



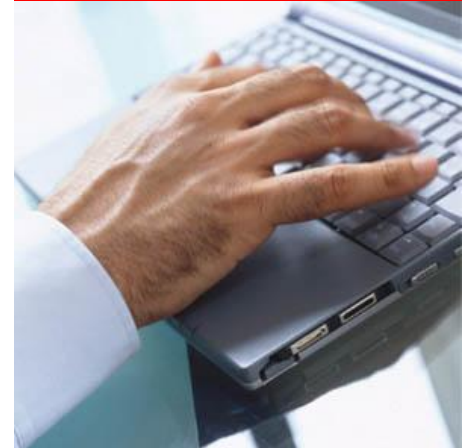
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Real-Time Business Intelligence using Oracle GoldenGate

Karsten Stöhr
Principal Sales Consultant

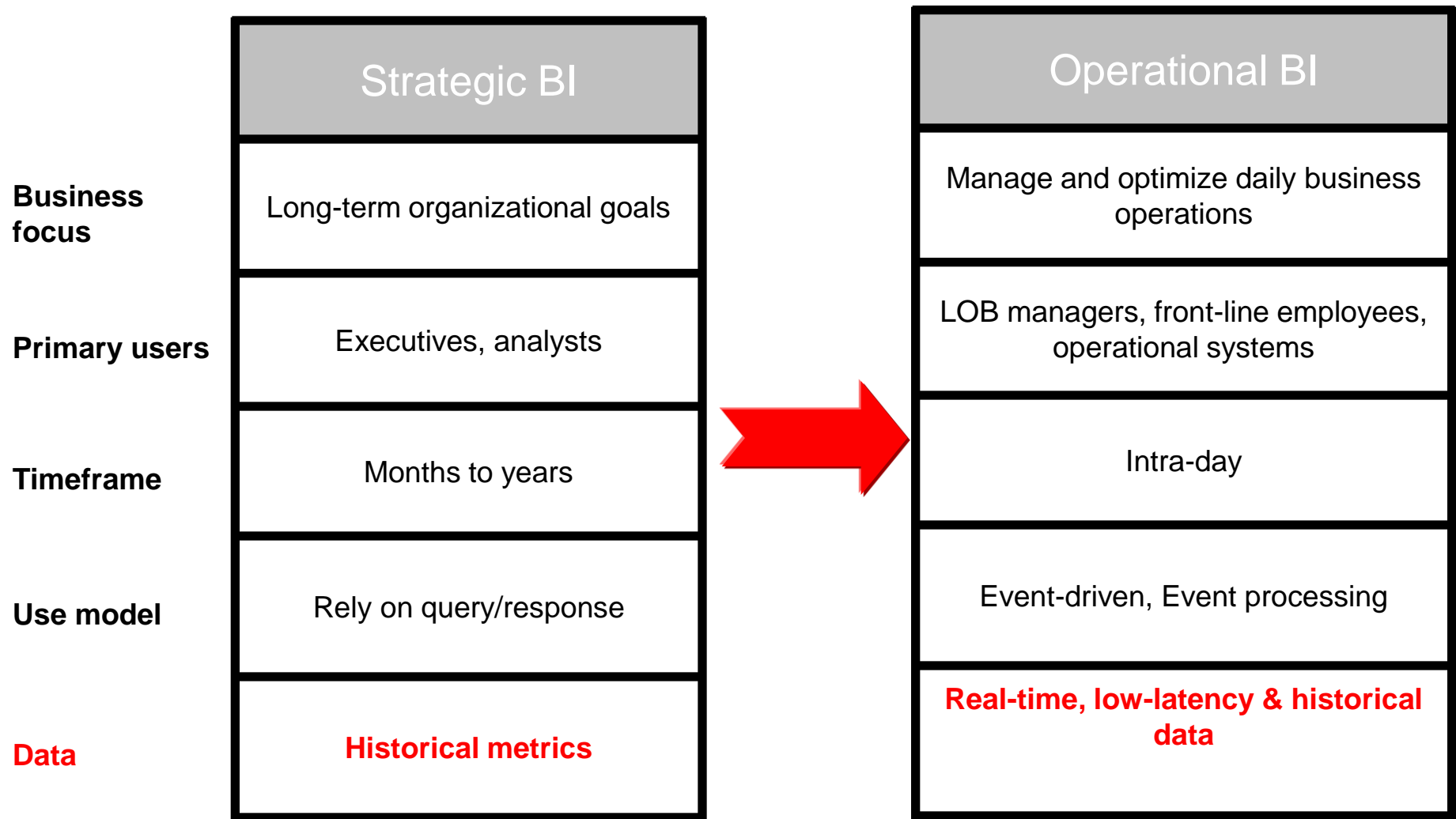
Agenda

- The trend for Operational BI
- Real-Time vs Traditional Data Warehousing
- Oracle GoldenGate Product Overview
- Case Studies
- Summary
- Q&A



Evolution of Business Intelligence

A Paradigm Shift

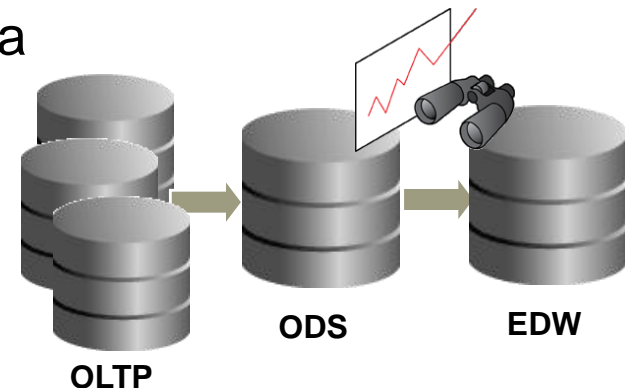
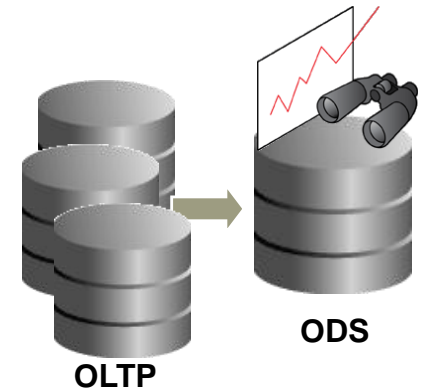
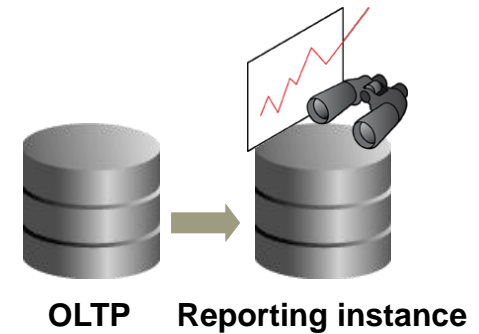


Real-Time, Operational BI in Action

- Fraud detection
- Customer churn
- Online promotion optimization
- Location-based offers
- Contact optimization
- Supply chain improvements

Architectures for Operational BI

- Single source, operational reporting
 - Restricted to a single application
 - Easily combines BI into transaction processing
- Multiple source integration for reporting
 - BI apps run on ODS using operational data
- Multiple source with operational and historical data
 - BI apps run on both ODS and the DW to combine historical analyses with transactional data



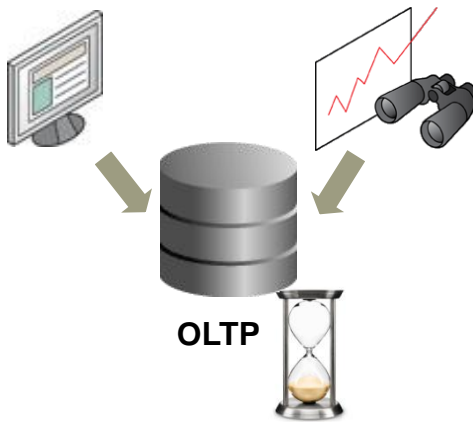
Common Mistakes for Operational Reporting

And Best Practices to Avoid Them

Single source, real-time operational reporting

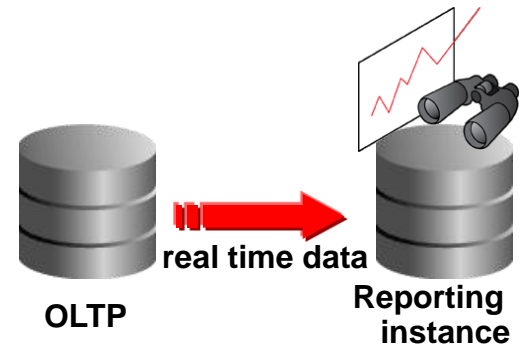
Mistake

- Run on the source OLTP system
- Degrades performance of transaction processing



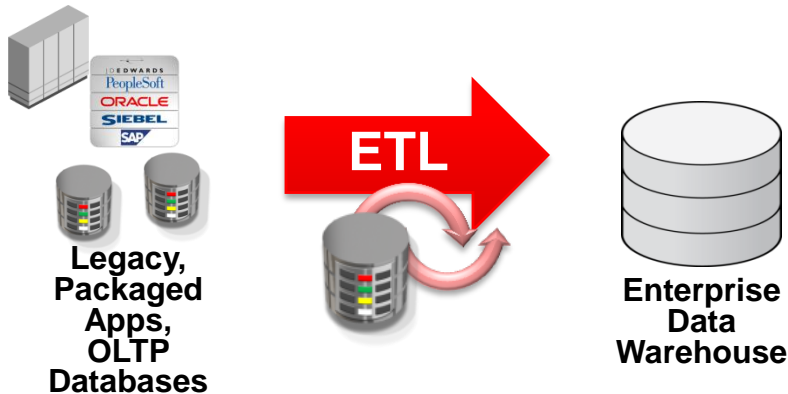
Best Practice

- Offload to a secondary, lower cost system in real time
- Maintain transaction processing performance



Drivers for Moving to Real-Time Data Warehouse

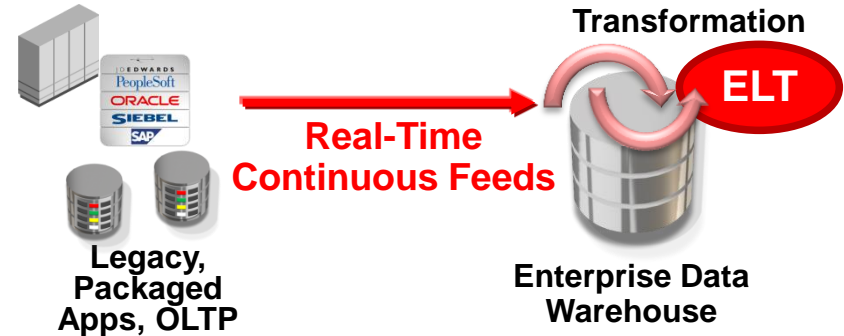
Traditional Data Warehouse



- Day+ old data
- Batch data extracts within specified “off business hours”
- A middle-tier server for transformations
- Process interruptions impact data recoverability



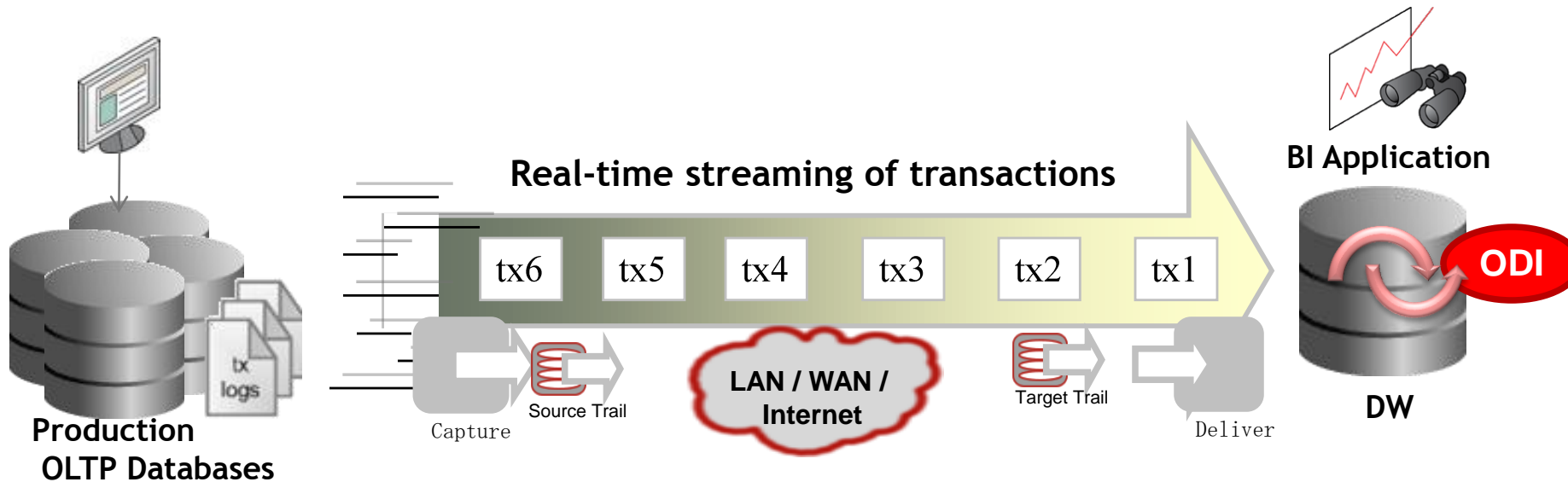
Real-Time Data Warehouse



- Timely, relevant data
- No batch windows on OLTP
- Reduced TCO by eliminating middle-tier server for transformations
- Complete recoverability after interruptions

Oracle for Real-Time Data Warehousing

Fastest Real-Time Data Integration, Fastest Bulk Data Transformation



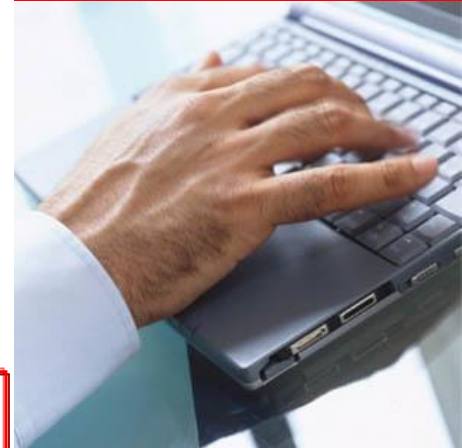
- Sub-second data latency
- Minimal overhead and no batch windows
- High-performance, in-database transformations
- Read-consistent changed data with referential integrity
- Complete data recoverability via Trail files

Comparison of Data Acquisition Methods

Attribute	Batch Scripts	SQL Query	Database Triggers	Oracle GoldenGate
Latency	Hours	Hours-Minutes	Minutes	Sub-seconds
Data Volume	Medium	Low	Low	High
Processing Overhead	Very High 20-50+%	High 15-20%	Medium-High 10-15%	Low 1-3%
Transaction Integrity	No	No	No	Guaranteed
Transformations	Intermediate	Basic	Basic	Basic - supplemented with ODI EE
Implementation Complexity & Risks	Medium	Medium to High	High	Low
Data Recoverability	Medium	Poor	Poor	Full
Management Overhead	Medium	Medium	High	Low

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What is Oracle GoldenGate?

*Oracle GoldenGate provides **low-impact** capture, routing, transformation, and delivery of transactional data across **heterogeneous** environments in **real time***

Key Differentiators:

Performance

Non-intrusive, low-impact, sub-second latency

Flexible and Extensible

Open, modular architecture - Supports heterogeneous sources and targets

Reliable

Maintains transactional integrity - Resilient against interruptions and failures

How Oracle GoldenGate Works

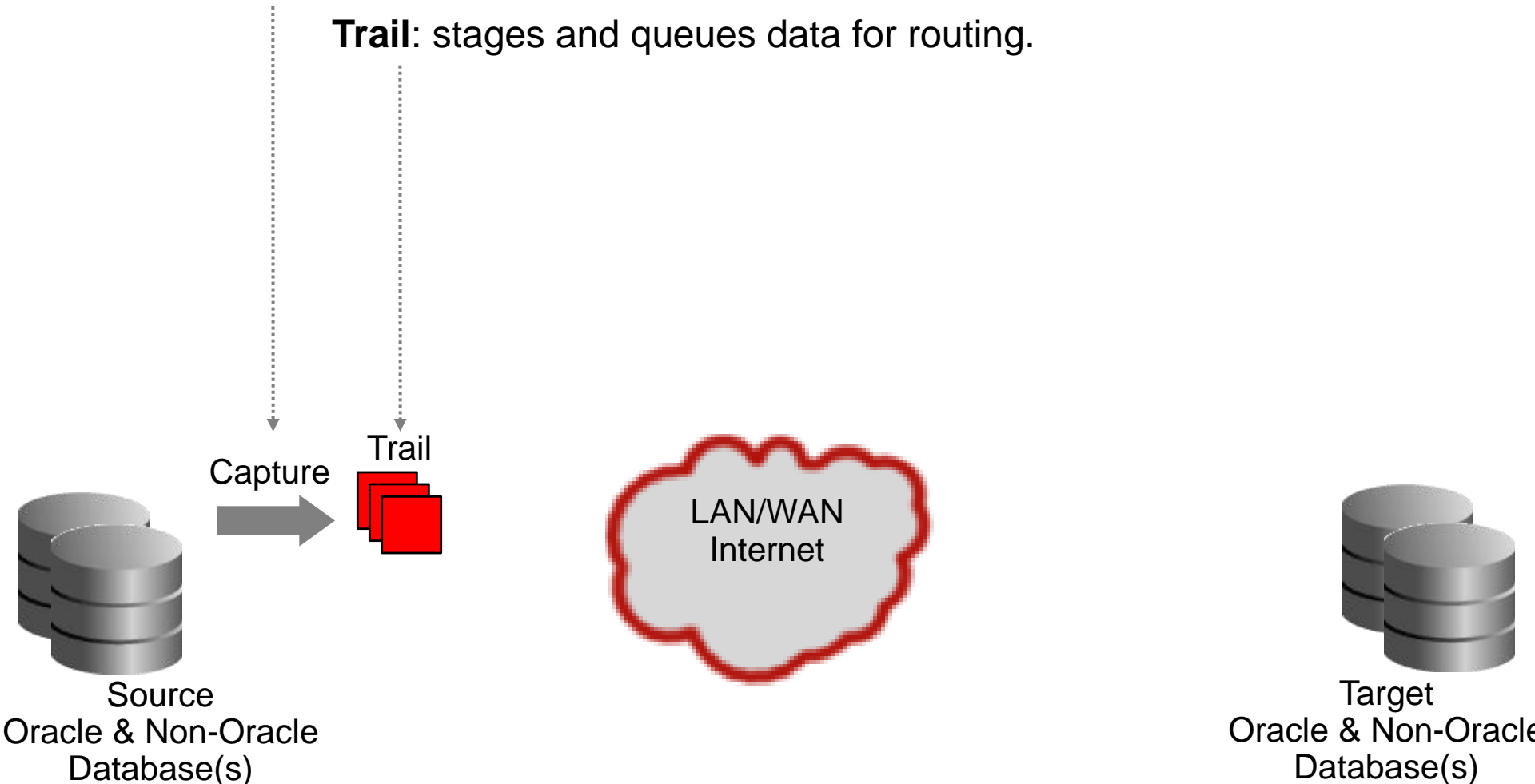
Capture: committed transactions are captured (and can be filtered) as they occur by reading the transaction logs.



How Oracle GoldenGate Works

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Trail: stages and queues data for routing.

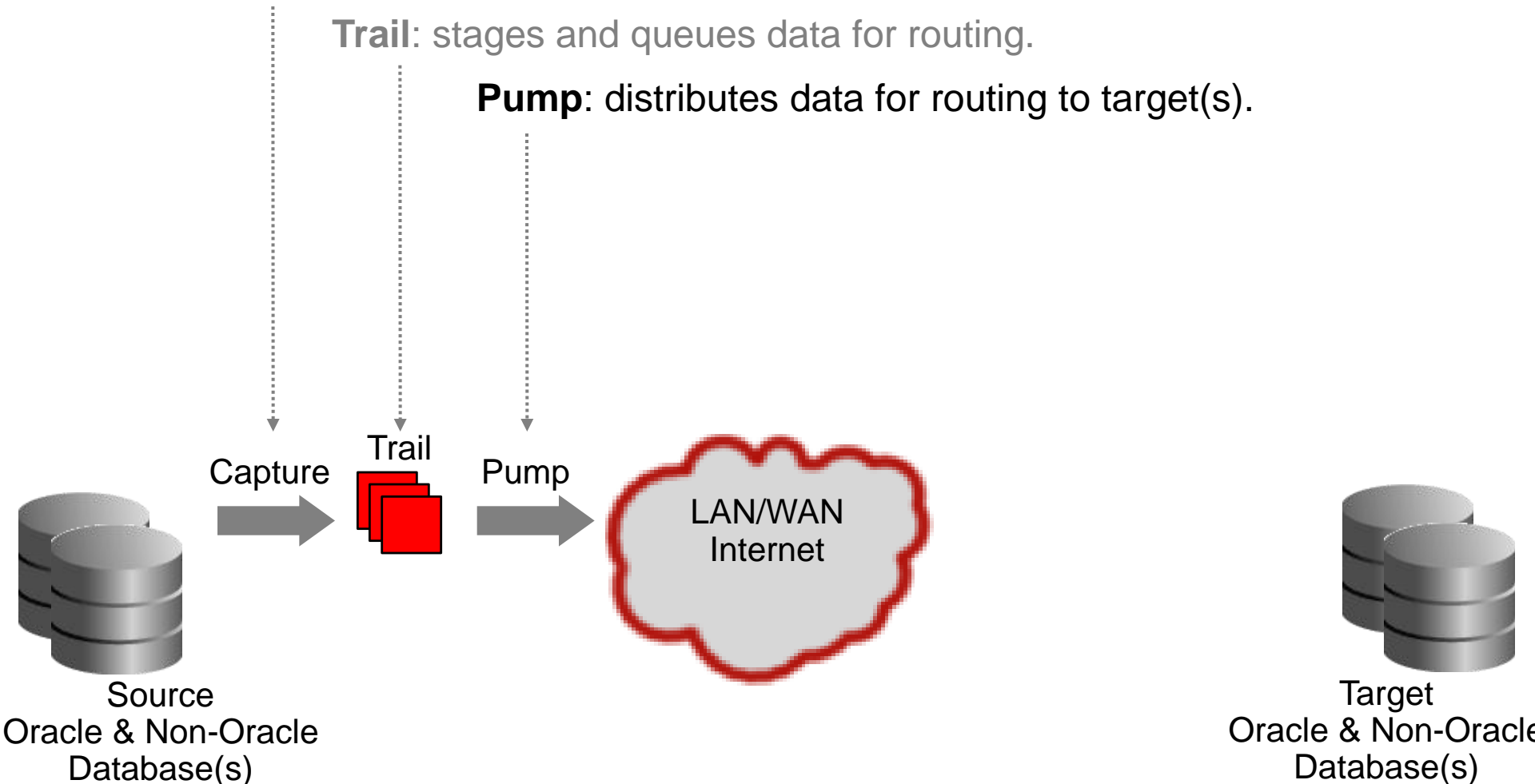


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Pump: distributes data for routing to target(s).



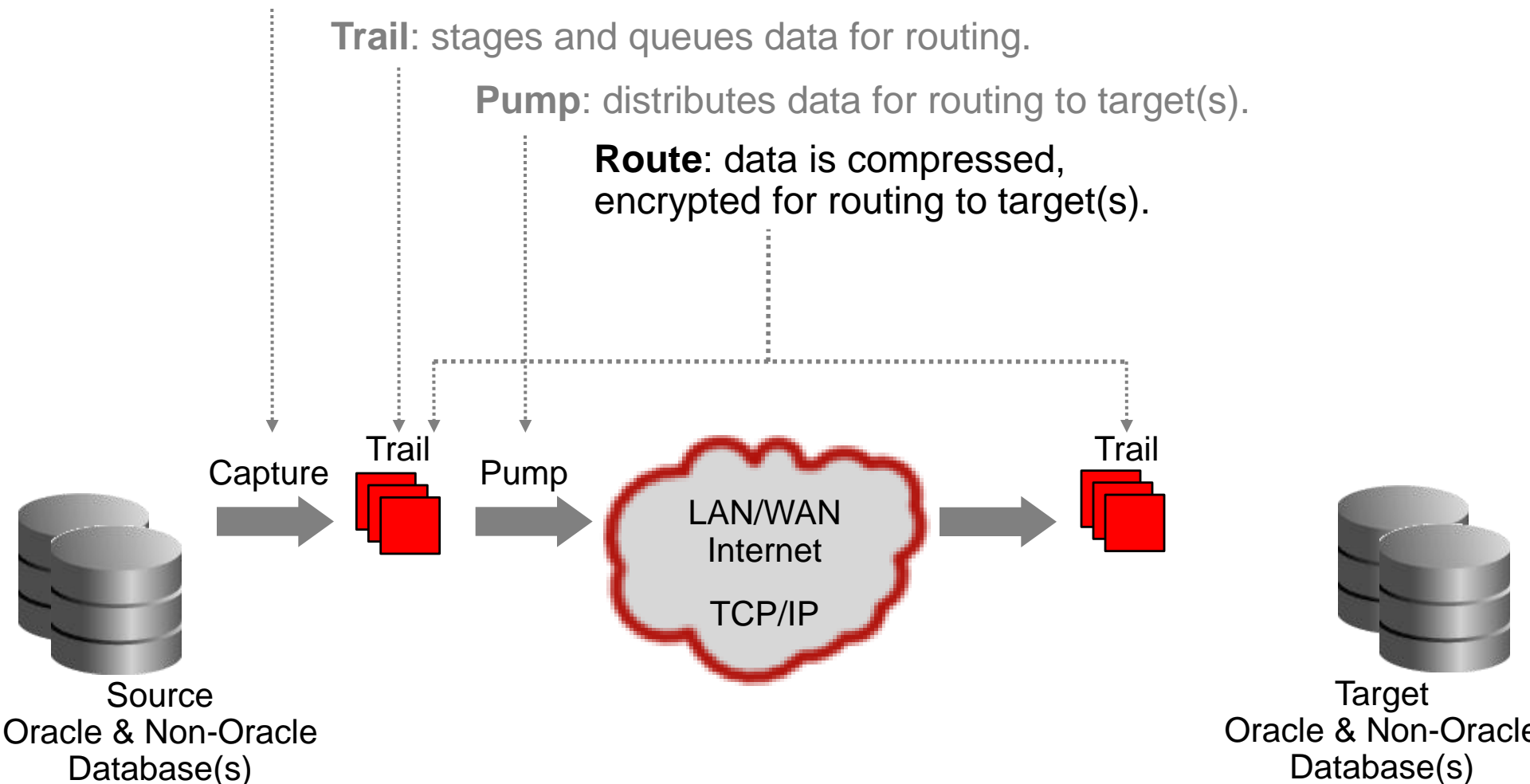
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How Oracle GoldenGate Works

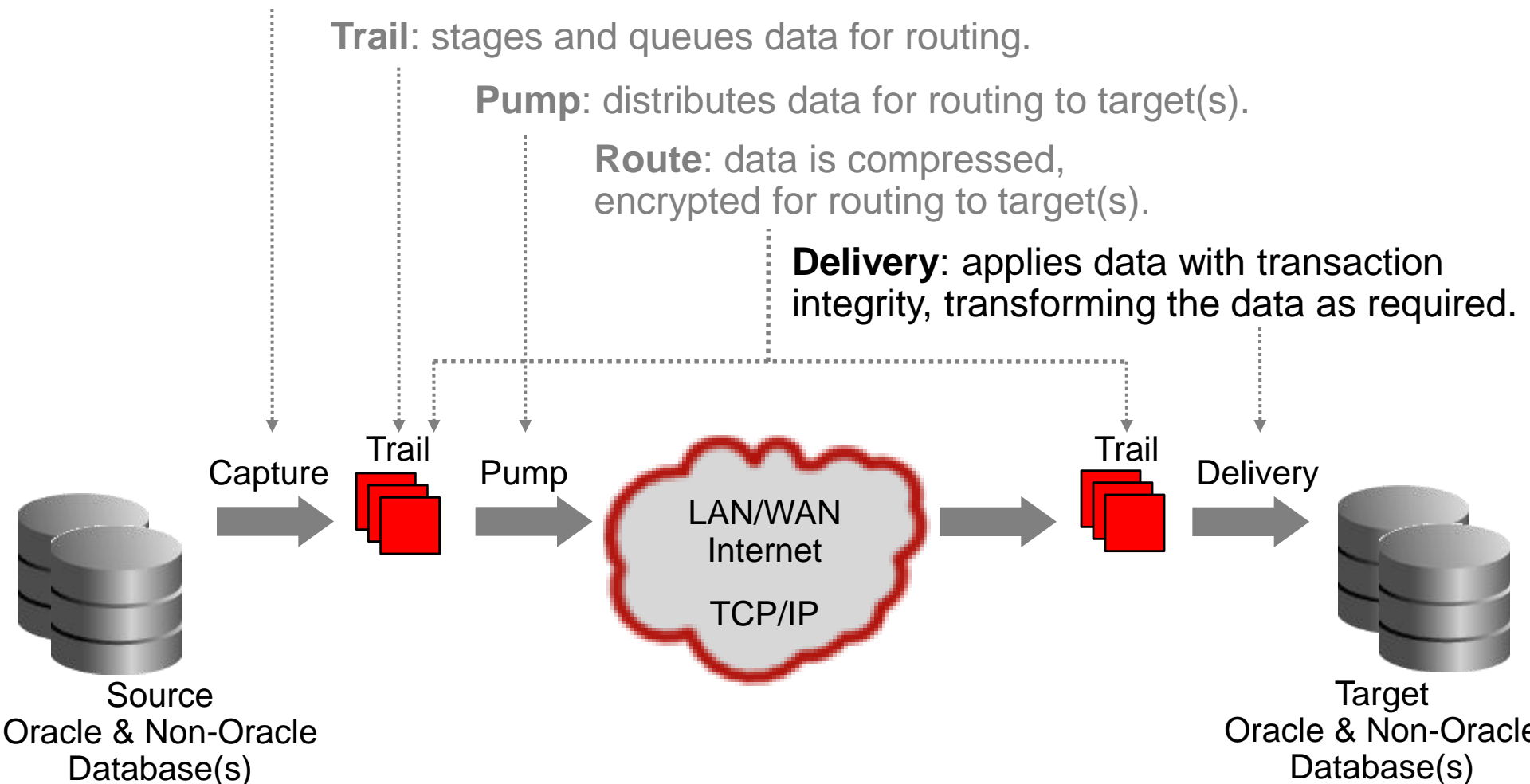
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Delivery: applies data with transaction integrity, transforming the data as required.



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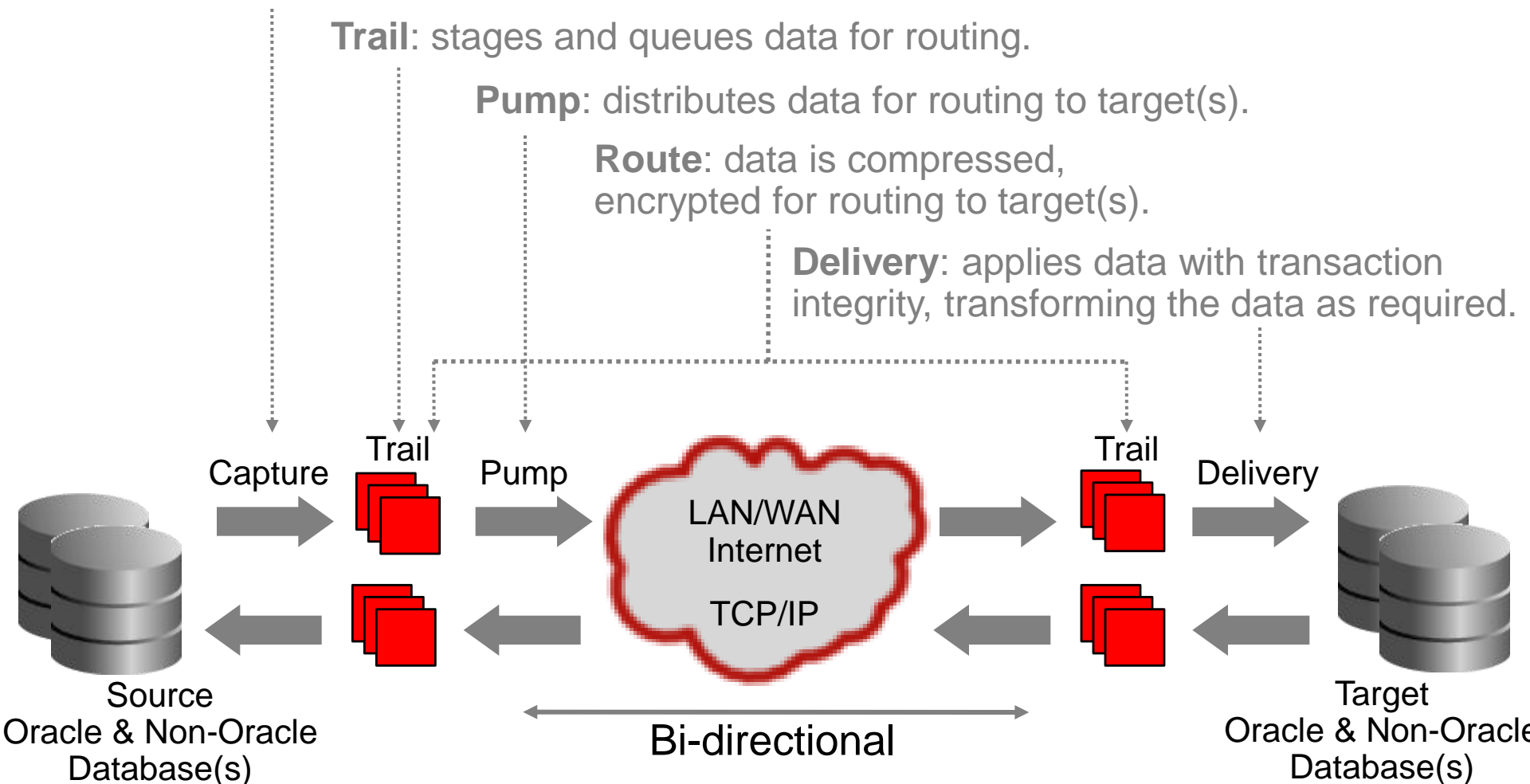
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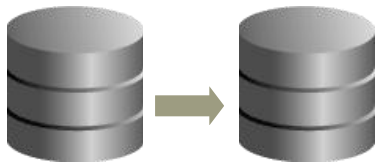
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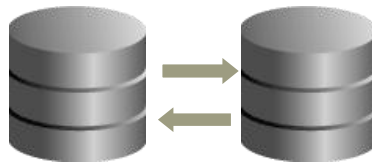


Oracle GoldenGate Topologies

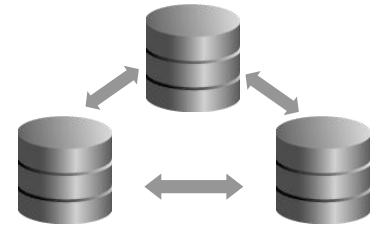
Unidirectional
Query Offloading



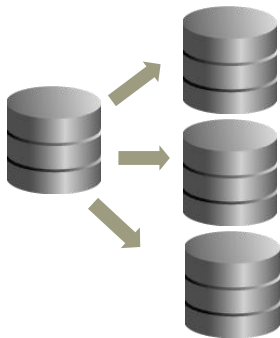
Bi-Directional
Live Standby or
Active-Active for HA



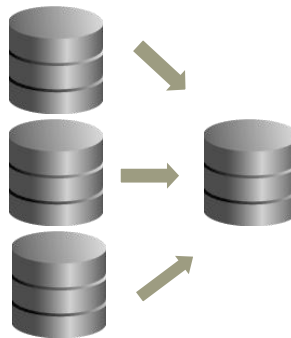
Peer-to-Peer
Load Balancing,
Multi-Master



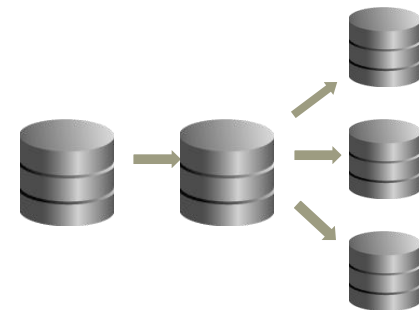
Broadcast
Data Distribution



Integration/Consolidation
Data Warehouse

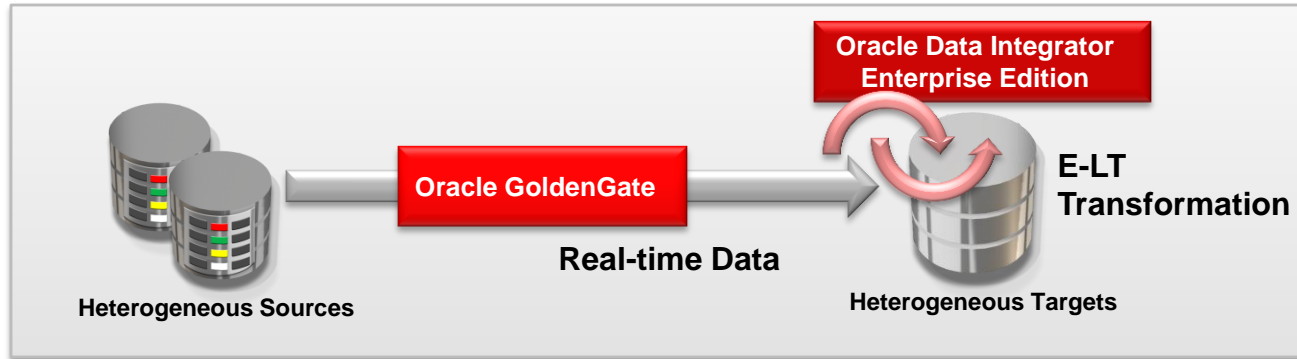


Cascading
Data Marts



Complementary and Used Together

Data Integrator Enterprise Edition and GoldenGate



Real-Time Data Integration and Replication

- **Fastest real-time solution**
- Sub-second latency for real-time feeds
- Guaranteed delivery eliminates data loss
- Eliminates down-time for migration and upgrades
- Least intrusive to source systems

Oracle GoldenGate

Bulk Data Movement and Transformation

- **Fastest E-LT Solution**
- Optimized SET-based transformation for high volume transformations
- Data lineage for improved manageability
- Integrates to Data Quality

Oracle Data Integrator Enterprise Edition

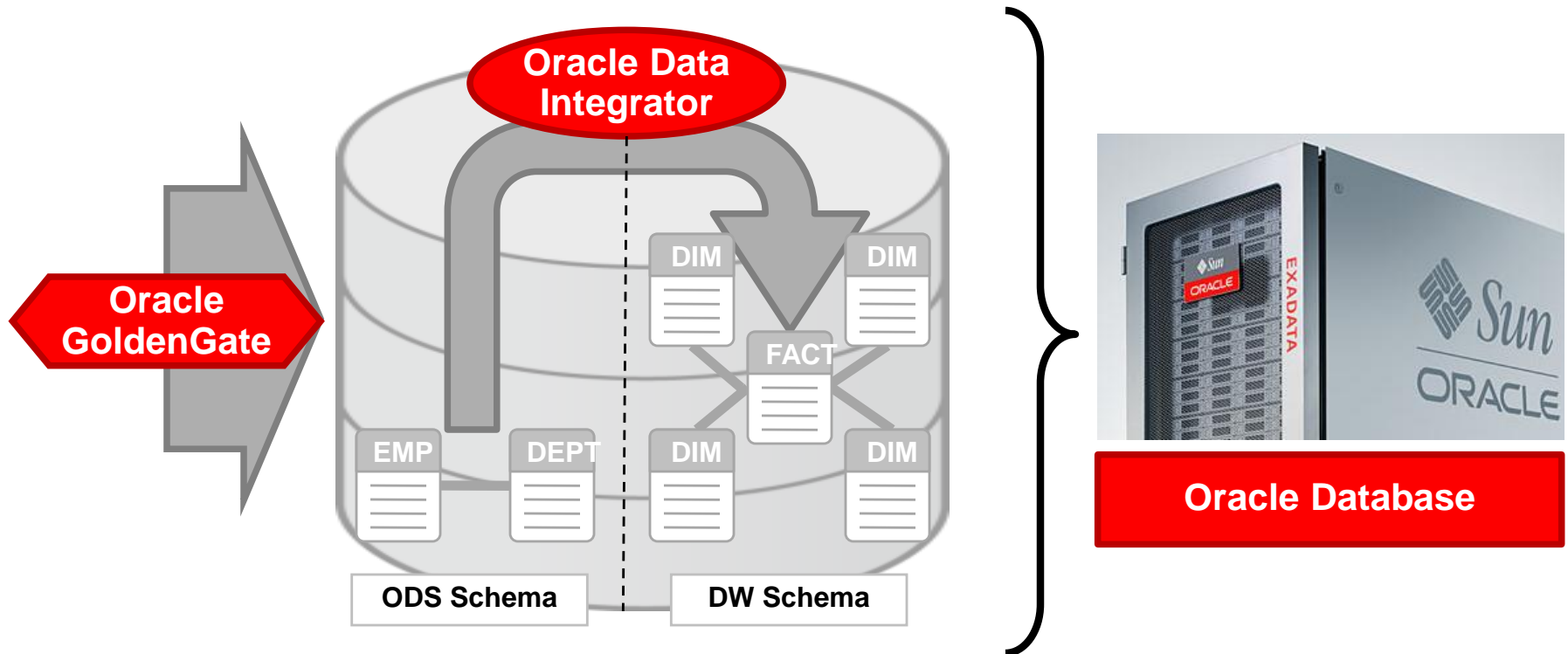
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Extreme Performance for Data Warehousing

Exadata V2 is the Platform for Real Time Data Warehousing

Load Exadata with GoldenGate; Generate Transforms from ODI-EE

- New Exadata platform optimized for OLTP and Data Warehousing suits Real Time DW
- Extreme Exadata performance can handle huge data volumes that come with Real Time DW





Oracle GoldenGate Configuration Examples

GoldenGate Capture Configuration

```
EXTRACT eoraks1  
USERID ollie, PASSWORD $f%t#k*  
RMTHOST 192.168.192.129, MGRPORT 7899  
RMTRAIL ./dirdat/ks  
TABLE ollie.tcustmer;  
TABLE ollie.a*;
```

GoldenGate Delivery Configuration

```
REPLICAT roraks1  
USERID ggs2 PASSWORD hdsakhfdkjsfhiu  
ASSUMETARGETDEFS  
DISCARDFILE ./dirrpt/roraks1.dsc, PURGE  
MAP ggs2.tcustmer, TARGET ollie.client;  
MAP ggs2.tcustord, TARGET ollie.order;  
MAP ggs2.*, TARGET ollie.*;
```

Column Mapping – Building History

This example uses special values to build history of operations data

```
INSERTALLRECORDS
MAP SALES.ACCOUNT, TARGET REPORT.ACCTHISTORY,
  COLMAP (USEDEFAULTS,
    TRAN_TIME = @GETENV("GGHEADER", "COMMITTIMESTAMP"),
    OP_TYPE    = @GETENV("GGHEADER", "OPTYPE"),
    BEFORE_AFTER_IND = @GETENV("GGHEADER",
                                "BEFOREAFTERINDICATOR"),
  );
```

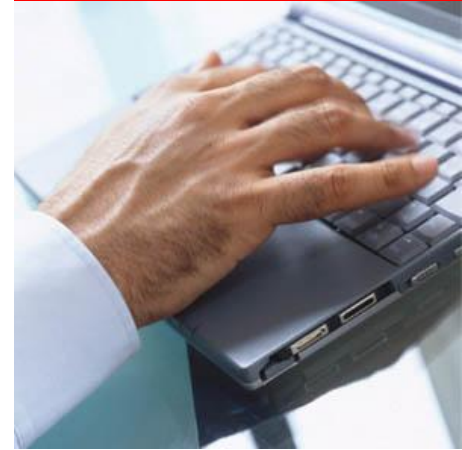

Functions – Example

```
MAP SALES.ACCOUNT, TARGET REPORT.ACCOUNT,  
COLMAP ( USEDEFAULTS,  
        TRANSACTION_DATE = @DATE ("YYYY-MM-DD",  
                                   "YY", YEAR,  
                                   "MM", MONTH,  
                                   "DD", DAY),  
        AREA_CODE      = @STREXT (PHONE-NO, 1, 3),  
        PHONE_PREFIX   = @STREXT (PHONE-NO, 4, 6),  
        PHONE_NUMBER   = @STREXT (PHONE-NO, 7, 10) );  
  
PHONE_NO = @STRCAT ("(", AREA_CODE, ")", PHONE_PREFIX, "-", PHONE_NUMBER)  
  
PRODUCT_CODE = @CASE (PRODUCT_CODE, "CAR", "A car", "TRUCK", "A truck")  
  
ANNUAL_SALARY = @COMPUTE ( MONTHLY_SALARY * 12)  
  
AMOUNT_COL = @IF (AMT > 0, AMT, 0)
```

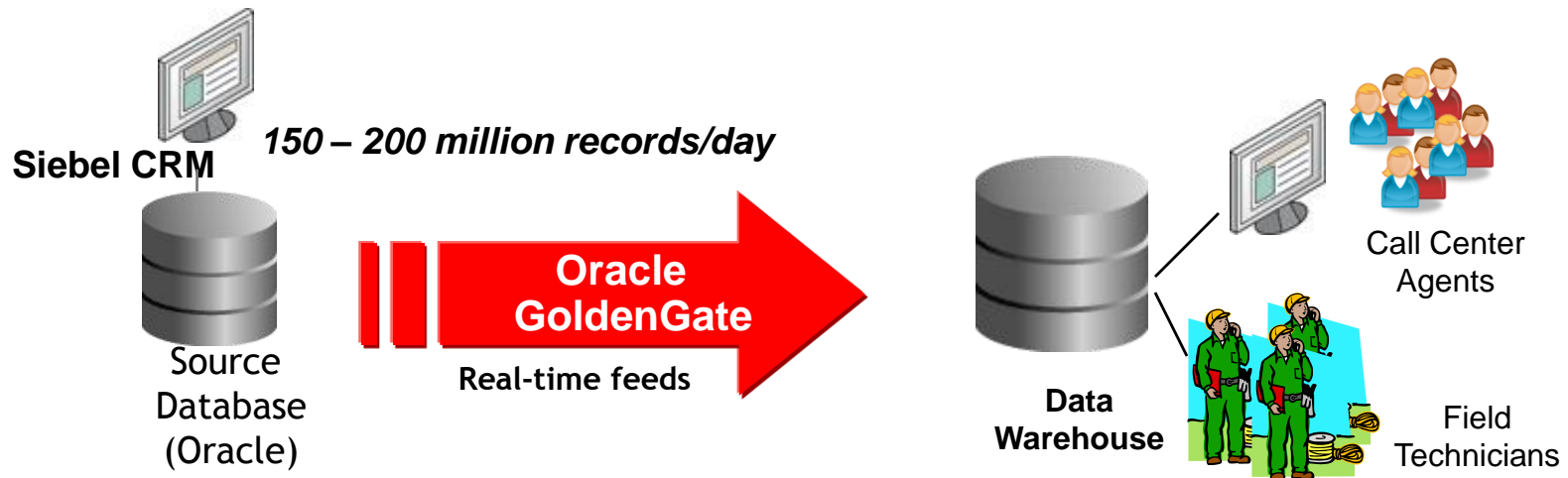


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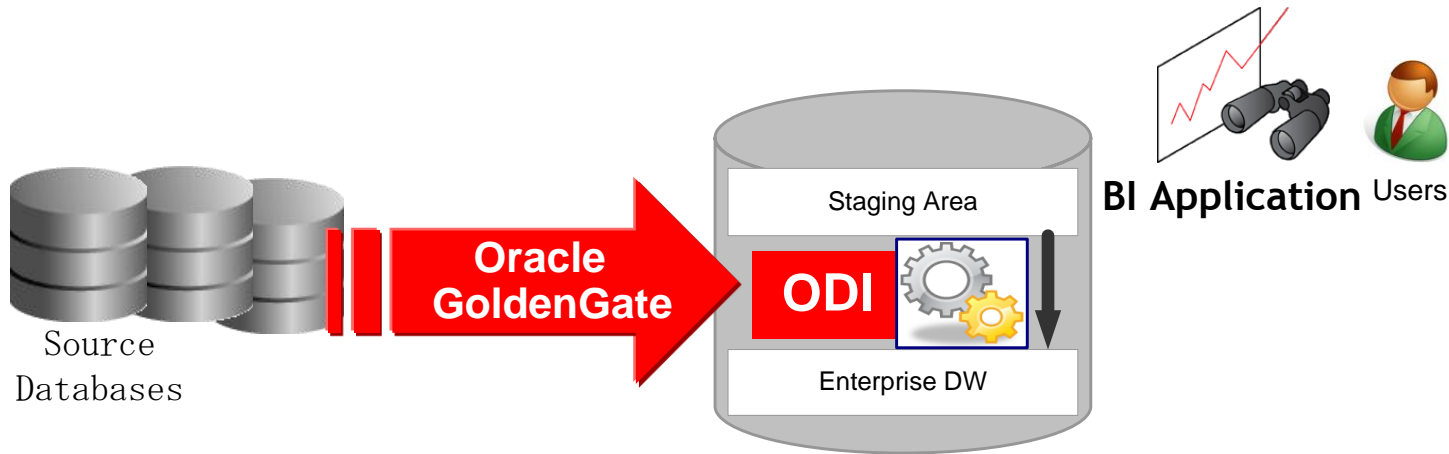
Customer Example: DIRECTV



Results:

- Reduced customer churn by 25%
- Increased responsiveness of field technicians by optimizing call routes
- More targeted/personalized offers by call center agents
- Ranked top in its industry in the American Customer Satisfaction Index

Customer Example: Overstock.



Results:

- Optimize decisions and decrease costs with real-time information
 - Customer analysis now done in minutes, rather than days
 - Reduced marketing spend with 'smart' campaign decisions
 - Reduced inventory costs
- Eliminated batch windows
- Ranked #2 in customer service by *National Retail Federation*

Benefits of Real-time BI with Oracle

Cut Costs, Reduce Risk, and Revolutionize Business Insight

Cut Costs and Improve Efficiencies.

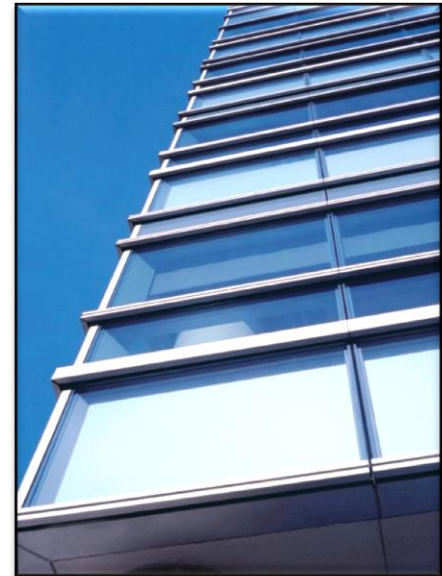
- Move only the changed data from redo logs and reduce source and network overhead
- Shorten implementation times from months to weeks using pre-packaged integrations to well-known applications, sources and targets.

Reduce Risk, Ensure Continuity

- Eliminate performance impact on source systems
- Reduce the risk of missed orders, poor customer interactions, missed opportunities through improved recoverability, data quality

Improve Business Insight

- Enable near real-time decision making with real-time data flows
- Combine real-time data with historical context for better insights



Summary of Best Practices For Achieving Real-Time BI



1. Consider **E-LT** for **lower TCO** and optimized transformations on the target
2. Leverage **non-invasive real-time data replication**, for **timely data** and improving data **recoverability**
3. Use log-based capture to **reduce overhead** and optimize OLTP **performance** to meet growing business demands
4. Combine real-time data with historical context **for better insights**
5. Enable **frontline employees' access** for maximum usage of operational intelligence

The preceding is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions.

The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.



Q&A

Get Started

- Visit the Oracle Fusion Middleware 11g web site at oracle.com/goto/fmw11g/index.html
- Oracle Data Integration on oracle.com oracle.com/goto/odi
- Oracle GoldenGate on oracle.com oracle.com/goto/goldengate
- Oracle BI/EPM on oracle.com oracle.com/solutions/business_intelligence/index.html

Resources

- Oracle GoldenGate Resource Kit: oracle.com/goto/goldengate
- Blog: <http://blogs.oracle.com/dataintegration>
- Technical information available at: oracle.com/technology/products/oracle-data-integrator/goldengate/index.html
- Data Integration Events <http://www.oracle.com/events>

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