

Oracle Business Intelligence and Data Warehousing From Storage to Scorecard

Getting actionable data in the hands of the right decision makers translates to positive business outcomes – whether that means competing more effectively, reducing operational costs, meeting compliance requirements, or anticipating changing market conditions. To get the right data to the right people at the right time, you need an integrated business intelligence and data warehousing solution that can provide fast access to reliable information and the tools to translate that insight into actions.

This brief summarizes the complete and integrated aspect of Oracle's Business Intelligence and Data Warehousing solution stack, and describes where Oracle's business intelligence, data integration and database solutions have several key technical integration points. Collectively, these integration and optimization points provide customers superior performance, ease of use, and minimize deployment risk. This in turn, gives your business unprecedented visibility, better alignment and faster time to value – all at a lower cost of ownership.

From Storage to Scorecard: A Complete Solution

Oracle delivers a complete business intelligence solution – from servers and storage to data warehousing and applications – that is engineered to work together.

The Oracle Exadata Database Machine

Oracle Exadata delivers extreme performance for large-scale data warehouse queries on a pre-configured system, built with the market leading Oracle Database and industry-standard server, storage and networking components from Sun. It's a fast, reliable, secure system that can easily scale to meet the complex data integration, reporting, analytics and data mining needs of the most demanding of organizations.

At the heart of the system, is the Oracle Exadata Storage Server, which has smart storage software that offloads data-intensive query processing from database servers closer to the data. This results in much less data getting sent over fast InfiniBand interconnects, improving concurrency and query performance by a factor of 10x. The introduction of Flash technology as a Smart Flash Cache in the Database Machine enables further performance speed-up for a variety of workloads. Oracle Exadata runs Oracle Database 11g and Real Application Clusters on Oracle Enterprise Linux or Solaris, and also includes complete InfiniBand infrastructure.

In-Database Analytics

Oracle options for in-database analytics include Oracle OLAP and Oracle Data Mining. Oracle OLAP is a calculation engine that is embedded in Oracle Database 11g, eliminating the need for additional

hardware and resources. It supports the entire spectrum of advanced analytical applications including planning, budgeting, forecasting, sales, and marketing to help identify key business trends and model complex business scenarios. Oracle OLAP helps you improve performance by reducing data movement and latency; lower IT costs and complexity by eliminating the need to purchase additional hardware; and provide enterprise-scale analytics on low-cost grids.

Oracle Data Mining provides a powerful, scalable and cost-effective infrastructure for building applications that automate the discovery of valuable new business intelligence and delivery of predictive analytics. Because the data, models and results remain in the Oracle Database, the need for separate dedicated analytical, statistical or mining servers is eliminated, security is maximized and information latency is minimized. Oracle Data Mining can help you make better-informed business decisions and increase productivity; solve business problems faster, while enabling faster deployment of your results; and speed time-to-market through immediate deployment, rapid prototyping and API-level integration.

Oracle Spatial Option

The Oracle Spatial Option provides spatial capabilities to Oracle Database 11g, by providing support for all geospatial and network models. Oracle Spatial provides features for you to perform location analysis on your customer, employee, competitor, or supplier data, and view it with partner or Oracle mapping tools.

Since Oracle Spatial features are accessible through standard languages such as SQL and Java, developers can integrate spatial features directly into business intelligence applications with relatively low cost and with minimal training. Oracle Spatial is directly integrated with the leading geospatial, mapping and location services technology vendors.

Oracle Business Intelligence Foundation

The Oracle Business Intelligence Foundation is an enterprise-class platform for reporting and analyzing data across heterogeneous relational, OLAP, and unstructured data sources. All styles of BI are supported, including pixel perfect reporting, interactive dashboards, ad hoc query, and OLAP analysis from a common environment. A rich end-user environment allows users to be notified of exceptions and issues, easily search for information, and consume and share information via enterprise applications, collaboration portals, mobile devices, and MS Office applications. A Common Enterprise Information Model promotes end-user self service by insulating business users from the underlying source systems while ensuring that all metrics, calculations, and definitions are accurate and consistent across all modes of delivery.

Oracle Business Intelligence Applications for ERP and CRM

Oracle's Business Intelligence Applications provide pre-defined data models and key performance indicators that are displayed in pre-built dashboards for such areas as sales analytics, service and contact center analytics, marketing analytics, financial analytics, supply chain analytics, project analytics, and workforce (human resources) analytics. Pre-built ETL scripts are also available for common sources such as the Oracle E-Business Suite, PeopleSoft, JD Edwards, Siebel CRM, and SAP.

Oracle Industry Business Intelligence / Analytics Applications

Specific data models and pre-defined reports and analytics are available from Oracle for a variety of industries including communications, financial services, healthcare, retail, and utilities. Oracle is also

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working with systems integrator partners who offer such models and solutions built upon key Oracle technology components for business intelligence and data warehousing.

Oracle Data Integration

Oracle's data integration product line, including Oracle Data Integrator Enterprise Edition, Oracle GoldenGate, and Oracle Data Quality, offers the best-of-breed solution for providing timely, accurate and continuous access to your data. Easy-to-use, and standards-based, Oracle's data integration solutions dramatically improve productivity, provide unparalleled efficiency, and lower the cost of ownership. Oracle's data integration solution is open to work with heterogeneous systems, and fully certified with and optimized for Oracle Exadata and Oracle Business Intelligence Solutions. Capabilities also include:

- **Scalable data Extract-Load-Transformation (E-LT) processing.** Instead of moving all the data through an intermediate "Extraction, Transformation, and Load" (ETL) server, Oracle Data Integrator's E-LT approach leverages the power of the target RDBMS engines to perform the transformation.
- **Bulk and Real Time data movement with log-based change data capture.** Data integration can be performed in batch mode or in real time. For real-time data integration Oracle GoldenGate offers change data capture from transaction logs of source databases. This data movement can be also bidirectional which is also used for high availability solutions.
- **Data Quality and Data Profiling.** To enable automated process to cleanse, standardize, enrich, and de-duplicate name and addresses as well as other business data. Additionally, Oracle uses semantic-based-recognition technology to handle extreme variability of typical product data and overcome the limitations of traditional data quality tools that were designed for customer (name and address) data.

Engineered To Work Together

Oracle has invested significant engineering resources to ensure that all components of its business intelligence and data warehousing solution are optimized to work together for extreme performance. The technical integration occurs in a number of ways.

Oracle Exadata and Oracle Business Intelligence

The Oracle Business Intelligence Foundation supports Oracle Database optimization techniques including intelligent query generation, intelligent function shipping, multi-pass analyses optimization, intelligent aggregate navigation, intelligent caching, and optimization where distributed data is accessed. The Oracle BI Foundation performs extensive function shipping to the Oracle Database to take advantage of optimizations within the database and query offload processing provided by Exadata.

The Oracle BI Foundation is also integrated with other extended Oracle Database analytics capabilities. For example, data tied to spatial latitude and longitude, stored in the form as geocodes, can be queried and displayed in map views created by Oracle BI Foundation users. The Oracle BI Foundation includes the Oracle MapViewer, a specialized tool for the display of spatial data in the Oracle Database. This integration enables the creation and display of multilayered, highly interactive and animated maps within dashboards and reports.

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Given that Oracle's data mining and advanced analytics operate natively inside the Oracle Database, mining insights and predictions also remain inside the database and can be accessed by SQL queries from Oracle BI Foundation. Predictive model results can be called interactively within reports and dashboards. For example, the Oracle BI Foundation interface might be used to review customer analytics of likely loyal and / or profitable customers sorted or filtered by gender, years as a customer, RFM (response, frequency, monetary), income, next-likely product to purchase, and other parameters.

With the Oracle BI Foundation you can also generate queries against data residing in Oracle OLAP Option cubes in the Oracle Database. Business analysts have the ability to perform robust OLAP style analytics, including member selection, ragged hierarchy navigation, and pivot tables from the same interface used for relational query and analysis.

Oracle Exadata and Oracle Data Integration

Oracle Data Integrator Enterprise Edition's (ODIEE) can run natively on Oracle Exadata to offer the most efficient data integration platform. Unlike other ETL solutions, ODIEE allows every transformation to occur on Oracle Exadata, without adding any additional hardware. With this architecture, data never leaves the Exadata server, and ODIEE scales along with the Exadata server. ODIEE supports many Exadata best practices out-of-the-box including built in support for external tables on DBFS for extremely fast parallel flat file loading, as well as support for many advanced complex incremental loading strategies which fully exploit the Exadata Smart Scan and Flash Cache technology.

Oracle GoldenGate's low-impact, real-time data replication capabilities enable customers to consolidate and migrate to Oracle Exadata without any downtime. In addition, it provides real-time data feeds from source systems to Exadata to enable reporting and BI with timely information. ODIEE is integrated with Oracle GoldenGate , together with Oracle Exadata they provide a low-overhead, high performance real-time data warehousing solution.

Oracle Business Intelligence and Oracle Data Integration

Oracle Data Integrator can work with any Business Intelligence system, but it is specially optimized to work with the Oracle BI Foundation. Specifically, it is optimizations for Report-to-Source-Lineage, so you can easily drill back from your dashboard to data details about where it came from and which transformation were applied.

Common Security Layer and Management Framework

Oracle's entire BI and data warehousing solution stack utilizes a common security layer and a comprehensive enterprise management framework.

The Oracle BI Foundation can leverage Oracle Database security in several ways to provide a more manageable approach than a tools-centric security approach would provide. For example, the Virtual Private Database (VPD) support in the Oracle Database restricts user access to data uniquely relevant to them within the schema. Oracle BI is made aware of VPDs through the enterprise semantic layer in the BI Server and VPDs are respected by queries cached in the BI Server. Other



security techniques include encryption of database data at the row and column level and data masking, all possible since the Oracle BI Foundation communicates with the database using OCI.

The Oracle BI Foundation shares a common management framework, Enterprise Manager, with the Oracle Database. Oracle Enterprise Manager provides a unified systems management tool across all components for performance, tuning, and automation of all operational tasks such as deployment, testing, and patch and upgrade. This common management framework ensures that all elements of the business intelligence and data warehouse environment are optimized to work together to ensure the highest performance, scalability, reliability, and availability.

Conclusion

Because Oracle owns the entire BI stack – from storage to scorecard - we are able to deliver systems that run faster, are easier to use and minimize deployment risk compared to systems built using components from different suppliers. These technical benefits translate to business benefits in the form of unprecedented visibility, faster time-to-market and better corporate alignment – all at a lower cost of ownership.

CONTACT US

For more information about Oracle's Business Intelligence and Data Warehousing solutions, please visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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