Oracle Data Integrator (ODI)

Sandrine Riley - Product Management, Oracle
Agenda

- Oracle Data Integration Overview
- Oracle Data Integrator Overview and New Features in 12c
- Oracle Data Integrator @ Oracle
- Oracle Warehouse Builder Migration Utility
Oracle Data Integration Overview
Data Integration Trends
Changing Requirements Fuel Market Growth

- Projected to grow to $3.2B\(^1\) by 2017
- **Big data** is the new normal
- Application data now lives in the **cloud** and in a multitude of disparate environments
- Conventional ETL tools are struggling to meet **performance** demands
- Integrating across applications

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\(^1\) Gartner Data Integration Magic Quadrant 2013 Report
New Requirements for Data Integration

Integrated and High Productivity Tooling

Any Data Latency, Real-time

High Performance, High Availability

Cloud Ready

Any Data, Any Source
Oracle Data Integration 12c
Delivering Real-Time Integration for Big Data and Cloud

- Future Ready
- Extreme Performance
- Fast Time to Value
Oracle Data Integrator
Customers
Enterprise-Class Data Integration with Oracle
Customers Achieve Tangible Results

<table>
<thead>
<tr>
<th>Company</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>overstock.com</td>
<td>Real-time enterprise data warehouse</td>
</tr>
<tr>
<td>Sabre Holdings</td>
<td>Reduced time by 30% to 40% to integrate a new data source into its warehouse</td>
</tr>
<tr>
<td>RAYMOND JAMES</td>
<td>50% reduction in time-to-market for new services</td>
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<tr>
<td>NYK Line</td>
<td>Reliable bulk data movement and transformation for high volume, transactions</td>
</tr>
<tr>
<td>Europe Airpost</td>
<td>Increased data loading process by 25% to 30%</td>
</tr>
<tr>
<td>BT</td>
<td>Improved data handling speed by more than 20% with automation</td>
</tr>
<tr>
<td>Verizon</td>
<td>Millions of $ savings from shared data services</td>
</tr>
<tr>
<td>Nestlé</td>
<td>Data warehousing for operations from restocking to marketing</td>
</tr>
</tbody>
</table>
Raymond James
Centralized Operational Data Store for Application Services

Faster Time to Solution

- Used Oracle Data Integrator along with Oracle GoldenGate for real-time data integration
- Feeds from HP NonStop, SQL Server, and Oracle databases into ODS
- Achieved higher application performance, reduced complexity and cost
- Accelerated time to market by 50% for applications supporting financial advisors
Royal Bank of Scotland
Reducing Risk with Better Data

Faster Time to Solution

- Used to take ~3-9 months for data to propagate from operational systems into the Data Warehouse
- Uses Oracle Data Integrator and Oracle GoldenGate to move data within a matter of days and reduced storage required from 150 GB to 20 GB
- Credit Risk Officers and Credit Risk Modelers do not need to perform individual checks and reconciliations
Fun Facts About Oracle Data Integrator

Travel and Rest Easy
Working behind the scenes to make the world a better place, one journey at a time… the technology behind Sabre Holdings’ technology includes Oracle Data Integrator.

Wherever your Freight is Moving
When you work with Schneider National, Oracle Data Integrator is part of the foundation to making sure your freight moves and arrives at its destination on time.

Save a Bundle
They do the work, you do the saving – Overstock.com uses Oracle Data Integrator to help you save money by checking over half a million prices each week and catering your experience on their website to you.

Life Well Planned
With Oracle Data Integrator, Raymond James Financial ensures your portfolio is tended to with the utmost care and in tune with today’s rapid pace of life.

Painting the Town
Or just your home - PPG Industries, known for its paints sold at Lowes and Menards, uses Oracle Data Integrator to manage all of its customer transactions.
Oracle Data Integrator 12c
New Features
Oracle Data Integrator

Bulk Data Processing and Data Transformation

- Certified for leading technologies to deliver fast time to value
- High-performance, low cost of ownership E-LT architecture
- Lightweight deployment
- Flexible, easy to enrich functionality

Oracle Data Integrator

- High Performance E-LT
- Declarative Design
- Extensible Knowledge Modules
- CEP Data Services
- Capable of Integrating Structured & Unstructured Data

Cloud

Apps

Database

Big Data
New Features in Oracle Data Integrator 12c

- Improved developer productivity through declarative flow based mapping
- Extreme performance through parallelism and low session overheads
- Enterprise solutions through support for big data analytics and Oracle BI Applications
ETL versus E-LT
Flexible Optimized Architecture

- Leverages **set-based transformations**
- Improves performance for loading, **no middle tier and no network hop**
- Takes advantage of **existing hardware and software infrastructure**
Declarative Design
Improved Productivity for Faster Time to Solution

- **Easy** and **universal** for designing simple to complex mappings
- **Robust** and **Reusable**: Create mappings once for any physical design
- **Quick** to define and refactor maps, high degree of automation
- **Extensible** model for any data integration mechanism

**Benefits**
- Significantly reduces the learning curve
- Shortens implementation times
- Simpler maintenance

[Diagram of ODI Declarative Design showing Define What You Want and Automatically Generate Dataflow]

ODI Declarative Design

Define **How**: Knowledge Modules

1. Define What You Want
2. Automatically Generate Dataflow
Flow Based Design
Increased Productivity through Enhanced Design

- **Declarative, flow based mapping** to easily design complex transformation logic combined with technology specific out of the box knowledge modules
- **Component reusability** to capture shared logic throughout mappings (sources, targets and transformations)
- **Step–by–step debugger** with complete user control / access to uncommitted data, and defining break points
Multiple Target Load
Improving Productivity through Multiple Data Flows

- A mapping can contain **multiple targets**
- Any component can map result to multiple downstream components
- **Split** component allows to split input logically based on expressions
Reusable Mappings
Improving Productivity through Component Reuse

- Capture common logic (sources, targets, transformations)
- Reuse logic in mappings
Performance Optimizations
Faster Loads for Improved Run-time Caching

- **In-session parallelism**
  - Parallel task execution
  - Narrower execution windows

- **Low overhead session during execution**
  - When executing repeated scenarios, restarting sessions
  - Efficient micro-batch loading for real time data
  - Reduced logging, better cache utilization reduce network traffic for entire IT system
Knowledge Modules
Simpler Design and Shorter Implementation Time

Pluggable Knowledge Modules Architecture

Reverse Engineer Metadata  Journalize (CDC)  Load from Source to Staging  Check Constraint  Integrate, Transform  Data Service

Sample Out-of-the-Box Knowledge Modules (100+)

Oracle Solutions
GoldenGate  Oracle Utilities  Oracle DBLINK  Siebel CRM  E-Business Suite  Oracle Merge  Oracle Web Services  Oracle Spatial

Sources
Hadoop  IBM DB2  SAP ABAP  SQL Server  Sybase  NoSQL  JMS  Teradata
Knowledge Modules

KEY ARCHITECTURE BENEFITS:

- Faster development and simpler maintenance using templates
- Easy to extend and add new best practices
- Enforces predictability and reduces cost of ownership

Integrated, High Productivity Reusable Modules
Extended Connectivity
Leverages Existing IT, Faster Implementation

- Big Data Support: Hadoop
- Best for Oracle: Merge, Spatial, Multi-Table Insert, Optimizer Hints and more
- Real-Time Data: CDC with GoldenGate
- Applications: E-Business Suite, Siebel, PeopleSoft, JD Edwards Enterprise One, JD Edwards World, SAP ERP and SAP BW
- Heterogeneous: Optimizations for all major RDBMS: IBM DB2, Microsoft SQL Server, Teradata, Netezza, etc.
Loading and Transforming Big Data

- Supports Hadoop standards
- Reverse engineer Hadoop metadata
- Check, validate and ensure data integrity with Hadoop
- Load data into HDFS/Hive
- Generate HiveQL and execute in Hadoop
- Leverage existing Hadoop transformations
Enterprise-Class
Scalable and Highly Reliable Data Integration Platform

<table>
<thead>
<tr>
<th>Scalable</th>
<th>Highly-Available</th>
<th>Secure</th>
<th>Engineered Systems Ready</th>
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</thead>
<tbody>
<tr>
<td>• Scales linearly</td>
<td>• Enterprise-scale</td>
<td>• Strong integration with</td>
<td>• Certified with Exadata,</td>
</tr>
<tr>
<td>on any RDBMS</td>
<td>clustered deployment</td>
<td>leading Identity Management</td>
<td>Exalogic and Big Data</td>
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<tr>
<td>without the need</td>
<td>on WebLogic Server</td>
<td>solutions</td>
<td>Appliances</td>
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<tr>
<td>of ETL-specific</td>
<td></td>
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</tr>
<tr>
<td>hardware</td>
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Oracle Data Integrator at Oracle
Adoption of Oracle Data Integration @ Oracle

Oracle ERP Applications
- EBS
- PeopleSoft
- JDE E1
- Fusion HCM
- Fusion CRM
- JDE World

Oracle Industry Applications
- Agile
- Retail
- Insurance
- Comms

Business Intelligence Performance Management
- BI Applications
- BI EE Server
- Planning
- Essbase
- Financial Management
- Spend Analyzer
- EPMA
- Profitability Management

Integration Packs
- CRM On-Demand
- Life Sciences
- Trade Promotions
- Transportation Management
- Retail Financials

Integration Middleware
- SOA Suite
- Activity Monitor
- Event Processor
- Service Bus
- BPEL PM
- WebLogic
- Enterprise Manager

Oracle Database (Standard)
- ODI Integrated
- OWB Embedded

Oracle Database (Enterprise Edition & Exadata)
- ODI Integrated
- TimesTen Integrated
- Exadata Certified

Big Data Appliance
- ODI Embedded
Data Integration for Business Analytics

- Oracle BI Apps completely re-architected solution leveraging the power of Data Integrator
- Oracle GoldenGate option available for customers that have real-time demands
- Number of new out-of-the-box tools to increase productivity and drive down TCO
- Report-to-source lineage and integrated data quality
- Common management: administration, monitoring, scheduling, auditing, exceptions
Moving to a More Modern BI / DW Approach

**Traditional ETL + CDC**
- Row-based transformations in ETL engine on expensive middle tier servers
- Invasive capture on OLTP systems using complex Adapters
- Streaming requires several hops

**Modern E-LT + Real-time**
- Heterogeneous solution with no mid-tier; set based transformations use database
- Mini-batches throughout the day or bulk processing nightly
- Non-invasive data capture
- Continuous low latency feeds from operational systems
Best Real-Time Data Integration Platform
Extreme Performance, Integrated & Optimized

- Support Any Legacy Data Feeds
- Non-Invasive Source Capture
- Support traditional use cases: Data Warehousing, Reporting, Data Distribution, etc.
- Highly-Efficient and Cost-Effective Solution for Exadata
ODI and Exadata – Real World Example
Extraordinary Improvement in Performance

- A complex branch of the customer’s tax allocation process runs 5 hrs 11 mins during quarter close
- Exadata and ODI combined is able to execute the process 42X faster (7mins 20secs)
Integration Between GoldenGate and ODI 12c

- Enable GoldenGate journalizing on interfaces without restructuring
- Manage GoldenGate Capture/Delivery instances in an ODI topology
- Deploy GoldenGate processes via ODI
- Support real time and bulk from the same interface
Management Pack for Oracle Data Integrator

Key Features

- Discovery of ODI components
  - Agents: Standalone and JEE
  - Repositories
  - Source and Target databases

- SLA Management
  - Alerts and Notifications

- Monitoring
  - Availability Monitoring
    - ODI homepage to quickly assess infrastructure status
Management Pack for Oracle Data Integrator

Key Features

Monitoring

- **Performance Monitoring**
  - Performance of ODI components
  - Sessions execution statistics & Historical metrics
  - SQL Drill Down (requires Oracle DB Diagnostics and Tuning packs licenses)

- **Seamless access to database execution details**
Oracle Warehouse Builder Integration
Oracle Warehouse Builder Integration

Overview

Goal

- Provide a migration path to OWB users
- Integrate OWB and ODI runtime for phased migration

How

- OWB repositories can now be managed in an ODI topology
- OWB jobs can be executed and monitored in ODI
- OWB to ODI migration utility
Oracle Warehouse Builder Integration

- Oracle Data Integrator is the strategic go-forward EL-T platform from Oracle
- Existing OWB customers are NOT being forced to migrate to ODI
  - Oracle offers Lifetime Support option for Sustaining Support on all OWB features
- Oracle Data Integrator 12c supports a phased migration approach
  - Execute and monitor existing OWB 11gR2 jobs from ODI 12c
  - Use the migration utility to convert existing OWB 11gR2 objects into their ODI equivalents
  - Start new developments using ODI 12c
Oracle Warehouse Builder Support Policies

Lifetime Sustaining Support for OWB Customers

<table>
<thead>
<tr>
<th>Release</th>
<th>GA Date</th>
<th>Premier Support Ends</th>
<th>Extended Support Ends</th>
<th>Sustaining Support Ends</th>
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<tr>
<td>OWB 10.1</td>
<td>Apr 2004</td>
<td>Jul 2007</td>
<td>Not Available</td>
<td>Jul 2010</td>
</tr>
<tr>
<td>OWB 10.2</td>
<td>Jul 2005</td>
<td>Jul 2010</td>
<td>Jul 2013</td>
<td>Indefinite</td>
</tr>
<tr>
<td>OWB 11.2</td>
<td>Sep 2009</td>
<td><strong>Jan 2015</strong></td>
<td><strong>Jan 2018</strong></td>
<td>Indefinite</td>
</tr>
</tbody>
</table>

Customer [Downloadable OWB Support Policies](#);
More Information about [Support Levels](#):
Migration Utility Overview
Components and Licensing

- Versions supported
  - OWB 11.2.0.4 to ODI 12c

- Requires an ODI-EE license

- Design-time metadata migration only
  - Data Objects
  - Mappings

- Separate command line utility
  - Uses OWB SDK and ODI SDK
Migration Scope Details
Supported OWB Design Time Metadata

- Module and Location
- Data Objects
  - Table (Columns, Keys, Indexes)
  - View (Columns, Keys)
  - Materialized View (Columns, Keys, Indexes)
  - External Table (Columns)
  - File (Records, Fields)
  - Sequence

- Mappings
  - Classic Mappings, Code Template Mappings, Pluggable Mappings

- Most Mapping Operators
  - Aggregator, Constant, De-duplicator
  - Expression, External Table, Filter
  - Flat File, Joiner, Key Lookup
  - Mapping Input Parameter, Materialized View, Pivot
  - Pre/Post Mapping Process, Sequence, Set
  - Sorter, Splitter, Subquery
  - Table, Table Function, Transformation
  - Unpivot, View

For more details refer to the [migration documentation](#)
Migration Scope Details
Unsupported OWB Design Time Metadata (sample)

- Process Flows
- Dimensional modelling metadata
- Oracle Discoverer metadata and derived OBIEE metadata
- Data Quality components
- Custom PL/SQL
- OMB*Plus scripts
- OWB Experts
How to get the Migration Utility?

Apply the following patches (available on My Oracle Support)

- OWB: #17830453
- ODI: #17053768

Supported Platforms: Windows 64-bit and Linux 64-bit

Supported Versions: OWB 11.2.0.4 and ODI 12.1.2.0.0

Migration documentation included in ODI documentation
Join the Data Integration Community

Twitter
twitter.com/ORCLGoldenGate

Facebook
facebook.com/OracleDataIntegration

Data Integration YouTube channel
youtube.com/oraclegoldengate

LinkedIn
“Oracle Data Integration”

Oracle’s Data Integration blog
blogs.oracle.com/dataintegration

Oracle Data Integrator Books

Oracle.com/goto/dataintegration
Of possible interest…

- ODI Change Data Capture Leveraging OGG:
  https://blogs.oracle.com/dataintegration/entry/deep_dive_into_oracle_data

- ODI on BigDataLite:
  https://blogs.oracle.com/dataintegration/entry/odi_12_1_2_demo

- ODI Archived Webcasts (OWB Migration Utility, Management Pack for ODI…):
Of possible interest…
Upcoming Webcast: ODI and OGG Integration

Next Webcast Special Topic
Oracle Data Integrator and Oracle GoldenGate Integration

Webcast Details
Thursday, April 3, 2014 - 10:00 AM PST | 1:00 PM EST
Web Conference Link: [595 048 238](https://oracleconferencing.webex.com)
Dial-In Number: AMER: 1-866-682-4770 ([More Numbers](https://oracleconferencing.webex.com))
Phone Meeting ID/Passcode: 3096713/505638
Big Data Lite
Virtual Machine
With ODI 12.1.3
Big Data Lite Demo Virtual Machine

- Linux Virtual Machine
- Emulates Big Data Appliance 4.2
- Cloudera Hadoop CDH 4.5
- Oracle DB 12c, NoSQL
- Oracle Big Data Connectors 4.2
- Oracle Data Integrator 12.1.2
Big Data Lite Demo with ODI
Transform and Load Activity data from Hive/Hadoop to Oracle DB

Oracle Data Integrator

Transform Hive-Hive

Load Hive-Oracle DB

Oracle DB Data Warehouse

Application Logs

Flume
Product Architecture
for Enterprise Scale Deployment

Desktop

JVM
- Java EE Application
- ODI SDK

ODI Studio
- Designer
- Operator
- Topology
- Security

Repositories
- ODI Master Repository
- ODI Work Repository

WebLogic 11g / Application Server

FMW Console
- ODI Plug-in

Servlet Container
- Java EE Application
- ODI Console
- ODI SDK
- Runtime WS
- Java EE Agent

Web Service Container
- Public WS
- Data Services

Data Sources Connection Pool

Sources and Targets
- Legacy
- Files / XML
- DBMS
- Applications
- ERP/CRM/PLM/SCM
- DW / BI / EPM

JVM
- Runtime WS
- Standalone Agent
Components in the Information System

- **Source (s)**: Files/XML, ESB, Apps, Database, etc.
  - **Target (s)**: EBS, Legacy, ERP, Data Warehouse, Files/XML, etc.

- **Repositories**
  - Metadata
  - Rules

- **User Interfaces**
  - Developer
  - Code
  - Execution Log

- **Agent**
  - Data Flow Conductor
  - Execution
  - Return Codes

- **Data Flow**
  - Execution
  - Return Codes

- **Data**