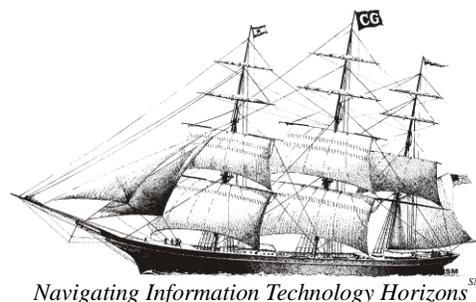


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Improving Your Data Center Through Integration — Oracle Delivers an Improved SuperCluster

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Management Summary

In a time of constantly tightening budgets, the typical homeowner is more likely to look into doing a project personally rather than paying someone else to do it for him. *Do It Yourself (DIY)* has become, for many, the watchword for home improvements. Do you want to remodel your basement into a “man cave”? You can go to Home Depot or Lowes and find manuals to assist you in your efforts. Do you want to build a deck? They have blueprints and ideas to get you started. You might classify these efforts as minor projects, things that fall within your realm of capabilities. But what about a major project, such as building an entire house? Would you ever attempt to do that, or even think about it? Working with architects, contractors, a variety of craftsmen and artisans, might be beyond the scope of your abilities. For this you might want to consult a real estate agent who can find you the finished product or work with a builder who knows what he is doing.

Doing it yourself, however, is exactly what many enterprise data center managers try to do, if they can find qualified staff, when it comes to deploying the typical and scalable business application with the reliability, availability, and serviceability required by senior management, while remaining within their budget. Because of the fear of the cost for an integrated solution, and the penalty for exceeding one’s budget, many an IT staff will be charged with the responsibility of finding the best platform, operating system, networking, storage, and application set, and then trying to put it together in a coherent fashion, despite the complexities inherent in a multi-product and usually multi-vendor architecture. Then, if they get that far, deploying it and then trying to maintain it becomes a big challenge, especially when an outage inevitably occurs – with six, or possibly more, separate vendors each pointing their finger at someone else. Then you may find out what DIY really costs in terms of down time and lost customers.

This is the problem that Oracle has addressed with its latest integrated effort, the *Oracle SuperCluster T5-8*. Oracle has established a goal to put together the fastest “engineered system” possible, complete with the fastest database and application server, fastest database server, connected over fast InfiniBand technology, and an operating environment carefully virtualized to support a highly-scalable solution. With the Oracle SuperClusterT5-8, Oracle believes that it has eliminated, or at least greatly reduced, the complexity of assembling, initializing, managing, and optimizing a robust platform for mission-critical work. To learn more about Oracle’s SuperCluster T5-8, please read on.

Controlling the Costs of an Enterprise Data Center

We have all heard the axiom, expressed by companies attempting to discredit it, that “Tape is dead.” This axiom has failed to pass the test of time, simply because not only has it stood that test, but its use has been simplified over the

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years (decades) to remove complexity from the deployment equation and thus has lowered the total cost of ownership (TCO) of the IT infrastructure. One axiom, however, that we can all believe in is that the more complex a solution, the more costly is that solution. With all things, if you can remove some of the complexity, you can simplify the solution and likely lower the TCO of deploying that solution. As a good rule of thumb, the more complex the solution, the greater the staff required to keep it operational.

What contributes to the complexity of an enterprise data center solution? What raises the TCO, destroying the data center budget? Many factors go into the calculation of the TCO and the list of items, assumptions, and methods of calculation may be different for every enterprise. First of all, the acquisition charges for a complex, multi-vendor architecture, and the software required to run it, tend to be significant, but usually they are only one-time charges, which tend to be followed (sooner or later) by annual maintenance charges. The operational costs of the facilities, including floor space and energy consumption, are ongoing charges, which are only going up. The more complex and expansive the solution, the more floor space it occupies and the more energy it consumes to drive the hardware and then cool the environment. Then there are the human charges – costs to implement and deploy a system that needs to be designed to respond to spikes in demand, and then to support and maintain it. People, your IT staff, are the critical factor to get new services up and running in order to keep up with critical enterprise requirements and changing business conditions. Here you have to factor in not only salaries but training and benefit costs as well. The increased staff that you have to hire to run the mission- and business-critical enterprise applications not only drains the IT infrastructure budget, but also increases the TCO.

Reliability and security are other factors that must be considered. Every hour, every minute of downtime might cost the enterprise millions of dollars in lost production and lost reputation. The system must remain operational. To do this, it is vital for the senior IT managers to invest in an integrated hardware and software solution that can simplify IT operations and reduce the drain on the enterprise IT budget. Reducing, and possibly eliminating, planned and unplanned outages should be a goal in

every deployment. In addition, enterprise data must remain secure, in an end-to-end operation, and protected from prying eyes with malicious intent.

The typical infrastructure stack involves deploying a complex, multi-vendor architecture. It is both expensive to acquire and deploy, and also to maintain. *What is the usual result of this activity?* It becomes a unique “one-off” configuration that cannot benefit from any economies of scale or integration. In fact, as the data center workload grows, it usually becomes (a) harder and harder to scale the infrastructure to meet the new demands and (b) more difficult to reach the performance goals and SLAs established by both senior management and the user community. A complex infrastructure also carries the potential burden of isolated (siloe) system resources, possibly creating an environment with inaccessible surplus capacities, which may make it wasteful, more vulnerable, and harder to keep operational.

Additionally, many larger enterprises, such as those involved in media and entertainment, are not looking to become systems integrators. Their business *is* media and entertainment. They want to acquire a reliable system that has both hardware and software pre-integrated to ensure fast, consistent operations at a reasonable cost, not just acquisition cost, but TCO!

The Oracle SuperCluster T5-8 is exactly that – a system that has been engineered for extreme performance, availability, operational efficiency, including deployment, data compression, and management efficiency, and security, in order to significantly speed up time-to-value when compared to a DIY architecture. Taking advantage of the best hardware that engineering could provide, Oracle released, in 2011, the *Oracle SuperCluster T4-4*. As with fine wines, time and advanced engineering makes most good things better. With the announcement of the *Oracle SPARC T5¹* in April 2013, Oracle has laid the groundwork for an even faster and more complete system for the most demanding enterprises.

With Oracle *Solaris* providing the operating environment, along with the *Oracle Sun ZFS Storage Appliance*, Oracle’s SuperCluster T5-8 is the ideal platform to achieve performance

¹ See **The Clipper Group Navigator** entitled *Resetting the Server Bar – Oracle Claims Database Performance Superiority* dated April 19, 2013, at <http://www.clipper.com/research/TCG2013006.pdf>.

Exhibit 1 — Oracle SuperCluster T5-8 Integration

- **Oracle Exalogic Elastic Cloud Software** – for the accelerated processing of *JAVA* and business applications.
- **Oracle Exadata Storage Server and Exadata Storage Server Software** – for accelerated database performance.
- **Oracle Enterprise Manager** – for a simple management and monitoring for the entire system.
- **Oracle Virtualization** – with no cost and zero overhead.
- **Oracle Solaris** – for unmatched scalability and rapid cloud provisioning.
- **Oracle SPARC Servers** – powered by the world’s fastest microprocessor with over 17 world record benchmarks.
- **Oracle Sun ZFS Storage Appliance** – for 10 times better storage efficiency via Hybrid Columnar Compression for general purpose seamless performance optimization.

Source: Oracle

advantages that the competition cannot match. This is even truer when Oracle applications and database are deployed, making this amalgamation a complete and integrated solution built on an “Oracle-on-Oracle” architecture. In doing so, the *Oracle SuperCluster T5-8*-based solution delivers the fastest servers, with extreme performance storage, and high-performance, low-latency networking via *InfiniBand*. This provides tightly coupled storage and the accelerated performance and high availability required for the consolidation of mission-critical databases applications and private cloud deployments, in a balanced architecture. For a complete list of the integrated components of the Oracle SuperCluster T5-8, see Exhibit 1, above.

Oracle SuperCluster T5-8

The SuperCluster T5-8 is the fastest engineered system ever manufactured by Oracle. Designed as a complete solution, with hardware and software² bound together, pre-tested, and integrated, it has the extreme performance intrinsic to the SPARC T5 processor. In fact, the Oracle SuperCluster T5-8 can be configured in a full rack with two nodes and up to 256 SPARC T5 cores and 4TB of memory. The Oracle SPARC T5 has twice the number of cores and threads as compared to the SPARC T4, with double the cache and 2.5 times the memory bandwidth. The Oracle SuperCluster T5-8 delivers response times 2.5 times that of the SuperCluster T4-4, with 33% greater storage capacity, three times the price/performance, while meeting all user

SLAs. In addition, with two 8-socket SPARC T5 processors, the SuperCluster T5-8 has no single-point-of-failure (SPOF), minimizing both planned and unplanned outages for 24x7 accessibility and five “9s” database and application availability, as reported by Oracle customers.

Oracle’s SuperCluster T5-8 also lowers the TCO of the IT infrastructure by enabling the consolidation of a myriad number of applications for efficient processing; not just Oracle applications, but for a heterogeneous mix of mission-critical applications from a wide variety of vendors. By reducing the number of servers required, the data center can (a) save significantly by reducing the administration and maintenance time being spent by the IT staff, and (b) by saving on both floor space and energy consumption, thus lowering the TCO of the IT infrastructure. In addition, with all of the components pre-tested at the factory, the system is up and running when it is installed, enabling the IT staff to implement new applications faster. It also enables the data center to deploy a secure, multi-tenant cloud, with automated provisioning of cloud services, faster than was possible before. With the Oracle SPARC T5 hardware-assisted encryption – the industry’s fastest Oracle-transparent data encryption – the SuperCluster delivers secure high-performance security for enterprise, web, middleware, and database applications.

The SuperCluster T5-8 utilizes all of the best engineering innovation that Oracle has put into *Oracle Exadata Storage Server* (with *Smart Cache Flash* for improved database response and throughput), *Oracle Exalogic* storage offerings (including *Elastic Cloud*

² This includes *Solaris* operating system, Oracle database, Oracle middleware, and core applications.

software capabilities to accelerate JAVA applications), and *Oracle Virtualization* (with zero overhead, via *Oracle VM Server for SPARC*). Each Exadata Storage Server is configured with either (12) 600GB high-performance disks or (12) 3TB high-capacity disks, and (4) 400GB Smart Cache Flash SSDs. This results in a dramatic decrease in application response time for consolidated and virtualized applications. This makes the Oracle SuperCluster T5-8 ideal for running mission-critical databases and applications, including consolidation and cloud processing.

Applications that can take advantage of the Oracle SuperCluster T5-8 capabilities include OLTP, batch, data warehousing, and analytics. In addition, by the use of unique *Hybrid Columnar Compression*, Oracle has lowered database storage requirements, improved data center efficiencies (with a ten-times database compression, resulting in a ten-times faster database execution), and created price/performance advantages over the competition.

The Oracle SuperCluster T5-8 has complete application-to-disk management with Oracle's *Enterprise Manager Ops Center12c*. This enables the IT staff to proactively monitor, manage, and troubleshoot the entire enterprise hardware and software environment. In addition, after investing thousands of hours in testing as a single integrated system to reduce risk and expedite updates, Oracle has enabled an integrated SuperCluster T5-8 with simplified maintenance and one-patch deployment for the entire system.

With *Oracle Platinum Services* provided by Oracle at no additional charge, the data center can rely upon a higher support level for the entire Oracle stack, including 24x7 remote fault monitoring. This enables the fastest response times for any detected fault and provides for patch deployment by Oracle engineers. This helps to reduce patch time by a factor of ten.

Oracle Integrated Solutions

Oracle SuperCluster T5-8 will run any application that is supported on *Oracle Solaris II* or *Solaris 10*. In addition, applications running on *Oracle Solaris 9* or *Solaris 8* can be deployed on a SuperCluster using *Oracle Solaris Legacy Containers* on Solaris 10. With an Oracle DBMS integrated into the SuperCluster T5-8, Oracle has provided the enterprise with a system designed for extreme

performance for all database and mission-critical applications. This includes third-party applications, such as those from SAS and SAP, in addition to Oracle's database and enterprise applications, including *Siebel*, *E-Business Suite*, *Peoplesoft*, and *JD Edwards*. This system is ideal for the consolidation of databases, applications, and private cloud onto a single, engineered system. Oracle has optimized the interaction among all of these applications with the standardized solution, in order to provide superior performance and significantly reduced cost/performance when compared to their competition.

Oracle has documented a myriad of Oracle SuperCluster T5-8 customers that have experienced a reduced TCO with up to 20 times consolidation of complex business systems³, up to four-times efficiency improvements, along with significantly reduced software licensing costs. The Oracle SuperCluster T5-8 is ideal for a multi-tenant cloud environment, SAP, heterogeneous databases and JAVA applications. One customer has documented a five-times performance improvement over its previous solution.

Conclusion

The Oracle SuperCluster T5-8 has been designed for extreme performance, integrated as a single system. With no single-point-of-failure, it provides the reliability that every enterprise demands for its mission- and business-critical applications. Through its unique and innovative compression capabilities, each system makes an ideal platform for optimized consolidation and virtualization, resulting in the highest efficiency possible, while maintaining the lowest-possible risk levels.

If your enterprise needs to remove complexity while reducing risks for its IT architecture and lower the TCO of its data center IT infrastructure in order to comply with budgetary and performance requirements, then you need to take a close look at Oracle's SuperCluster T5-8 for your integrated system database and application requirements.



³ As compared to competitive systems.

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