

Sun Java™ Availability Suite

Premier HA and Disaster Recovery Solution



Highlights

- Delivers high availability to Solaris™ (SPARC® and x64-based platforms)
- Room, campus-level, and geographic clustering options
- Advanced technology offerings for Oracle® deployments
- Industry's largest portfolio of agents (50+) for applications
- Simple \$50 USD/employee/year pricing subscription model, in addition to perpetual license model
- Part of Solaris Enterprise System



Executives and IT managers recognize that downtime is costly, whether planned or unplanned. Disruption to data systems can result in lost revenue and productivity, poor customer satisfaction, and regulatory fines. In addition, regulatory requirements such as Sarbanes-Oxley, the Health Insurance Portability and Accountability Act of 1996 (HIPAA), and Basel 2 require organizations worldwide to ensure auditable access to information in order to maintain compliance, even during business disruption. With an effective disaster recovery plan, companies in virtually any industry can position themselves as reliable partners or vendors.

For all these reasons, the use of high availability (HA) — and increasingly, disaster recovery — to protect services from unexpected events is considered mandatory for most enterprises and organizations. However, as with any IT requirement, the cost of a HA or disaster recovery solution should not outweigh its inherent value to the business.

To keep application services available around the clock and around the globe, the Sun Java™ Availability Suite now offers the industry's premier HA and disaster recovery solution — delivering the predictability, resilience, and disaster recovery that enterprises need to stay in business after virtually any kind of infrastructure failure — at affordable prices.

Sun Java™ Availability Suite

The Java Availability Suite is an integrated platform that delivers best-in-class HA to business services, keeping global enterprises running 24x7 during planned maintenance, failures, or disasters. The tested and proven platform runs on the Solaris™ 10 Operating System (OS) for both SPARC® and x64 architectures, and supports the largest portfolio of applications in the industry. It also includes simple cluster agent builder tools to provide HA to custom applications.

The Java Availability Suite provides various levels of availability to suit the evolving needs of every data center in any industry — from affordable, basic single-node application restart, to simple two-node fail-over, to a more sophisticated disaster tolerance solution spanning unlimited distances.

The Java Availability Suite consists of four components:

- Sun™ Cluster software — Provides application and service failover to help ensure high availability for mission-critical services running across up to 16 nodes.
- Sun Cluster Geographic Edition software — Delivers multisite disaster tolerance, connecting clusters across unlimited distances.
- Sun Cluster Agents — Manage the availability of applications. The Java Availability Suite offers the largest number of prebuilt agents for industry applications, as well as a toolkit to build agents for custom applications.
- Developer Tools — The Java Availability Suite contains the developer tools within the Sun Java Studio Enterprise, Sun Studio, and Sun Java Studio Creator.

Leveraging the predictable Java Enterprise System subscription and regular release model, virtually continuous application availability can be achieved with tighter integration and reduced risk for \$50 USD per employee per year.

Key components of the Java Availability Suite

Sun Cluster software

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. In essence, the cluster becomes a single managed entity, presenting itself and its services to clients as if they were a single system.

The Sun Cluster framework extends the Solaris OS, enabling core Solaris services — devices, file systems, and networks — to operate seamlessly across a cluster, while still maintaining full Solaris OS compatibility with existing applications. Sun Cluster software provides HA and scalability to everyday Solaris applications through continuous network and data availability.

Applications with Sun Cluster Agents can achieve even higher levels of availability with automatic fault detection and application recovery, as well as enhanced scalability. This allows multiple instances of the application to run within control of the cluster.

Sun Cluster software helps limit application service outages by monitoring hardware and software in a cluster of up to 16 nodes. When a failure occurs, the applications are restarted on the same node or another node in the cluster.

Failover services

The Sun Cluster architecture delivers inherent HA services. It enables IT organizations to maintain service levels on critical applications and services. Failover services provide HA to single-instance applications by failing over the application to a backup node in the event of a failure.

Global network services

In the Sun Cluster architecture, incoming requests from the network are routed to a network interface card (NIC) that hosts the global Internet Protocol (IP) address. The requests are then load balanced to the various instances of the cluster-controlled, distributed application. Packets exit the network through the local interface card to prevent saturation of the global interface.

Scalable services

The Sun Cluster software allows a single application or service to run across multiple domains or systems within cluster control, providing ease of manageability as well as automatic rebalancing of service levels. By adding more domains or systems to the cluster, capacity and continuity can be increased. This enables IT operators to load balance across multiple servers to achieve greater response time and throughput without sacrificing availability.

Very fast recovery from failure

Sun Cluster software is integrated into the Solaris OS kernel, enabling fast error detection, fast software switchover, and parallelized application and infrastructure restarts. When a failover occurs, the failed instance of the application is automatically restarted on the same node if the node is healthy, and on a backup node if it is not. After the failover is complete, the physical server from which clients of the application obtain service and data is transparent.

Centralized management

Sun Cluster software includes the Sun Cluster Manager to centrally manage and administer a cluster. This centrally managed environment delivers ease of administration and lower operating costs.

The Sun Cluster module in Sun Management Center also enables a third-party, Simple Network Management Protocol (SNMP) agent to collect configuration and state information about Sun Cluster software, providing the added flexibility of managing Sun Cluster configurations via third-party management tools.

Other key features include I/O fencing, application traffic striping, and integration with storage subsystems.

New features in Sun Cluster software

- *Solaris 10 OS support* — Applications running on Solaris 10 can run under Sun Cluster software control, enabling users to benefit from Solaris 10 OS features, such as improved performance and dynamic tracing.
- *Solaris Containers coexistence* — Sun Cluster HA for Solaris Containers enables Sun Cluster to boot, halt, monitor, and failover containers between Sun Cluster nodes, as well as start, stop, and probe applications within containers via user-written Solaris Service Management Facility (SMF) scripts. The Sun Cluster software and unmodified Sun Cluster agents run in the Solaris global zone, while applications with SMF scripts can run in nonglobal zones.
- *Network Appliance Network Attached Storage (NAS) support* — Eliminates the requirement that quorum devices be based on the Small Computer System Interface (SCSI) or Fibre Channel (FC) interface. Any Network Appliance NAS device may be deployed as a quorum device. This support includes failure fencing with Oracle Real Application Clusters (RAC) and all Sun Cluster enabled applications except HA-NFS. Additionally, there are no restrictions on cluster size.

- *Shared interconnect with Virtual Local Area Network (VLAN)* — Enables sharing of physical network interfaces between private and public networks without jeopardizing the network infrastructure's redundancy. Sharing network interfaces can decrease deployment costs by enabling low-end hardware platforms to participate in a cluster.
- *Automatic quorum discovery* — Automatically discovers and configures quorum devices during installation, allowing faster, easier, and less error-prone configuration.
- *Sun Trunking support* — Enables the use of Sun Trunking software, which aggregates multiple Ethernet ports into a single virtual link or trunk, for the public network in a Sun Cluster environment. Once aggregated, these point-to-point links act as a single pipe to provide increased bandwidth and higher availability than single adapter card links.
- *Eight node support with Sun Cluster Advanced Edition for Oracle RAC* — Provides increased manageability for Oracle RAC deployments on the Java Availability Suite for both SPARC and x64 platforms. This product leverages industry-leading Sun Cluster software to deliver best-in-class high availability, manageability, and performance for Oracle RAC customers in enterprise and database grid markets. This end-to-end Sun stack comprising StorEdge™ QFS software, Sun Cluster RAC agent, and Solaris Volume Manager extensions makes it easier than ever to manage Oracle 10g RAC databases.
- *Jumbo frames support* — Provides support for jumbo frames (Ethernet packet size up to nine kilobytes or KB) both on the public network and private interconnect for a Sun Cluster configuration. This capability can improve performance for applications using bulk data transfers, such as NFS and Oracle RAC.
- *Solaris x64 support* — Full support for AMD x64 processor-based systems running the Solaris 10 OS, enabling enterprises to utilize high-performance/low-cost servers in Sun Cluster configurations.
- *Infiniband support* — Enables Sun Cluster configurations to use Infiniband, a high-bandwidth/low-latency, switched-fabric networking solution for the private interconnect, improving performance of Sun Cluster software (particularly Oracle RAC).

Sun Cluster Geographic Edition Software

Sun Cluster Geographic Edition software enables a multisite disaster recovery solution that manages the availability of application services and data across geographically dispersed Sun Cluster systems. In the event that a primary Sun Cluster becomes unavailable, Sun Cluster Geographic Edition software enables IT operators to start up the business services with replicated data on the secondary Sun Cluster.

Sun Cluster Geographic Edition software is designed for enterprise business services requiring a disaster recovery solution to survive disasters that can produce wide-area outage, failure, or destruction. Sun Cluster Geographic Edition is also targeted at enterprise customers who need their data and applications to follow the sun, enabling round-the-clock, 24x7 operations in support of their global customers.

Sun Cluster Geographic Edition software provides the following features:

Unlimited distance

Two cluster sites can be separated by any distance. This capability enables enterprises to adequately separate two cluster sites to help ensure that both sites are not afflicted by the same disaster.

For example, if a company had implemented primary and secondary sites in New York City and Boston, both sites would have been down during the United States' East Coast power failure of 2003. This feature enables enterprises to separate data centers into areas that are unlikely to be affected by similar disasters, such as power grid failures.

N+1 multisite support

To provide a cost-effective disaster recovery solution for enterprises with multiple primary sites, Sun Cluster Geographic Edition software differentiates itself from other solutions by supporting multiple geographically dispersed sites. For example, with this extremely flexible N+1 capability, one backup (secondary) site can form multiple pairs with multiple primary sites — with the added benefit of improved disaster tolerance for multiple sites.

Cluster pair configuration

A cluster pair can be configured as active-active or active-standby. In active-active, a pair of sites can function both as a primary site and as a secondary site to each other. With active-standby, one site is the active primary site, while the other is a passive secondary site in standby mode. These two methods provide a flexible, cost-effective disaster recovery solution, enabling enterprises to fully utilize both Sun Clusters or simply put the secondary Sun Cluster on standby.

Data replication

Data replication enables the Sun Cluster Geographic Edition software to mirror data from one site to another through a Transmission Control Protocol/Internet Protocol (TCP/IP) or Fibre Channel connection. Sun Cluster Geographic Edition software supports both host- and storage-based data replication technologies, offering IT managers the choice to implement the data replication technology that best suits their needs. Sun StorEdge Availability Suite 3.2.1 can be utilized to

implement host-based data replication that is agnostic of underlying storage, while Sun StorEdge TrueCopy software can be used for storage-based replication on Sun StorEdge 99x0 (high-end storage subsystem-based replication) systems. In addition, Sun Cluster Geographic Edition software employs configurable Secure Internet Protocol (IPSec) for secure data replication over IP.

Managed takeover

In the event of a large-scale outage, such as a power failure or other disaster, the managed takeover feature enables IT operators to initiate disaster recovery by starting cluster-controlled application services — with associated replicated data — at the secondary site with one easy-to-use click command in Sun Cluster Manager.

Managed switchover

A similar feature, managed switchover, enables IT operators to execute a planned migration of application services, along with replicated data, to a secondary site even in the absence of a failure. This one-click command enables planned events such as maintenance and 24x7 work around the globe by switching services to another site temporarily and transparently to users.

Single-node secondary site

To provide a cost-effective disaster recovery solution, a single node can be used at the secondary site, as opposed to matching the number of nodes at the primary site.

Global heartbeat monitoring

A partnership establishes heartbeat monitoring between two cluster sites that run the Sun Cluster Geographic Edition software. Clusters

in a partnership exchange secure heartbeats over Secure Socket Layer (SSL) and IPsec to continuously monitor each other's presence and health. A single cluster can participate in more than one partnership with other clusters to enable N+1 sites. This feature allows IT operators to keep track of cluster health status at all sites.

Global resource manager

The global resource manager maps application resources with replicated data, and manages each of these protection groups as a unit between two geographically dispersed Sun Cluster sites. This helps ensure that in a takeover or switchover, application services running on clusters with multiple applications use the correct replicated data.

Notifications

Sun Cluster Geographic Edition software notifies IT operators when the cluster heartbeat at the primary or secondary sites times out or makes a recovery. The software can be configured to notify via a status flag in Sun Cluster Manager, send e-mail, or execute scripts. And the heartbeat time-out period can be set to a value that best meets the workload and distance between two sites.

Custom heartbeat

Sun Cluster Geographic Edition software also offers flexibility and choice by allowing customized plug-ins to provide a heartbeat mechanism using other protocols, such as e-mail or HTTP, across a wide range of physical media (satellite, microwave link, and so on).

Automated DNS update

In the event of a takeover or switchover, Sun Cluster Geographic Edition software automatically switches the Domain Name System (DNS)

to the secondary site. With automated DNS update, clients experience minimal disruption because they continue to connect to the same Uniform Resource Locator (URL) for application services.

Single point of management

The Sun Cluster Manager is also employed to manage the Sun Cluster Geographic Edition environment, enabling IT operators to configure, control, and monitor cluster pairs, resource groups, and heartbeats, as well as manage Sun Clusters at each site. It supports scripting via a command line interface (CLI) and SSL for secure heartbeat and cluster communication. For higher security, Sun Cluster Geographic Edition software uses Role-based Access Control (RBAC) rights to control end-user access to cluster operations.

Application portfolio

Sun Cluster Geographic Edition supports a wide range of more than 50 industry-leading applications from Oracle, SAP, Sun, Sybase and others, which are also supported by Sun Cluster software.

Sun Cluster agents

Sun Cluster software offers a comprehensive portfolio of applications supported through agents from Sun. An agent starts, stops, and monitors the application's health, and takes corrective action to regain application availability upon failure. Applications need not be modified to benefit from the enhanced availability offered by the Sun Cluster agent.

Sun and third-party software vendors have created a large number of prebuilt agents for popular applications such as Oracle, Siebel, SAP, Sybase, Sun middleware, and many more.

Sun Cluster Advanced Edition for Oracle RAC

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. The new Sun Cluster Advanced Edition for Oracle RAC is an end-to-end Sun stack comprising StorEdge QFS software, Sun Cluster RAC agents, and Solaris Volume Manager extensions. This makes it easier than ever to manage Oracle 10g RAC databases. All features in the Oracle RAC agent allow for maximum Oracle RAC uptime by reducing how long it takes to detect and recover from a failure.

In addition, Sun Cluster software includes Remote Shared Memory (RSM) technology for fast messaging in a Sun Cluster environment, which is tuned for optimal performance of Oracle RAC.

Developer tools

Sun Cluster agent toolkit

Sun and many independent software vendors (ISVs) provide a number of ready-to-deploy agents. Alternatively, developers can use the Sun Cluster API or Sun Cluster Agent Builder to cluster-enable applications to run as scalable or fail-over services. The Agent Builder tool allows developers to create an agent with a few 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. The Java Availability Suite also includes award-winning developer tools contained within Java Studio Enterprise, Sun Studio, and Java Studio Creator.

Sun Java Studio Enterprise

Java Studio Enterprise is a complete enterprise development platform that provides rapid modeling architecture and design capabilities, focuses on performance interpretation and tuning of applications, and facilitates global developer team collaboration. It provides a flexible, powerful develop-debug-test-deploy solution for anything from simple Web applications, to portlet components of Web portals, to sophisticated enterprise applications and Web services.

Sun Java Studio Creator

Java Studio Creator is the premier 100% Pure Java™, standards-based visual solution designed to meet the needs of skilled developers whose primary concern is rapid development of business-critical Web applications. Based on the award-winning NetBeans™ IDE, Java Studio Creator provides a variety of mature features to simplify and speed coding. It enables developers throughout an organization to easily develop applications based on reliable, widely deployed Java technology standards, such as the Java 2 Platform, Enterprise Edition (J2EE™). Combined with a Sun Developer Network subscription, Java Studio Creator provides a complete learn/ develop/deploy solution for Web-based applications.

Sun Studio

Sun Studio 10 software is Sun's latest developer tool suite for C, C++, and Fortran application development. Sun Studio provides developers with a comprehensive, integrated suite of tools for the development, debugging, tuning, and deployment of enterprise applications on Sun platforms, including both SPARC and AMD Opteron™, running the Solaris OS.

Sun Cluster Open Storage Program

In order to meet stringent demands for high availability in a heterogeneous data infrastructure, Sun establishes a direct relationship with industry storage vendors through the Sun Cluster Open Storage Program.

The Program provides an expanded choice of industry storage arrays that are interoperable with Sun Cluster software. This enables Sun and storage vendors to certify joint solutions with Sun Cluster software and the Sun I/O stack for highly-available, mission-critical applications.

Sun Cluster software services

One of the primary causes of system failure during the early stages of the product life cycle is improper installation and configuration. Sun's trained engineers can install and set up Sun Cluster and Sun Cluster Geographic Edition software correctly and quickly, with a final deliverable of cluster reference documentation. This enables IT staff to stay focused on business-critical tasks.

In addition, a business continuity workshop and the SunReady™ Availability Assessment are available to help IT managers determine how best to deploy a disaster recovery solution utilizing Sun Java Availability Suite software.

Conclusion

Today's businesses depend on IT. Data and application availability is paramount. Given environmental, political, and economic uncertainty, enterprises require solutions they can count on to keep their applications and data available to users, regardless of events. The Sun Java Availability Suite, featuring Sun Cluster software, Sun Cluster Geographic Edition software, and agents for the industry's leading applications, gives enterprises the confidence that while the clock keeps ticking, their applications will, too.

Sun Java™ Availability Suite

Platform support

With Solaris x86 and x64 platforms

- Sun Fire™ V20 and V40z servers
- Sun StorEdge 3310 RAID, or 3310/3320 (JB) arrays, 3510, 6130, 6920, 9970/9980/9990 on V40z and Galaxy servers
- Sun Dual Gigabit Ethernet and Dual SCSI/P adapters
- Sun Quad Gigabit Ethernet adapter
- Sun Ultra™ 320 Dual PCI SCSI host adapter card
- FC HBAs

With Solaris SPARC platforms

- Servers
 - Netra™ 120, 240, 440, t1120/1125, t1400/1405, T1 AC200/DC200, 1280, 20
 - Sun Enterprise™ 220R, 250, 420R, 450, 3500, 4500, 5500, 6500, 10K
 - Sun Fire V120, V210, V240, V250, V440, V490, 280R, 480, V880, V890, V1280, 3800, 4800/4810, 6800, 12K, 15K
 - Sun Fire E2900, E4900, E6900, E20k, E25k
 - T1000 and T2000
- Sun storage
 - Sun StorEdge S1, MultiPack, D1000, D2, A1000, A3500(SCSI/FC), A5000, A5100, A5200, T3, 3120, 3310, 3510 RAID, 3511 RAID, 3910/3960, 6120/6320, 6130, 6910, 6920, 6960, 9910/9960, 9970/9980, 9990
 - Netra st D130, st A1000, st D1000
- Third-party storage
 - EMC, IBM, Network Appliance, NEC2, HP EVA, HP, HDS, LSI

Interoperability details: www.sun.com/clusters/osp

- Supported SAN switches
 - Sun 1-Gb 8- and 16-port switches
 - Sun 2-Gb 8-, 16-, and 64-port switches
 - Brocade SilkWorm 2800, 3200, 3250, 3800, 3850, 3900, 6400, 12000, 24000 switches
 - McData 4300, 4500, 6064, 6140 switches

- Supported Interconnects
 - On-board 100 Mb/sec port, Sun Quad FastEthernet, SunFastEthernet™, and SunSwift™ adapters
 - Sun Gigabit Ethernet adapter
 - Peripheral Component Interconnect (PCI) Scalable Coherent Interface (SCI)
 - Infiniband
- Supported public networks
 - Asynchronous Transfer Mode (ATM)
 - On-board 100 Mb/sec port, Sun Quad FastEthernet, SunFastEthernet, and SunSwift adapters
 - Sun Gigabit Ethernet adapter
- Supported operating systems
 - Solaris 9 and 10 OS for x86 platforms
 - Solaris 10 OS for x64 platforms
 - Solaris 8, 9, and 10 OS for SPARC platforms
- Supported volume managers
 - Solaris Volume Manager
 - VERITAS Volume Manager
- Supported file systems
 - Solaris UNIX Filing System (UFS)
 - VERITAS File System (VXFS)
 - Sun StorEdge QFS
- Supported Sun Cluster agents
 - HA for Solaris Containers
 - HA Oracle 8i, 9i, Database 10g, Parallel Server (OPS), 9i RAC6, Oracle Application Server, and e-Business Suite
 - HA DNS
 - HA NFS
 - HA Sybase, Sybase Adaptive Server Enterprise (ASE) 12.5
 - HA SAP liveCache database, J2EE Application Engine, and Enqueue Server, Scalable SAP
 - HA Siebel, Siebel 7.7– HA Java System Web, Application, Messaging, Directory, Calendar servers, and Message Queue, Java System Application Server Enterprise Edition 8.1, Java System Web Server

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- HA Apache Web/Proxy Server, Tomcat, scalable Apache Web/Proxy Server
- HA NetBackup
- HA Samba
- HA DHCP
- HA IBM WebSphere MQ, MQ Integrator
- HA BEA WebLogic Server
- HA Sun StorEdge Availability Suite
- HA MySQL
- HA N1™ Grid Engine, Sun N1 Service Provisioning System
- Agents available through third parties
 - BM DB2 (EE and EEE)
 - HA Informix Dynamic Server