications without impacting business operations or end user experience.

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