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ORACLE EXALYTICS IN-MEMORY MACHINE: A BRIEF INTRODUCTION

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Introduction

The key to successful analytics is gaining timely insights from data that leads to better decision making. A study[1] found that "high-performance businesses… are five times more likely to use analytics strategically compared with low performers." Firms, more than ever, need to resolve their business challenges by turning high volumes of data into actionable insights that can enable them to advance their business objectives, achieve their revenue goals, and sustain a competitive advantage. This is not, however, easy to achieve when data resides in multiple and disconnected data sources. Organizations struggle with accessing relevant data from various data sources and effectively producing a common version of the truth across the enterprise. According to a survey[2], 44% of organizations say that integration – meaning connecting disparate data sources, is the number one data priority in their organization. In addition to data integration, 46% of respondents in the same survey cited that reducing costs and increasing efficiencies are in their top three of the primary challenges facing their organization in the next two years. The potential payoff for firms can range from higher shareholder value to a market leadership position.

The vision of delivering fast, interactive, insightful analytics in an efficient way has remained elusive for most organizations. Most enterprise IT organizations continue to struggle to deliver actionable analytics due to tight deadlines, changing requirements and ever tightening budgets. The issue is further aggravated by the fact that most enterprise analytics solutions require dealing with a number of hardware, software, storage and networking vendors, and precious resources are wasted integrating the hardware and software components to deliver a complete analytical solution.

Oracle Exalytics In-Memory Machine is the world's first engineered system specifically designed to deliver high performance analytics, modeling and planning. Oracle Exalytics has been built using industry-standard hardware, market-leading business intelligence software and in-memory database technology that allows for the optimum use of massive amounts of compute and high-speed memory. Oracle Exalytics is an optimized system that delivers answers to all your business questions with unmatched speed, intelligence, simplicity and manageability.

Oracle Exalytics' unmatched speed, visualizations and scalability delivers extreme performance for existing analytical and enterprise performance management applications and enables a new class of intelligent applications like Yield Management, Revenue

[1] "Getting Serious About Analytics: Better Insights, Better Decisions, Better Outcomes", Accenture, 2010.

[2] "New Intelligent Enterprise Global Study", MIT Sloan Management Review, 2010.

Management, Demand Forecasting, Inventory Management, Pricing Optimization, Profitability Management, and Rolling Forecast etc.

Oracle Exalytics requires no application redesign, and can be deployed in existing IT environments by itself or in conjunction with Oracle Exadata and/or Oracle Exalogic to enable extreme performance and best-in-class user experience. Based on proven hardware, software and in-memory technology, Oracle Exalytics lowers the total cost of ownership, reduces operational risk, and provides unprecedented analytical capability for workgroup, departmental. and enterprise wide deployments.

Oracle Exalytics Overview

Oracle Exalytics In-Memory Machine is the industry's first engineered in-memory analytics machine that delivers no-limit, extreme performance for Business Intelligence and Enterprise Performance Management applications.

Oracle Exalytics In-Memory Machine hardware is an optimally configured server architected to enable in-memory analytics for business intelligence workloads and includes powerful compute capacity, abundant memory, fast storage and fast networking options, and also supports direct attached storage options.

The Oracle Exalytics In-Memory Machine features an optimized Oracle Business Intelligence Foundation Suite and Oracle TimesTen In-Memory Database for Exalytics. Business Intelligence Foundation takes advantage of large memory, processors, concurrency, storage, networking, operating system, kernel, and system configuration of Oracle Exalytics hardware. This optimization results in better query responsiveness, higher user scalability and markedly lower TCO compared to standalone software. Oracle TimesTen In-Memory Database for Exalytics is an optimized in-memory analytic database, with features exclusively available on Oracle Exalytics platform.

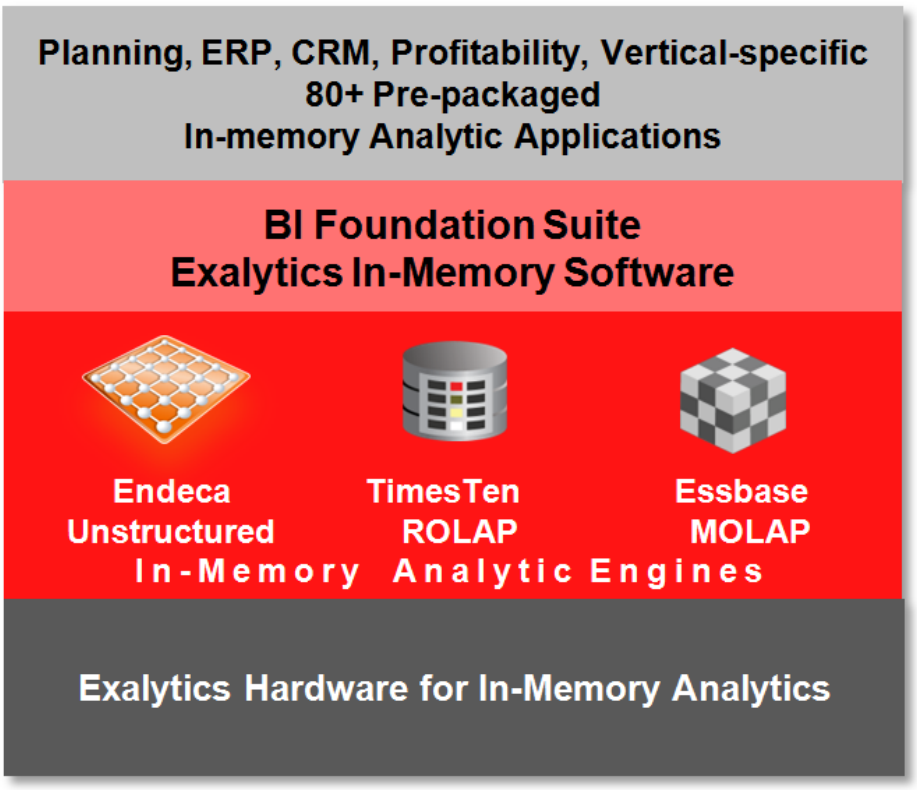


Figure 1: Oracle Exalytics engineers hardware and software designed to work together seamlessly

Oracle Exalytics Hardware Architecture

Oracle Exalytics hardware is delivered as a server that is optimally configured for in-memory analytics for business intelligence workloads. Multiple Oracle Exalytics machines can be clustered together to expand available memory capacity and to provide high availability.

The highlight of Oracle Exalytics hardware configuration is of course, the memory. Oracle Exalytics includes several Terabytes of DRAM, distributed across multiple processors, with a high-speed processor interconnect architecture that is designed to provide a single hop access to all memory. This memory is backed up by several terabytes of PCI Flash storage and hard disks. These stores can be further backed by SAN or network attached storage, extending the capacity of the machine and providing data high availability.

The memory and storage is matched with the right amount of compute capacity. Oracle Exalytics high-speed processors provide excellent single-thread performance as well as support high-thread concurrency. These processors are matched with operating systems (Oracle Enterprise Linux and Oracle Solaris) that can utilize their capabilities, including compensating for Non-Uniform Memory Access, providing dynamic processor clocking, resource isolation, and virtualization for running multiple applications with minimal overhead.

A high-performance business intelligence system requires fast connectivity to data warehouses, operational systems and other data sources. Additionally, multiple network interfaces are also required for deployments that demand high availability, load balancing and disaster recovery. Oracle Exalytics provides dedicated high-speed InfiniBand ports for connecting to Oracle Exadata. These operate at quad data rate of 40Gb/s and provide extreme performance for connecting to both data warehousing and OLTP data sources. In addition, several 10Gb/s Ethernet ports are also available for high-speed connectivity to other data sources and clients. Where legacy network interconnectivity is desired, multiple 1GB/s compatible ports are also available.

While a highly available service requires at least two Oracle Exalytics machines configured in Active-Active or Active-Passive configurations, individual Oracle Exalytics machines are designed to have a long operating life and provide several built-in safeguards against hardware failures. Oracle Exalytics includes redundant hot-swappable power supplies, fans and RAID configured disks and flash to ensure that most common types of hardware failures do not result in system downtime.

Oracle Exalytics includes a complete server management infrastructure with Oracle Integrated Lights Out Management (ILOM). Oracle ILOM provides complete management and administration of the server hardware via remote (SSL, HTTPS) and serial connectivity. The ILOM has its own dedicated network por.

Oracle Exalytics Software Overview

Oracle Exalytics is designed to run the entire stack of Oracle Business Intelligence and Enterprise Performance Management applications. The following software runs on Exalytics:

1. Oracle Business Intelligence Foundation Suite, including Oracle Essbase
2. Oracle TimesTen In-Memory Database for Exalytics
3. Oracle Endeca Information Discovery
4. Oracle Exalytics In-Memory Software

Oracle Business Intelligence Foundation Suite

Oracle Business Intelligence Foundation Suite delivers the most complete, open, and integrated business intelligence platform on the market today. Oracle Business Intelligence Foundation Suite provides comprehensive and complete capabilities for business intelligence, including enterprise reporting, dashboards, ad hoc analysis, multi-dimensional OLAP, scorecards, and predictive analytics on an integrated platform.

Oracle Business Intelligence Foundation Suite includes the industry's best-in-class server technology for relational and multi-dimensional analysis and delivers rich end user experience that includes visualization, collaboration, alerts and notifications, search and mobile access.

Oracle Business Intelligence Foundation Suite also includes Oracle Essbase - the industry leading multi-dimensional OLAP Server for analytic applications.

Oracle TimesTen In-Memory Database for Exalytics

Oracle TimesTen In-Memory Database (TimesTen) is a proven memory-optimized full-featured relational database with persistence. TimesTen stores all its data in memory optimized data structures and supports query algorithms specifically designed for in-memory processing. Using the familiar SQL programming interfaces, TimesTen provides real-time data management that delivers blazing-fast response times, and very high throughput for a variety of workloads.

Oracle TimesTen In-Memory Database for Exalytics, based on Oracle TimesTen In-Memory Database, has been specifically enhanced for analytical processing at in-memory speeds.

Columnar Compression: Oracle TimesTen In-Memory Database for Exalytics supports columnar compression that reduces the memory footprint for in-memory data. Compression ratios of 5X are practical and help expand in-memory capacity. Analytic

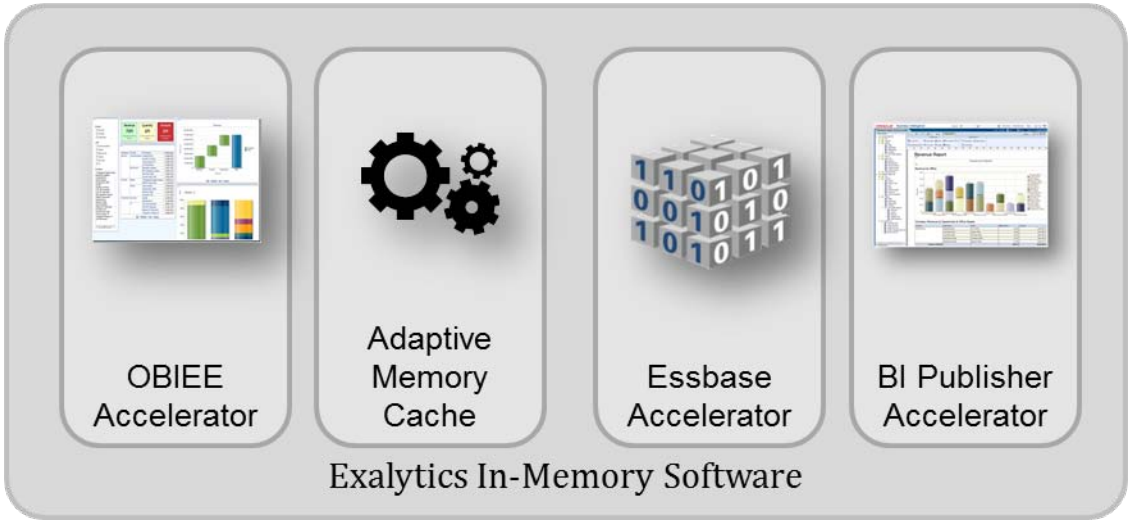
algorithms are designed to operate directly on compressed data, thus further speeding up the in-memory analytics queries.

Oracle Endeca Information Discovery

Oracle Endeca Information Discovery running on Oracle Exalytics enables rapid insights into new sources of data including unstructured content in social media, websites, content management systems, raw text from documents, email, and more. By correlating this data to the structured data in data warehouses and enterprise applications, users can more accurately manage data and extract meaning form unstructured sources, ultimately driving better business decisions and innovations. Oracle Endeca's in-memory architecture, highly scalable, column oriented, multi-core parallelized and natively in-memory features enable it to optimally leverage Oracle Exalytics to deliver speed of thought performance

Oracle Exalytics In-memory Software

Oracle Exalytics in-memory software is a collection of in-memory features, optimizations and configuration that enable Oracle Business Intelligence Foundation Suite and components to make most of the in-memory architecture of Oracle Exalytics in-Memory Machine. Oracle Exalytics In-Memory Software is certified and supported only on Oracle Exalytics In-Memory Machine.



Oracle Exalytics In-Memory Software consists of

1. Oracle OBIEE Accelerator
2. Oracle Essbase Accelerator
3. Oracle In-Memory Data Caching
4. Oracle BI Publisher Accelerator

Oracle OBIEE In-Memory Accelerator

Oracle Exalytics In-Memory Software adds on hardware-specific optimizations to Oracle Business Intelligence Enterprise Edition (included in Oracle Business Intelligence Foundation Suite). These optimizations make OBIEE specifically tuned for Oracle Exalytics hardware - for e.g., the processor architecture, number of cores, the memory latency and variations.. These optimizations have shown to provide up to 3X improvement in throughput at high loads and thus can handle 3X more users than similarly configured commodity hardware.

Oracle Essbase In-Memory Accelerator

Oracle Exalytics In-Memory Software adds on hardware-specific optimizations to Oracle Essbase included in the Oracle Business Intelligence Foundation Suite. These enhancements enable Oracle Essbase to leverage processor concurrency, memory latency, memory distribution, availability of flash storage, and provides improvements to overall storage layer performance, enhancements to parallel operations, enhanced MDX syntax and a high performance MDX query engine. Oracle Essbase on Oracle Exalytics provides up to 4X faster query execution as well as reduction in write-back and calculation operations, including batch processes. Flash as storage provides 25X faster Oracle Essbase data load performance and 10X faster Oracle Essbase Calculations when compared to hard disk drives. Benchmarks have demonstrated linear scalability when consolidating up to 16 Essbase applications or more on Oracle Exalytics.

These enhancements are particularly important for advanced scenario modeling, forecasting and planning, management reporting and profitability analysis. New capabilities built within Oracle Hyperion Enterprise Performance Management Applications leverage Oracle Essbase optimizations. These pre-configured Oracle EPM applications running on Oracle Exalytics (For e.g. Oracle Hyperion Planning, Oracle Hyperion Profitability and Oracle Cost Management) empower organizations to plan for profitable growth and report with confidence.

In-Memory Data Caching

Oracle Exalytics In-Memory Software provides multiple ways to use the large memory available with Oracle Exalytics to provide better Business Intelligence and Enterprise Performance management applications. These are:

- Oracle In-Memory Intelligent Result Cache
- Oracle In-Memory Adaptive Data Mart
- Oracle In-Memory Table Caching

Each of these mechanisms is described in detail below.

Oracle In-Memory Intelligent Result Cache

Oracle Exalytics Result Cache is a completely reusable in-memory cache that is populated with results of previous logical queries generated by the server. In addition to providing data for repeated queries, any result set in the result cache is treated as a logical table and is able to satisfy any other queries that require a sub-set of the cached data.

For best query acceleration, Oracle Exalytics provides tools to analyze usage, as well as identify and automate the pre-seeding of result caches. The pre-seeding ensures instant responsiveness for queries at run time.

Oracle In-Memory Adaptive Data Mart

Most business intelligence deployments have workload patterns that focus on a specific collection of "hot" data from their enterprise data warehouse. In such cases, the most efficient way to provide sub-second interactivity is by identifying and creating a data mart for the relevant "hot" data. Implementing the in-memory data mart in Oracle TimesTen for Exalytics provides the most effective improvement in query responsiveness for large data sets. Tests with customer data have shown a reduction of query response times by 20X as well as a throughput increase of 5X.

Automated Recommendation:

Traditionally, creating a data mart for query acceleration has often required expensive and error prone manual research to determine what data aggregates or cubes from subject areas to cache into memory. Oracle Exalytics dramatically reduces, and in many cases eliminates, costs associated with this manual tuning by providing the necessary tools that can be used to identify, creates and refresh the best fit in-memory data mart for a specific business intelligence deployment – thus dramatically reducing the costs of implementing and maintaining the fast query response and high throughput required for data intensive business intelligence deployments.

In cases where the entire 'hot' data cannot fit into the memory of a single machine, the data may be split across multiple Oracle Exalytics machines to increase the memory capacity available for in-memory analytics.

In-Memory Table Caching

Selective facts and dimensions from analytic data warehouses may be cached "as is" into Oracle TimesTen In-Memory Database on Exalytics. In many cases, especially with enterprise business intelligence data warehouses, including pre-packaged Business Intelligence Applications provided by Oracle, the entire data warehouse may be able to fit entirely in memory.

In such cases, replication tools like Oracle GoldenGate and ETL tools like Oracle Data Integrator can be used to implement table caching mechanisms into Oracle TimesTen in-Memory database for Exalytics. Once tables are cached, Oracle Business Intelligence metadata can be configured to route queries to the TimesTen In-Memory database, providing faster query responses for the cached data.

Oracle BI Publisher In-Memory Accelerator

Oracle Business Intelligence Publisher features piped document generation and high-volume bursting that can enable the generation of an extremely large number of personalized reports and documents for business users in time periods that were previously not achievable. This is enabled via a configuration setting and the use of Exalytics' substantial compute, memory, and multi-threading capabilities. Performance can be further optimized by configuring BI Publisher to use memory disks (for non-clustered environments only) or solid state drives.

The Engineered System Value

Engineered systems from Oracle – such as Oracle Exalytics, Exadata, and Exalogic are pre-integrated to reduce the cost and complexity of IT infrastructures while increasing productivity and performance. Engineered systems include optimizations at every layer of the stack to simplify data center operations, drive down costs, and accelerate business innovation. These are tested, certified, packaged, deployed, upgraded, managed, and supported together – thus minimizing disruptions from incompatible components in the system, while providing the best total cost of ownership for customers who benefit from purchasing the hardware, software, components, and support from a single vendor.

Ideal Platform for Business Analytics Consolidation

Traditional analytic applications and systems are operated with a separate server for development, testing, and deployment. This inevitable results in "server-sprawl", resulting in increased complexity and cost of ownership. Lines of business in an organization often end up running their siloed analytic environments, usually duplicating time and resources to maintain a high-availability environment.

Oracle Exalytics consolidates and simplifies the environments by allowing several analytic application environments to run on a single server leveraging Oracle Exalytics pre-built and fine-grained resource isolation and zero-overhead virtualization. Both BI and EPM applications can be run on a single server without compromising on either performance or scalability. From multiple servers running innumerable combinations of hardware and software to a single server with a single set of software – operating system, database, middleware, and application – translates into fewer patches, more reliability, and a more

predictable administration environment. The massive application consolidation that Oracle Exalytics delivers can substantially improve consolidation ratios and reduce maintenance and administrative costs.

An Entirely New User Experience

Oracle Exalytics delivers extremely powerful end-user experience for best-in-class reporting, dashboards, ad hoc querying, OLAP analysis and performance scorecards. Every knowledge worker in an organization can gain better insight by consuming information in the format and delivery channel best suited to their role, preference, and experience level. Rich visualization capabilities, including a wide range of interactive chart types, spatial maps, data-dense trellis displays, and multi-dimensional tabular formats present information in more meaningful and compelling ways. Information can be delivered through dashboards, scorecards, or reports, within enterprise portals and collaboration workspaces, business applications, Microsoft Office tools, and mobile devices. The software components running on Oracle Exalytics, like Oracle Business Intelligence Foundation Suite, Oracle TimesTen for Exalytics and Oracle Essbase have been specifically enhanced to take advantage of the compute capacity and in-memory capabilities of Oracle Exalytics.

Figure 2: Dashboards visualizations and user-interactions enable speed-of-thought analysis

Interactivity and Responsiveness

Oracle Exalytics features a number of user interface enhancements to promote interactivity and responsiveness. Features like Google style auto-text complete, cascaded prompts, dynamic user interface refresh and contextual right-click interactions makes it easier for the end user to analyze data and for the first time deliver some of the most commonly used web style interactions to an enterprise software solution. Oracle Exalytics promotes self service analytics and makes it easier to develop analytics content by introducing a Presentation Suggestion Engine (PSE) which provides recommendations on type of visualizations to use to best represent a data set.

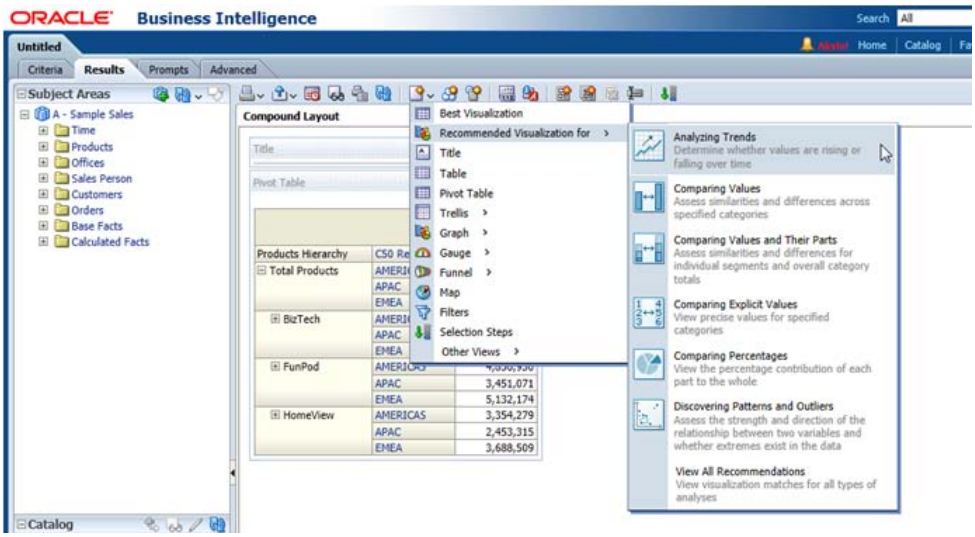


Figure 3: Oracle Exalytics Presentation Suggestion Engine promotes self service analytics

Advanced Visualizations

Oracle Exalytics features new micro charts and multi-panel trellis charts to visualize dense multi-dimensional, multi-page data on a single screen. The multi-panel trellis charts are particularly effective at displaying multiple visualizations across a common axis scale for easy comparison, to see a trend and quickly gain insights.

Figure 4: Oracle Exalytics Trellis Charts View provide better visual data discovery.

Mobile

Oracle Business Intelligence Foundation Suite supports Mobile BI for Apple iOS devices, including iPad and iPhone. Any content available in Oracle BI Enterprise Edition is made available to mobile users without any change or redevelopment, allowing users to perform analytics anywhere, anytime.

The visualization and interactivity enabled by Oracle Exalytics will also be available on supported mobile devices. With Oracle Exalytics, organizations can scale to larger populations of mobile users without extra servers to maintain or content to redevelop, making analytics on Oracle Exalytics truly pervasive.

Figure 5: Oracle Exalytics delivers interactive visual analysis to iOS and Android.

Oracle Exalytics and Oracle Exadata: Better Together

Oracle Exadata Database Machine is the only database machine that provides extreme performance for both data warehousing and online transaction processing (OLTP) applications, making it the ideal platform for consolidating onto grids or private clouds. It is a complete package of servers, storage, networking, and software that is massively scalable, secure, and redundant. With Oracle Exadata Database Machine, customers can reduce IT costs through consolidation, manage more data on multiple compression tiers, improve performance of all applications, and make better business decisions in real time.

Oracle Exalytics complements Oracle Exadata's high performance query processing capabilities by delivering best in class user experience for analytical workloads including reporting, dashboards, ad-hoc and OLAP. Oracle Exalytics has been designed from the ground-up to be complementary to Oracle Exadata. Starting from the network interfaces,

protocols to middleware to database interaction, Oracle Exalytics provides the best overall cost of ownership when connected to Oracle Exadata. Oracle Exalytics comes with pre-configured and pre-tested options to get the best performance, and the lowest total cost of ownership (TCO) without extensive tuning with Oracle Exadata.

InfiniBand Interconnectivity

Oracle Exalytics provides a dedicated multiple InfiniBand interface that is designed to provide redundant connectivity to Oracle Exadata's private InfiniBand network. This connection allows 40Gb/s of dedicated connectivity to Oracle Exadata, unfettered by external interference. For clusters of a few Oracle Exalytics nodes, no additional switching infrastructure is needed to connect to Oracle Exadata. In addition, the Oracle Exadata switching network provides a high-speed, fully redundant cluster interconnect between Oracle Exalytics systems.

The high-speed InfiniBand network allows for extremely low latency, high capacity pipe for replicating/populating the in-memory database as well as for querying data warehouses and operational data sources on Oracle Exadata.

Oracle Exalytics Optimizations for Oracle Exadata

Oracle Exalytics In-Memory Machine supports optimum SQL generation for Oracle Exadata. For large analytics deployments where the data warehouse can't entirely fit into Oracle Exalytics in-memory cache, Oracle Exalytics deployments can benefit by leveraging Oracle Exadata's massively parallel processing and extreme performance capabilities.

In addition, Oracle Exalytics can use Oracle Exadata as an extension to its in-memory cache/data mart. Such a configuration boosts the capacity of the in-memory cache/data mart and is especially suited for providing uniform responsiveness over large federated deployments.

Performance with Compatibility

Though Oracle Exalytics represents a breakthrough in performance and usability, it supports the broad portfolio of Oracle BI and EPM applications right out of the box. In addition, customers that have existing applications built on OBIEE and Essbase can migrate their applications seamlessly to exploit the power of Oracle Exalytics and are fully enabled to exploit the in-memory analytics technologies without changes to the applications.

Foundation for a New Class of Applications

The breadth of functionality and the level of performance provided by Oracle Exalytics enable a new class of applications that were not possible before. Prebuilt analytic applications, delivered on a complete and integrated BI technology foundation, and running in optimized Engineered Systems are the way to go. This combination assures the easiest, most risk free implementation, is proven to deliver strong business value, delivers speed-of-thought performance and massive scale, and is aligned with Oracle technology and applications strategies, while remaining open to work with each customer's individual IT environment. Oracle has a complete suite of applications that are optimized for Oracle Exalytics including:

- Oracle BI Applications for Applications Unlimited & Fusion
  - Financial Analytics
  - HR Analytics
  - Procurement & Spend Analytics
  - Supply Chain & Order Management Analytics
  - Project Analytics
  - Manufacturing Analytics
  - Enterprise Asset Management Analytics
  - Sales Analytics
  - Contact Center Analytics
  - Marketing Analytics
  - Service Analytics
  - Loyalty Analytics
  - Partner Analytics
- Oracle Transactional based Analytical Applications
  - JD Edwards EnterpriseOne In-Memory Sales Advisor
  - JD Edwards EnterpriseOne In-Memory Project Portfolio Management
  - Oracle In-Memory Consumption Driven Planning
  - Oracle In-Memory Performance Driven Planning
  - Oracle In-Memory Logistics Command Center
  - Oracle E-Business Suite In-Memory Cost Management
  - PSFT: In-Memory Project Discovery

All analytics applications developed on Oracle Business Intelligence Enterprise Edition or Oracle Essbase can run on Exalytics and are likely to benefit from Oracle Exalytics In-Memory Software.[i]

Ideal Platform for Consolidation.

Oracle Exalytics is the ideal platform for customers looking for a multi-department, shared analytic infrastructure. Whether departmental or large-scale consolidation, features such as fixed partitioning options, pre-built virtualization, and fine-grained resource allocation availability bring unparalleled consolidation and efficiency.

Highly Interactive Applications on Federated Data Sources

Federated data sources pose a particular challenge to business intelligence applications as data sources vary widely in performance characteristics. Having an in-memory data mart in the middle tier allows moving the common 'hot' data to the middle tier to provide impressive improvement in the overall responsiveness of applications.

Dramatically Faster Planning Cycles

Oracle Exalytics is uniquely suited to deploy rich, iterative financial and operational planning applications. Features like dramatically reduced planning and budgeting cycle times, improved plan accuracy by adding finer grained operational data, richer dimensionality in planning models and scalability for planners across the extended enterprise extends traditional planning applications outside the Office of Finance and into the Line of Business. Oracle Exalytics enables broad new classes of applications like Demand Forecasting, Inventory Management, Pricing Optimization, Profitability Management, and Rolling Forecast etc.

Conquer Analytical Complexity

In-memory analytics in Oracle Exalytics is well suited to address high workload solutions which frequently hit up against processing or data volume limitations where traditionally customers have had to invest extensively in hardware, tuning and maintenance. Oracle Exalytics with its optimized hardware and software combination take away the challenge of repeated tuning and maintenance.

Pre-Packaged Business Intelligence Applications

Oracle's prepackaged business intelligence applications offer the best value on Oracle and competing ERP and CRM applications. Through certified support for all Oracle BI & EPM applications, Oracle Exalytics takes it to the next level in performance, ROI, scalability and manageability by delivering pre-tested and pre-engineered systems.

Enable Intelligent Decision Cycle – Detect, Analyze, Model, Act

The combination of the state of the art analytics and modeling infrastructure in Oracle Exalytics expand the ability of business intelligence users from historical and situational awareness to ask forward looking questions and compare models to help decision making. Oracle Business Intelligence Foundation Suite Action Framework accelerates decision making by turning insights into actions through the ability to invoke business processes from within the business intelligence dashboards and reports.

Scalable and Unified Management Reporting

Oracle Exalytics provides rich and consistent reporting on all enterprise performance management applications via Oracle Essbase and Oracle Essbase Analytics Link thereby enabling scalable and unified management reporting applications.

Visual analysis of large volumes of information

Oracle Exalytics features advanced visualizations allowing business users to analyze large volumes of information easily and expands the use of analytics beyond the highly trained analysts and statisticians.

In summary, Oracle Exalytics In-Memory Machine is an engineered system pre-integrated to reduce the cost and complexity of an organization's IT infrastructure, while dramatically increasing productivity and performance. By integrating best-of-breed software and hardware, customers are able to reallocate their resources from maintaining their data center operations, to focusing on achieving their growth and profitability objectives. As the industry's first engineered system for business analytics, Oracle Exalytics cements Oracle's position as the #1 vendor in business analytics, continually leading the way to help organizations gain more insight, across more data, and drive better outcomes in every aspect of their business.

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[i] Minimum version numbers apply. Consult certification matrix.