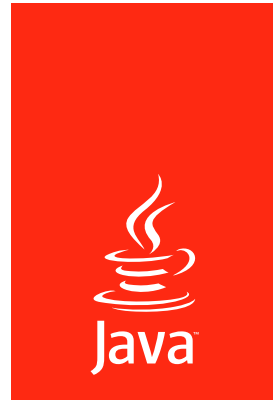


# Sun™ Cluster Software and Oracle Real Application Clusters (RAC)

High Availability, Scalability, and Ease of Manageability



## Key feature highlights

- New end-to-end Sun solutions for ease of manageability
- Support for Oracle Real Application Clusters (RAC) files on a shared file system with Sun StorEdge™ QFS software
- Support for Sun-only clustered volume management with Sun Cluster Oracle RAC SVM Edition, which combines Sun Cluster software with the Oracle RAC agent and Solaris Volume Manager software's cluster functionality — all in one affordable, easy-to-deploy package
- Increased Oracle9i and Oracle 10g RAC service levels with low cost of ownership
- World-class availability, scalability, and manageability
- Wide choice in servers and storage support
- Reduced costs and complexity by expanding choices in storage arrays and volume managers while enforcing mission-critical high quality at competitive prices
- Remote Shared Memory tuned for optimal Oracle RAC performance
- A long-standing, winning relationship gives customers the benefits of outstanding, mature technology, services, and support

Sun's application service management philosophy is simple: 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 enduring relationship between Sun Microsystems and Oracle Corporation is key in making this philosophy a reality. It helps ensure that Sun™ Cluster environments and Oracle Real Application Clusters (RAC) deliver world-class availability, scalability, manageability, and ease of deployment.

Sun Cluster software takes 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 in a cluster. In essence, the cluster becomes a single-managed entity, and presents itself and its services to clients just as if it were an individual server.

A Sun Cluster environment includes servers, storage, interconnects, public networks, the Solaris™ Operating System (OS), Sun Cluster 3 software, and Sun Enterprise™ Services. 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 framework extends the Solaris OS, enabling core Solaris OS services — devices, file systems, and networks — to operate seamlessly across a clustered environment while maintaining full Solaris OS compatibility with existing applications. It is designed to provide high availability (HA) and scalability to everyday Solaris OS applications through continuous network and data availability. Services

written to the easy-to-deploy Sun Cluster 3 software application programming interface (API) can achieve even higher levels of availability as well as scalability.

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. Sun Cluster software offers Oracle 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 servers, storage, and network connectivity products, the Solaris OS, and Sun support services work in tandem to augment the availability features of Sun Cluster 3 software. This helps to provide the highest possible uptime to application services.

## Sun Cluster software offers Oracle RAC customers world-class availability, scalability, and manageability.

### Oracle Uses Sun Cluster for Oracle IT

*“The combination of the Oracle RAC database and the Sun Cluster software has allowed us to deliver a highly available, consolidated system to run our global organization.”*

– Marwan Eways, VP Global Systems Architecture, Oracle Corporation

### Minimal Downtime

Sun Cluster software is designed to provide fast error detection, fast software switchover, and parallelized application and infrastructure restarts. Enhanced rolling upgrade functionality helps keep planned downtime low by enabling the cluster software to be upgraded to a new version without bringing the cluster down. Sun Cluster software also supports Oracle RAC configurations using raw disks, which offer better availability over volume manager-based configurations. All features allow for maximum Oracle RAC uptime by reducing the time involved in detecting and recovering from a failure.

### Integrity of Membership

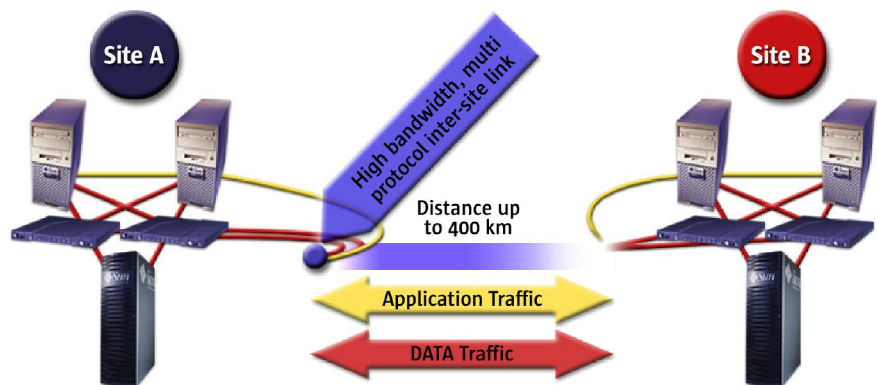
Sun Cluster software offers one of the most reliable cluster membership functions among clustering technology by integrating cluster membership monitoring functions into the Solaris OS. The integration allows for faster failure detection and recovery, leading to higher integrity of cluster node membership. This helps ensure that an errant node is fenced out of the cluster and effectively prevents it from manipulating shared data.

### Data Integrity

Oracle RAC deployments depend on Sun Cluster software for data integrity features, such as quorum and disk fencing, which protect the integrity of Oracle RAC data in the event of failure.

### Disaster Recovery

Using Sun's Infrastructure Solution for Enterprise Continuity, Sun Cluster software nodes can be separated by up to 400 km by leveraging dense wave division multiplexing (DWDM) optical technology to provide application service continuity in the event of a catastrophic failure. Applications can be deployed in failover, active-passive, or active-active configurations within the Enterprise Continuity solution.



Campus Clusters that use standard Fibre Channel technology are also supported in the environment, allowing for disaster recovery across a distance of up to 10 km.

**Strength of Sun Technology**

Sun offers a proven, scalable, and high-performing server family. Sun’s products help customers create breakaway business strategies in the enterprise by providing innovative yet safe network computing solutions. The choice of Sun server and storage solutions with integrated Solaris Volume Manager for Sun Cluster software offers an extremely low total cost of ownership (TCO) to help maximize the business gain on investment. In addition, support for Oracle RAC with Sun StorEdge™ QFS software provides the ability to manipulate RAC files on a shared file system. Finally, with innovative networking technology, Sun can provide excellent scalability for today’s demanding clustered environments.

**Wide Choice of Configurations**

Sun’s Open Storage Program ([sun.com/clusters/osp](http://sun.com/clusters/osp)) provides customers with an expanded choice of third-party storage arrays, including NAS devices, that are supported with Sun Cluster software. In addition to seamless interoperability, certified and tested configurations are cooperatively supported by Sun and the associated storage vendor. Sun also offers three new Sun Cluster and Oracle RAC solutions:

- Sun Cluster and Oracle RAC With a Shared File System — A Sun-only solution providing the ease of a shared file system with no significant drop in performance. This solution requires the use of Sun StorEdge QFS software.
- Sun Cluster and Oracle RAC With Clustered Volume Management — A Sun-only clustered volume management solution for the highest raw performance. This solution requires the purchase of the Sun Cluster Oracle RAC SVM Edition.

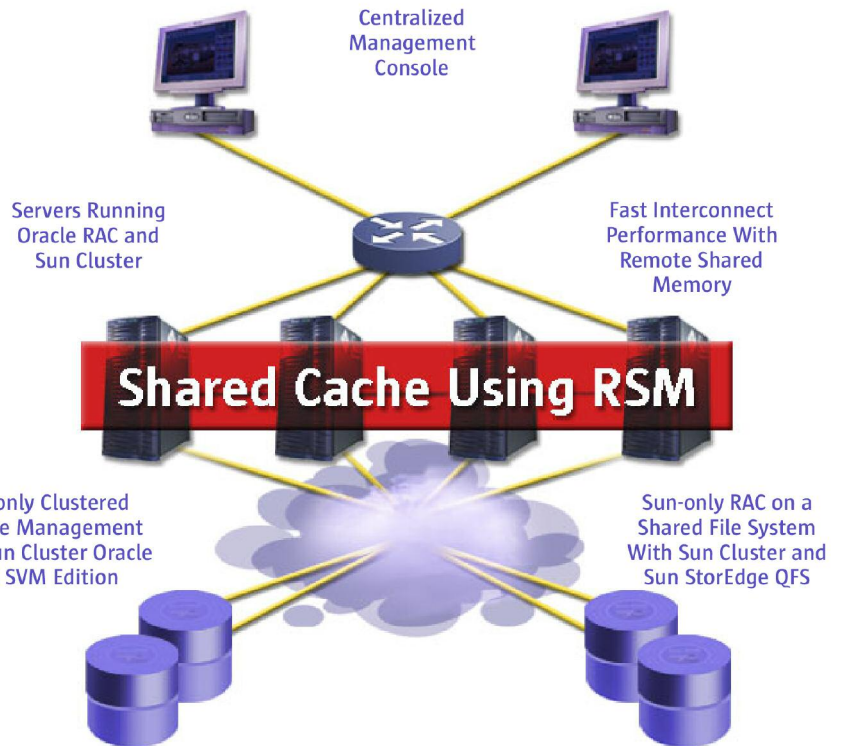
- Sun Cluster and Basic RAC — A no-frills RAC solution for customers who do not want to use shared file systems or want to use non-Sun volume managers.

**Integrated Solutions**

Sun Cluster software integrates with Solaris Volume Manager for Sun Cluster to manage clustered disk sets for Oracle RAC on SPARC® platforms. By deploying a total Sun solution, including clustering, a shared file system using Sun StorEdge QFS software, and support for clustered disk sets in Solaris Volume Manager, customers can improve availability and data integrity as well as lower both licensing and administrative costs.

**Scalability**

The scalability of a system is its ability to withstand additional load without compromising service levels. Combined, the easily scaled Sun Cluster software and seamless horizontal scalability of Oracle RAC offer just that.



**Real-World Scalability**

Sun Cluster software exceeds customers’ real-world demands for scalability by providing eight-node support for Oracle RAC.

**World-Class Interconnect Technology**

Sun Cluster 3 software includes Remote Shared Memory (RSM) technology, offering improved service levels for distributed applications running in the Sun Cluster environment. The RSM API enables application developers to bypass the TCP/IP stack and access high-speed, high-bandwidth, and low-latency interconnect hardware directly for fast messaging in the Sun Cluster environment. RSM works on the Scalable Coherent Interconnect (SCI-PCI) from Sun and is tuned for optimal performance of Oracle RAC.

**Scalable Services for Outstanding Availability**

Sun Cluster software supports distributed applications via scalable services, augmenting the scalability and availability by automatically recovering a failed instance of an application to provide consistent service levels.

# Sun Cluster Software and Oracle Real Application Clusters (RAC)

## Manageability

An easily manageable environment keeps IT costs low. IT environments deploying Oracle RAC with Sun Cluster software benefit from the improvements to manageability with support for RAC files (including data files) on the shared file system functionality of Sun StorEdge QFS software.

In addition, Sun Cluster software includes Oracle RAC Runtime Management, which simplifies the management of Oracle RAC in a clustered environment. It provides administrators with the ability to configure runtime parameters associated with the RAC framework, obtain the status of RAC components, and automatically start up Oracle RAC database instances and listeners.

## Easy Infrastructure Management

Sun Cluster software incorporates system management tools such as Sun Management Center software and SunPlex™ Manager to create a centrally managed hardware and software environment for easy administration and lower costs. Manageability is further enhanced with the SunPlex Resource Group Manager (RGM) feature, providing a central point of control for cluster services. With RGM, all cluster resources are efficiently managed and administered just as if they were on a single system.

## Single Point of HA Manageability

Sun Cluster software provides a single point of manageability for HA environments, enabling high availability for the entire Oracle deployment — including the database, application server, applications, and Web servers — with availability agents for Oracle RAC, OPS, E-Business Suite, Database, and Oraclegi Application Server, including the Oracle Directory Monitor (OIDMON), Oracle Directory Process (LDAP), Oracle HTTP Server (via OPMN) and the Enterprise Manager (EM).

## Easy Agent Development

Sun and many ISVs provide a number of ready-to-deploy agents. Alternatively, developers can use the Sun Cluster API or SunPlex Agent Builder to cluster-enable applications to run as a scalable or failover service. The Agent Builder tool enables developers to create an agent with two simple clicks. The tool generates source code for an agent that can be further enhanced if required, or produces a precompiled binary that can be installed without any need for coding.

## Higher Security

The Solaris OS continues to surge ahead of the competition with its rock-solid reliability and security. In addition, an Oracle RAC cluster can be further secured with the Solaris Security Toolkit — a toolkit designed to simplify and automate the process of hardening the security of Solaris systems based on proven security best practices and practical customer site experience.

## Ease of Deployment

A clustered Oracle RAC solution can be delivered through the Customer Ready Systems (CRS) program. With CRS, all of the components of the solution are installed, configured, and tested in the factory before arriving at the customer's site. This enables customers to deploy highly available Oracle RAC services more simply, safely, and swiftly.

## Sun Cluster Software and Oracle RAC Configurations

A Sun Cluster environment consists of two or more qualified servers (up to eight nodes), storage products, system interconnects, and public networks running the Solaris 9 Operating System for x86 platforms or the Solaris 9 or 8 Operating System for SPARC platforms.

### Learn More

Get the inside story on the trends and technologies shaping the future of computing by signing up for the Sun Inner Circle program. You'll receive a monthly newsletter packed with information, plus access to a wealth of resources. Register today at [sun.com/joinic](http://sun.com/joinic).

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