Cisco Unified Computing System: The Right Foundation for Oracle Databases and Applications

Solution Brief
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Highlights

Modern Infrastructure for Oracle Environments

- Cisco Unified Computing System™ (Cisco UCS®) is a single system that delivers performance and agility at reduced total cost of ownership (TCO).

Flexibility and Simplicity

- Every aspect of the Cisco UCS infrastructure can be configured dynamically, making each server ready to power any workload at any time.

Lower Cost of Operations

- Integrated, model-based management increases IT staff productivity, improves reliability, and reduces the risk of failures due to inconsistent configurations.

Cisco RISC/UNIX Migration Services

- Cisco® RISC/UNIX Migration Services use proven industry-leading methodologies and practices to migrate applications from RISC-based architectures to the award-winning Cisco UCS.

Helping Customers Every Day

- Migrating from RISC/UNIX platforms to Cisco UCS enabled EMC to experience 2 to 20 times better performance on mission-critical workloads.

Having proven itself in some of the largest, most demanding Oracle database and application environments, Cisco Unified Computing System™ (Cisco UCS®) is emerging as a versatile and dynamic solution for cloud computing and data center consolidation.

For years, many companies have trusted their demanding computing environments to RISC/UNIX platforms. These systems delivered reliability, availability, scalability, and many other features, but now a new generation of servers is beginning to take their place. Based on the x86 architecture and open standards-based operating systems such as Linux, these servers have surpassed RISC/UNIX server platforms. Cisco UCS takes advantage of this new class of servers to deliver faster, simpler, more agile database and application deployment with enterprise-class reliability, availability, and serviceability (RAS). Testimony to the success of the Cisco approach is the way that EMC, a leading global storage system vendor, reinvigorated its infrastructure with Cisco UCS and significantly reduced capital expenditures (CapEx) and operating expenses (OpEx).

The Decline of RISC/UNIX Platforms and the Rise of Cisco UCS

RISC/UNIX platform value has diminished because of limited flexibility, lagging performance, and high costs. Today, many companies are turning to Cisco UCS as the agile, cost-effective, and high-performance foundation for Oracle databases and applications.

From Complexity to Simplicity

The capability to quickly, efficiently, and cost-effectively scale data warehouses is crucial for businesses. Typically, IT departments accommodate rising demand by simply adding units of computing power. Each RISC/UNIX system, with hundreds of touch points, must be painstakingly installed and configured.

Cisco UCS eliminates this cumbersome and time-consuming process. With Cisco UCS, server, networking, storage, and intelligent management resources work together in a self-aware and self-integrating system. Server identity, personality, and I/O connectivity are abstracted from the hardware, enabling these characteristics to be applied on demand. Every aspect of a server's configuration, from firmware revisions and BIOS settings to network profiles, can be assigned through the system's open, documented, standards-based XML API or Cisco UCS Manager GUI.

Standards-Based Platform Brings Greater Flexibility

As businesses succeed, increasingly large volumes of information must be accessed and processed by a growing user base. Demand for additional performance capacity is frequent and unpredictable. With aging and proprietary RISC/UNIX infrastructure failing to provide the performance and flexibility needed, companies are looking for alternatives. Cisco UCS provides the standards-based platform and solutions that offer greater flexibility and scalability at an attractive price.

From Expensive to Cost-Effective

RISC/UNIX acquisition and maintenance costs are now a significant component of IT budgets. On average, the platform has a 65 percent higher total cost of acquisition than systems based on the x86 architecture. In addition, expensive operating and maintenance costs, combined with per-core software licensing, further increases RISC/UNIX system expenses. With energy and data center floor space costs continuing to rise and training costs increasing because fewer administrators are experienced in RISC/UNIX systems, increased overhead costs are affecting profits. As a result, many organizations are realizing that RISC/UNIX architectures are no longer cost effective.

Cisco UCS changes the cost equation by supporting more applications with a smaller number of servers. Cisco's high-density, high-performance design increases consolidation ratios for 2-socket servers while saving the capital, operating, real estate, and licensing costs of running virtualization software. In addition, Cisco UCS Manager's role- and policy-based management preserves organization-specific role assignments. Subject-matter experts gain the capability to define policies that lower-level administration staff can implement, further increasing staff effectiveness and reducing operational expenses.

From Aging to Modern Infrastructure

In many organizations, the installed base of RISC/UNIX systems is ready to be replaced or refreshed, prompting wholesale upgrades or migrations to better platforms. According to an IDC Worldwide Server Tracker Q4 2012 study, the RISC/UNIX market has declined by 34.8 percent since 2007. This decline is due in part to changing processor roadmaps, which delayed the release of faster systems with more advanced capabilities. In addition, the acquisition of Sun Microsystems by Oracle is causing SPARC customers to consider Oracle's appliance focus and the risk it poses for vendor lock-in.

The landscape of the business-critical application market is changing, and there has never been a better set of alternatives to RISC/UNIX architectures. Many commercial, off-the-shelf enterprise applications have been restructured to take advantage of the improved economics and technological advancements of industry-standard x86-architecture hardware. According to an IDC Worldwide Server Tracker 2Q 2011 study, x86-architecture servers make up 97 percent of the total processor market by volume. In just two years, sales of Cisco UCS are outpacing market growth for x86 blades, and Cisco has become the number-three vendor worldwide in x86 blade server factory revenue .

Cisco UCS: Reinvigorating Customer Deployments

Between 2009 and 2010, EMC's IT department migrated its Oracle E-Business Suite 11i Customer Relationship Management (CRM) solution from Sun Enterprise 25000 servers, based on SPARC running the Oracle Solaris operating system, to Cisco UCS and Linux. An aggressive timeline and business continuity requirements mandated a smooth cutover to the new platform. Today, the EMC CRM solution supports

over 40,000 users with up to 4000 concurrent users during peak periods.

The Cisco UCS Solution

EMC wanted to use Oracle Real Application Clusters (RAC) to create a database grid that could scale horizontally with the addition of more Oracle RAC nodes. After evaluating several options for a next-generation computing platform, EMC decided to move to Cisco UCS because of the mutual commitment of Cisco, EMC, and VMware to virtualization and VCE Vblock™ Infrastructure Packages.

The solution includes six blade server chassis spread across three cabinets, with redundant power in each cabinet for high availability. Each Cisco UCS B440 High-Performance Blade Server includes dual converged network adapter (CNA) cards that present multiple network interface card (NIC) and Fibre Channel over Ethernet (FCoE) devices. All public and interconnected NICs are protected with N+1 interfaces on each server and to bind the two adapters into a single interface for high performance. Access to storage devices is protected using N+1 Fibre Channel interfaces on each server configured with EMC PowerPath to protect against a failure.

Easy Transition Delivers Operations Benefit

Cisco RISC/UNIX Migration Services provided a smooth and timely transition that allowed EMC to reduce CapEx and OpEx and improve business flexibility and agility with world-record setting Oracle performance.

Flexible Design

In autumn 2010, the Cisco RISC/UNIX Migration Services team assisted EMC's IT department in the migration effort. The solution design used a standard Cisco UCS configuration. Requiring little or no customization, the system was configured with no single point of failure and with high-bandwidth I/O throughput of 80 Gbps per chassis. Because the system would serve as a foundation for cloud architecture, the design provided the flexibility to add or remove Cisco UCS computing and I/O fabric components (external and interconnected) to support changes in business requirements.

Reduced Costs

Cisco UCS is designed to help reduce CapEx and OpEx. In the EMC solution, the lack of additional physical rack space, power supplies and cables, connectivity wiring, patch panels, and Ethernet ports resulted in lower capital costs. In addition, EMC saved on software costs with Oracle licenses that were half the cost of most other RISC/UNIX systems. Other savings included:

- Reduced environmental expenses: A typical Cisco UCS blade server draws 300 fewer watts of power than a typical RISC/UNIX tower server. As a result, EMC reduced its requirements for power and cooling.
- Lower support and maintenance costs: Because standard Cisco UCS support covers networking hardware, EMC was able to eliminate additional maintenance costs for its network infrastructure.
- Improved staff efficiency: The simple, plug-and-play management included with Cisco UCS enabled EMC to automate tasks that resulted in fewer onsite support visits.

In total, EMC estimates that migration of its Oracle application to Cisco UCS saves the company approximately US$5 million to US$7 million annually.

Greater Agility

Cisco UCS provides an agile architecture for Oracle data warehouses. The solution is a cohesive system that simplifies setup, improves business metrics, and enables just-in-time resource provisioning. IT departments can scale the infrastructure to accommodate dynamic business demands, and repurpose high-performance, high-capacity Cisco UCS blade servers without expensive onsite support visits.

In the EMC solution, six Cisco UCS B440 High-Performance Blade Servers were deployed and configured with Oracle RAC to protect against physical node failure during the migration project. The environment uses four blade servers, with two held in reserve as standby systems. In the event of an outage or the need for additional short-term computing power, a Cisco UCS server can be provisioned from the server pool.

World-Record-Setting Oracle Performance

Testing of EMC's solution showed performance results that were 2 to 20 times faster than previous results, as shown in Figure 1.

- Customer service quote renewal transactions improved more than 200 percent, from 11.5 seconds to 5.6 seconds.

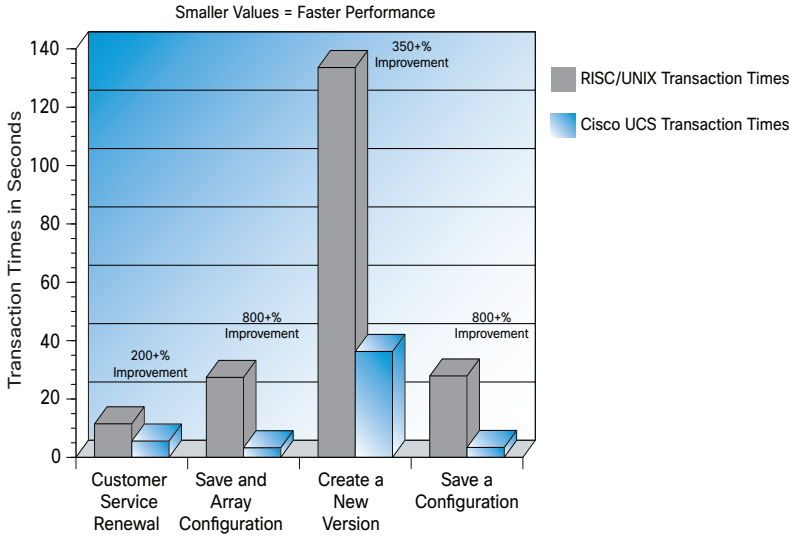

Figure 1. Cisco UCS Improves Performance for All Major Transactions

- In EMC Channel Express, save-and-array-configuration transactions improved more than 800 percent, from 27.4 seconds to 3.3 seconds.
- Create-a-new-version transactions improved more than 350 percent, from 133.6 seconds to 36.3 seconds.
- Save-a-configuration transactions improved more than 800 percent, from 27.9 seconds to 3.4 seconds.
- Batch runtimes and user response times showed up to 60 percent improvement.

In addition, the original system typically used up to 100 percent of resources, but the Cisco UCS solution uses only 10 percent of available resources, leaving significant headroom for growth.

Smooth Migration with Cisco

With the Cisco Services team onsite and ready to address any challenges, EMC achieved a smooth transition of its CRM application over one weekend. Corporate goals to improve operation performance while lowering energy, power, and cooling costs were met.

Today, EMC has the benefits of high-availability capabilities that are far more affordable than those provided by the previous infrastructure. By migrating to the Cisco UCS platform, EMC's IT department now can provide an open and scalable computing platform with a strategic architecture for private cloud computing.

For More Information

- For more information about migrating to Cisco UCS, please visit http://www.cisco.com/go/migratetoucs.
- For more information about EMC's migration to Cisco UCS, please visit http://www.cisco.com/en/US/solutions/collateral/ns340/ns517/ns224/ns977/ns1141/white_paper_c11-685375.html.
- For more information about Oracle systems running on Cisco UCS, please visit http://www.cisco.com/go/oracle.

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