Sun™ Cluster Software for SAP NetWeaver Platforms

Higher Availability and Better Service-Level Management

Key feature highlights

Industry-Leading High Availability
- Improves service levels, availability, and scalability for the SAP NetWeaver platform with low cost of ownership
- Provides end-to-end availability for SAP NetWeaver platforms — from the Web server to the database
- Monitors and automatically fails over all single points of failure in the SAP NetWeaver environment

Ease of Manageability
- Supports up to eight nodes in a cluster, allowing multiple SAP solutions to be deployed in one cluster
- All tiers of the SAP stack can be consolidated within a Sun™ Cluster environment, allowing for a single point of management for simple and easy administration and lower costs

Comprehensive Coverage of All Components in an SAP Deployment
- Agents for Web and application servers; enqueue and replication servers; SAP Central Services; Java™ 2 Platform, Enterprise Edition (J2EE™) Engine; SAP Database (SAPDB); and liveCache
- Only high-availability (HA) solution that manages the availability of the SAP liveCache database
- World-class availability, services, and support with a wide choice of servers and storage 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 business relationship between Sun Microsystems and SAP is key in making this philosophy a reality. It helps ensure that SAP NetWeaver platforms running in Sun™ Cluster environments deliver world-class availability, scalability, manageability, and support.

Sun Cluster Software

Sun Cluster software improves 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 environment to recover from a failure with minimal service-level degradation and data corruption. Sun Cluster software offers SAP NetWeaver customers world-class availability by helping to reduce the length of degraded service levels and helping to ensure 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 SAP NetWeaver customers world-class availability, scalability, and manageability.

Sun Cluster HA for SAP NetWeaver

SAP NetWeaver is a comprehensive integration and application platform that unifies and aligns people, information, and business processes across technologies and organizations. It is an integrated platform based on Web services that supports the Java™ 2 Platform, Enterprise Edition (J2EE™ platform). SAP NetWeaver is the foundation for all SAP solutions — including SAP xApps composite applications, my SAP Business Suite solutions, and SAP R/3 Enterprise.

Sun Cluster agents for SAP are designed to provide high availability and scalability for the entire SAP deployment. They provide end-to-end availability for SAP NetWeaver platforms by monitoring and failing over all components of the SAP infrastructure, including SAP Database, liveCache, enqueue server, replication server, J2EE Engine, application servers, and SAP Central Services (SCS).

Using these Sun Cluster agents, the resiliency of the SAP NetWeaver environment can be increased significantly. If a node within the cluster goes down, other nodes in the Sun Cluster environment automatically take over the workload of the failed node, reducing downtime and helping to ensure consistent service levels for critical applications. The Sun Cluster environment seamlessly detects and recovers from failures in the system, protecting SAP clients from degraded service levels and allowing business to run at a predictable, consistent pace.

HA Agent for SAP Enqueue Server and Replication Server

The SAP enqueue server is a lock management system that allows multiple application servers to synchronize access to the database and maintain data consistency. In older versions of SAP R/3, failure recovery in the central instance requires rebuilding the enqueue table before the central instance can continue processing requests. In versions 6.4 and later of the SAP core, SAP introduces a replication feature whereby the SAP replication server replicates the enqueue table to a secondary node. If a failure impacts the enqueue table, the enqueue server immediately starts using the replicated table, thus keeping downtime to a minimum.

With the new replicated enqueue server, the service is no longer a part of the SAP central instance. Instead, it is a dedicated server running independently of any other SAP component. If the enqueue server fails, it does not automatically fail over to the node containing the replicated table. In addition, the enqueue entries are not replicated beyond the replica server. Therefore, if both nodes crash at the same time, all enqueue locks are lost and the SAP enqueue service is unavailable to users until the replicated server is started again.

The HA agent for SAP enqueue server is designed to provide high availability for the replicated enqueue servers. The agent supports and optimizes SAP's replication feature by using the new resource group affinity features of Sun Cluster 3.1 9/04 software.

A resource group is a set of related or interdependent resources that migrate as a unit if a failover or switchover is initiated on the resource group. The new SAP agents include affinity relationships between the resource groups for the enqueue server and replication server that optimize the availability of the SAP deployment.

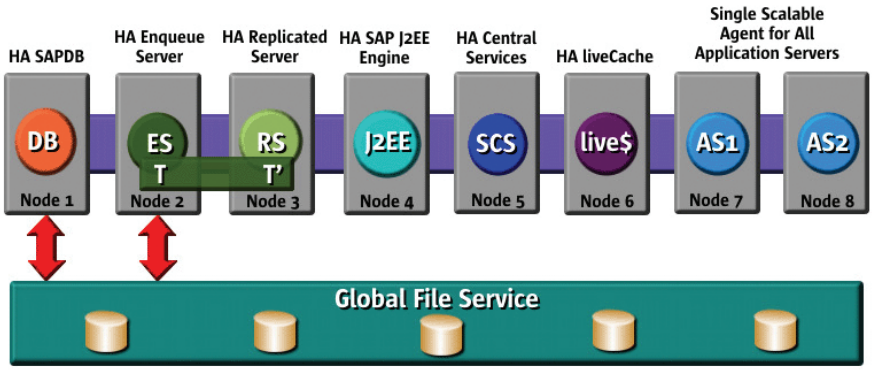
With Sun Cluster 3.1 9/04 and later, the administrator can set an affinity and dependency relationship between the enqueue and replication servers. This relationship stipulates that if the enqueue server node should fail, it always fails over to the node where the replication server is running. In addition, the replication server is moved to another available cluster node. The benefit is that the enqueue locks are not lost and downtime is minimized in the most efficient way.

HA Agent for SAP J2EE Engine

SAP now offers customers a choice of SAP J2EE technology-based application servers or traditional ABAP/4 application servers. The Sun Cluster HA agent for SAP J2EE Engine is designed to provide high availability for the single points of failure within the SAP J2EE Engine by monitoring the J2EE Engine and failing over to another node in the event of software or hardware failures. Both the SAP enqueue server agent and SAP J2EE Engine agent are required to run SAP NetWeaver within a cluster using Sun Cluster software.

HA Agent for SAP Database (SAPDB)

The SAP Database (SAPDB) is a single point of failure that can bring the entire service down should it fail. The HA agent for SAPDB is designed to provide high availability for SAPDB instances (versions 7.4.03 and higher) in SAP environments by monitoring and restarting or failing over the database instance to another available node in case of hardware or software faults. This eliminates the single point of failure of the SAPDB to help improve service levels.



HA Agent for SAP liveCache

The SAP xserver establishes all connections to the liveCache database. The HA agent for SAP liveCache monitors the health of the SAP xserver. In the event of a failure, the database is failed over to a backup node that is running the SAP xserver process as a warm standby. This helps ensure the fastest possible recovery time for the SAP liveCache database. The agent also provides scalability, allowing the xserver to be distributed across nodes in the cluster for better performance and load balancing. Coexistence of the SAPDB and SAP liveCache HA agents is tested and supported.

Scalable Agent for SAP

Sun Cluster software allows applications to be distributed across nodes in the cluster, providing easy manageability, application scalability, and automatic recovery of service levels. For example, using the scalable SAP agent, system administrators can load balance SAP services across multiple servers to achieve greater performance without sacrificing availability. With Sun Cluster Global Network Services, this load balancing is transparent to the clients because the cluster appears to them as a single IP address. And by adding more systems to the cluster, capacity and continuity can easily be increased.

The scalable agent for SAP delivers two functions:

- A failover function that starts, stops, and monitors the SAP central instance (versions before SAP R/3 6.4)
- A scalable function that uses just one set of SAP scripts to start, stop, and monitor multiple SAP application instances

Because there is only one set of scripts to manage, the scalable agent eases operation of the clustered SAP environment. In the event of an application instance failure, SAP log-on groups allow clients to connect to a surviving application instance to continue service. However, this surviving instance can quickly become overloaded, resulting in degraded performance until the failed instance is manually recovered. By using the scalable agent, the failed instance is automatically restarted to allow the client load to be redistributed among members of the log-on group. In this way, SAP deployments in a Sun Cluster environment can maintain consistent service levels.

The Sun Cluster scalable agent for SAP is database independent and can be used with any DBMS supported by SAP solutions. The agent supports as many SAP solutions or application instances as the hardware supports, enhancing flexibility when deploying SAP NetWeaver.

Additional High-Availability Features

Maintaining Service Levels After Failover

Sun Cluster Prioritized Service Management (PSM) is a policy-based, service-level management feature that provides high service levels for high-priority services in the event of a failover to a backup node. With PSM, mission-critical SAP applications can be assigned required resources and service levels by off-loading low-priority SAP or non-SAP services on the backup node.

Efficient Resource Utilization

All tiers of the SAP stack can be consolidated within the Sun Cluster environment, improving resource utilization and service levels by offering pools of resources within which a failed component can be recovered. Sun Cluster 3 software also works in conjunction with Solaris Resource Manager software to help guarantee resources to the SAP systems with the highest priority while optimizing server resources.

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.

Manageability

An easily manageable environment keeps IT costs low. The Sun Cluster Global File Service (GFS) offers a single management view of SAP components and/or DBMS for easy administration. In addition, the GFS makes it easier to install SAP application instances because the SAP scripts only need to be installed once on the GFS in order to be applied to the other nodes in the cluster.

Sun™ Cluster Software for SAP NetWeaver Platforms

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

All tiers of an SAP NetWeaver platform can be consolidated within a Sun Cluster environment, allowing for a single point of management with agents for SAPDB, SAP Enqueue (including enqueue and replication servers, Central Services, and Web Application Server), SAP J2EE Engine, and SAP liveCache. For SAP versions 6.2 and earlier, use the Sun Cluster agents for SAP Central Instance instead of SAP Enqueue.

In addition, the Global File Service eases the administrative tasks of running SAP solutions in a cluster by allowing a single installation of the SAP software on the GFS for all nodes. Therefore, any changes to the software are reflected across all nodes.

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 SAP solutions 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

Clustered SAP solutions 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 SAP solution services more simply, safely, and swiftly.

Wide Choice of Storage Configurations

The Sun Cluster Open Storage Program (*sun.com/cluster/osp*) provides customers with an expanded choice of third-party storage arrays 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 Cluster Software and SAP NetWeaver 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 OS for x86 platforms or the Solaris 9 or 8 for SPARC® platforms.

Conclusion

By helping to ensure consistent service levels, reducing risks, and offering easy manageability, Sun Cluster environments can vastly improve application service levels for SAP NetWeaver platforms while lowering the cost of deploying a highly available SAP site.

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