Oracle Solaris Remote Lab
A Solaris 11 Developer Cloud

Ron Larson
Angelo Rajadurai
Oracle Systems ISV Engineering
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### Solaris 11 for Developers
#### Webinar Series

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<th>Webinar Series Topic</th>
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<tr>
<td>Oracle Solaris Remote Lab</td>
<td>11-13-12</td>
<td>Ron Larson &amp; Angelo Rajadurai</td>
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<td>@ 10am PT</td>
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Oracle Solaris Remote Lab
An Exastack Lab offering

- The OSRL is a virtual lab that facilitates Partner's application validation on Solaris 11.

- Through a simple and straightforward cloud interface, ISVs can easily configure their application test environment on either SPARC or x86 Solaris Virtual Machines.

- The design of the OSRL relies heavily on several Solaris 11 technologies
Six Steps to Successful Validation

STEP 1: Check-out Virtual Machines
- ORACLE SOLARIS 11 VM
- ORACLE DATABASE VM
- WEBLOGIC VM
- APACHE, MySQL and PHP VM

STEP 2: Upload Files

STEP 3: Install Application

STEP 4: Run Verification Tests

STEP 5: Download Results

STEP 6: Review Test Results
Angelo
- but I’m not Italian

Rajadurai
- Means King & Lord
- but I’ve got no blue blood in me…

But …
- Have been with Sun / Oracle from 1993
- ISV Engineering organization
- Work with partners to help understand Adopt Solaris Technologies
- Architect of the OSRL
Agenda
What we will learn today!

Oracle Solaris Remote Lab - Demo
Introduction to Technologies
- Solaris Zones
- Solaris Network virtualization
- Solaris ZFS
- Image Packaging System
- Secure Global Desktop

OSRL - Under the Covers

Call to Action
Demo
Technology Introduction
Oracle Solaris Zones

• Provide Virtual Environment
  • with performance, scale and observability
  • without Virtual Machine overhead
• Appearance of many OS instances
  • Single kernel
  • Isolated namespaces for: IP addresses and port range, process lists and authentication (file, NIS, LDAP,...), ZFS, NFS services, and many more
• Separate security, resource management, and failure scopes
• Can boot, reboot a zone, run SMF services
• Customers typically run 2 – 200 zones per machine
• Can create a new zone in minutes or seconds if cloning
Oracle Solaris Zones

- Secure
  - Excellent track record
  - Audit available globally and/or per zone
  - Zones always run with reduced privilege
- Mature, widely adopted, in production at many sites
  - Part of Solaris 10 FCS, continuously enhanced
  - Runs on Solaris x86 & SPARC
- More features in Solaris 11
  - Immutable Zones
  - NFS server in Zone
  - Automatic Networking (anet)
  - Boot environment support
Network Virtualization

• Why stop with the application infrastructure?
• Virtualizes and consolidates the network infrastructure
  • Reduce cost
  • Reduce complexity
• Integrated functionality
  • Firewall, Routing, Load Balancing, Bridging
Network Virtualization and Zones Integration

- Improved flexibility without physical NIC restrictions
  - Exclusive IP for zones by default
  - Automatic VNIC creation
  - Vanity naming of NICs (net0)
  - zonestat(1) for zone observability
Oracle Solaris ZFS

• Oracle Solaris ZFS delivers dramatic advances in data management
  • Near-zero administration
  • Data protection with snapshots, replication, shadow migration
  • Greater efficiency through deduplication and compression
  • Secure data with on-disk encryption

• Correct data every time
  • Solid data integrity with end-to-end checksums
  • Self-healing file system prevents silent data corruption
  • Advanced data protection with triple-parity RAID
Oracle Solaris ZFS

Only file system designed for hybrid storage pools

- Data is intelligently and automatically migrated between DRAM, Flash and Disk
- Continuously optimizes storage system performance and efficiency
- Simplifies management, transparently managed as a single storage pool
The Root Oracle Solaris 11 File System

- ZFS is the only supported file system for root file system
- Integration with Solaris install and zone technologies leverage snapshot and clone capabilities
- Boot Environments (BE)
- Zone Boot Environments (ZBE)
Integrated System Software Management

- Image Packaging System
  - Network and file-based repositories
  - Utilizes ZFS snapshot/clones
  - Automatic software dependency checking
  - Removes patch management issues – only package updates
  - Fast and efficient update process
What is Oracle Secure Global Desktop?
“Cloud Access” software for enterprise applications

- “Cloud-Access” software
  - Provides access to centrally-hosted Oracle, web-based, Windows, Unix, and Mainframe/Mid-frame applications
  - Lightweight browser-based client
  - No VPN infrastructure and associated support costs
  - Certified Access to Oracle’s web-based applications
  - Lightweight / non-intrusive client installation
  - Industrial-grade network security
  - DMZ and Firewall friendly
Oracle Secure Global Desktop

Adaptive Internet Protocol (AIP)

- Provides optimal network performance to clients, even in varying bandwidth conditions
  - Fast performance over LAN, WAN and Internet
  - Dynamically adjusts as needed
  - Use the designed intelligence or place a bandwidth limit
- Used to transmit data between X protocol engine and client’s display engine
  - Request pruning, & merging
  - Caching
  - Compression
- Why spend extra $$ for performance over WAN?
OSRL

Under The Covers
OSRL – Network Design
Security

• Isolation
  • All services are in isolated servers
  • UI and backend in different data centers
  • All services runs in Zones
  • No direct ssh access to any of the service Zones.
  • Global Zone and Non-Global zones use different physical networks
  • Access to Zones running services is through Global Zones only.
  • No implicit or explicit partner access to bare metal
  • Separate NFS & SGD server per partner
  • Each partner has their own VLAN
Security

• Authentication
  • Oracle Access Manager Single Sign on
  • No passwords stored in OSRL database
  • Forced authentication every time partner accesses VMs
  • Multiple levels of authentication

• Authorization
  • Manual verification of partner validity before using the lab
  • List of authorized users stored in multiple locations and checked in multiple locations
  • SGD, NFS, UI all have their own authorization
Performance

• Zone cloning utilized for all service zones
  • NFS, SGD, WebUI, Database, Gateway
  • Zone Cloning a very quick operation because of Zones+ZFS
• New Partner VMs created using cloning
  • Just a few mins to create VM
• Partner VLAN access through local network no firewall involved
  • Provide by Solaris Network Virtualization
# OSRL - Data

<table>
<thead>
<tr>
<th>Create</th>
<th>Security</th>
<th>Performance</th>
<th>Resource Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Encrypted ZFS</td>
<td>• Data stored in ZFS SA</td>
<td>• Single Zpool multiple ZFS file systems</td>
</tr>
<tr>
<td></td>
<td>• Partner specific Key</td>
<td>• Hybrid Storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Each partner has their own ZFS File System</td>
<td>• Disk + SSD + RAM</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• ZFS Cloning</td>
<td></td>
</tr>
<tr>
<td>Use</td>
<td>• Data isolated in VLAN</td>
<td>• All intra VM data transfers self contained in Blade chassis</td>
<td>• ZFS clones</td>
</tr>
<tr>
<td></td>
<td>• Separate NFS server per partner</td>
<td></td>
<td>• Share everything but the changes</td>
</tr>
<tr>
<td></td>
<td>• SGD - CDM</td>
<td></td>
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<tr>
<td>Delete</td>
<td>• ZFS Secure delete</td>
<td>• ZFS encrypt + Delete</td>
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<tr>
<td></td>
<td></td>
<td>almost instantaneous operation</td>
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## OSRL - Virtual Machines (Zones)

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<tr>
<td>• ZFS encryption for zone file system</td>
<td>• ZFS + Zone cloning</td>
<td>• Zone cloning</td>
<td>• Zone cloning</td>
</tr>
<tr>
<td>• Exclusive IP stack + VNIC</td>
<td>• new zone in minutes</td>
<td>• less than 18 MB of RAM</td>
<td>• less than 100 MB of Disk</td>
</tr>
<tr>
<td><strong>Use</strong></td>
<td><strong>Security</strong></td>
<td><strong>Performance</strong></td>
<td><strong>Resource Sharing</strong></td>
</tr>
<tr>
<td>• All Zones isolated in non-routable VLAN</td>
<td><strong>Create</strong></td>
<td><strong>Use</strong></td>
<td><strong>Delete</strong></td>
</tr>
<tr>
<td>• Secure global desktop access</td>
<td>• ZFS encryption for zone file system</td>
<td>• ZFS encrypt + Delete almost instantaneous operation</td>
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</tr>
<tr>
<td><strong>Delete</strong></td>
<td><strong>Use</strong></td>
<td><strong>Delete</strong></td>
<td><strong>Resource Sharing</strong></td>
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<tr>
<td>• ZFS Secure delete</td>
<td><strong>Delete</strong></td>
<td>• ZFS encrypt + Delete almost instantaneous operation</td>
<td>• Zone shares all OS resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Single kernel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Single storage</td>
</tr>
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</table>
When $1 + 1 > 2$

- **Zone + ZFS**
  - Fast zone provisioning
  - Very low overhead
  - Encrypt file system as well as share resource

- **Zones + Network virtualization**
  - Allows for sharing single physical network
  - VLAN tagging allows for creating one VLAN/Partner
  - Exclusive IP stack on shared physical network
When $1 + 1 > 2$

• Zones + ZFS + NFS
  • Each NFS server is a zone
  • Single data store
  • Single Physical server
  • Multiple NFS file systems shared with ZFS
  • ZFS supports NFS sharing
  • Encryption + Cloning reduces overhead

• Zones + IPS
  • Global Zone has IPS proxy
  • Single IPS repository accessible from non routable VLAN
Secure Access is Key

- Oracle Secure Global Desktop
  - Secure access to xterm and Desktop
  - API allows to integrate into Web UI
  - Single point of entry for the network
  - Intelligent routing to access VMs
  - Client Drive Mapping for secure file access
Resources for Solaris 11 Developers

Oracle Solaris 11 Developer Webinar Series

Join us for a complimentary webinar. In just one hour you will learn how to streamline your development process to maximize the performance of your application with Oracle Solaris 11.

- See preview here
- Learn why there is no more patching!
- Understand Oracle Solaris 11 cloud features
- Review how to maximize application reliability in Oracle Solaris 11
- Live Chat with Oracle Solaris 11 Engineers

Who should attend?

Application developers and administrators wanting a deep-dive on key features of Oracle Solaris 11 which you can exploit to make your applications superior to your competitors and easier to use.

Please note: (after registering) You will receive details on how to attend the meeting in a separate confirmation e-mail shortly before the webcast.

Agenda - Next Sessions

- Click on event to register
- All webinars on Tuesday’s 9-10am PT (Event will support VOIP)

**TODAY’S Webinar**

Webinar Series Topic: Oracle Solaris Remote Lab
- Date: 11-13-12 @ 10am PT
- Speaker: Ron Larson (Project Manager, ISV Engineering) and Angela Rajadurai (Principal Software Engineer)

Recorded Sessions

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APPLY NOW for Oracle Solaris Remote Lab

Thank you for your interest in accessing the Oracle Exastack Remote Labs. These provide qualifying OPN members with access to remotely accessible environments for the purpose of testing and tuning their applications on the latest major releases of Oracle Solaris, Oracle Linux or Oracle VM.

Upon completion of testing and once your application publicly supports the latest major release, your application qualifies to participate in Oracle Exastack Ready and receive additional OPN benefits.

Eligibility Criteria for access to the Oracle Exastack Remote Labs:

- You must be an OPN member at the Gold level or higher.
- You must have membership in the applicable OPN Knowledge Zones (Oracle Solaris, Oracle Linux, Oracle Server Virtualization). We recommend that at least one employee declares an interest in the applicable Knowledge Zone for the purposes of receiving communications.
- Your OPN PRM Administrator must complete the Oracle Exastack Remote Labs online application (available on the upper right hand side of this page or on the develop lab within each respective Knowledge Zone).
- You must provide an active URL that describes your application and verifies that your application is generally commercially available to commercial customers.
- You must have published and current OPN Solutions Catalog profile for both your company and your application. Click here to view your current profile.
- You must achieve and maintain Oracle Exastack Ready status for the applicable Oracle product within the Oracle Exastack Remote Labs offering within two months of announcing general availability of your application support of the latest major release of Oracle Solaris, Oracle Linux and/or Oracle VM.
- You agree to update your application to be fully compatible and function with the applicable Oracle product within the Oracle Exastack Remote Labs offering within 24 months of Oracle’s release of a new major release or version of the applicable Oracle Exastack Remote Labs offering.
- Your OPN PRM Administrator must accept the terms and conditions of the Oracle Exastack Remote Labs Addendum to the Oracle PartnerNetwork Agreement.

If you have any questions, chat with a partner expert now or email OracleExastack ww2@oracle.com.

To start the application process, please select "Apply Now" at top of this page.
Hardware and Software

Engineered to Work Together
ORACLE