



An Oracle White Paper
September 2013

Infosys Finacle Core Banking Solution on Oracle SuperCluster and Oracle's SPARC T-Series Servers

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Introduction

For central banks around the world, advanced IT technology is now ubiquitous, and while technology solves many problems, it can invite others. Banks must embrace new technologies to attract and retain customers with increasingly sophisticated service demands. Banks must also improve business processes while managing and defending against technology-based fraud. Core banking has emerged as one of the greatest developments in banking technology, replacing cumbersome and time-consuming end-of-day consolidation between branch banks and centralized banks. In fact, centralized banks worldwide now mandate the implementation of core banking technology for fast, efficient, and secure banking. This powerful technology drives improved customer satisfaction and retention, provides comprehensive business functionality, and helps meet regulatory requirements.

Infosys Finacle core banking solution provides a comprehensive, integrated, yet modular and agile approach to core banking that addresses banks' sophisticated needs in easy-to-configure modules that work together as a system. By providing all of the building blocks needed for business functionality, Finacle 10 enables users to configure products and processes flexibly in order to tailor the solution to their exact needs and adapt to a diverse and dynamic environment. With a 360-degree single-source view into customer accounts, banks can empower customers with relevant information and delight them with the right offerings—presented at the right time through the right channel.

Choosing the right infrastructure for deploying Finacle core banking solution is likewise important. Infrastructure shortcomings can ultimately limit agility and the ability to rapidly address changing customer needs. Unfortunately, many vendors lock clients into proprietary infrastructure that doesn't perform well or scale to support large numbers of users. The joint Infosys and Oracle solution for Finacle core banking demonstrates strong performance, scalability, and consolidation opportunities, letting financial institutions deploy a leading core banking solution on proven Oracle infrastructure.

Deploying Finacle Core Banking Solution on Oracle Infrastructure

Just as other businesses have faced transformational moments, the financial services industry has undergone many changes in recent years. Driven by mergers, consolidation, expansion, shifting customer preferences, and continuously evolving regulatory constraints, banks must move quickly to embrace change and accelerate growth. As they approach this transition, most want to avoid the fragmented and piecemeal technology approaches that proved a limitation in the past.

Deploying Finacle core banking solution on Oracle infrastructure provides an ideal solution. The availability of Finacle 10 on Oracle Solaris marks an important milestone, enabling banks to deploy Finacle core banking solution on Oracle SuperCluster engineered systems and Oracle's SPARC T-Series servers. This unique technology combination matches state-of-the-art core banking software from Finacle with hardware, software, database, and storage solutions from Oracle that are all optimized and engineered to work together. As described later in this paper, Oracle's testing has yielded:

- The first Finacle 10.2.x workload tests published on any system, yielding compelling OLTP and batch results for Oracle SuperCluster T4-4 and SPARC T4-4 servers
- The first Finacle 10.2.x test results published on Oracle WebLogic Server, utilizing Oracle Real Application Clusters (Oracle RAC)
- Batch results that exceeded Finacle acceptance criteria, processing greater than 15% more accounts and 3.2 to 3.7 times the required minimum records per second, all achieved within one third of the specified time, with plenty of CPU resources available to handle further load
- OLTP results that exceeded Finacle acceptance criteria with more users and more transactions per second, all with sub-second response times and with considerable CPU resources remaining available.

Finacle Core Banking Solution

Banks must consistently maintain and grow their business, handling high transaction volumes and simultaneously managing ever-increasing customer expectations. Business innovation is key, and banks must concentrate on attracting and retaining customers while reducing their total cost of operations. To address these needs, Finacle core banking solution succeeds by implementing a layered Service-Oriented Architecture (SOA), straight-through processing (STP) capabilities, web-enabled technology, and support for true 24 x 7 operations. As a result, Gartner places Finacle core banking solution in their Leader's Quadrant consistently as a leader for vision and execution excellence.¹

¹ Gartner: "Magic Quadrant for International Retail Core Banking", 2012

Finacle core banking solution gives banks considerable agility letting them:

- **Create a differentiated and unique customer experience.** Finacle core banking solution enables banks to provide a hassle-free and unified banking experience that is personalized to customer needs.
- **Expand product offerings.** With a robust and comprehensive core solution, banks can expand product offerings on demand, and stay ahead in a competitive marketplace.
- **Configure bundled product suites.** The modular nature of the solution allows banks to easily configure bundled product suites to cater to the growing demands of today's customers.
- **Generate right-sell opportunities.** Finacle core banking solution enables a phased, strategic approach in generating right-sell opportunities.
- **Eliminate data redundancy.** By deploying the solution, banks can build a master data system that consolidates all customer and product data and eliminates redundancy.
- **Increase productivity of front-line staff.** Automation and ease-of-operation lends itself to increases in productivity.
- **Comply with emerging global regulations.** Regulatory compliance is a significant concern for any bank, and Finacle core banking solution lets banks rest assured of being compliant with growing regulations.
- **Manage growth with proven scalability.** The solution is designed to be scalable and support the specific pace of growth needed by the bank.
- **Maximize business agility.** Banks can customize their client interface without altering base code, ensuring faster adaptation to changing business conditions.
- **Minimize risk.** The Global Delivery Model (GDM) accelerates schedules with time and cost predictability. Infosys Rapid Implementation Methodology (InRIM) ensures rapid, smooth, and successful deployment, minimizing risks.
- **Improve customer service.** Finacle's integrated framework enables banks to offer products and services through multiple channels including branches, telephone, ATMs, internet, and mobile devices, while ensuring a single view of customers across these channels.
- **Support for multi-country growth.** The solution offers a proven multi-country deployment framework with support for multi-currency accounting, multiple legal entities and businesses across multiple time zones and multi-lingual transactions.

Oracle SuperCluster—An Oracle Engineered System

Traditional build-your-own solutions for banking infrastructure can rapidly prove to be complex and costly. Oracle engineered systems represent a different and compelling alternative.

The Oracle Engineered Systems Approach

Build-your-own solutions tend to represent one-off designs that require considerable IT staff time to design, integrate, test, and optimize. Even many vendor-supplied solutions lack the technology depth and ownership to provide meaningful integration. As a result, IT staff must focus on integration issues, when they should be focused on the strategic goals of the organization. As an Oracle engineered system, Oracle SuperCluster offers a different approach that provides a single point of accountability, components designed to work together, and a tested and proven architecture (Figure 1).

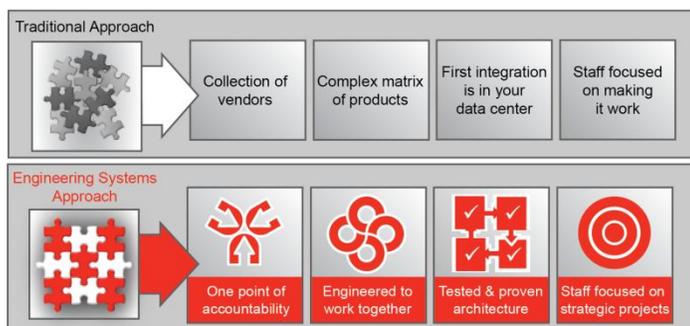


Figure 1. Oracle engineered systems such as Oracle SuperCluster accelerate the entire Oracle technology stack, providing simplicity and cost savings over multi-vendor build-your-own approaches.

Oracle SuperCluster

Like all Oracle engineered systems, Oracle SuperCluster is a complete solution optimized to provide the best performance, availability, and security for running business-critical Java and enterprise applications. In fact, Oracle Database and Java perform up to 10 times faster on Oracle SuperCluster than on other platforms, improving user response times and helping to meet service level agreements. Organizations deploying Oracle SuperCluster can achieve 99.999% application availability, minimizing both planned and unplanned downtime and providing the highest service levels for core business applications across all tiers of the data center. These benefits derive from a careful Oracle engineered systems approach that includes:

- Hardware and software engineered to work together
- Integration driven by organizational alignment within Oracle
- Optimization across the full solution stack
- Synchronized hardware and software release schedules

Oracle SuperCluster is particularly well suited for multi-tier enterprise applications such as Finacle core banking solution that are comprised of web, database, and application components. This versatility along with powerful bundled no-cost virtualization capabilities offers an ideal platform on which to consolidate large numbers of applications, databases, and middleware workloads. Deploying complex multi-user development, test, and production environments is also considerably simpler and faster.

- **High performance.** Everything about the Oracle SuperCluster architecture is designed around delivering improved application performance and a responsive end-user experience. Oracle's SPARC T-Series compute nodes offer the best Oracle Database performance. Oracle Exadata Storage Servers coupled with Oracle's Exadata Storage Server Software contribute the same technology that powers Oracle Exadata Database Machine. Integral InfiniBand networking provides fast communication and low latency between system components. Oracle ZFS Storage Appliance provides flash-accelerated storage for applications and data.
- **Full high availability.** Organizations must increasingly reduce risk by ensuring continued application and database operation in the face of both internal and external events. Oracle SuperCluster helps ensure continuous operation in the case of component failure. Beyond redundant hardware, the system is architected with high-availability functionality in database and application layers as well. When required, Oracle Real Applications Cluster (Oracle RAC) can be used to provide continuous database access to help ensure that applications and users can continue to operate after an unplanned event. Unified patching of the entire stack can further reduce downtime.
- **Safe and effective consolidation.** Many organizations want to reduce costs and complexity through consolidation, but consolidation platforms must provide essential availability and isolation along with necessary scalability to meet application demands. Oracle SuperCluster is ideal for replacement and consolidation of legacy database and application infrastructure. The platform provides a large computational platform and Oracle Exadata storage technology for database consolidation. Integrated no-cost virtualization offers workload isolation, predictable performance, and information security. High availability provides for safety of operations while the coordinated and integrated platform offers simplified management and updating.
- **A complete Oracle engineered system.** As an Oracle engineered system, Oracle SuperCluster provides a complete platform that is integrated, tested, and pre-architected to help facilitate complete solutions. This approach removes the need for IT organizations to focus on basic hardware integration, accelerating time to operations and allowing more time to focus on strategic application projects. Organizations can deploy Oracle SuperCluster rapidly, and grow the solution in multiple dimensions as needed. This approach can save considerable time and money over multi-vendor build-your-own approaches that require integration, interoperability testing, and complex support structures to achieve desired functionality or levels of performance.

SPARC SuperCluster T4-4

Baseline Finacle core banking solution performance testing described later in this paper was conducted on the full-rack version of SPARC SuperCluster T4-4 (Figure 2) which is composed of:

- Four SPARC T4-4 servers from Oracle for application and database processing
- Six Oracle Exadata Storage Servers for enhanced database performance and storage
- Two Oracle ZFS Storage Appliances for application file storage
- Two InfiniBand switches for a high-throughput, low-latency interconnect

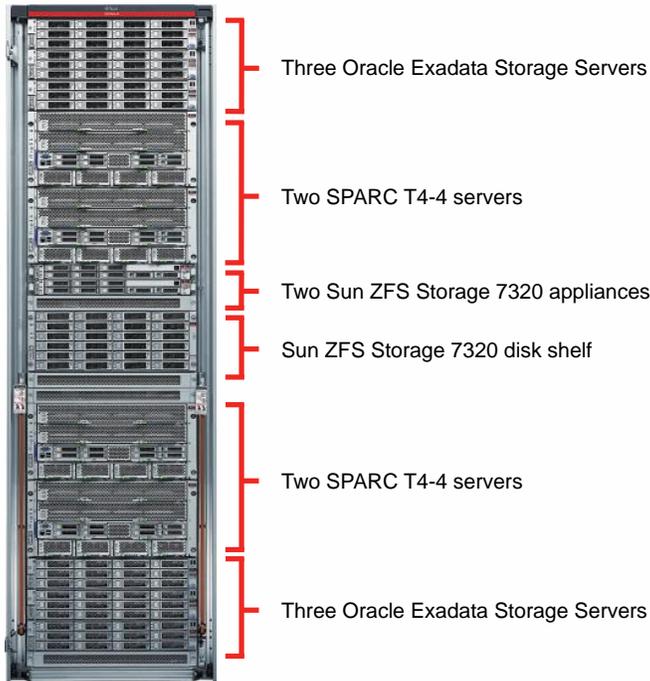


Figure 2. Full-rack SPARC SuperCluster T4-4 integrates compute, storage, I/O, and networking into a pre-configured and pre-tested Oracle engineered system.

The recently-available Oracle SuperCluster T5-8 platform is also an ideal platform for deploying and consolidating Finacle core banking solution, as described later in this document (please see Table 5 for a technical comparison between SPARC SuperCluster T4-4 and Oracle SuperCluster T5-8).

Oracle's SPARC T-Series Servers

For smaller Finacle core banking solution implementations, individual SPARC T-Series servers can provide an effective solution, allowing banks to start small and grow as their needs change.

SPARC T4-4 Servers

SPARC T4-4 servers were used in the Finacle core banking solution performance testing described later in this document. Based on Oracle's SPARC T4 processor, these scalable servers have delivered scalable performance and 20 world records for Java™ and database performance (Table 1).

TABLE 1. SPARC T4-4 AND ORACLE SOLARIS WORLD RECORDS

Oracle Fusion Middleware and Oracle applications	<ul style="list-style-type: none"> • #1 Oracle Fusion Middleware: SPECjEnterprise² • #1 Oracle E-Business Suite consolidation • #1 Oracle's PeopleSoft Human Resources / Self-Service • #1 Oracle's JD Edwards consolidation • #1 Oracle's Siebel Platform Sizing and Performance Program • #1 PeopleSoft Financial Management solutions • #1 Siebel Loyalty batch • #1 JD Edwards EnterpriseOne (interactive and batch) • #1 PeopleSoft Payroll batch • #1 Oracle E-Business Order to Cash • #1 SPECjvm²
Industry applications	<ul style="list-style-type: none"> • #1 Communications Activation • #1 Communications Service Broker • #1 Business Records Management • #1 Financial Modeling
Database and analytics	<ul style="list-style-type: none"> • #1 3-TB TPC-H four processor • #1 Oracle Database Security Transparent Data Encryption • #1 Oracle OLAP On-Line Analytical Processing • #1 Oracle Business Intelligence Enterprise Edition • #1 Oracle Essbase

Each SPARC T4-4 server features two or four sockets, each with an 8-core 3.0 GHz SPARC T4 processor, and up to 2 TB of RAM. Built-in no-cost virtualization with Oracle VM Server for SPARC lets each server support up to 128 virtual systems and thousands of Oracle Solaris Zones. Integrated on-chip cryptographic acceleration offers support for 16 industry standard security ciphers. Four hot swappable redundant (2+2) power supplies and 16 hot swappable PCI Express Module slots keep systems running around the clock.

Oracle's SPARC T5-8 Server

Oracle's next-generation SPARC T5-8 servers are also ideal for Finacle core banking solution deployments, expanding the number of users and transactions that can be supported, and redefining

² SPECjEnterprise and SPECjvm are registered trademarks of the Standard Performance Evaluation Corporation (SPEC)

consolidation opportunities. The SPARC T5-8 server is the world's fastest single server for Oracle Database. Optimized to accelerate enterprise applications, this high-end server delivers extreme performance and outstanding virtualization capabilities in a compact design. Multiplying available performance, these servers offer improved price/performance leadership, support for more cores and more sockets, and add significant advancements in power management.

Each SPARC T5-8 server features:

- Support for up to eight SPARC T5 processors (up to 128 compute cores), with low 1-hop latency
- Support for up to 4 TB of memory
- Double the throughput and 1.2 times the single-threaded throughput of previous-generation designs
- Enterprise-class reliability, availability, and serviceability
- Support for up to 16 hot-pluggable low-profile PCIe 3.0 slots

Finacle Core Banking Performance Testing

Banks need to run a mixture of workloads, including both on-line transaction processing (OLTP) and batch jobs. OLTP performance must keep pace with rapid and unpredictable growth, supporting fast response times to provide interactive performance with a large number of concurrent users and ad-hoc transactions. Batch performance must be sufficient to process significant numbers of records in available batch processing windows.

To help organizations evaluate potential systems for Finacle core banking solution, Finacle provides specially designed workloads and tests to exercise potential core banking infrastructure for both OLTP and batch activities. Finacle also specifies strict minimum acceptance criteria that help determine acceptable levels of system performance. Both OLTP and batch workloads were tested using the following configuration:

- 70 million Finacle SB accounts
- 2,200 branches
- 10.5 TB database size

Table 2 lists acceptance criteria for the Finacle OLTP testing, along with the software stack that was employed for testing on Oracle systems.

TABLE 2. FINACLE OLTP TEST CRITERIA AND SOFTWARE AS TESTED

Acceptance Criteria	
Finacle OLTP testing	<ul style="list-style-type: none"> Tens of thousands of concurrent users and several hundred transactions per second (TPS)
Software Stack as Tested	
Web tier	<ul style="list-style-type: none"> Oracle HTTP Server V11.1.1.6.0
Application tier	<ul style="list-style-type: none"> Oracle WebLogic Server v10.3.4
Database tier	<ul style="list-style-type: none"> Oracle Database 11g Release 2 (V11.2.0.3.0, 64-bitSPARC) Oracle RAC configuration
Operating system	<ul style="list-style-type: none"> Oracle Solaris 10 8/11, Oracle Solaris 11
Finacle core banking software	<ul style="list-style-type: none"> Finacle 10.2.10

Table 3 lists Finacle’s acceptance criteria for the batch workload testing, along with the software stack that was employed on Oracle systems for testing.

TABLE 3. FINACLE OLTP TEST CRITERIA AND SOFTWARE AS TESTED

Acceptance Criteria	
Finacle batch testing	<ul style="list-style-type: none"> Several million accounts and thousands of records per second in an hour-long batch window
Software Stack as Tested	
Database tier	<ul style="list-style-type: none"> Oracle Database 11g Release 2 (V11.2.0.3.0, 64-bitSPARC) Oracle RAC configuration
Operating system	<ul style="list-style-type: none"> Oracle Solaris 10 8/11, Oracle Solaris 11
Finacle core banking software	<ul style="list-style-type: none"> Finacle 10.2.10

Because banks come in many sizes, Oracle sought to characterize Finacle core banking solution performance across a range of Oracle infrastructure. For larger system scalability, Oracle engineers performed workload testing on a SPARC SuperCluster T4-4 engineered system. To characterize smaller system performance, engineers also tested individual SPARC T4-4 servers combined with Oracle’s Pillar Axiom 600 storage system. The tested configurations along with result summaries are provided in the sections that follow.

Finacle Workload Testing on SPARC SuperCluster T4-4

Oracle SuperCluster provides an ideal platform for Finacle core banking solution, offering pre-engineered and pre-tested, and pre-tuned components that offer a complete infrastructure solution.

Finacle OLTP Testing on SPARC SuperCluster T4-4

For testing, Finacle core banking solution configuration was deployed on a four-node SPARC SuperCluster T4-4. To understand performance and utilization characteristics as completely as possible, different components were deployed on the four nodes of the system, with each software component of Finacle core banking solution occupying its own node (Figure 3).

- *The client/generator layer* was comprised of load generators, a load controller, and a number of desktop and laptop systems.
- *The web server tier* was comprised of two SPARC T4-4 servers with the Oracle HTTP Server running on four processor cores and 256 GB of RAM on one server, and Oracle WebLogic Server running on eight processor cores and 256 GB RAM on a separate SPARC T4-4 server within SPARC SuperCluster T4-4.
- *The application server tier* consisted of the Finacle C application running on its own SPARC T4-4 server on 28 processor cores with 512 GB RAM.
- *The database server tier* consisted of Oracle RAC running on a SPARC T4-4 server with 32 processor cores and 1 TB of RAM, accessing Oracle Exadata Storage Servers.

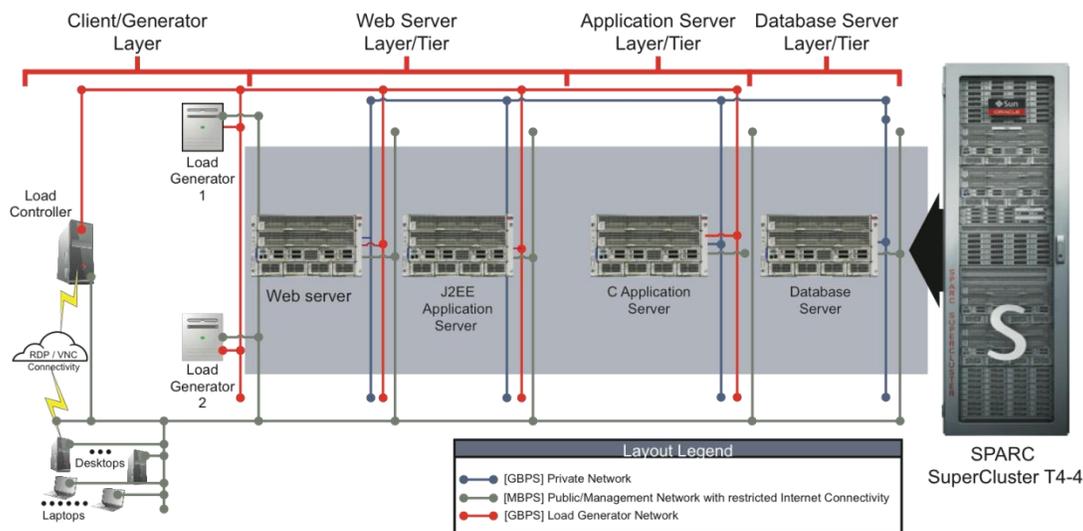


Figure 3. SPARC SuperCluster T4-4 configuration as tested for Finacle core banking solution OLTP testing.

Configured as shown, SPARC SuperCluster T4-4 easily surpassed both the required number of users as well as the number of transactions per second prescribed by Finacle, with a sub-second average transaction response time. Moreover, these results were accomplished utilizing only a small fraction of the CPU and memory resources of SPARC SuperCluster T4-4, including:

- 34.5% CPU and 5% RAM utilization at the Web tier
- 17.15% CPU and 24.5% RAM utilization at the J2EE tier
- 31% CPU and 31.5% RAM utilization at the C application tier
- 8.2% CPU and 40.5% RAM utilization at the Oracle Database tier

With these low utilization numbers, the web, J2EE, and C application tiers for this test workload could easily be consolidated using 24 of the available 32 cores on a four-socket SPARC T4-4 node within SPARC SuperCluster T4-4. Additionally, the Oracle Database tier could easily reside within only eight cores on each of two SPARC T4-4 nodes in an Oracle RAC configuration.

Finacle Batch Testing on SPARC SuperCluster T4-4

Finacle batch testing was also conducted on SPARC SuperCluster T4-4. In this case, three SPARC T4-4 nodes were configured as follows:

- *Two C application servers* were configured on SPARC T4-4 servers within SPARC SuperCluster T4-4, each using 16 cores and 512 GB RAM
- *Oracle RAC* ran on another SPARC T4-4 server configured with 32 cores and 1 TB of RAM, working with Oracle Exadata Storage Servers within the SPARC SuperCluster chassis (Figure 4).

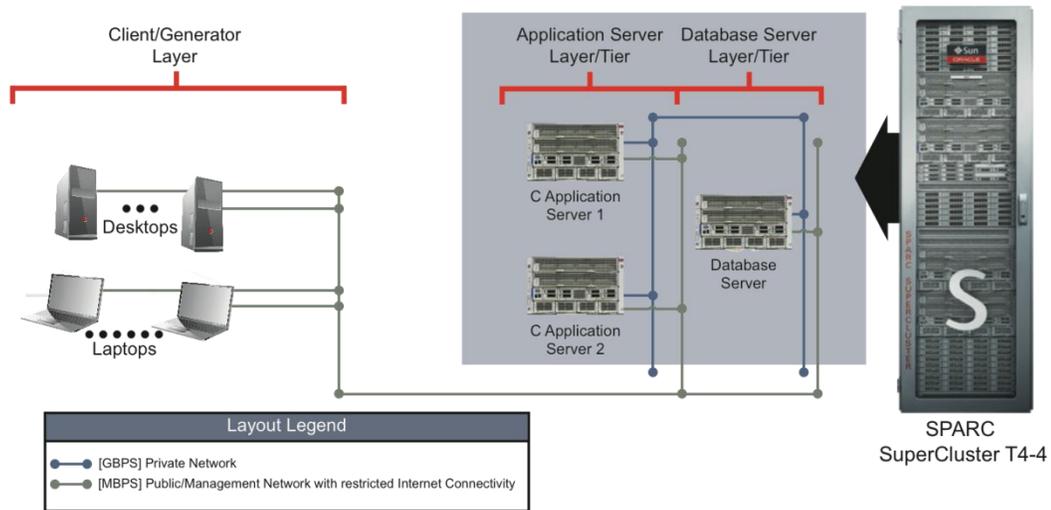


Figure 4. SPARC SuperCluster T4-4 as configured for Finacle core banking solution batch testing.

Like the OLTP workload testing, the system easily bested the acceptance criteria of several million accounts and thousands of records per second, with SPARC SuperCluster T4-4 supplying:

- *Interest booking (EOD)*: 3.6 times the required minimum performance in one third the time, with ~15% more accounts
- *Interest calculation (6 month)*: 15% more accounts processed, having met the RPS target

As with the OLTP workload testing, CPU and memory utilization remained modest, indicating that additional headroom exists on the systems, including:

- *Interest booking*. 82.5% CPU and 10% RAM utilization at the two C application tiers
- *Interest booking*. 27% CPU and 38% RAM utilization at the database tier
- *Interest calculation*. 92% CPU and 10% RAM utilization at the two C application tiers
- *Interest calculation*. 42.5% CPU and 38% RAM utilization at the database tier

These performance results and low utilization numbers demonstrate that both workloads could be independently supported on a half-rack (two-node) SPARC SuperCluster T4-4.

- The C application tiers could be deployed using 16 cores in each of the two SPARC T4-4 nodes.
- The Oracle Database tier could reside on 16 cores within each of the SPARC T4-4 nodes running Oracle RAC.

Finacle Workload Testing on the SPARC T4-4 Server

For smaller deployments, organizations can also consider deploying individual SPARC T4-4 servers for Finacle core banking solution. This approach allows banks to start small and grow capacity as their needs dictate. Oracle performed testing of SPARC T4-4 servers using Oracle's Pillar Axiom storage system to determine performance and utilization on both Finacle OLTP and batch workloads.

Finacle OLTP Testing on SPARC T4-4 Servers

To evaluate performance, the Finacle core banking solution configuration was deployed on Oracle's SPARC T4-Series servers as shown in Figure 5.

- *The client/generator layer* was comprised of load generators, a load controller, and a number of desktop and laptop systems.
- *The web server tier* was composed of a SPARC T4-1 server and a SPARC T4-4 server. Oracle HTTP Server ran on four cores of the SPARC T4-1 server while Oracle WebLogic Server ran on six cores on the SPARC T4-4 server.
- *The application server tier* consisted of the Finacle C application running on its own SPARC T4-4 server on 32 cores with 512 GB RAM.
- *The database server tier* consisted of Oracle RAC running on across two SPARC T4-1 servers, accessing Oracle's Pillar Axiom 600 storage system for database storage.

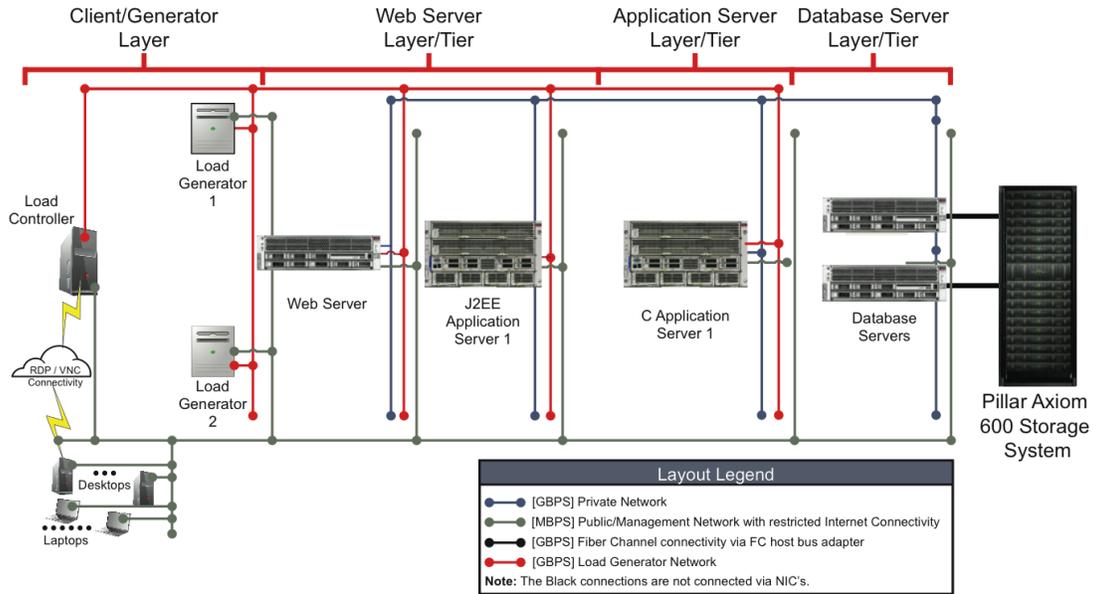


Figure 5. The SPARC T4-4 OLTP test configuration utilized a Pillar Axiom 600 storage system.

Configured as shown, the SPARC T4-4 server configuration easily surpassed both the required number of tens of thousands of users as well as the minimum hundreds of transactions per second prescribed by Finacle, accomplishing a sub-second average response time. As before, these results were accomplished utilizing only a small fraction of the CPU and memory resources of the servers under test, including:

- 26% CPU utilization at the C application tier
- 21% CPU utilization at the Oracle Database tier
- 19% CPU utilization at the J2EE tier
- 42% CPU utilization at the Web tier

The low CPU utilization at each tier indicates that all three tiers of the test workload (web, J2EE, and C application) could easily be consolidated onto a single four-socket SPARC T4-4 server, reducing both CapEx and OpEx over more complex multi-system configurations.

Finacle Batch Testing on SPARC T4-4 Servers

Finacle batch testing was also conducted on SPARC T4-4 servers. In this case, four SPARC T4 processor-based nodes were utilized (Figure 6) configured as follows:

- *Two C application servers* were configured on SPARC T4-4 servers, each using 16 cores and 512 GB of RAM.
- *Oracle RAC* ran across two SPARC T4-1 servers, each using eight cores and 128 GB of RAM, and accessing a Pillar Axiom 600 storage system.

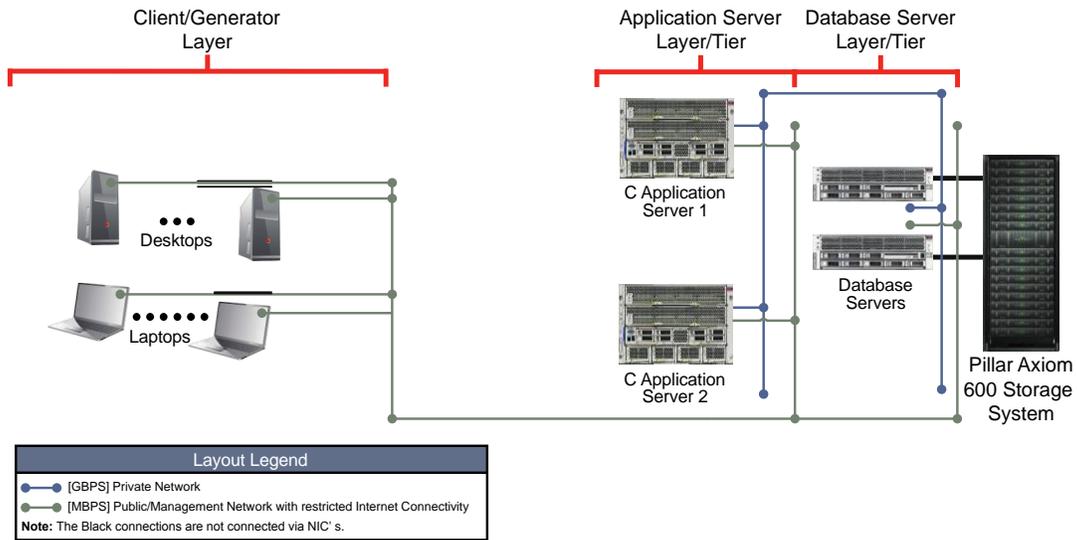


Figure 6. SPARC T4-4 server batch configuration as tested for Finacle core banking solution.

As with the OLTP workload, the SPARC T4-4 configuration easily surpassed the acceptance criteria of several million accounts and thousands of records per second within a one hour batch window, including:

- *Interest booking (EOD):* Higher performance by a factor of 3.2 times, with greater than 15% more accounts processed in roughly 1/3 the time
- *Interest calculation (6 month):* Exceeding the target number of accounts by greater than 15% in nearly the same batch window

As with the OLTP workload testing, system utilization remained modest.

- *Interest booking*. 68% CPU utilization at the C application tier (across two SPARC T4-4 servers)
- *Interest booking*. 53–58% CPU utilization at the database tier (Oracle RAC across two SPARC T4-1 servers)
- *Interest calculation*. 61% CPU utilization at the C application tier (across two SPARC T4-4 servers)
- *Interest calculation*. 75–81% CPU utilization at the database tier (Oracle RAC across two SPARC T4-1 servers)

These utilization results indicate that consolidation for similar workloads onto a pair of SPARC T4-4 servers is a very real possibility, with each Oracle RAC instance occupying eight cores of each SPARC T4-4 server for high availability.

Additional Scalability and Consolidation with Oracle SuperCluster T5-8 and SPARC T5-8 Server

Real-world banking requires infrastructure to gracefully serve multiple workloads as dictated by the needs of the business. Consolidation of both OLTP and batch workloads onto common IT infrastructure represents a compelling option, potentially resulting in both dramatic simplification, and more flexible utilization of IT resources. The Oracle SuperCluster engineered system framework with Oracle's no-cost virtualization technology makes consolidation of Finacle core banking solution workloads possible, allowing workload isolation and security along with agility and improved overall utilization.

Using the Finacle workloads run on SPARC SuperCluster T4-4 and SPARC T4-4 servers as an indicator of typical business loads, systems based on Oracle's SPARC T5 processor offer even more scalability and consolidation potential. The SPARC T5 processor supplies double the number of cores of the SPARC T4 processor, and the SPARC T5-8 server offers up to 2.5 times the price/performance of competitive systems along with larger memory capacity.

Oracle SuperCluster T5-8, in particular, offers a capable and scalable platform that potentially allows consolidation of both OLTP and batch processing for the Finacle core banking solution workloads. Oracle SuperCluster T5-8 is a completely pre-configured and tuned engineered system, integrating SPARC T5-8 servers, Oracle Exadata Storage Servers, Oracle ZFS Storage Appliance, and InfiniBand networking. The result is a platform that effectively provides over twice the performance and larger capacity in the same data center footprint. Table 5 illustrates the technical differences between SPARC SuperCluster T4-4 and Oracle SuperCluster T5-8.

TABLE 5. ORACLE SUPERCLUSTER COMPARISON

	SPARC SUPERCLUSTER T4-4		ORACLE SUPERCLUSTER T5-8	
	HALF RACK	FULL RACK	HALF RACK	FULL RACK
Compute nodes	2 SPARC T4-4 servers	4 SPARC T4-4 servers	2 SPARC T5-8 servers	2 SPARC T5-8 servers
SPARC processors	8 SPARC T4 processors	16 SPARC T4 processors	4 SPARC T5 processors	8 SPARC T5 processors
SPARC T3 processor cores	64	128	128	256
Memory	2 TB	4 TB	2 TB	4 TB
Oracle Exadata Storage Cells	Oracle Exadata Storage Server X3-2 <ul style="list-style-type: none"> • Memory: 64 GB • Smart Flash Cache: 1.6 TB • Capacity with high-performance drives: 3.25 TB • Capacity with high-performance drives: 16 TB 		Oracle Exadata Storage Server X3-2 <ul style="list-style-type: none"> • Memory: 64 GB • Smart Flash Cache: 1.6 TB • Capacity with high-performance drives: 3.25 TB • Capacity with high-performance drives: 16 TB 	
Oracle Exadata Storage Servers	3	6	4	8
Exadata storage capacity (high-performance drives)	9.75 TB	19.5 TB	13 TB	26 TB

Conclusion

Faced with incredible challenges and promising new opportunities, banks need flexible and agile solutions that solve their unique problems while providing high-performance infrastructure that scales with their needs. As demonstrated by the workload testing described herein, Finacle core banking solution running on Oracle SuperCluster and Oracle's SPARC T-Series servers provides a complete high-performance solution as well as the opportunity to consolidate infrastructure for considerable CapEx and OpEx savings. Engineered to reduce cost and risk in the enterprise, Oracle SuperCluster supplies strong Finacle 10 performance while providing top-to-bottom integration of the solution stack, ease of deployment, and on-going maintenance—letting banks focus on their customers and their most important strategic business priorities.

References

For more information, visit the web resources listed in Table 6.

TABLE 5. WEB RESOURCES FOR FURTHER INFORMATION

DESCRIPTION	WEB RESOURCE URL
Oracle SuperCluster	oracle.com/supercluster
Oracle's SPARC servers	oracle.com/us/products/servers-storage/servers/sparc/overview/index.html
Oracle virtualization technology	oracle.com/us/technologies/virtualization/oracle-vm-server-for-sparc/overview/index.html
Oracle Solaris	oracle.com/solaris
Oracle's Pillar Axiom Storage	oracle.com/us/products/servers-storage/storage/san/pillar/pillar-axiom-600/overview/index.html
Infosys Finale	infosys.com/finacle/Pages/index.aspx



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September 2013

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