SunPlex™ Systems/Oracle9*i*™ Real Application Clusters

High Availability, Scalability, Ease of Manageability

Key Feature Highlights

- Increase Oracle9*i* RAC service levels with low cost of ownership
- A long-standing, winning relationship gives customers the benefits of superior, mature technology
- World-class availability, scalability, and manageability
- Wide choice in servers and storage support

Sun's application service management philosophy is that IT professionals should be able to focus on "managing the service, not the server." In other words, they should devote their time to delivering the high service levels and features that their customers require, while also reducing the associated costs and risks. The business relationship between Sun Microsystems and Oracle Corporation is key to making this philosophy a reality, and helps ensure that SunPlex™ systems and Oracle9*i* Real Application Clusters (RAC) deliver world-class availability, scalability, manageability, and ease of deployment.

SunPlex Systems take general-purpose clustering beyond the realm of high availability by adding the simplicity of single system manageability and the potential of seamless scalability. It provides a single, globally-coherent process and resource management view for the multiple nodes of a cluster. In essence, the cluster becomes a single managed entity, and presents itself and its services to clients as if it were an individual server.

A SunPlex system includes servers, storage, interconnects, public networks, Solaris (OE) software, Sun Cluster 3.0 software, and Sun Enterprise™ Services. Sun Cluster 3.0 is the software that enables SunPlex systems.

Additionally, the easy-to-use cluster agent development environment can dramatically reduce agent development time from weeks to days or hours, depending on the complexity of the application and the agent.

The Sun Cluster 3.0 framework extends the Solaris™ Operating Environment (OE), enabling core Solaris OE services—devices, file systems, and networks—to operate seamlessly across a SunPlex system while maintaining full Solaris OE compatibility with existing applications.

Sun Cluster 3.0 software provides high availability (HA) and scalability to everyday Solaris applications through continuous network and data availability. Services that are written to the easy-to-use Sun Cluster 3.0 API can achieve even higher levels of availability as well as scalability.

Oracle9*i* Real Application Clusters can deliver pay-as-you-grow scalability, with the highest levels of availability, for all your applications. Users can add servers to a cluster as their needs change—and each new server actually increases the fault tolerance of the complete clusters. Oracle9*i* RACs offer users:

- Virtually unlimited scalability
- Efficient use of each new server in a cluster
- Failover from a failed server in under 15 seconds

World-Class Availability, Scalability, and Manageability.

"The Sun clustered server architecture gives us all the flexibility we need. Frankly, we are delighted, and we intend to shift our platforms increasingly towards Sun. That says it all."

Oswald Schnappinger
Application Operations and Services Manager
Wacker Chemie GmbH

The availability of an application service depends on the ability of the application deployment environment to recover from a failure with minimum downtime and corruption of data. SunPlex systems software offers Oracle9*i* RAC customers world-class availability by helping to ensure the least possible downtime, integrity of cluster node membership, and data integrity in the event of a failure. In addition, Sun server, storage, and network connectivity products, the Solaris Operating Environment, and Sun support services work in tandem to augment the availability features of Sun Cluster 3.0 software. This helps ensure the highest possible uptime to application services.

Minimal Downtime

SunPlex systems software provides fast error detection, fast software switch-over, and parallelized application and infrastructure restarts. SunPlex systems also support Oracle9*i* RAC configurations using raw disks, which provide better availability over volume manager-based configurations. All features allow for maximum Oracle9*i* RAC uptime by reducing the time involved in detecting and recovering from a failure.

Integrity of Membership

SunPlex systems offer one of the most reliable cluster membership functions by integrating Cluster Membership Monitor functions into the Solaris OE kernel, allowing member heartbeats to be monitored in the kernel. This integration with the Solaris Operating Environment allows for faster failure detection and recovery, leading to integrity of cluster node-membership which, in turn, ensures that an errant node is fenced out of the cluster. This effectively prevents the errant node from manipulating shared data.

Data Integrity

Oracle9*i* RAC deployments depend on SunPlex systems for superior data integrity features such as quorum and disk fencing, which help ensure the integrity of Oracle9*i* RAC data in the event of failure.

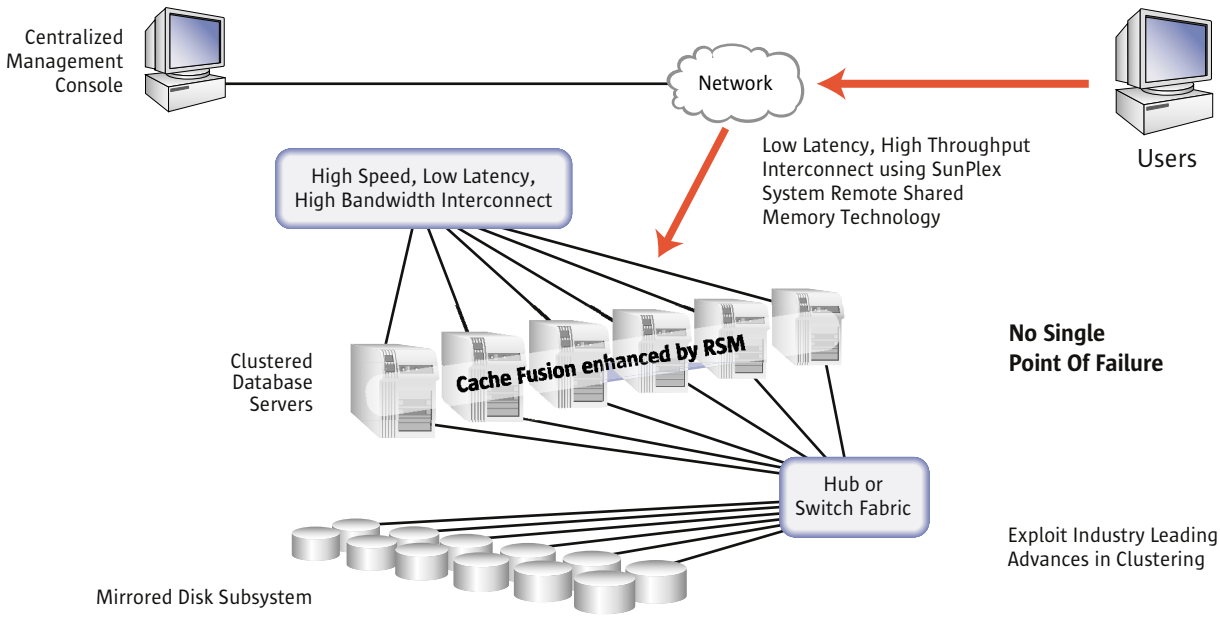
Disaster Recovery

If a catastrophic failure brings down an entire campus, SunPlex systems deploying Oracle9*i* RAC can recover data reliably through support for campus clusters that allow RAC nodes to be separated by several miles.

In addition, SunPlex Systems support various remote data replication products which allow data to be recovered across geographic distances.

Strength of Sun Technology

Sun offers a proven, scalable, and high-performing server family. Our products help customers create breakaway business strategies in the enterprise by providing innovative yet safe network computing solutions for the enterprise. The choice of Sun storage solutions offers an extremely low total cost of ownership (TCO) so customers can maximize the business gain for their investment. With our superior networking technology, Sun is able to provide world-class scalability in the SunPlex platform.



SunPlex Systems–Oracle9i RAC Architecture

Scalability

The scalability of a system is its ability to withstand additional load without compromising service levels. The combination of the easily scaled SunPlex system and the seamless horizontal scalability of Oracle9*i* RAC offers a platform that does just that.

Real World Scalability

SunPlex systems exceed a customer's real-world demands for scalability by providing 4-node support for Oracle9*i* RAC, allowing it to scale to up to 424 CPUs.

World-Class Interconnect Technology

Premier interconnect technology from Sun Microsystems is key to delivering massive scalability. SunPlex systems offer support for Remote Shared Memory technology (RSM), which enhances the performance of distributed applications by allowing for fast messaging between instances of a distributed application. RSM powers Oracle9*i* RAC release 2 to offer superior performance. RSM improves bandwidth and reduces latency manifold to allow a SunPlex/Oracle9*i* RAC deployment to deliver superior performance.

Scalable Services for Superior Availability

SunPlex systems support distributed applications via Scalable Services, which augment the scalability and availability of distributed applications by the automatic recovery of a failed instance of the application to offer consistent service levels.

Manageability

An easily manageable environment keeps IT costs low. IT environments deploying Oracle9*i* RAC in SunPlex systems benefit from the improvements to manageability that both Oracle and Sun have made to their respective solutions.

Easy Infrastructure Management

SunPlex systems incorporate system management tools, such as Sun Management Center software and SunPlex Manager, to create a centrally managed hardware and software environment that can provide easy administration and lower operating costs. Manageability is further enhanced with the SunPlex Resource Group Manager (RGM) feature, which provides a central point of control for cluster services. RGM software simplifies administration by managing each system's resources within a cluster context, so all cluster resources are efficiently managed and administered as if they were on a single system.

For More Information

To learn more about Sun Cluster 3.0 software and the SunPlex system, please visit our Web site at www.sun.com/clusters.

For more information about the Sun and Oracle Alliance, go to www.sun.com/oracle.

Centrally managed hardware and software.

Scalable Services For Easy Manageability

Scalable Services drive manageability costs down by easing the manageability of the end-to-end deployment. User applications and Oracle9*i* RAC are managed within the same SunPlex environment, reducing the complexity of the IT environment and easing its manageability.

Easy Agent Development

SunPlex systems offer an easy cluster agent development environment, dramatically reducing agent development time from weeks to days or hours, depending on the complexity of the application and the agent. The SunPlex Agent Builder generates agent code in Ksh or C with two simple clicks. The Builder also offers the Generic Agent functionality that generates precompiled agent binaries that require no code writing or modification. This easy agent development environment has built significant ISV enthusiasm for the SunPlex systems API. Customers like the choices of Agents for commonly used applications that are sold and supported by Sun.

Support For Security Hardening

A SunPlex system provides a secure environment for RAC deployments by supporting Security Hardening on all Sun-supported Sun Cluster 3.0 agents.

Ease of Deployment

The Clustered Database Platform 280/3 offers a packaged Oracle9*i* RAC-SunPlex System that can reduce the time to deployment by weeks, and maximize personnel productivity. The Clustered Database Platform 280/3 consists of a rack with preconfigured redundant Sun Fire 280R systems, mirrored StorEdge T3 arrays, and network components. It also includes Sun Cluster 3.0 software, and Oracle9*i* RAC preinstalled and pretested in the factory to make SunPlex-RAC deployments simple, safe and swift.

SunPlex System/Oracle9*i* RAC Configurations

A SunPlex system comprises two or more qualified servers (up to four nodes supported), storage products, system interconnects, and public networks running the Solaris 8 or Solaris 9 Operating Environment.

Supported Server Platforms

The following server platforms are supported for use with Oracle9*i* RAC. Additional systems are continuously being qualified.

- Netra™ t 1120/1125, t 1400/1405, T1 AC200/ DC200, and Netra 20 servers
- Sun Enterprise™ 220R, 250, 420R, 450, 3500, 4500, 5500, 6500, and 10000 servers
- Sun Fire™ 280R, V880, 3800, 4800/4810, 6800, 12K, and 15K servers

Supported Storage Products

The following storage products are supported. Additional systems are continuously being qualified.

- Sun StorEdge™ MultiPack, D1000, A3500 (SCSI/FC), A5000, A5100, A5200, T3, 3910/3960, 6910/6960, 9970/9980, 9910/ 9960, and S1 arrays
- Netra st D130 and st D1000 servers
- Sun StorEdge Network FC Switch-8 and Switch-16

Simpler.
Safer.
Swifter.

Sun Clustered Database Platform 280/3

Supported Third-Party Storage

- EMC Symmetrix Supported SAN Switches
- Brocade Silkworm 2400 and 2800

Supported Interconnects

The following SunPlex system interconnects are supported. Plans are in place for additional SunPlex system interconnects to be available in the future.

Sun-Supported Interconnects:

- On board 100 Mbits/sec port, Sun Quad FastEthernet™, Sun FastEthernet, and SunSwift™ adapters
- Sun Gigabit Ethernet adapter
- PCI-Scalable Coherent Interface (SCI) (The only interconnect that supports Remote Shared Memory)

NOTE: Up to six links of interconnects transferring data in parallel are supported in one SunPlex system.

Supported Public Networks

The following public networks are supported. Plans are in place for additional public networks to be available in the future.

- On board 100 Mbits/sec port, Sun Quad FastEthernet, Sun FastEthernet, and SunSwift adapters
- Sun Gigabit Ethernet adapter

Supported Volume Managers

- VERITAS Volume Manager (VxVM) with cluster functionality

Sun Cluster Software Coexistence

- Solaris 9 Resource Manager, Solaris Resource Manager 1.2

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