

Virtualization – Roadmap

(started Dec 2008... today)

- Virtualization Technical survey
(Hypervisors , vendors, technologies etc)
- FREE Product (or very “cost effective”)
- Check for “commercial support”
(whenever the need will occur...)
- Technical analysis of various products
 - XEN variations → Citrix Free Edition
 - VMWare → VMWare ESXi
 - VirtualBox

Long-term Goal

- **Cost savings in H/W**
 - Approx. 1 Physical Machine / 3~4 virtual servers
 - Re-use of old servers (or recycle them)
 - Efficiency in HW support SLAs
- **Better administration of H/W – S/W**
 - Instant (or very rapid) provisioning of servers and/or services
 - Snapshots – backup features – DR services
- **Support of Legacy – Discont. Systems**
 - (DOS programs, Windows 98/NT systems etc)

Customer/Company Wishes

- “Bare-metal” Hypervisor
(more efficient in servers environments)
- Support for MS Windows / Linux “Guest” OS's on SAME Physical Host machine
- Administration through a simple console or client-side program/interface
- Open standard (non proprietary) format of backup images (ova-ovf formats)
- Simple solution for developers on desktop virtualization environments

Fulfilling Customer Needs

- Server Virtualization

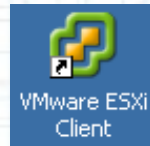
- XenServer (from ver4. up to 5.5)

CITRIX
XenServer



- VMWare ESXi (from ver 3.5 up to 4.1)

vmware
ESXi



- Desktop virtualization

- VirtualBox (on top of MS Windows XP clients, due to developers needs)



Fulfilling Customer Needs



- Citrix XenServer Free Edition

XenServer Features		Free Edition	Advanced Edition	Enterprise Edition	Platinum Edition
Free virtual infrastructure	XenServer hypervisor	✓	✓	✓	✓
	IntelliCache	✓	✓	✓	✓
	Resilient distributed management architecture	✓	✓	✓	✓
	VM disk snapshot and revert	✓	✓	✓	✓
	Resilient distributed management architecture	✓	✓	✓	✓
	XenCenter management	✓	✓	✓	✓
	Conversion tools	✓	✓	✓	✓
	XenMotion® live Migration	✓	✓	✓	✓

Fulfilling Customer Needs

- Advanced Features in Paid Editions ! 

XenServer Features		Free Edition	Advanced Edition	Enterprise Edition	Platinum Edition
Advanced management and automation	Distributed virtual switching		✓	✓	✓
	Heterogeneous pools		✓	✓	✓
	High availability		✓	✓	✓
	Memory optimization		✓	✓	✓
	Performance alerting & reporting		✓	✓	✓
	Dynamic workload balancing			✓	✓
	Host power management			✓	✓
	Live memory snapshot and revert			✓	✓
	Provisioning services (virtual)			✓	✓
	Role-based administration			✓	✓
	StorageLink			✓	✓
	Web self-service with delegated admin			✓	✓
	Automated VM protection and recovery				✓
	Lab manager with self-service portal				✓
	Provisioning services (physical)				✓
	Site recovery				✓
Cost per server		Free	\$1,000	\$2,500	\$5,000

Fulfilling Customer Needs



- VMWare ESXi Free Edition
(better “brand name” in commercial product, not so “open” in architecture in free edition)

ESXi limitations

- No official interactive console (there is only a “unsupported” hidden console: <http://www.virtualizationadmin.com/articles-tutorials/vmware-esx-articles/general/how-to-access-the-vmware-esxi-hidden-console.html>) - With 4.1 the Tech mode support is now fully supported
- ESXi 4.0 has no official supported SSH access (there is only a “unsupported” access: <http://www.yellow-bricks.com/2008/08/10/howto-esxi-and-ssh/>) - Changed in 4.1, where SSH is a service
- No /etc/ssh/sshd_config file for SSH non-root access (but is still possible: <http://www.yellow-bricks.com/2008/08/14/esxi-ssh-and-non-root-users/>)
- No support for some 3th part backup programs (see also 📁 [Backup solutions for VMware ESXi](#)) - Resolved with “last” version of those programs
- No support for some 3th part programs
- ESXi 4.0 hasn’t Active Directory authentication for “local” user - Implemented in 4.1
- No full crontab for schedule jobs and scripts locally (but there is a root crontab in /var/spool/cron/crontabs/root)
- No hot-add feature for virtual disk in ESXi 4.0, but only on ESXi 3.5 (or also on ESXi Advanced with hot-add license) - resolved with first updates
- No SNMP “get” polling”
- No virtual Serial or Parallel port
- No USB disk in the “console”
- No support for mount ext2/ext3/ntfs/cifs filesystem in the console
- No fully functional esxtop
- No fully functional esxcfg-mpath
- No vscsiStats tool
- ESXi 4.0 has only experimental support for boot from SAN - Resolved with 4.1
- ESXi 4.0 has limited PXE install or scriptable installation (but seems that there is a solution: http://www.vmware.com/pdf/vsp_4_pxe_boot_esxi.pdf and <http://www.mikedipetrillo.com/mikedivirtualization/2008/11/howto-pxe-boot-esxi.html>) - Resolved with ESXi 4.1
- Normally with a standalone ESXi host you’ll get 1 hour of performance data, the graph should be set to reset every 20 seconds (you can also extend the performance data to 36 hours with a simple hack - http://www.vm-help.com/esx/esx3i/extending_performance_data.php)

Fulfilling Customer Needs

- VirtualBox (Desktop virtualization)
 - Portability
 - No HW Virtualization required
 - Guest additions support (3D, shared folders etc)
 - Guest multiprocessing (SMP) (virtual cpu's on vmachine)
 - USB device support & iSCSI support
 - HW compatibility (IDE, SCSI devices etc), ACPI support , PXE boot support
 - Multiscreen resolution
 - Snapshots
- Small setup, fast install, very effective



Cost Analysis

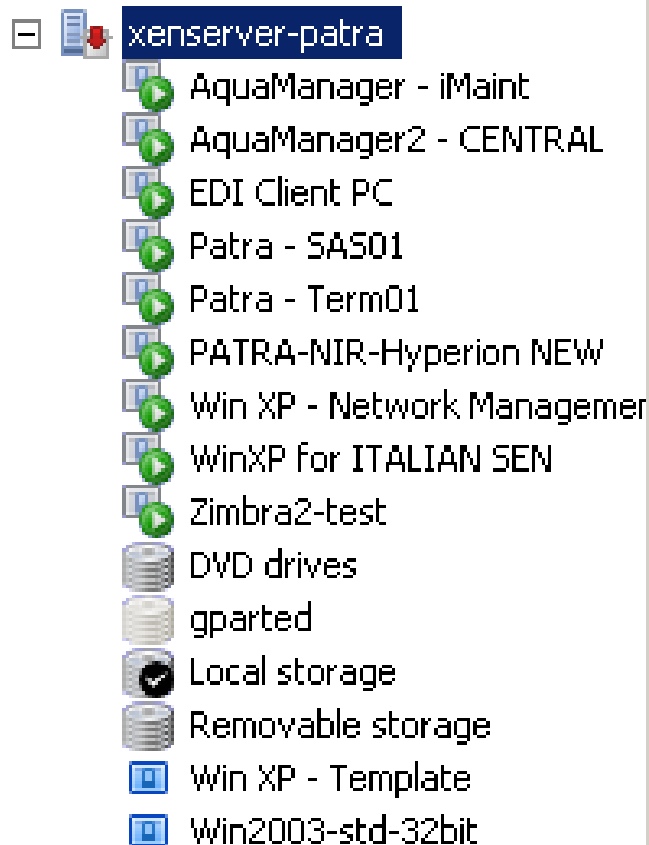
- ALL the previous mentioned solutions, were free editions
 - Citrix XenServer 5.5 Free edit.
 - VMWare ESXi Free edition
 - VirtualBox
- Cost of training / self support the product
- ROI of time/effort, because of simplicity of management and extra features (DR, snapshots, server provisioning etc)

Strengths and Advantages

- Citrix XenServer has better support in console/cli whereas VMWare ESXi has limited CLI support
- Both (Citrix-VMWare) solutions have “commercial products” for upgrade and paid support, which gives the IT the appropriate confidence for using them in production environments
- Both products have free webinars / white papers on implementations and solutions

Demo ... Screenshots

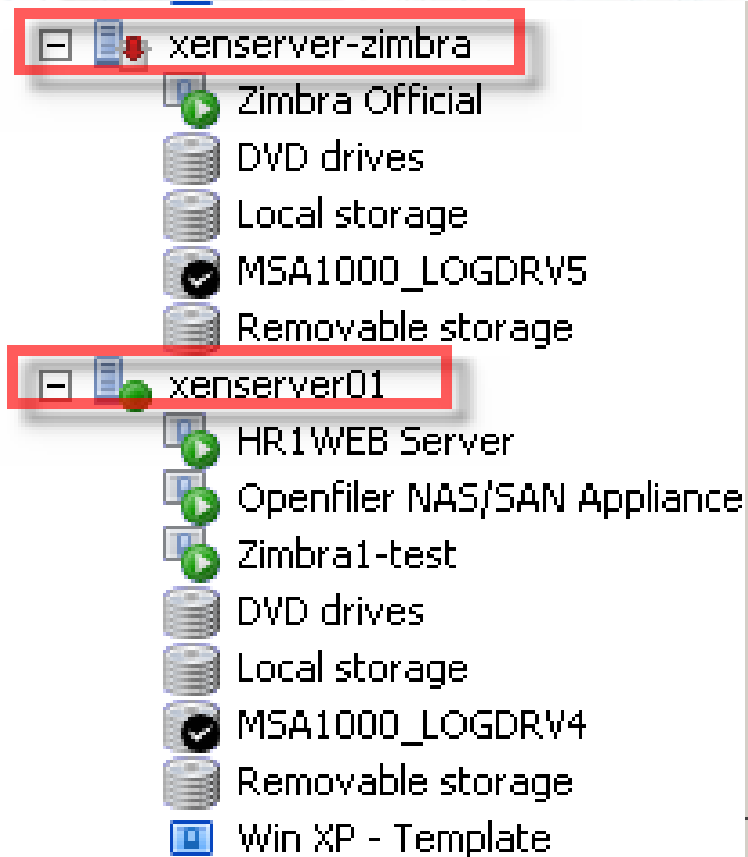
- 1 Citrix XenServer HOST serving 8 live MS Windows systems
(12GB RAM, 2x250GB SAS HD on Raid1)



- 4 Win2003 SRV
- 4 WinXP systems
- 1 WinXP
(test – not prod)
- WinXP Template
- Win 2003 SRV template

Demo ... Screenshots

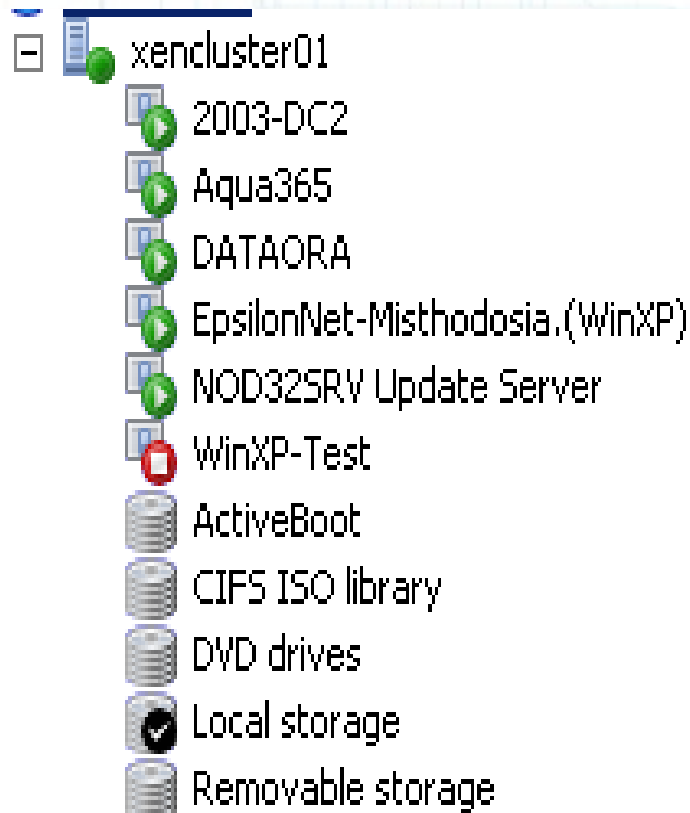
- 2 Citrix XenServers hosting LIVE Linux RedHat installations which includes :



- LIVE Zimbra Email suite (on RedHat 5.4 x64)
- LIVE WEBServer for HR (on RedHat 5.4 x32)
- OpenFiler installation (demo)

Demo ... Screenshots

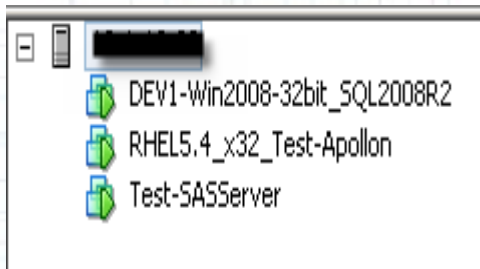
- 1 Citrix XenServers hosting LIVE Windows installations which includes :



- Win AD Domain Controller2 (Win 2003 SRV)
- Appl.Server for Production Program (Aqua) (Win 2003 srv x32)
- Cognos server (production) (Win 2003 srv x32)
- Win XP pc for HR (misthodosia)
- Antivirus Server (production) (Win 2000 srv x32)

Demo ... Screenshots

- 1 VMWare ESXi server hosting 3 Developing (Test) servers




- Test SQL Dev server (Win2008R2)
- Test Oracle Server (on RedHat 5.4 x32)
- Test Appl.Server for ERP (Win2003)

vm-esxi.local VMware ESXi, 4.0.0, 208167

Getting Started Summary Virtual Machines Resource Allocation

General

Manufacturer:	Dell Computer Corporation
Model:	PowerEdge 2850
CPU Cores:	2 CPUs x 3,591 GHz
Processor Type:	Intel(R) Xeon(TM) CPU 3.60GHz
License:	ESXi 4 Single Server Licensed for 2 physical CPU...
Processor Sockets:	2
Cores per Socket:	1
Logical Processors:	4
Hyperthreading:	Active
Number of NICs:	2
State:	Connected
Virtual Machines and Templates:	3
VMotion Enabled:	N/A
VMware EVC Mode:	N/A
FaultTolerance Enabled:	N/A
Active Tasks:	
Host Profile:	N/A
Profile Compliance:	 N/A

Next Steps of Action

- KVM implementation ?
 - Support issues, add-ons ?
- XEN.org implementation ?
 - Full “bare metal” hypervisor
- Continue using best of today's technologies, and contribute to communities (case studies, wiki, forums) in order to advance this technology
- VDI (Virtual Desktop Infrastructure ...)

Next Steps of Action

- Thank you for your time
- Questions ... demo cont.

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