Managing any flavour of virtualization: openQRM in the enterprise data center

Linuxtag 2007
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Agenda

➢ OpenQRM in General
➢ Virtualization in general
➢ Different types of Virtualization
➢ Virtualization layer in openQRM
➢ Virtualization and Storage-integration
➢ Details about the openQRM Virtualization-plugins
➢ Time for questions and discussion
A typical situation in a data-center

- Many server-islands with different requirements and special installations
- Different utilities to monitor and manage the systems
- Different SLA's for each of the server-islands
- One or more system-administrator per island
- New systems being requested continuously
- Many underutilized systems just consuming power and producing heat

How can openQRM help us with this situation?
openQRM: Goals and Concepts

➢ Separation of different modules in the data-center
  ➢ Servers -> physical hardware
  ➢ Services -> Operation System + Applications
  ➢ Storage- and Network-devices
➢ Abstraction of modules via Virtual-environments
➢ Plug-able architecture, huge selection of plugins
➢ Automated mechanisms for enhanced monitoring, system-management and rapid deployment
➢ Support for different operation systems and virtualization types
Project History

➢ Derived from a proven commercial product
➢ Open-source since beginning of 2006
➢ openQRM Project on Sourceforge.net
➢ Active development by the community
Virtualization in general

➢ Full Virtualization
  ➢ unmodified guest operating system
  ➢ more overhead
➢ Para Virtualization
  ➢ needs modified guest operating system
  ➢ better performance
➢ Light Virtualization/Isolation
  ➢ runs only one, modified host OS
Managing different types of virtualization technologies

- Finding the best virtualization technology per application
- Migrating from physical to virtual
- Migrating from virtual to virtual
- Administrate configuration for different virtualization types (host + partition)
- Manage partition “images”
Virtualization layer in openQRM

- Unifies the different virtualization types
- Transparent support for migrating from physical resources to virtual partitions from different types
- Server-images does not require any changes
Virtualization and Storage-integration

- Virtual partitions just require memory + storage
- Fast-cloning from “golden-images”
  - LVM
  - NetApp
- Backup/Restore in central place
- Automated for deployment “on-the-fly”
Virtualization Host-management

➢ Not only a GUI for a single virtualization Host
➢ Automated Host deployment
➢ Automatic installation of the virtualization components on the Host VE
➢ Cluster of shared Hosts (SSI)
➢ Load-balancing and scalability
Virtualization Partition-management

- Partitions created on behalf of Host-resource
- Partitions are just another type of resource
- openQRM maps partition commands to actions on the virtualization Host
- Administration just like physical servers
- Partitions can move easily from one virtualization Host to another
- Transparent resource management
The Xen plugin

- Automatic installation and pre-configuration of Xen on the Host VE via a resource boot-service
- Adding/removing/mapping of virtual network-interfaces
- Mapping of the virtual CPUs
- Increasing/decreasing memory consumption “on-the-fly”
- Pause/Unpause
- Handing over block-devices (FC/LVM)
- Live-migration
- Xen-console within the openQRM user-interface
- Supports NFS and Iscsi storage-servers
# XEN CONFIGURATION (PARTITION ID 1-1-0)

## Partition Profile

**Virtual Hardware**

<table>
<thead>
<tr>
<th>RAM</th>
<th>124 MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual CPU's</td>
<td>1 CPUs</td>
</tr>
<tr>
<td>CPU assignment</td>
<td>Nr.</td>
</tr>
</tbody>
</table>

**Apply Configuration**

## Partition Commands

**Actions**

- Pause partition 1-1-0

**Migrate partition 1-1-0 to**

- [ ] live
- [ ] regular

**Go**

## Partition Console

**Access**

```
open console
```
Fedora Core release 4 (Stentz)
Kernel 2.6.18-xen on an i486

puppetclient login: 

Connected to 192.168.88.199 9002

online
The Qemu plugin

- Automatic installation and pre-configuration of Qemu on the Host VE via a resource boot-service
- Support for kqemu and KVM
- Adding/removing/mapping of virtual network-interfaces
- Increasing/decreasing memory consumption
- Supports NFS and Iscsi storage-servers
- Does not require special boot-image
The Linux-VServer plugin

- Automatic installation and pre-configuration of the Linux-Vserver tools on the Host VE
- Adding/removing/mapping of virtual network-interfaces
- Increasing/decreasing memory consumption
- Supports NFS storage-servers
- Best for web-farms
The VMware plugin

➢ Provided and maintained by Qlusters
➢ Manages existing VMware-server
➢ Support VMware GSX and ESX
➢ based on VMware API
➢ Supports NFS, Iscsi and local-deployment
➢ Integrated with the Provisioning-Portal
A typically reference installation

- openQRM High-Availability setup
  - “distributed setup”
  - HA-database
  - automated fail-over to Hot-standby's
  - dedicated storage-servers
- Nagios plugin for enhanced monitoring
- LVM plugin for fast-cloning from server-templates
- Puppet- and Webmin plugin for Configuration management
- Xen, Vmware, Qemu and Linux-VServer plugin
Summary and Conclusion

➢ Powerful and robust management platform
➢ Concept of separation into modules
➢ Open architecture / fully plug-able
➢ Automated rapid deployment
➢ Conforms different virtualization technologies
➢ Flexible and scalable
➢ Adapts to any environment
openQRM on the internet

openQRM website
http://www.openqrm.org

openQRM project
http://sourceforge.net/projects/openqrm

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Time for your questions
Many thanks and have a great time at Linuxtag!