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Oracle Hyperion EPM Applications on Oracle Exalytics In-Memory Machine: Performance Management without Constraints
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Executive Overview

Delivering predictable performance in today’s volatile business environment requires organizations to significantly evolve and often reinvent their performance management processes. This need for transformation cuts across all areas of enterprise performance management: faster planning cycles, adoption of best practices such as driver-based rolling forecasts, tapping into the wisdom of finance and operational business users in the forecasting process, granular modeling of costs and profitability, a virtual financial close process that is optimized for business visibility, and real-time delivery of management reporting to mobile users are some key examples of where organizations are headed today. However, traditional solutions and the systems they are deployed on often constrain the ability of organizations to make this transformation in an agile and cost effective manner. The Oracle Exalytics In-Memory Machine is a purpose-built system that is engineered to support the business analytics and performance management needs of today’s businesses. Oracle’s Hyperion enterprise performance management (EPM) system deployed on Oracle Exalytics In-Memory Machine delivers unparalleled capacity, performance and scalability, at a much lower total cost of ownership compared to traditional systems, and takes performance management beyond the IT constraints of today. This paper outlines the business and technical benefits of deploying Oracle Hyperion EPM applications on Oracle Exalytics In-Memory Machine.
Introduction

Oracle’s Hyperion enterprise performance management system is comprised of a modular suite of integrated applications that support a broad range of strategic and financial performance management processes and help unlock business potential. This comprehensive, market-leading suite enables organizations to plan for profitable growth, report with confidence and accelerates business value. Oracle’s Hyperion EPM system provides flexible deployment options including on-premise, via the cloud or on engineered systems designed for high performance and scalability.

Oracle’s Hyperion EPM system includes applications that address Strategy Management, Enterprise Planning and Budgeting, Financial Close and Reporting, as well as Profitability and Cost management. These applications leverage Oracle Business Intelligence Foundation and Oracle Fusion Middleware to integrate data from multiple sources and provide dashboards, reporting and analytics. The modules can be deployed out of the box, extended with Oracle Business Intelligence (BI) technologies, or tailored to meet specific needs. By providing a holistic view of your business, Oracle’s Hyperion EPM system helps organizations increase speed and agility, improve decision-making abilities, and enhance corporate performance.

The Oracle Exalytics In-Memory Machine (Oracle Exalytics) is the industry’s first engineered in-memory analytics machine that delivers no-limits, extreme performance for Business Intelligence and Enterprise Performance Management applications. The Oracle Exalytics hardware is a single server that is optimally configured for in-memory analytics for BI and EPM workloads and includes powerful compute capacity, abundant memory, and fast networking options.

Deploying Oracle’s Hyperion EPM system on the Oracle Exalytics engineered system can break the constraints imposed by today’s IT systems, and help organizations transform their performance management processes. Let’s illustrate this point with a specific example: Today, a business may be forced to limit participation in financial planning and budgeting to just the users in finance in order to ensure application performance. With Oracle Exalytics, there is little degradation in responsiveness and application performance as more users are added, allowing planning systems to be deployed very broadly across the enterprise.

In the rest of this paper, we describe the business value as well as the technical benefits that can be realized by running Oracle’s Hyperion EPM system on Oracle Exalytics. Also provided below is a quick review of Oracle’s engineered systems.

Oracle Engineered Systems

Oracle’s engineered systems combine best-of-breed hardware and software components with game-changing technical innovations. Designed, engineered, and tested to work best together, Oracle’s engineered systems can power the cloud or streamline data center operations to make traditional deployments even more efficient. The components of Oracle’s engineered systems are preassembled for targeted functionality and then—as a complete system—optimized for extreme performance. By taking the guesswork out of these highly available, purpose-built solutions, Oracle delivers a solution that is

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integrated across every layer of the technology stack—a simplicity that translates into less risk and lower costs for business. Only Oracle can innovate and optimize at every layer of the stack to simplify data center operations, drive down costs, and accelerate business innovation.

Oracle Exadata

The Oracle Exadata Database Machine is purpose built to run the Oracle Database. It is engineered to be the highest performance and most available platform for running the Oracle Database. Built using industry-standard hardware from Sun, and intelligent database and storage software from Oracle, the Exadata Database Machine delivers extreme performance for all types of database workloads including Online Transaction Processing (OLTP), Data Warehousing (DW) and consolidation of mixed workloads. The Exadata Database Machine is an easy to deploy system that includes all the hardware needed for running the Oracle Database. The database servers, storage servers and network are pre-configured, pre-tuned, and pre-tested by Oracle. All Exadata Database Machines are identically configured so customers benefit from the experience of thousands of other users that have deployed the Exadata Database Machine for their mission critical applications. The Oracle Exadata Database Machine runs the standard Oracle Database. Therefore, any application that runs with the Oracle Database today can be seamlessly migrated to the Exadata Database Machine with no changes to the application.

Oracle Exalogic Elastic Cloud

Oracle Exalogic Elastic Cloud is a datacenter building block designed to allow enterprises to rapidly deploy and provision mission-critical, high performance private and public clouds. Exalogic is an Engineered System, integrating compute, networking and storage hardware with virtualization, operating system and management software. Exalogic provides breakthrough performance, reliability, availability, scalability and investment protection for the widest possible range of business application workloads, from middleware and custom applications to packaged applications from Oracle and hundreds of 3rd party vendors.

Oracle SPARC SuperCluster

Oracle’s SPARC SuperCluster is the world’s most efficient multi-purpose engineered system, delivering extreme efficiency, cost savings, and performance for consolidating mission critical applications and rapidly deploying cloud services. Oracle’s SPARC SuperCluster represents a complete, pre-engineered, and pre-tested high-performance enterprise infrastructure solution that is faster and easier to deploy than a collection of individual database and application servers. The system combines innovative Oracle technology—the computing power of Oracle’s SPARC servers, the performance and scalability of Oracle Solaris, the Sun ZFS Storage Appliance, the optimized database performance of Oracle Database accelerated by Oracle Exadata Storage Servers, and a high-bandwidth, low-latency InfiniBand network fabric—into a scalable, engineered system that is optimized and tuned for consolidating mission-critical enterprise applications.

Oracle’s SPARC SuperCluster provides both the capacity for growth, as well as the fine-grained server virtualization needed to isolate individual application components. With multiple layers of enterprise application infrastructure consolidated onto a high-performance, highly available SPARC SuperCluster system, deployment speed, application performance, and availability can all be optimized. Designed as a
pre-configured, pre-tested, and ready-to-deploy SPARC SuperCluster engineered system, the solution provides a complete and optimized infrastructure solution for applications, built around robust compute, networking, storage, virtualization, and management resources. The result is a system that is orders of magnitude easier to manage, and up to five times faster to deploy than alternatives, all while occupying considerably less real estate requiring less power. Furthermore, the SPARC SuperCluster system provides full built-in redundancy resulting in a highly reliable infrastructure without single point of failure. An issue with one component will not impact other components of the system offering true isolation. Customers can consolidate multiple environments with minimum disruption, without fear of performance degradation, and the ability to achieve required service levels.

Oracle Exalytics In-Memory Machine

Oracle Exalytics is an engineered system for analytics delivering speed of thought performance and best visual analysis with no limits. It consists of a combination of a powerful hardware platform, Oracle BI Foundation Suite (OBI EE & Essbase) and In-memory Analytics software (Times Ten for Exalytics and Adaptive In-memory Tools). OBI EE, Essbase and Times Ten for Exalytics have all been adapted from their standalone state, and enhanced to run faster, more effectively and more efficiently upon the Exalytics platform.

As analytic applications become more sophisticated and calculation-intensive, the use of mobile BI expands, user adoption increases, and data volumes explode making the need for speed and efficiency more important than ever. In-memory technology can dramatically accelerate analytic performance. Oracle Exalytics In-Memory Machine is the industry’s first engineered system for analytics that combines market leading BI foundation, in-memory analytics software, and best-in class hardware engineered and optimized to work together to deliver extreme performance for Business Intelligence and Enterprise Performance Management applications. As a result, users can visually navigate and drill into information at the speed of thought, without limits on the complexity of their questions or the volume of the underlying data. Oracle Exalytics drives a new class of smarter and more powerful analytic applications that simply weren’t possible using conventional BI software and generic hardware configurations.

Oracle Business Intelligence Foundation running on Oracle Exalytics has been specially enhanced to take advantage of large memory, processors, concurrency, storage, networking, operating system, kernel, and system configuration afforded by the Oracle Exalytics hardware. Oracle TimesTen In-Memory Database for Exalytics has been specially enhanced for analytical processing at in-memory speeds. With lightening fast scan speed of up to 100 million rows/second and up to 10x columnar compression, Oracle TimesTen In-Memory Database for Exalytics delivers faster reports & dashboards for departmental as well as enterprise wide consumption.
Hyperion EPM Applications on Oracle Exalytics: Business Benefits

In this section, we discuss how Oracle Exalytics enables the evolution of enterprise performance management to meet today’s needs and describe the business value realized from these efforts.

Enterprise Planning: Improved Accuracy in Planning and Forecasting

Deploying Oracle Hyperion Planning on Oracle Exalytics provides organizations the ability to increase the velocity of planning and forecasting processes, while enabling planning in more detail and by more users across the organization – resulting in significant and measurable improvements in forecast accuracy. Improvements in forecast accuracy translate into substantial business value – industry analysts estimate that even a nominal 3% improvement in accuracy could drive as much a 2% gain in profit margins. Here are some specific drivers related to forecast accuracy that are enabled by Oracle Hyperion Planning on Oracle Exalytics:

- **Exploiting the ‘Wisdom of Crowds’**: Oracle Hyperion Planning on Oracle Exalytics provides the system capacity to support the participation of thousands of users across all lines of business (LOB) in the planning process. These LOB managers and operational staff inject their business insights and market wisdom into the process, enabling the creation of financial plans and forecasts that they can deliver on in a consistent and predictable manner.

- **Adoption of planning best practices**: Dealing with increased business volatility requires the use of planning best practices such as rolling forecasts, driver based planning using detailed operational drivers, scenario based modeling, and risk adjusted planning. These best practices raise the complexity of planning models and place higher demands on the planning system in terms of
calculation performance and system throughput. Oracle Exalytics provides the perfect platform for delivering on these requirements.

- **Dynamic re-planning:** In today’s business, plans are made only to be revised in response to changes in business and market conditions. Oracle Hyperion Planning on Oracle Exalytics provides the ability to make plan revisions at the speed of business, enabling finance and LOB managers to make responsive course corrections in the face of volatility. This improved agility translates into substantial gains in the predictability of business performance.

- **Operational alignment:** Oracle Hyperion Planning on Oracle Exalytics supports the creation of granular financial planning models that incorporate operational detail, allowing tight linkages and alignment across financial plans and operational LOB plans. Financial plans can now incorporate and align with detailed operational assumptions related to input costs, product mix detail and manufacturing capacity, for example, on an ongoing basis. This alignment is especially important given the frequent need to make revisions to operational plans.

**Financial Close: Enabling the Virtual Close**

Financial consolidation and close remains a quarterly or monthly process at most businesses today. The primary focus of the traditional close process is on meeting the compliance requirements of external statutory reporting. Many leading businesses have recognized the value of an ongoing close cycle, termed “Virtual Close”, where books are closed on a daily, weekly or on-demand basis using a simplified and more automated close process. The primary goal of virtual close is to deliver timely and accurate visibility into financial performance for internal stakeholders. Consolidated and accurate financial information can then be used to validate forecasts, review variances, identify trends, and help determine needed corrective actions.

Organizations have long recognized the need for and the value of a virtual close process. However, this has remained an elusive goal due to limitations in system capabilities and associated costs. Let’s review how Oracle Hyperion EPM applications on Oracle Exalytics can help make virtual close a reality, and unlock significant business value:

- **Define the “right” Virtual Close process:** A key step in virtual close is for each business to define this transformational process in their own unique terms: the right frequency for ongoing close given the pace of business, the right subset of close processes that are relevant for internal visibility and decision making purposes, the set of consolidation and reconciliation tasks that can be automated in order to remove human bottlenecks, and the right subset of finance experts who need to be involved in virtual close. Oracle Hyperion EPM applications provide the right framework for laying out this definition in detail. Once the close process is defined right, it starts to become more feasible to implement.

- **Accelerate the close process:** Oracle’s vision for the Oracle Hyperion Financial Close Suite includes the leverage of Oracle Exalytics to help accelerate key steps in the financial close process. In simple terms, the virtual close process steps fall into the following broad categories:

- **Data consolidation:** This group of tasks relates to the extraction and integration of data and associated metadata from one more transactional and operational systems, and cleansing and consolidating the data in the right form for the close process. The Oracle Hyperion Financial Close
Suite provides several key modules such as Oracle Hyperion Financial Data Quality Management, Oracle Hyperion Data Relationship Management and Oracle Hyperion Financial Close Management that help address this category of tasks with speed, accuracy and automation.

- **Calculation processing:** Financial close involves the processing of detailed and often complex rules related to the consolidation of business results from the various corporate entities, addressing topics such as currency conversions, inter-company processing, detailed allocations, and the application of appropriate global accounting rules. Oracle Exalytics provides the system capacity to accelerate and compress these batch processes so that steps that take overnight runs can in the future be executed in hours or even minutes. System constraints on calculation processing cycles are a key blocking factor for most businesses today.

- **Preparation of reports:** Visibility and real-time information access is the driving factor for virtual close. The Oracle Hyperion Financial Close Suite provides the functional breadth to address the full spectrum of needs here. A key element of Oracle’s vision in this area includes leveraging the power of Oracle Exalytics to drive real-time visibility across the enterprise. We’ll review this in more detail in the next section on management reporting.

Management Reporting: Real-time Visibility for the Mobile Enterprise

Management reporting picks up where virtual close leaves off. Organizations have a compelling need to see better and act faster today – business managers, analysts and knowledge workers in every line of business need timely and accurate insights into business performance, in order to make the right decisions, outrun the competition and optimize business operations. Traditional approaches to management reporting have been joined at the hip with the monthly close process. Teams of finance and IT professionals work together at the end of every close period to produce pre-defined reports and briefing books for key internal stakeholders. However, the pace of business change and the voracious data appetite of on-the-go knowledge workers are forcing a transformational shift in the approach to management reporting. The key elements of this shift with the potential to substantially improve business value are outlined below:

- **Insights, not just data:** Today’s management reporting needs to go beyond just reporting to deliver actionable business insights. What does this mean? It’s about adding qualitative commentary to get behind the numbers – what is potentially driving the negative variance in revenues for a given product line, for example. It’s about enabling forward looking scenario analysis, not just historical reporting of what has happened – how would revenues shift if we dropped prices for that product line by 20% in this case.

- **Not just for executives:** Today’s management reporting needs to go beyond just the top-50 executives in the organizational hierarchy. High-impact decisions are made at much lower levels in the organization today, requiring actionable business insights to be made available at all these levels. Given this, the scope and scale of management reporting and the associated demands on the system platform are significantly higher. Oracle Business Analytics solutions on Oracle Exalytics are designed to address this trend towards democratization of management reporting.
• **Real-time, on-the-go:** The knowledge worker today demands real-time access to insights. Last month’s snapshot just doesn’t cut it. Nor do they want to be tied to their desktops; real-time visibility needs to be available on mobile devices. And, it needs to be available with all the richness, visualization and interactivity that come with consumer apps on mobile devices. Delivering on these requires comprehensive analytics capabilities as well as a robust platform that can power the back-end processing to support all this richness and interactivity for thousands of business users. Oracle EPM and BI solutions running on the Oracle Exalytics engineered system provide just the right combination to deliver on the promise of this new management reporting paradigm.

**Profitability and Cost Management: Granular Insights Enable Better Decisions**

Profitability and cost management is no longer the domain of just a few analysts in cost accounting. It is now getting elevated to a core management discipline as a central element of how decisions are made, how business priorities are set, and how employees are rewarded. Not all customers are equally profitable; and not all products add to the bottom line. Given these realities, organizations are focused on the accurate capture and active dissemination of profitability insights to decision makers so that their actions are guided by profit considerations. Furthermore, many internal functions such as IT, Finance, Human Resources and Marketing are increasingly operated as shared services. This creates a need for organizations to accurately model and measure the allocation of these shared costs to the divisional, business unit or product level, for example, in order to understand the true profitability at these levels. A generational shift is happening in the approach to profitability management. We describe some key elements of this shift that are enabled by the combination of Oracle Hyperion Profitability and Cost Management (HPCM) solution and the Oracle Exalytics engineered system:

• **Granular Models:** Cost allocation models are getting more granular in order to accurately capture the cause-and-effect relationships in each step of cost allocation. Organizations want to model profitability at the product level, instead of product family; they want to understand customer value using micro-segmentation. These models can become very large, complex, and can have processing times that make it difficult to do more than one or two data refresh and calculation cycles per day. As an application built on Oracle Essbase, HPCM is able to leverage the power of Oracle Exalytics to ensure unconstrained support for detailed and complex models. It also provides specific capabilities such as micro-costing in support of the need for increased granularity.

• **More Users:** The appetite for cost and profitability insights is spreading across the organization, placing increased demands on the profitability system. HPCM and Oracle BI on Oracle Exalytics provide the ability to support large user populations with no impact on response characteristics to make this a reality. As a result, organizations are better positioned to incorporate profitability and cost metrics as a fundamental consideration in all areas of performance management and decision making.

• **Timely Insights:** Business users are not willing to wait until month-end cycles for cost models to be recalibrated. They need on-demand refresh of the models and on-the-fly what-if modeling to assess the profit impact of decisions in a timely manner. The ability of HPCM on Oracle Exalytics to address these demands help deliver significant gains in the quality of decisions and overall predictability of financial and operational performance.
Hyperion EPM Applications on Oracle Exalytics: Technical Benefits

In this section, we summarize the technical benefits of deploying Oracle Hyperion EPM applications on Oracle Exalytics. The technical benefits fall into two major categories: improvements in performance and scalability, and significant reductions in cost of ownership through a simplified deployment footprint.

Improvements in Performance and Scalability

**End User Response Times:** The deployment of Oracle Hyperion EPM applications on Oracle Exalytics provides responsive end user performance even with substantial increases in the concurrent workload. Many pre-built EPM applications such as Oracle Hyperion Planning and Oracle Hyperion Profitability and Cost Management, as well as wide range of custom LOB planning and reporting applications leverage Oracle Essbase as the underlying multi-dimensional analytic platform. Oracle Essbase on Oracle Exalytics incorporates a number of optimizations for in-memory operation including improvements to overall storage layer performance, enhancements to parallel operations, enhanced MDX syntax and a high performance MDX query engine. These optimizations allow EPM applications to deliver consistent end user performance even as more and more users come online. Some specific examples from internal benchmarks include:

- Up to 93x response time improvement with individual MDX queries
- Up to 15x response time improvement for individual interactive calc scripts

The figure below provides a summary of the response time profile based on internal benchmarks with the Oracle Hyperion Public Sector Planning and Budgeting application:

![Response Time Profile](image)

*Figure 2: Oracle Exalytics In-Memory Machine Can Support Large Numbers of Concurrent Planning Users Without Any Appreciable Increase in Response Times*
**User Scalability:** A closely related technical benefit is the ability to deliver consistent throughput as user counts are increased. Again, the combination of Oracle Essbase and Oracle Exalytics allows Oracle Hyperion EPM applications to deliver up to 20X improvements in overall throughput relative to commodity hardware as summarized in the figure below.

![Figure 3: Oracle Exalytics In-Memory Machine User Loading And Transaction Throughput Shows Significant Performance Improvement Over More Traditional Solutions](image)

**Batch Processing:** Oracle Exalytics delivers dramatic improvements in batch processing, allowing many operations that require overnight or weekend runs on traditional hardware to be run multiple times on an intra-day basis. This compression of batch windows delivers greater agility and acts as the enabling technology for transformational EPM processes such as virtual financial close, dynamic re-planning and real-time profitability analysis. Internal benchmark tests have shown significant gains such as:

- Up to 7X improvement in Oracle Essbase BSO cube restructuring operations
- Up to 10x improvement with parallel data export operations with Oracle Essbase
- Up to 20X improvement in performance for complex calculations
- 3-4X faster performance for HPCM standard profitability model calculations

An important point to note here is that existing EPM and Oracle Essbase applications can take advantage of the performance and scalability benefits of Oracle Exalytics without any significant redesign or reconfiguration of the applications.
Simplicity of Deployment Drives Lower Cost of Ownership

The capacity of Oracle Exalytics allows deployment architectures to be simplified through the use of application consolidation. There are two key aspects to application consolidation in the context of EPM applications:

- **Applications** that previously had to be broken up due to system constraints can now be designed, configured and deployed as a single, integrated application on Oracle Exalytics without concerns related to scalability and performance. As a specific example, larger organization often fragment their financial planning and budgeting deployment into multiple application instances due to platform constraints – these can now be unified on Oracle Exalytics.

- **Multiple applications** can be deployed together on a single Oracle Exalytics environment. For example, given the compute, memory and storage capacity of Oracle Exalytics, one or more Oracle Hyperion Planning applications, one or more Oracle Essbase applications for custom planning and/or reporting, as well as one or more Oracle Hyperion Profitability and Cost Management applications can all be deployed together on a single Oracle Exalytics server.

The ability of Oracle Exalytics to support application consolidation results in simplified deployment architectures, and translates into measurable savings in hardware investments, administration costs, IT support staffing and overall costs of ownership.

Figure 4: Oracle Exalytics In-Memory Machine Simplifies System Infrastructure
Conclusion

Oracle’s Hyperion enterprise performance management system deployed on Oracle Exalytics delivers unparalleled capacity, performance and scalability, at a much lower total cost of ownership compared to traditional systems, and takes performance management beyond the constraints of today’s systems. This improves the ability of organizations to deliver predictable performance in today’s volatile business environment and realize significant and measurable business value.