SimpliVity Hyperconverged Infrastructure for Oracle

Solution Brief

Key Benefits:

- ✔ Optimized for OLTP workloads
- ✔ Improved performance
- ✔ Operational efficiency
- ✔ VM-centricity
- ✔ Simplified test/dev.
- ✔ 3x lower TCO
- ✔ Native Data Protection
- ✔ Improved Capacity Planning
- ✔ High Availability

SimpliVity is the revolutionary hyperconverged platform, delivering the best of both worlds: x86 cloud economics and enterprise capabilities. SimpliVity was designed from the ground up to simplify IT and support Tier-1 applications and server workloads, like Oracle.

ORACLE Gold Partner

Oracle specializes in developing enterprise software products, particularly its own brands of database management systems. Modern IT organizations use Oracle for efficient collection, processing, and storing of big data. With over 400,000 customers in over 145 countries, Oracle has a vast range of databases and applications which are a critical part of many business' IT infrastructure including Oracle E-Business Suite, PeopleSoft Enterprise, Siebel, Primavera, Taleo, and RightNow.

Mission critical Oracle databases demand high performance, high availability, business continuity, and fast application deployment. Data growth is the root cause of several challenges that exist around storage capacity requirements, performance degradation, and increasing cost of infrastructure and software licenses.

Virtualization creates an abstraction layer between the resources required by the application and operating system, and the underlying hardware that provides those resources. Virtualization provides numerous benefits to database administrators (DBAs) including consolidation, ease of provisioning, manageability, and availability of applications. Nonetheless, DBAs still need to overcome several challenges in a virtualized environment:

Common Challenges with Infrastructure Supporting Oracle

1. Accommodating resource-intensive Online Transaction Processing (OLTP) workloads
2. Driving out cost and inflexibility associated with siloed legacy infrastructure
3. Ensuring high availability, which is typically complex and costly
4. Maintaining database performance requirements
5. Reducing cost associated with Oracle licensing, which is based on CPU
6. Ensuring an effective data protection process that avoids replication bottlenecks
7. Provisioning, refreshing, and managing production, test and development Oracle environments more efficiently

As a result of these challenges, legacy infrastructure supporting typical Oracle databases can no longer keep pace with demand.

SimpliVity's Solution - Hyperconvergence

Organizations leveraging Oracle need a solution that is aligned with the business challenges and maintains high performance to meet service level agreements (SLAs). There is only one solution necessary to support Oracle applications, SimpliVity hyperconverged infrastructure.

SimpliVity's hyperconverged solution, the OmniCube, is a scalable, modular, 2U building block of x86 resources. SimpliVity offers the best of both worlds with cloud economics and enterprise capabilities within the platform - delivering fundamental innovations critical to the success of IT organizations using, or planning to use, Oracle.

OmniCube is an all-in-one platform that assimilates storage, compute, networking, hypervisor, real-time deduplication, compression, and optimization along with powerful data management, data protection, and disaster recovery capabilities. SimpliVity provides a single shared resource pool, abstracting applications and VMs from the underlying hardware across not just server, storage, network, but also backup, disaster recovery, WAN optimization, and cloud enablement.

VMware's "DBA Guide to Databases on VMware" recommends avoiding "silos" when designing the storage architecture[1]. SimpliVity's hyperconverged solution inherently removes silos from IT as it consolidates all infrastructure beneath the hypervisor into one single 2U building block. Planning Oracle environments on SimpliVity's hyperconverged infrastructure inherently involves the roles of the DBA, storage admin, VMware admin, and application owner as each function is assimilated into the hyperconverged platform and is managed from the same screen.

The critical enabling technology of SimpliVity's hyperconverged infrastructure is the Data Virtualization Platform, which is made up of two key components:

1. Inline Deduplication, Compression, and Optimization

SimpliVity deduplicates, compresses, and optimizes ALL data inline at inception, once and forever, across all stages of the data lifecycle. This significantly increases data efficiency with the elimination of vast amounts of redundant log data, allows for increased longevity and retention of critical historical data, increases performance by maximizing utilization of available CPU, memory, and IOPS for applications instead of wasting them on storage processes and backup. It also creates more efficient use of available bandwidth by only sending unique data across the WAN in remote operations.

2. Global Unified Management

SimpliVity provides an intelligent network of collaborative systems that provides massive scale-out capabilities and VM-centric management through a single unified interface for the entire global infrastructure, known as the federation. SimpliVity's global unified management allows database administrators to manage all resources globally from a single pane of glass: VMware vCenter. This provides VM-centricity and the ability to backup, restore, and move virtual machines—and their associated data—in seconds or minutes, with a click of a button without all the manual efforts to manage and configure disk groups, LUNs, shares, volumes, disk groups, masking, mapping, and complicated replication configurations.

SimpliVity provides several benefits for Oracle environments:

1. **Optimized for OLTP workloads:** Oracle databases run OLTP workloads, which facilitate and manage transaction-oriented applications, typically for data entry and retrieval transaction processing. The key goals of OLTP applications are availability, speed, concurrency, and recoverability. SimpliVity is the ideal supporting infrastructure for OLTP workloads with high availability and native data protection ensuring that the database is always up and running. SimpliVity's OmniStack Accelerator Card and inline deduplication, compression, and optimization allow the database to run at peak performance levels with reduced latency, regardless of the number of concurrent users.

[1] VMware. "DBA Guide to Databases on VMware." 2011

2. **Native data protection:** SimpliVity fundamentally changes and improves backup operations for Oracle. SimpliVity's native data protection provides DBAs with a comprehensive data protection strategy for Oracle databases.

   SimpliVity backups are full logical backups, at the VM level. Since every backup is a full duplicate of the original VM at the moment of creation, SimpliVity backups will see significant deduplication and compression rates. Typically, SimpliVity customers often achieve 50:1 or 100:1 capacity savings. To view validation, please view our third party TechValidate results.

   Since no VM storage is processed, read or written during a SimpliVity backup, there is no impact to VM performance. Traditionally, third party backup applications consume storage IOPS and host CPU and memory resources, potentially impacting the production VMs that need the CPU and memory. SimpliVity's Data Virtualization Platform prevents this tradeoff.

   SimpliVity's integrated VM-level backup, restore and disaster recovery capabilities ensure data protection for Oracle environments, locally and remotely. The data protection features benefit from the Data Virtualization Platform as all full logical backups are deduplicated, compressed, and optimization across the global federation.

3. **Cost Savings:** SimpliVity's hyperconverged infrastructure significantly reduces the total cost of ownership (TCO) by at least 3x when compared to the legacy infrastructure stack across Capital Expense (CAPEX) and Operational Expense (OPEX). Hyperconvergence combines previously disparate products and applications into a single, scalable, modular 2U building block. The OmniCube natively includes data protection and backup at the VM-level, eliminating the need for expensive third party backup appliances. Furthermore, by collapsing storage into the host servers, costly storage area networks can be eliminated.

4. **Operational efficiency:** SimpliVity simplifies management across all sites within a single pane of glass, reduces the need for additional IT resources across multiple sites, and maximizes productivity of IT staff by automating mundane tasks. This allows DBAs to focus on innovation, analytics, and application development. One user can manage the entire global infrastructure spanning one or multiple sites through one, simple interface. Policy and automation capabilities in the management layer enable dramatic improvements in operational efficiency and productivity.

   Oracle Automatic Storage Management (ASM) provides integrated clustered file system management capabilities for managing Oracle database files. However, Oracle ASM cannot determine the optimal data placement or LUN selection with respect to the underlying storage. Therefore, as VMware notes, Oracle ASM is not a substitute for close communication between the storage administrator and the database administrator[2]. SimpliVity's global unified management increases the visibility between the storage admin and the DBA, and allows for management of all VMs globally from within vCenter.

5. **Performance:** In regards to mission-critical applications, databases are commonly spread over multiple LUNs and volumes to maximize I/O performance – such as placing log and datafiles in separate LUNs. This practice is not necessary with SimpliVity's data efficiency technology and OmniStack Accelerator Card. SimpliVity eliminates IOPs, effectively solving the storage performance issues.

6. **VM-centricity:** VMware recommends creating dedicated datastores to service database and IO intensive workloads[3]. With global unified management, SimpliVity allows the DBA to

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[2] VMware. "DBA Guide to Databases on VMware." 2011

[3] VMware. "DBA Guide to Databases on VMware." 2011

manage VMs rather than datastores, or LUNs in a physical environment. Everything is done at the VM level, allowing DBAs to define individual SLAs for different applications.

7. **Test/Dev and Non-Production environments**: Excessive resources are typically devoted to managing test, development, and maintenance environments for Oracle databases. Test/dev and maintenance environments tend to drive multiple copies of data fits and multiple databases that all have the same data in them. SimpliVity's data efficiency technology eliminates redundant data at inception across all stages of the data lifecycle, which allows for maximum data efficiency in non-production environments without the upfront cost of point solutions. Moreover, SimpliVity provides the ability to clone a running VM, which allows DBAs to quickly spin up and down test/dev environments.

8. **Simplified capacity planning:** SimpliVity's OmniStack Accelerator Card provides processing power for deduplication and compression activities and reserves the CPU for the application and database. This allows for simplified capacity planning, eliminates overprovisioning, and CPU resource allocation, as CPU resources are not taken up by the infrastructure itself. When needed, new systems can be seamlessly added into the federation, adding the linear performance and capacity required by growing databases.

Oracle Customer Use Case:

Top design and construction firm, The Neenan Company, runs Oracle on SimpliVity OmniCube. Neenan improved performance by greater than 75 percent and realized capacity savings of 100:1 to 200:1 after implementing OmniCube. SimpliVity doubled improvement in Neenan's Oracle RAMAN and Export backup times. Additionally, there were huge reductions in physical equipment with Neenan alone, bringing its data center setup down from three racks to one.

Syntrophos, a leading IT service provider in the Netherlands, deployed OmniCube in support of several tier-1 applications, including Oracle. Syntrophos provides high quality ICT, GEO-information, and consulting services to over 120,000 citizens and seven smaller governmental agencies. End-user access to the critical services that Oracle provides was a key priority for selecting supporting infrastructure. With SimpliVity, Syntrophos saw data efficiency rates of 63:1, which resulted in 360TB capacity savings and infrastructure footprint reduction. Syntrophos was also able to mitigate the cost associated with Oracle's licensing fees, reducing overall TCO. Furthermore, SimpliVity allowed for a comprehensive data protection strategy for applications and databases which dramatically improved RPOs and RTOs, eliminating risk and introducing time and cost savings.

To read more please view our case studies and our TechValidate SimpliVity OmniCube results.

Solution Summary:

SimpliVity is the ideal solution to support Oracle databases. The Data Virtualization Platform has proven to effectively reduce IOPs, and tremendously improve Oracle application performance. The Global Unified Management feature enables Oracle users to manage the data across all of their sites from anywhere within the federation without adding additional IT resources or separating their data from the logs. SimpliVity enables Oracle customers to overcome backup and performance challenges while supporting critical business functions. SimpliVity provides the best of both worlds – x86 cloud economics and enterprise capabilities – the optimal foundation for Oracle environments.

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