Mission-Critical Platforms for Databases and Enterprise Applications

Converged Platforms Allow Rapid Response to Business Needs

Mission-critical databases for enterprise resource planning (ERP), customer relationship management (CRM), analytics, business intelligence, data warehousing and enterprise applications enable an enterprise to maintain a competitive edge. They support efficient operations and are the repositories for an enterprise’s highly valued asset, its data.

To deliver mission-critical database services, converged platforms have emerged as the platform of choice. Comprising servers, storage, networking and associated management software, these tightly integrated systems eliminate lengthy integration of disparate hardware. Converged platforms enable IT to become highly responsive to business requirements. IT can rapidly deploy new databases and applications, and meet mission-critical database service level agreements (SLAs), while maintaining operational efficiencies for system administration.

Overview

Converged platforms offload systems integration responsibilities from IT departments. By employing converged platforms, IT can save time that would have been required to evaluate best-in-class technologies from disparate vendors. There is no need for lengthy periods of integration, sizing and testing to deliver mission-critical and business-critical databases and enterprise applications.

Converged platforms can be advantageous over disparate servers, storage and networking from various vendors because converged platforms are a tight, preconfigured integration. Preliminary integration efforts by the converged platform providers eliminate the guesswork of sizing, tuning and performance optimization of system elements, including servers, storage, networking and software.

Database delivery is essential for mission-critical and business-critical use cases. Converged platforms enable IT to be highly responsive to business for rapid database and application deployment, relative to the efforts of disparate technologies from varying vendors. In addition to this responsiveness, converged platforms are expected to be high performing and highly reliable for...
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Data availability; slow database performance and data unavailability is unacceptable.

However, converged platforms are only as reliable and high performing as their base elements. These elements include server reliability, availability and serviceability (RAS), storage performance and availability, and a balanced configuration of compute processing with storage.

Not all converged platforms offered by providers are the same in terms of performance, reliability and quality. For example, converged platforms for general-purpose workload use cases may not meet specific workload requirements for databases. They may be challenged to handle peak workload I/O, low latency IOPS, sequential read storage performance, block sizes and RAID configuration, complex query processing, system robustness and redundancy. They may not have the tools required to ease and simplify administration.

Hitachi has built converged platforms specific to enterprise database workload requirements for IT agility and responsiveness, mission-critical performance and data availability, and operational efficiency.

Hitachi Unified Compute Platform (UCP) Select is a tightly integrated configuration of Hitachi compute blades or rack-optimized servers, Hitachi enterprise-class storage, and Hitachi software for database operation efficiency. As this solution profile explains, these components have been optimized for mission-critical Oracle online transaction processing (OLTP) workloads and complex query performance for Microsoft SQL Server data warehouse.

Hitachi Unified Compute Platform Select for Oracle Database

Hitachi Unified Compute Platform Select for Oracle Database is engineered, pretested and qualified to provide predictable performance and the highest reliability in demanding, dynamic Oracle environments. Hitachi has had a successful track record for over 20 years of mission-critical Oracle delivery. This solution is a tight integration of Hitachi compute blades and enterprise-class Hitachi storage, and networking elements, validated to ensure consistent, predictable Oracle performance.

IT Agility: Oracle Database Responsiveness to Business

Increasing IT agility serves an enterprise by enabling rapid deployment of databases and associated applications. These capabilities help businesses to take advantage of business events, such as customer attainment, regional expansion, mergers and acquisitions, or new supply chains. Hitachi Data Systems offers a single source for Oracle database deployments with preconfigured equipment, reference architectures, guides and services for IT agility.

Hitachi improves Oracle time to deployment by providing:

- Predictable, repeatable, reliable results with prevalidated reference architectures.
- Faster speed to deploy and increased ability to meet changing needs, with a single source for components and prescriptive guides.
- Massive throughput and unprecedented configuration flexibility of Hitachi Compute Blade hybrid I/O architecture.
- Extreme reliability of Hitachi Unified Storage, rated at 99.999% uptime, and its symmetric active-active controllers.
- Nondisruptive, high-speed data replication for immediate use of data in decision support, software testing and development, and data protection operations.
- Logical snapshot data replication, which allows immediate use without impacting host service or performance levels.
- Delivery of high-performance and reliable backup and recovery via Oracle Enterprise Manager and Oracle Recovery Manager.

Simplified and centralized storage management with Oracle Enterprise Manager and Hitachi Command Suite.

Hitachi UCP Select for Oracle Database: Compute, Storage and Management Elements

UCP Select for Oracle Database tightly integrates Hitachi Compute Blade 2000 (CB 2000) and Hitachi Unified Storage 150 (HUS 150). Together, this balanced configuration of compute with storage performance provides predictable reliability and performance for Oracle databases.

Hitachi Compute Blade 2000

Hitachi Compute Blade 2000 blade server, an enterprise-class platform, features a balanced system architecture that eliminates bottlenecks in performance and data throughput. CB 2000 leverages embedded logical partitioning features for unprecedented configuration flexibility.

This blade server integrates network, power and server resources into a single, space-efficient, flexible solution. Its rack-mountable 10U chassis houses up to 8 server blade modules. For I/O versatility, there are 6 bays for internal switches and, uniquely for a blade server, up to 16 slots for standard low-profile PCI Express 2.0 cards. With sophisticated, built-in RAS features, CB 2000 reduces the risk of unplanned downtime for mission-critical applications on Oracle database.

Performance. CB 2000 meets the performance needs of large-scale systems that require extremely high compute power and I/O (via a hybrid I/O subsystem). In addition, CB 2000 supports multiblade symmetric multiprocessing (SMP) capabilities on high-performance blades, allowing aggregation of up to 4 blades to create a single server environment.

Scalability. The robust, rack-mountable 10U chassis of CB 2000 houses up to 8 server blade modules. With the X57A2 high-performance blade, 4 blades supporting up to 2 processors can be aggregated, supporting up to 64 cores per environment. Memory is expandable up to 1TB, and the I/O subsystem supports up to 8 expansion mezzanine cards and 8 PCIe cards for a single environment. Virtualization capability can also be scaled up: LPAR supports...
configurations of up to 16 LPARs per environment.

- **Reliability.** The CB 2000 chassis is fully redundant and components are hot-swappable. These components include: redundant switch and management modules, extremely reliable backplane and I/O, N +1 or fully redundant power supply modules, and N+M model; failover protection follows. There are “M” backup blades for every “N” active server blade, so failover is cascading. In the event of hardware failure, the system automatically detects the fault and identifies the problem by indicating the faulty module, allowing immediate failure recovery.

- **Configuration Flexibility.** CB 2000 supports Linux operating systems (OS), a wide range of virtualization solutions in addition to LPAR, and industry-standard PCIe cards. This support provides a high level of flexibility and investment protection. The system is also extremely expandable in terms of processor cores, I/O slots, memory and other components. The chassis can be configured via a point-and-click graphical HTML-based web interface.

Enterprise-class capabilities of CB 2000 also extend to workloads. CB 2000 allows the most demanding workloads, particularly I/O-intensive applications, such as OLTP, to be run with extremely high performance, reliability, manageability, scalability and flexibility. These capabilities now make it possible to run mission-critical applications and consolidate systems at the application or database tiers.

**Hitachi Unified Storage 150**

Hitachi Unified Storage 150 is rated at 99.999% uptime for data availability and features a symmetric active-active controller with dynamic load balancing. Features include native multipathing and host load balancing to spread I/O workloads across resources, which make setup faster, reducing administrator and software costs, and optimizing performance.

With built-in automation that optimizes performance, end users can be assured that they will get the most out of their investment. Intuitive and easy-to-use software that comes with system has been designed to simplify even the most complex environments.

**System Management**

- **Hitachi Compute Blade Management.** Hitachi Compute Blade 2000 supports up to 2 management modules for redundancy. Each module is hot-swappable and supports live firmware updates without the need for shutting down the blades. These characteristics make it the best choice for a highly available system.

Each module supports an independent management LAN interface from the data network for remote and secure management of the chassis and all blades. Each module supports a serial CLI and a web interface. The management modules also support SNMP and email alert notification so that administrators are always notified of any issues.

- **Hitachi Command Suite** features a unified architecture that integrates the products from the bottom up. Instead of separate products linked together, the software products in Hitachi Command Suite use a common code base. They use the same graphical user interface and share a common look and feel. Configuration and storage tier information is combined and synchronized in a database accessed by multiple products, rather than on separate databases requiring larger data repositories that could be subject to inconsistencies. The new design improves the efficiency and reliability of storage management information, and a consistent and more flexible user experience.

- **Oracle® Enterprise Manager Grid Control System Monitoring Plug-in for Hitachi Storage** allows database and storage administrators to monitor and manage their storage infrastructure from within Oracle Enterprise Manager Grid Control System. It provides real-time visibility into utilization, availability and performance metrics and enables database and storage administrators to optimize their storage infrastructure for Oracle database applications.

- **Oracle® Recovery Manager Adapter for Hitachi Storage** allows administrators to manage storage backup and recovery from within Oracle Enterprise Manager Grid Control System. With out-of-the-box integration to Oracle Recovery Manager and Oracle Enterprise Manager Grid Control System, users of in-system Hitachi ShadowImage® Heterogeneous Replication (for enterprise systems) and ShadowImage Replication (for modular systems) software gain a complete, high-performance, backup and recovery solution for their Oracle databases.
Hitachi Unified Compute Platform Select for Microsoft SQL Server 2012

Hitachi Unified Compute Platform Select for Microsoft SQL Server 2012 data warehouse is a preconfigured and validated converged platform. The solution is a balanced configuration of Hitachi rack server with Hitachi enterprise-class storage that enables complex query performance and scaling options for Microsoft SQL Server data warehouse.

Hitachi UCP Select for Microsoft SQL Server 2012: Compute, Storage and Networking Elements

UCP Select for Microsoft SQL Server 2012 data warehouse is a complete Microsoft SQL Server database management system (DBMS) configuration. Its main elements include Hitachi server, Hitachi enterprise-class storage and networking. This optimized and balanced configuration of compute processing capability and storage performance meets specific workload requirements of Microsoft data warehousing, such as complex query performance with sequential read storage performance.

UCP Select for Microsoft SQL Server 2012 also provides a reliable and scalable converged platform for the most demanding enterprise data warehousing requirements. Its compute and storage infrastructure provide a balanced configuration: A single Hitachi Compute Rack 220 server using Intel E5-2600 processors with a Hitachi Unified Storage 150 system is optimized for Microsoft SQL Server data warehouse.

Hitachi Compute Rack 220

Hitachi Compute Rack 220 (CR 200) is an Intel Xeon processor-based midrange rack mountable server platform, providing advanced systems management and redundancy options. It is data center friendly. With just a 2U footprint, CR 200 delivers the performance that is required to meet the requirements of Microsoft SQL Server data warehouse and other enterprise-level challenges.

CR 220 server uses Intel E5-2600 processors managed by a web-based management interface and includes:
- RAID-level configuration, with up to eight 2.5-inch (6.35cm) internal drives.
- Sustainable power-saving capabilities.
- 2-socket Intel-Xeon-based server.
- Configuration flexibility to meet business needs.
- Dense 2U rack-mountable design.
- 16 processor cores from 2 Intel Xeon CPUs; 192GB of RAM.
- 4 dual-port Fibre Channel host bus adapters for redundant connectivity to storage system.

Hitachi Unified Storage 150

As previously mentioned, Hitachi Unified Storage 150 is rated at 99.999% uptime for data availability. It features a symmetric active-active controller with dynamic load balancing to meet both uptime requirements and sequential read performance for Microsoft SQL Server data warehouse. The solution’s HUS 150 configuration includes:
- Dual controllers for active-active link redundancy.
- 32GB total system cache.
- 32TB initial usable disk capacity.

Next Steps

Hitachi Unified Compute Platform solutions have been designed to meet enterprise-level database workload requirements with IT agility and responsiveness, mission-critical performance and data availability. UCP for Oracle Database and UCP for Microsoft SQL Server 2012 optimize Hitachi compute blades or rack servers, Hitachi enterprise-class storage, and Hitachi software. They support mission-critical Oracle OLTP workloads and complex query performance for Microsoft SQL Server data warehouse.

Please contact your Hitachi Data Systems or Hitachi TrueNorth™ Partner representative or visit www.HDS.com for more information.