OpenStack on Oracle Solaris 11 Frequently Asked Questions

Introduction

OpenStack has been integrated into Oracle Solaris 11 providing a comprehensive self-service environment for managing compute, network and storage resources in the data center. Integrated into all the core enterprise-ready foundations of Oracle Solaris 11, including Oracle Solaris Zones, Elastic Virtual Switch networking, and the Oracle Solaris ZFS filesystem, administrators can get a complete private cloud environment up and running in hours.

Frequently Asked Questions

Overview

Q: What is OpenStack?

A: OpenStack is open source software that enables the easy creation and management of private and public cloud environments. OpenStack is a cloud solution that controls large pools of compute, storage, and networking resources throughout a datacenter, all managed through a dashboard that gives administrators control while empowering their users to provision resources through a web interface. The project itself is just over 3 years old, started in July 2010.

Q: Who is involved in OpenStack?

A: The OpenStack community is a wide community of software developers (both individual and corporate) and admins/users. The OpenStack community was started in 2010 when NASA and Rackspace merged separate cloud projects into a new initiative. Since then, the OpenStack community has grown at a rapid pace and includes many corporate interests.

For more details see:

http://www.openstack.org

Q: What value does Oracle Solaris bring to OpenStack deployments?

A: Oracle Solaris has been the #1 enterprise platform for many years, with an outstanding history of providing a very reliable, scalable and well performing platform in which to host enterprise applications. Oracle bring years of engineering mission critical systems through Oracle Solaris and SPARC to cloud computing, and will be able to provide unique differentiators in terms of cloud deployment, VM provisioning, high availability and security with Oracle Solaris technologies. These benefits can be summarized as follows:

Scalable, mature and industry proven hypervisor - Oracle Solaris Zones offers significantly lower virtualization overhead compared to a leading virtualization technology vendor, giving customers the ability to maximise their data center resources with much higher utilization. Oracle Solaris Zones are also deeply integrated into other Oracle Solaris technologies providing a very efficient and flexible offering. Combined with comprehensive network virtualization and software defined networking capabilities, zones are a perfect fit for OpenStack compute resources.

Fast cloud creation and agile application provisioning - OpenStack can be a very complex platform to provision, taking months in some cases. Oracle Solaris has reduced this complexity with a pre-built OpenStack template that can be deployed in less than 10 minutes for a single node evaluation. Unified archives are central to this deployment providing a way to quickly deploy application stacks to compute resources.

Fast, fail-proof cloud update - One of the major problems with OpenStack solutions from other vendors is the ability to update it to future versions, taking weeks in some cases. Oracle Solaris makes this an easy and fail-proof process, updating a full cloud environment in less than 20 minutes. Through integration with the Oracle Solaris packaging system, ZFS Boot Environments ensure quick roll back should anything go wrong for whatever reason.

Application driven Software Defined Networking - Taking advantage of Oracle Solaris network virtualization capabilities, applications can now drive their own behavior for prioritizing network traffic across the cloud. Combined with Elastic Virtual Switch, administrators have complete flexbility and a single point of control for virtualized environments across their cloud environment.

Engineered with Oracle software and hardware in mind - Best private cloud for Oracle. Oracle Solaris has been engineered as part of the wider Oracle software and hardware red stack. Significant investments into providing optimizations throughout this red stack ensure that it is a reliable and high performing solution for today's data center demands. This includes Oracle's Software in Silicon initiative which implements accelerators directly into the processor to deliver a rich feature-set that enables quick development of databases and applications that are more reliable and run faster.

Enterprise ready with HA capabilities through Oracle Solaris Cluster - Thanks to Oracle Solaris Cluster, cloud deployments can ensure high availability through application failover during any unexpected outages. Oracle Solaris Cluster is the best solution for HA capabilities with Oracle Solaris providing significantly faster application recovery capabilities thanks to deep kernel-level integrations that no other vendor can match.

Rock-solid security of data and network traffic - Oracle Solaris prides itself in providing a highly secure platform for enterprise use. This trust continues to OpenStack with a secure cloud platform to meet the needs of security concerns and compliance regulations.

Single vendor support across hardware and software - Oracle is the #1 enterprise vendor offering a full stack solution for customers. Oracle is the only vendor that can provide a complete single vendor solution that is well tested, well integrated, and provides a single point of contact for support issues saving significant heartache and costs.

Q: What parts of OpenStack have been integrated into Oracle Solaris?

A: Oracle Solaris 11 includes a complete OpenStack distribution. It includes the following services: Compute (Nova), Networking (Neutron), Block Storage (Cinder), Object Storage (Swift), Image Management (Glance), Identity Management (Keystone), Application Orchestration (Heat) and Management Dashboard (Horizon) based on

OpenStack Juno. These have been tightly integrated into Oracle Solaris. Future revisions of OpenStack on Oracle Solaris will include additional services.

Q: Will OpenStack be ported to Oracle Solaris 10?

A: No, there are no plans to port OpenStack to Oracle Solaris 10.

Technical Details

Q: How is Nova Compute integrated into Oracle Solaris?

A: Oracle Solaris will initially deliver compute based on container-like technology called Oracle Solaris Zones. OpenStack will support both native non-global zones, along with a new feature called Oracle Solaris Kernel Zones. Support for Oracle VM for SPARC, namely Logical Domains (LDOMs), will be available in the near future.

Q: What are Oracle Solaris Kernel Zones?

A: Oracle Solaris Kernel Zones are a new feature of Oracle Solaris Zones that enable greater isolation and independence of virtual environments on Oracle Solaris. In essence, a kernel zone does not share a kernel with the host (that is, the global zone); instead, a VMM-style interface is provided to the OS instance via virtual device interfaces, in a similar manner to other type-2 VMMs such as KVM (the most common virtualization compute technology used in OpenStack). "Type-2" VMMs run on top of an operating system ("the host"), instead of directly on the bare metal. The Solaris instance combined within this VMM is "the guest" and is fully paravirtualized for performance.

Kernel Zones require specific hardware and firmware. Read more about Kernel Zones requirements and usage at the following page:

http://docs.oracle.com/cd/E36784_01/html/E37629/index.html

Q: How is Neutron Networking integrated into Oracle Solaris?

A: Neutron will take advantage of the extensive network virtualization capabilities included in Oracle Solaris 11 by exposing relevant configuration through virtual NICs, virtual LANs, IP Tunnels and virtual switches.

Q: What is Elastic Virtual Switch?

A: Elastic Virtual Switch (EVS) is a framework that extends the existing network virtualization capabilities in Oracle Solaris 11 to virtual switches and spans those virtual switches across multiple physical servers or compute nodes as if it was a single switch. This capability solves the huge complexity of managing multiple VMs in a cloud environment and is the foundation for the integration into the Neutron networking OpenStack service. The network virtualization features in Oracle Solaris will help administrators easily provision the networks attached to virtual environments, maintain service level agreements, and provide isolation in a multi-tenant environment sharing a single set of resources.

Q: How is Cinder Block Storage integrated into Oracle Solaris?

A: The ZFS file system is the primary backend for block and object storage. As a result of this integration, OpenStack will be able to take advantage of numerous capabilities of ZFS including instant snapshot and cloning, encryption, send/receive streams, redundancy and data integrity. iSCSI LUN configuration and provisioning will be administered through the COMSTAR framework.

Q: What is COMSTAR?

A: Common Multiprotocol SCSI Target, or COMSTAR, is a software framework that enables you to convert any Oracle Solaris 11 host into a SCSI target device that can be accessed over a storage network by initiator hosts. COMSTAR is used for provisioning storage through the iSCSI protocol as part of a plugin to the block storage service, Cinder. The OpenStack implementation relies on ZFS being the backend storage filesystem.

Q: How is Glance Image Management integrated into Oracle Solaris?

A: A new form of image archive called Unified Archives will be the primary integration point for Glance. This will allow very fast provisioning of environments captured by developers or administrators into the cloud.

Q: What are Unified Archives?

A: Unified Archives are a new feature of Oracle Solaris that allow administrators to create an archive of their system and/or virtual environments either for disaster recovery or system cloning purposes. It leverages ZFS streams to capture a system that can be deployed to bare metal, LDOMs or Oracle Solaris Zones. Unified Archives take advantage of the OVF virtualization format.

Q: What are the integration points for packaging and service start up?

A: IPS packages have been created for all of the OpenStack components and their dependent libraries. The Image Packaging System (IPS) is a network based package management system that allows administrators to install and update their systems from a series of network repositories. This will allow administrators to quickly install OpenStack on the systems, and seamlessly update them to future versions with full rollback capability thanks to ZFS Boot Environments.

Additionally, OpenStack has been integrated into the Service Management Facility (SMF). SMF is responsible for starting and restarting services in the operating system, and provides a high level of availability in the event that services fault for any reason.

Q: How do I upgrade my OpenStack Havana cloud to the Juno release?

A: Administrators can upgrade from Havana to Juno by using the following procedure:

https://community.oracle.com/docs/DOC-910993

A more automatic upgrade will be provided in future.

Q: How is configuration management done in OpenStack and Oracle Solaris?

A: New to Oracle Solaris 11 is the Remote Administration Daemon (RAD). This framework provides tools and a protocol for remote administration on the operating system and is the seamless glue that is used to create new compute nodes, configure networking, or provision storage.

In combination with RAD, the Puppet configuration manager provides automation for managing the configuration of multiple systems across the data center. A number of Puppet modules have been written to interface with various aspects of the operating system, from software management and services, to virtualization and networking.

More Information

Q: How can I get more information about OpenStack and Oracle Solaris

A: You can read more about OpenStack on Oracle Solaris from the OpenStack Technology Spotlight:

http://www.oracle.com/technetwork/server-storage/solaris11/technologies/openstack-2135773.html

Or by joining the OpenStack on Oracle Solaris mailing list:

http://openstack.java.net

Q: How can I get more news about Oracle Solaris 11?

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

Blogs:
http://blogs.oracle.com/solaris

Facebook:
http://www.facebook.com/solaris

LinkedIn:
http://www.linkedin.com/groups/Oracle-Solaris-Insider-3951282

YouTube:
http://www.youtube.com/oraclesolaris

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