Oracle Solaris 11 is a complete, integrated and open platform engineered for large-scale enterprise environments. Its built in virtualization provides a highly efficient and scalable solution that sits at the core of that platform. With the inclusion of Kernel Zones, Oracle Solaris 11 provides a flexible, cost efficient, cloud ready solution perfect for the data center.

**Built In Virtualization**

Oracle Solaris 11 enables no compromise virtualization, allowing enterprise workloads to be run within a virtual environment at no performance cost, as if they were being run in a bare-metal environment. The virtualization capabilities of Oracle Solaris are available and integrated into the core OS, making Oracle Solaris easily accessible and cost effective to utilize.

In addition, the combination of Oracle Solaris Zones, Oracle VM for SPARC, and physical domains in Oracle’s high-end system portfolio provides a feature rich environment to suit every workload with extreme administrative efficiency. With both Oracle Solaris Zones and Oracle VM for SPARC also recognized as license boundaries by most enterprise software vendors, significant cost savings are achievable.

**Oracle Solaris Kernel Zones**

Oracle Solaris Kernel Zones, the latest addition to the Oracle Solaris Zones family, were added in Oracle Solaris 11.2. Kernel Zones combines the zero overhead virtualization capability with independent kernel versions and independent patching for greater flexibility with application workloads. Kernel Zones maintains the same, simple to use interface of other Oracle Solaris Zones types, including the same resource controls, meaning that they can be instantly adopted.

In addition with the inclusion of seamless Physical-to-Virtual (P2V), Virtual-to-Virtual (V2V) and Virtual-to-Physical (V2P) it is possible to move between and utilize any of the Oracle Solaris Virtualization technologies, eliminating the penalty previously involved in changing virtualization types which allows the most suitable virtualization technology to be selected. It is also possible to go back to no virtualization at all running directly on bare metal, which can be useful to aid debugging any system problems.

**Highly Efficient and Scalable**

Oracle Solaris 11 allows enterprise workloads to be run within a virtual environment at no performance cost. What this means in practice is that Oracle Solaris Zones have the...
ability to provide 32X the density of the leading virtualization technology vendor while also negating the 25% virtualization tax that the vendor’s solution incurs. This not only leads to the requirement for fewer systems, but also makes more efficient use of those resources. In essence, with Oracle Solaris 11 the platform resources are all deployed to power the application environment rather than being wasted on the virtualization solution itself.

In addition, the ability of Oracle Solaris Virtualization to scale linearly to 1000s of processors and 10s of TB of RAM means that it is possible to virtualize even the biggest workloads so that many more applications, from the smallest to the largest, can be virtualized. These advantages combine to provide less complexity, much more flexibility and previously unattainable levels of efficiencies. The number of systems to manage is greatly decreased, and ultimately the cost to business is significantly reduced.

Driving Data Center Cost Efficiency

Businesses are seeing significant advantage in Oracle’s virtualization solutions, avoiding the virtualization performance tax of other leading virtualization vendors while also increasing VM density per system.

The combination of Oracle Solaris and SPARC is also driving a reduction in management costs with a 6X savings when compared to an equivalent solution using Red Hat Enterprise Linux and x86 based systems over a 3-year period. A major US telecommunications provider also saw significant savings through improved management. After deploying Oracle Solaris 11, they calculated they had saved over $500 USD per VM when compared to conventional x86 virtualization solutions. The total cost of savings for them could increase to over $20 million USD over time with their environment of over 40,000 VMs. These benefits come from the improvements that Oracle has made to simplify administration, eliminate the cost of compliance, and use hardware more efficiently.

Integrated into the Core Platform

Oracle Solaris Virtualization is tightly integrated into all the key platform components: compute, network, storage, lifecycle management and security, providing an easy to manage environment. These allow the transfer of costs away from the day to day running of the business and funnel them into growing/transforming the business. Strategic thinking is enabled as the tactical issues are taken care of quickly and easily.

In practice this means easy access to rapid application deployment, compliance, reducing planned service outages and running in a highly available environment. For example Oracle Solaris Zones leverage ZFS, which in turn allows boot environments, built-in Oracle Solaris lifecycle management uses these to update zones quickly. Oracle Solaris Zones can be deployed automatically into the infrastructure, and a newly deployed zone comes with network device automatically configured. This all means that tasks are much easier to perform (usually a single command), while the process that they follow has best practice built in and costly errors are eliminated.

Agile and Compliant Application Deployment

Agility, flexibility and time to market are key factors for businesses. Oracle Solaris 11 introduces a new archive format called Unified Archives enabling applications to be
deployed twice as fast as leading Linux based platforms. Unified Archives enable rapid cloning of application environments across virtualization and bare-metal through the development, test and production lifecycle with full Virtual-to-Physical and Physical-to-Virtual portability.

This integrated deployment workflow has been extended to ensure businesses can stay secure and compliant during the whole application lifecycle. For example, once an application environment has been developed, tested and certified, it can be securely deployed and locked down for production use with Immutable Oracle Solaris Zones. This helps to ensure that applications are not compromised and always compliant, critical when deploying 1000’s of VMs in a cloud environment.

**Application Driven Software Defined Networking**

With the trend towards cloud computing, businesses are struggling to translate existing quality of service metrics for service-level agreements to more complex environments that have a greater amount of consolidation and multi-tenancy. Oracle Solaris 11 enhances its existing, integrated software defined networking technologies to provide much greater application agility without the added overhead of expensive network hardware.

The introduction of Elastic Virtual Switch in Oracle Solaris 11.2 enables application agility across a completely distributed set of systems across an arbitrary geographic region without having to redefine your physical network topology. Through the use of VXLANs and centralized virtual switching, physical network infrastructure can entirely be decoupled leading to lower hardware costs, greater network density and more flexible resource control.

Oracle Solaris 11 uniquely extends this base SDN functionality up into the application layer (Layer 7), including all Java based applications, by exposing APIs that enables applications to drive their own priority traffic through a series of resource flows right down to the underlying storage. This advanced capability enables automation of resource management and critical cloud SLAs.

**An Enterprise OpenStack Distribution**

Oracle Solaris 11 includes a full distribution of OpenStack, the popular open source project that provides cloud management infrastructure, as a standard, supported part of the platform. OpenStack on Oracle Solaris provides a seamless, enterprise-class experience for managing compute, storage, and network resources in the data center through a centralized web based portal. This combination enables organizations to securely deliver services in minutes rather than weeks or months and, using OpenStack’s vendor-neutral API, also manage a heterogeneous mix of hypervisors and infrastructure in the data center. In addition, with Oracle Solaris Virtualization being the powerhouse of this offering, OpenStack is able to take full advantage of all the benefits that come with no compromise virtualization.

A full OpenStack based cloud can be up and running in less than 10 minutes on Oracle Solaris 11 using a pre-configured Unified Archive image that has all the OpenStack services included in it, ready to run your first compute instance. With integrated lifecycle management technologies, updating the cloud is a single step all the way down to the firmware including all virtualized environments, with full failsafe rollback if necessary.
This overall simplicity to software lifecycle management has led to a 16X efficiency gain for a major US financial customer with a significantly higher VM administration management ratios for Oracle Solaris 11 compared to leading Linux based platforms.

More Information

For more information about Oracle Solaris 11.2, visit oracle.com/solaris.