Oracle Solaris 10 Virtualization Frequently Asked Questions (FAQ)

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1-What are Oracle Solaris Containers?

As an integral part of the Oracle Solaris 10 operating system, Oracle Solaris Containers isolate software applications and services using flexible, software-defined boundaries. A breakthrough approach to virtualization and workload management, Oracle Solaris Containers let many private execution environments be created within a single instance of the Oracle Solaris OS. Each environment has its own identity, separate from the underlying hardware, yet behaves as if it is running on its own system, making consolidation simple, safe, and secure.

Oracle Solaris 10 Containers focus on application and workload management by creating isolated environments with extensive resource management controls. Isolation addresses security issues and prevents the contention that occurs when two applications each think they own the same configuration file. Resource management controls allow specifying CPU and memory limits so that an application in one container does not negatively impact another by consuming more resources than are allocated to it.

2-What are the benefits of Oracle Solaris Containers?

The benefits of Oracle Solaris Containers include the following:

- It provides a no-cost management solution: Oracle Enterprise Manager Ops Center. Support for Oracle Enterprise Manager Ops Center is also included when Oracle Solaris support is purchased.

- Higher system utilization can be achieved due to the ease of consolidating multiple single-system, dedicated applications onto a single multi-container system.

- Multiple applications can share a single system but still remain completely isolated from one another.

- Restarting a container is much quicker because you are not rebooting the entire operating system, and provisioning a container is much quicker than provisioning a complete Oracle Solaris 10 system.

- A system administrator can create an environment that the container administrator can customize for the application.

3-What is an Oracle Solaris Zone and how is it different from a container?

Initially, there was a distinction between containers and zones, the former being a superset of the latter. Over time, that distinction has disappeared, so the terms are now used interchangeably. In Oracle Solaris 11, the term *containers* has been dropped and only the term *zones* is used.

4-What are the resource management components of Oracle Solaris Containers?

Resource management tools control the amount of CPU and memory resources an application receives. Resource management tools also help with measuring the usage of an application. These statistics could be used for health monitoring and capacity planning, as well as for billing and charge back.

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5-What is the overhead for running a container?

Generally, the overhead is very low: less than 1 percent per Oracle Solaris Container.

6-Can containers move between systems?

Yes, it is possible to halt a container, detach it, and then reattach it to another system.

7-Can a container span different systems?

No, Oracle Solaris Containers cannot span Oracle Solaris instances.

8-Does the Oracle Solaris Cluster software support Oracle Solaris Containers?

The Oracle Solaris Cluster software does support Oracle Solaris Containers, both the resource management parts as well as Oracle Solaris Zones. In an Oracle Solaris Cluster configuration, applications can run inside zones, which are considered to be virtual nodes. With Oracle Solaris Cluster Geographic Edition, Oracle Solaris Containers can be failed over across unlimited distances providing a disaster recovery setup. For more information, visit the Oracle Solaris Cluster site.

9-Can I schedule the utilization of Oracle Solaris Containers to be different at different times of the day?

Yes. You can change the settings at any time directly through the command-line interface or by using scripts or `cron`.

10-Can Oracle Solaris Containers interact directly?

They interact as if they are on different systems, through the network or shared disk. For example, if they interact through the network, the system knows that one Oracle Solaris Container is talking to another, so communications will go through the network stack. Communication between Oracle Solaris Containers is very fast because it never leaves the system or even hits the network interface card.

11-Is there a Trusted Oracle Solaris 10 product? What is Oracle Solaris Trusted Extensions?

The term *Trusted Oracle Solaris* refers to earlier, specially developed versions of the Oracle Solaris operating system that were modified to include labels and mandatory access control technology. The last release of a separate Trusted Oracle Solaris OS was Trusted Oracle Solaris 8.

As of Oracle Solaris 10 11/06, labels and mandatory access controls are included as a standard part of the Oracle Solaris OS. The collective features providing this functionality are known as Oracle Solaris Trusted Extensions, which is not a separate operating system and does not require a separate support contract. All applications that run with Oracle Solaris 10 and Oracle Solaris Containers will work when Oracle Solaris Trusted Extensions is enabled. Since it is an integrated feature of Oracle Solaris 10, it is supported on all systems on which Oracle Solaris 10 runs, x86 and SPARC.

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12-What is the difference between running Oracle Solaris Containers with or without Oracle Solaris Trusted Extensions enabled?

Oracle Solaris Containers provide virtualized environments to host multiple applications, which is great for performing server consolidation. The Oracle Solaris Trusted Extensions feature utilizes Oracle Solaris Containers extensively to provide security boundaries and to enforce Mandatory Access Control by labeling a container. Oracle Solaris Containers behave slightly differently when running with Trusted Extensions enabled, providing a single-system view of services such as authentication databases, security configuration, file system and network interfaces. Communication between Oracle Solaris Containers is generally disallowed by default when Trusted Extensions is enabled and permitted only by explicit specification.

In summary, customers running with Trusted Extensions enabled use labeled Oracle Solaris Containers to provide a security boundary for their file systems, data, applications, and users.

13-Where can I find white papers and how-to guides on Oracle Solaris Containers?

All collateral for Oracle Solaris Containers is available here.

14-Will Oracle Solaris Zones partitioning technology work with the Oracle Solaris 9 Resource Manager functionality that was introduced with Oracle Solaris 9?

Yes. The features of the Resource Manager have been integrated into the Oracle Solaris 10 OS. Oracle Solaris Zones and the Oracle Solaris resource management feature are both part of Oracle Solaris Containers and are designed to work together.

15-What type of isolation do Oracle Solaris Containers provide?

Oracle Solaris Containers provide security, application fault, and namespace isolation. This means that once users are working in Oracle Solaris Containers, they cannot compromise or even see outside of their Oracle Solaris Containers other than in the regular ways, such as through the network or shared file systems. The namespace isolation allows Oracle Solaris Containers to have their own users and even their own `root` user, who has authority only inside the `root` user's own Oracle Solaris Container.

16-Can every Oracle Solaris Container have its own `root` user?

Yes, and the Oracle Solaris Container `root` user only has authority to change or configure things inside the `root` owner's own Oracle Solaris Container.

17-Can every Oracle Solaris Container have its own name server?

Yes. You can even have different Oracle Solaris Containers listening to different name server types. One Oracle Solaris Container could be listening to an NIS server, while another could be listening to an LDAP server.

18-How do I log in to an Oracle Solaris Container?

You log in through standard protocols, such as `ssh`, `telnet`, or `rlogin`. There is also a specific way to log in to an Oracle Solaris Container called `zlogin` if the user is in the base operating system (called the global zone). With `zlogin`, a user can log directly in to an Oracle Solaris Container.

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19-How do I install software in an Oracle Solaris Container?

There is no change in the installation process. The same tools and the same process apply in an Oracle Solaris Container. However, you now have a choice to install in a particular Oracle Solaris Container or to install system-wide.

20-How do I patch a system with Oracle Solaris Containers?

There is no change in the patch process.

21-Can an Oracle Solaris Container access a raw device?

Yes; however, this is not the default behavior, because access to a raw device can compromise the security isolation. The global administrator can choose to separately add the raw device to the Oracle Solaris Container.

22-How is an Oracle Solaris Container different from a Dynamic System Domain?

Dynamic System Domains are based on hardware. They offer electrical separation with different versions of the operating system possible per domain. The number of domains is limited per system. Oracle Solaris Containers are based on software. They offer logical separation with the same operating system in each Oracle Solaris Container. Oracle Solaris Containers offer enormous scalability: while there is no hard-coded limit, up to 8,000 containers per OS image are available, well exceeding today's normal requirements.

23-When do I use a Dynamic System Domain and when do I use an Oracle Solaris Container?

Dynamic System Domain features include the ability to hot-plug hardware and run different versions of the Oracle Solaris Operating System per domain. Oracle Solaris Containers provide very fine-grained control over what an application can do and see. If your applications require the type of separation that separate operating systems can give you, then you should use a Dynamic System Domain; otherwise, you can use Oracle Solaris Containers. The real benefit comes when you use Oracle Solaris Containers within a Dynamic System Domain.

24-What new Oracle Solaris Container features have been introduced since Oracle Solaris 10 was initially released?

Oracle Solaris 10 now provides new tools to more easily manage containers. You can clone them, rename them, and move them on the same system. You can also migrate them from one system to another.

Additionally, you can now customize the security level that the container boots to better suit application requirements.

Starting in Oracle Solaris 10 10/08, when a container is detached and then reattached to a new system, it is automatically upgraded to the latest patches and packages associated with the new system. This allows for flexibility when performing rolling upgrades of systems and ensures the consistency of systems when moving workloads. Also new in Oracle Solaris 10 10/08 is the ability for Oracle Solaris Containers to officially utilize a ZFS file system as their root. Upgrading an Oracle Solaris 10 system that has containers with ZFS-based roots is also supported.

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25-Why is cloning important, and can you give an example on how you would use the cloning feature for Oracle Solaris Containers?

Cloning is the fastest way to provision a zone. It allows creating an unconfigured image in advance and, before using it, configuring it with a new `/etc/sysidcfg` file. This is particularly suitable for dynamic environments because a new zone can be configured in a matter of seconds.

As another example, if you plan to have several developers on the same system, you could, for example, create a container with all the right applications and developer tools as a golden master. You can then use the new cloning feature to replicate this golden master and quickly create an identical container with the same set of applications and tools for every new developer.

26-How can I migrate an application running on a dedicated Oracle Solaris 10 system to an Oracle Solaris Container?

The first step is to run the Oracle Solaris Zones Preflight System Checker, `zonep2vchk`. This script is available from the Oracle Solaris download site and also included in Oracle Solaris 10 1/13. This script will identify any potential problems prior to you following the migration procedure.

27-How can I migrate an application running on a dedicated Oracle Solaris 8 or 9 system to an Oracle Solaris Container?

There is a special product, Oracle Solaris Legacy Containers, that allows you to create an Oracle Solaris 8 or 9 Container that can run on Oracle Solaris 10.

As an example, an Oracle Solaris 9 Container provides an environment that looks identical to an Oracle Solaris 9 environment to an application formerly running on an Oracle Solaris 9 system. While Oracle Solaris has always had a strong binary compatibility story, if an application first checks that it is running on an Oracle Solaris 9 system, that check will fail on an Oracle Solaris 10 system. However, that check would not fail on an Oracle Solaris 9 Container, because that container looks identical (from the application's point of view) to a physical Oracle Solaris 9 system.

28-How can I migrate an application running on a dedicated Oracle Solaris 10 system (or in an Oracle Solaris 10 Container) to an Oracle Solaris 11 system?

The first step is to run the Oracle Solaris Zones Preflight System Checker, `zonep2vchk`. This script is available from the Oracle Solaris download site and also included in Oracle Solaris 10 1/13 as well as Oracle Solaris 11 11/11 and 11.1. This script will identify any potential problems prior to converting to an Oracle Solaris 10 Zone running on Oracle Solaris 11. You can find out how to implement an Oracle Solaris 11 Zone on Oracle Solaris 11 here.

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29-Is Oracle Solaris Live Upgrade compatible with Oracle Solaris Containers?

Yes; on Oracle Solaris 10 8/07 and later releases, you can use Oracle Solaris Live Upgrade for patching and upgrading systems with Oracle Solaris Containers. This offers two important operational advantages, particularly around patching.

First, you can patch without taking the system offline, because you patch a copy of the system. If you are using ZFS for the boot environment, the process of making a system copy is very fast—half or minute or less. If you are using UFS for the boot environment, making a copy takes an hour or so.

Second, after patching the copy, you then can boot from that copy. If you experience a problem, you can easily revert back to the original environment.

30-How can I get more news about Oracle Solaris?

Catch the latest news and information from our social media sites:

- Blog
- Facebook
- Twitter
- LinkedIn
- YouTube

For more information on Oracle Solaris 10, please visit the Oracle Technology Network Website.

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