

ORACLE SOLARIS CONTAINERS

OPTIMIZING RESOURCE USE FOR PREDICTABLE SERVICE LEVELS

KEY BENEFITS

- Applications can be dynamically moved or replicated to fit the changes of the business.
- Administrative costs can be lowered by safely combining multiple applications onto a single system.
- Conflicts among applications running on the same system are reduced by isolating the applications.
- Support for predictive self-healing minimizes fault propagation and unplanned downtime.
- Enhanced security prevents unauthorized access and unintended intrusions.
- Oracle Solaris Containers are integrated with other groundbreaking Oracle Solaris 10 features—at no additional cost.

With the cost of managing vast networks of servers and software escalating, companies are looking for ways to reduce IT infrastructure costs and better manage service levels. However, consolidating multiple applications onto a single system means changing the way applications are deployed—often an expensive proposition. One way to avoid this is by taking advantage of virtualization on Oracle Solaris. By employing virtualization, Oracle Solaris Containers let organizations maintain the one-application-per-server deployment model while still sharing hardware resources.

Virtualization Made Easy

Working at a system virtualization level, Oracle VM Server for SPARC—in conjunction with Oracle Solaris CoolThreads technology found in Oracle’s Sun Fire UltraSPARC T1 servers—enables multiple operating systems (OSs) to run simultaneously.

As an integral part of Oracle Solaris 10, Oracle Solaris Containers isolate software applications and services using flexible, software-defined boundaries. Oracle Solaris Containers represent a breakthrough approach to virtualization and software partitioning, allowing many private execution environments to be created within a single instance of Oracle Solaris 10. Each environment has its own identity, separate from the underlying hardware, so it behaves as if it’s running on its own system—making consolidation simple, safe, and secure.

Because Oracle Solaris Containers are independent from the underlying hardware, application services can be recreated on other systems as needed. Each application runs in its own private environment—without dedicating new systems or OSs—and many application resources can be tested and deployed on a single server without impacting one another. System and network resources can be allocated and controlled on a fine-grained basis, helping to simplify computing infra-structures and improve resource use. As a result, you can better consolidate applications onto fewer servers without concern for resource constraints, fault propagation, or security breaches.

Your virtualization technology choice, however, does not have to be an exclusive one. In fact, you can gain the benefits of multiple technologies by adopting a hybrid approach. For example, it’s possible to run Oracle Solaris Containers within a domain, giving you the flexibility of multiple OS versions with the scalability and performance of Oracle Solaris Containers.

Increase Resource Use, Deliver Predictable Service Levels

No two organizations have the same workloads or employ system resources in the same manner. Regardless of how your datacenter is arranged, a vast amount of computing capacity often goes untapped. And while your users are continually searching for more computing resources to help solve problems, your systems can still be either underused or overwhelmed due to resource allocation issues.

Server consolidation can help IT organizations lower costs by reducing the hardware and system administration required to run applications; however, provisioning applications with the appropriate resources on a shared system can be tricky. Oracle Solaris Containers give you the ability to prioritize applications and control resource use. This means that computing resources—CPUs, physical memory, network bandwidth, and more—can be dedicated to a single application and then shared with others in an instant, without moving applications or rebooting the system.

For example, a database, Web server, and batch application, each running on its own system, can be consolidated onto a single server configured to give each access to one-third of the available system resources. That same server can be automatically reconfigured so that the Web server receives 75 percent of network bandwidth during peak load conditions. With the ability to dynamically allocate resources where they're most needed and the increased observability that Oracle Solaris DTrace integration provides, Oracle Solaris Containers help increase resource use while ensuring that service-level agreements are still met.

Ensure Application Isolation, Lower Risk

With Oracle Solaris Containers, your organization can establish isolation mechanisms to improve resource use. Each application can run in its own private environment, virtually eliminating error propagation, unauthorized access, and unintentional intrusions. Providing fine-grained control, Oracle Solaris Containers ensure that all workloads have access to an appropriate amount of computing resources—and that no workload is able to consume the entire system (unless authorized to do so).

Because resources are isolated and dedicated to an Oracle Solaris Container and its applications (rather than to a complete system), highly efficient application consolidation is now possible. For example, Web servers typically listen to network port 80, which requires root privileges and presents a high security risk. To reduce this risk and run multiple Web servers per system, each Web server can run in an Oracle Solaris Container, listen to its own unique port 80, and have its own root user—thus operating in an isolated and secure manner.

Indeed, even a single service can benefit from the isolation that Oracle Solaris Containers provide. To continue with the Web server example, it's possible to use Oracle Solaris Containers to help address the common issue of Web server security and Web page defacement by separating Web server administration and Web page maintenance from each other.

Speed Application Testing and Deployment

Developing new applications and services, and getting them operational quickly, is critical. Oracle Solaris Containers speed this process.

With Oracle Solaris Containers, you can create environments on multiple systems and start them where they're needed. You can modify and test applications and services in one Oracle Solaris Container, and later deploy them to an online area without impacting other users. You can test multiple deployment scenarios with ease. And your administrators can roll back to previous settings and configurations if needed. Because application testing no longer requires dedicated systems that sit idle most of the time, you spend less time—and money—getting services up and running.

The migration features in Oracle Solaris Containers (including attach, detach, and clone) make it possible to rapidly create, test, and deploy applications in a production environment. This not only reduces required downtime but also puts in place, by default, a rollback strategy. A developer can now create an application in a Oracle Solaris Container, harden it, and hand it off to the test team. The test engineer can test and verify the migrated Oracle Solaris Container before handing it over to the production team. Finally, the production administrator can duplicate and introduce the verified and hardened Oracle Solaris Container into production. All of this can be done more rapidly than in a traditional, nonvirtualized environment—and with minimal disruption.

Reduce Costs, Improve Return on Investment

Maintaining flexibility and improving manageability are key components of any effective cost-cutting strategy. Oracle Solaris Containers aid in this process by helping you organize resources and gain a better understanding of how they're being used. With the ability to securely and dynamically manage and tune Oracle Solaris Containers, you can host multiple applications on one system and make better use of expensive resources. In addition, Oracle Solaris Containers gather workload-based usage data rather than system data, making it easier to more-accurately charge for resources used. System-related administrative tasks are performed for the entire system instead of each application environment independently, saving time and money.

With Oracle Solaris Containers and Oracle Solaris 10, you can lower your costs, reduce downtime, and make better use of resources. As a result, you can expect an improved ROI.

Integration

Oracle Solaris Containers take advantage of other technologies built into Oracle Solaris to make your environment even more cost effective and observable. The integration with Oracle Solaris ZFS, for example, enables multiple Oracle Solaris Containers to consume a minimal disk footprint by using ZFS snapshots. The global administrator can also hand off ZFS disk sets to the Oracle Solaris Container administrator, for example, allowing them to create their own snapshots and clones.

By taking advantage of the observability that DTrace provides within an Oracle Solaris Container, application developers are able to probe their applications, allowing them to debug system problems that are typically difficult to diagnose using traditional debugging tools.

Usability

Oracle Solaris Containers enable you to more-accurately recreate your physical system in the virtualized world by allowing simple, easy-to-configure CPU and memory resource management together with a specific network configuration. This makes it easy to define Oracle Solaris Containers. As a result, Oracle Solaris Containers can be developed and deployed rapidly—with no time-consuming hardware purchase cycle.

One example of this flexibility comes in the form of IP instances, which allow a network port to be dedicated to a Oracle Solaris Container. In such cases, the Oracle Solaris Container administrator has control over the network port and can allow configuration of IP address, routing table, and network device settings within the Oracle Solaris Container.

RELATED SERVICES

The following services are available from Oracle Support Services:

- Update Subscription Services
- Product Support Services
- OnlineDBA
- OnlineDBA for Applications

Extended Functionality

You can extend the functionality of Oracle Solaris Containers by using Oracle Solaris with trusted extensions or Oracle Solaris Containers for Linux Applications.

Trusted extensions—an advanced security feature of Oracle Solaris—implement labels to protect your data and applications based on their sensitivity level, not just on who owns or runs them. Credit card information, classified data, and personal records remain secure and can't be accessed by or written to unauthorized sources.

Oracle Solaris Containers for Linux Applications enable Linux applications to run unmodified on Oracle Solaris 10. This allows you to maximize IT consolidation, increase flexibility (through lowered barriers to migration), remove dependencies on unpredictable schedules and source code availability, and boost cross-platform development by extending the observability features of Oracle Solaris 10 to the Linux platform.

Contact Us

For more information about Oracle Solaris Containers, please visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.



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