



From VMware to Proxmox

Federico Calzolari

Scuola Normale Superiore - INFN Pisa



Outline



- VMware ESXi @sns-pisa
 - Pro and Contra

- Proxmox
 - Installation
 - How to use
 - Cluster management
 - Virtual machine creation
 - Virtual machine live migration, dump
 - Pro and Contra
 - Command-line

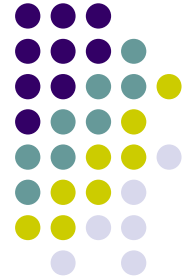
VMware ESXi infrastructure



- VMware ESXi @sns-pisa
 - All the Grid services
 - CE, SE, UI
 - 3 WN [testbed]
 - Monitoring and control tools

- Storage
 - Shared storage via NFS
 - DRBD Distributed Replicated Block Device

VMware ESXi evaluation



■ PRO

- Free
- Operating system + Hypervisor layer embedded in 180 MB
- Installation: 5 minutes via live CD
- Stability (more than one year without any crash)
- Performance: support for 1 Gb eth, iSCSI
- Support for live Snapshots
- Manageability: WYSIWYG interface

■ CONTRA

- No live Migration – it needs for VMotion (to be paid)
- Limited hardware support
- Management console VMsphere needs for Windows
- ssh shell and command-line are unsupported (need to be hacked)

Proxmox



Installation: live CD start

Proxmox



The screenshot shows the Proxmox Installer interface. At the top, the title bar reads "PROXMOX INSTALLER". Below the title bar are three buttons: "Install" (with a floppy disk icon), "Just Start" (with a play button icon), and "Webbased" (with a folder icon). The main section is titled "Network Configuration".

Please verify the displayed network configuration. You will need a valid network configuration to access the configuration interface after installation.

Afterwards press the Next button to continue installation. The installer will then partition your hard disk and start copying packages.

- **IP address:** Set the IP address for the Proxmox Virtual Environment.
- **Netmask:** Set the netmask of your network.
- **Gateway:** IP address of your gateway or firewall.
- **DNS Server:** IP address of your DNS server.

Hostname (FQDN):

IP Address: . . .

Netmask: . . .

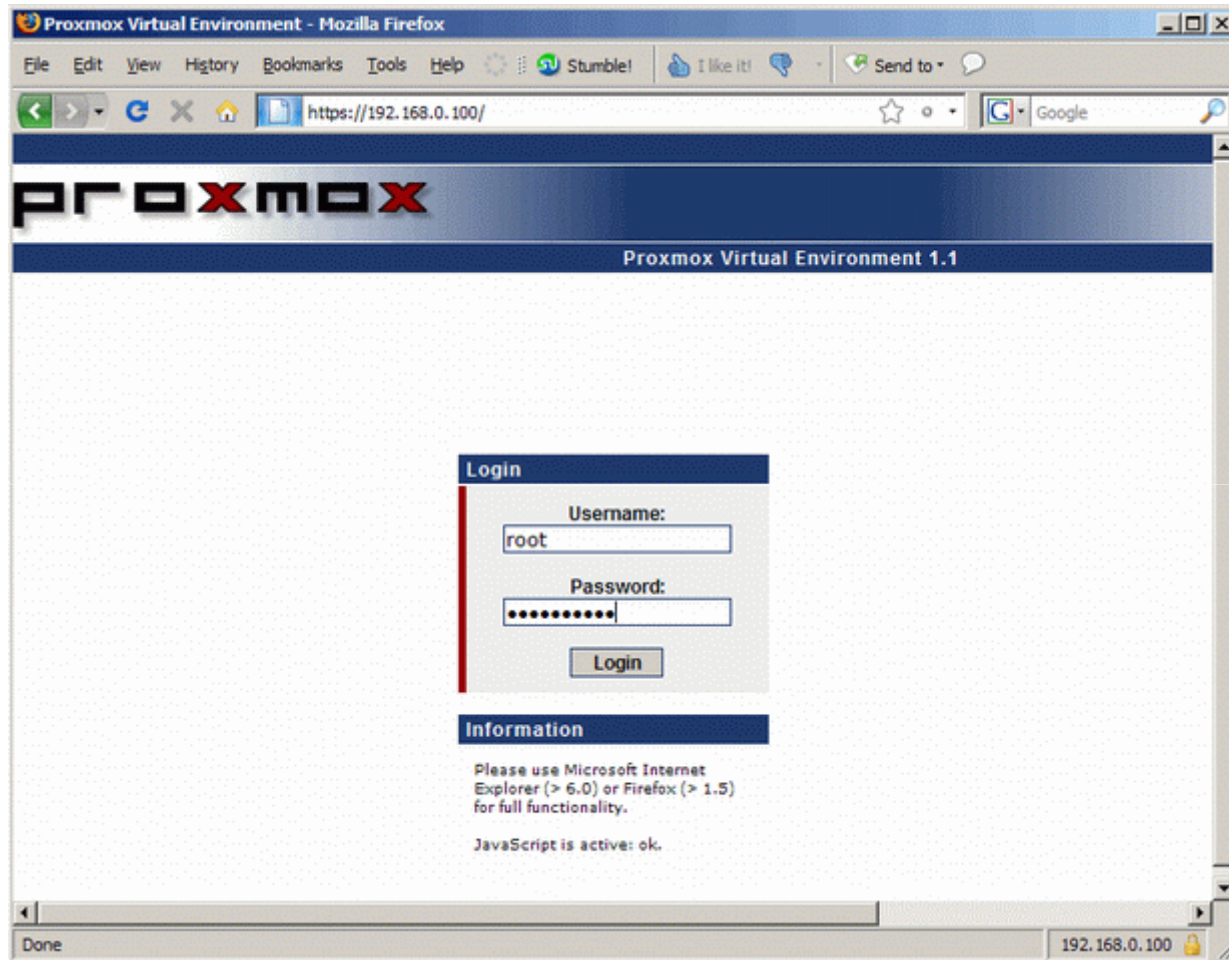
Gateway: . . .

DNS Server: . . .

At the bottom left is an "Abort" button and at the bottom right is a "Next" button.

Installation: server setup [Network]

Proxmox



Access the console management via web

Proxmox



The screenshot shows the Proxmox Virtual Environment web interface in a Mozilla Firefox browser window. The address bar shows the URL <https://192.168.0.100/>. The page title is "Proxmox Virtual Environment 1.1". The main content area displays the cluster status for "server1".

Proxmox Virtual Environment

Welcome to the Proxmox Virtual Environment!
For more information please visit our homepage at www.proxmox.com

Hostname	IP Address	Role	State	Uptime	Load	CPU
server1	192.168.0.100	Master	active	00:16	0.00	1%
server2	192.168.0.101	Node	active	00:06	0.03	3%

Local System Status ('server1')

Uptime	13:56:21 up 00:16, load average: 0.0
CPU(s)	2 x AMD Athlon(tm) 64 X2 Dual Core Pr
CPU Utilization	1.08%
IO Delays	0.00%
Physical Memory (3.60GB/183MB)	183MB
Swap Space (4.00GB/0KB)	0KB
HD Space root (94.49GB/632MR)	0.68%

Physical servers cluster status

Proxmox



The screenshot shows the Proxmox Virtual Environment web interface in a Mozilla Firefox browser. The page title is "Proxmox Virtual Environment 1.1". The left sidebar contains navigation menus for "VM Manager" (Virtual Machines, Appliance Templates), "Configuration" (System, Backup), and "Administration" (Server, Logs, Cluster). The main content area is titled "Virtual Machines" and includes tabs for "List", "Create", and "Migrate". Under "Running Maintenance Tasks", it says "Nothing to view". Below, there are two tables for "Cluster Node 'server1'" and "Cluster Node 'server2'".

VMID	Status	Name	Uptime	Disk
103	running	vm3	16 minutes	10.00GB
104	running	vm4	16 minutes	32.00GB

VMID	Status	Name	Uptime	Disk
101	running	vm1	17 minutes	372MB
102	running	vm2	1 hour	403MB

Virtual machines status

Proxmox



Proxmox Virtual Environment - Mozilla Firefox

File Edit View History Bookmarks Tools Help Stumble! I like it! Send to

https://192.168.0.100/vmlist/create.htm

Proxmox Virtual Environment 1.1 www.proxmox.com

Virtual Machines

List Create Migrate

Configuration

Type:	Container (OpenVZ)	VMID:	101
Template:	debian-5.0-standard_5.0-1_	Cluster Node:	server1 (192.168.0.100)
Hostname:	vm1.example.com	Start at boot:	<input checked="" type="checkbox"/>
Memory (MB):	512	Disk space (GB):	8
Swap (MB):	512		
Password:	••••••••		
Confirm Password:	••••••••		

Network

Network Type:	Virtual Network (venet)	DNS Domain:	example.com
IP Address:	192 . 168 . 0 . 102	First DNS Server:	145 . 253 . 2 . 75
		Second DNS Server:	213 . 191 . 92 . 86

create

Done 192.168.0.100

Create a virtual machine

Proxmox



The screenshot shows the Proxmox Virtual Environment web interface in a Mozilla Firefox browser. The address bar displays `https://192.168.0.100/apl/download.htm`. The left sidebar contains navigation menus for VM Manager, Configuration, and Administration. The main content area is titled "Appliance Templates" and features tabs for "Local" and "Download".

Local | **Download**

Certified Appliances

Description	Version	Type
↓ CYAN Secure Web	1.4.7-2	openvz
↓ Proxmox Mail Gateway	2.2-1	openvz

Section 'admin'

Description	Version	Type
↓ Zenoss Core IT monitoring	2.3.0-1	openvz

Section 'system'

Description	Version	Type
↓ CentOS 4 (standard)	4-2	openvz
↓ CentOS 5 (standard)	5-2	openvz
↓ Debian 4.0 (standard)	4.0-3	openvz
↓ Fedora 9 (standard)	9-1	openvz
↓ Ubuntu 8.04 (minimal)	8.04-1	openvz

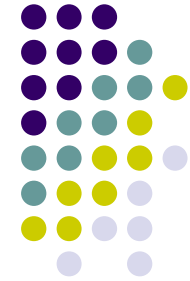
Section 'www'

Description	Version	Type
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The browser status bar at the bottom shows the URL `https://192.168.0.100/apl/index.htm` and the IP address `192.168.0.100`.

Create a virtual machine from OpenVZ template

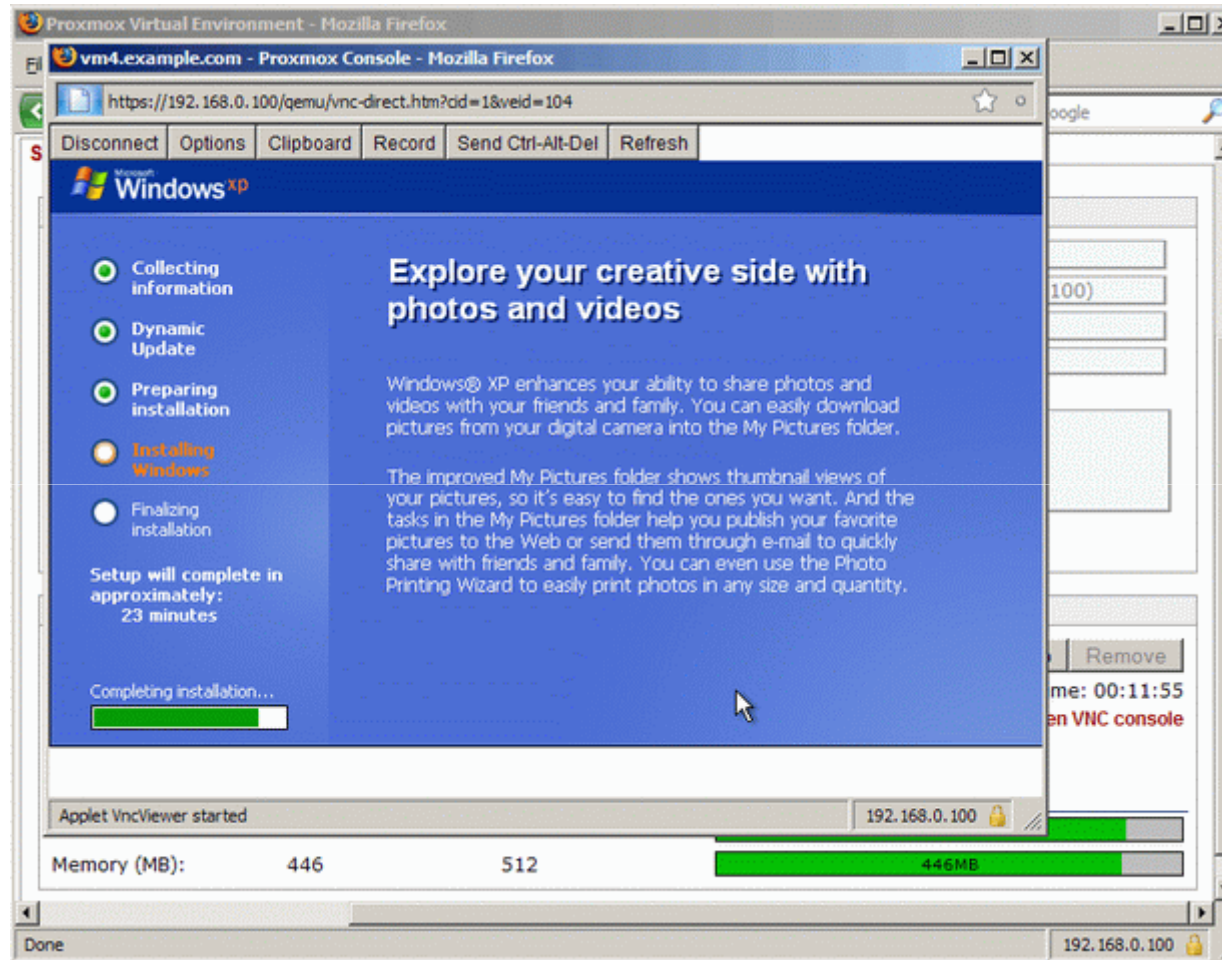
Proxmox

A screenshot of a Proxmox Virtual Environment VNC console. The main window displays the Debian installer boot menu with a red spiral logo on the left and the Debian logo on the right. The menu options are: Install (highlighted), Graphical install, Advanced options, and Help. The Debian logo includes the text 'debian GNU / Linux'. Below the main window, there is a status bar showing 'Applet VncViewer started' and the IP address '192.168.0.100'. At the bottom, a resource usage table is visible.

CPU Utilization:	98	100	98.00%
Memory (MB):	13	512	13MB

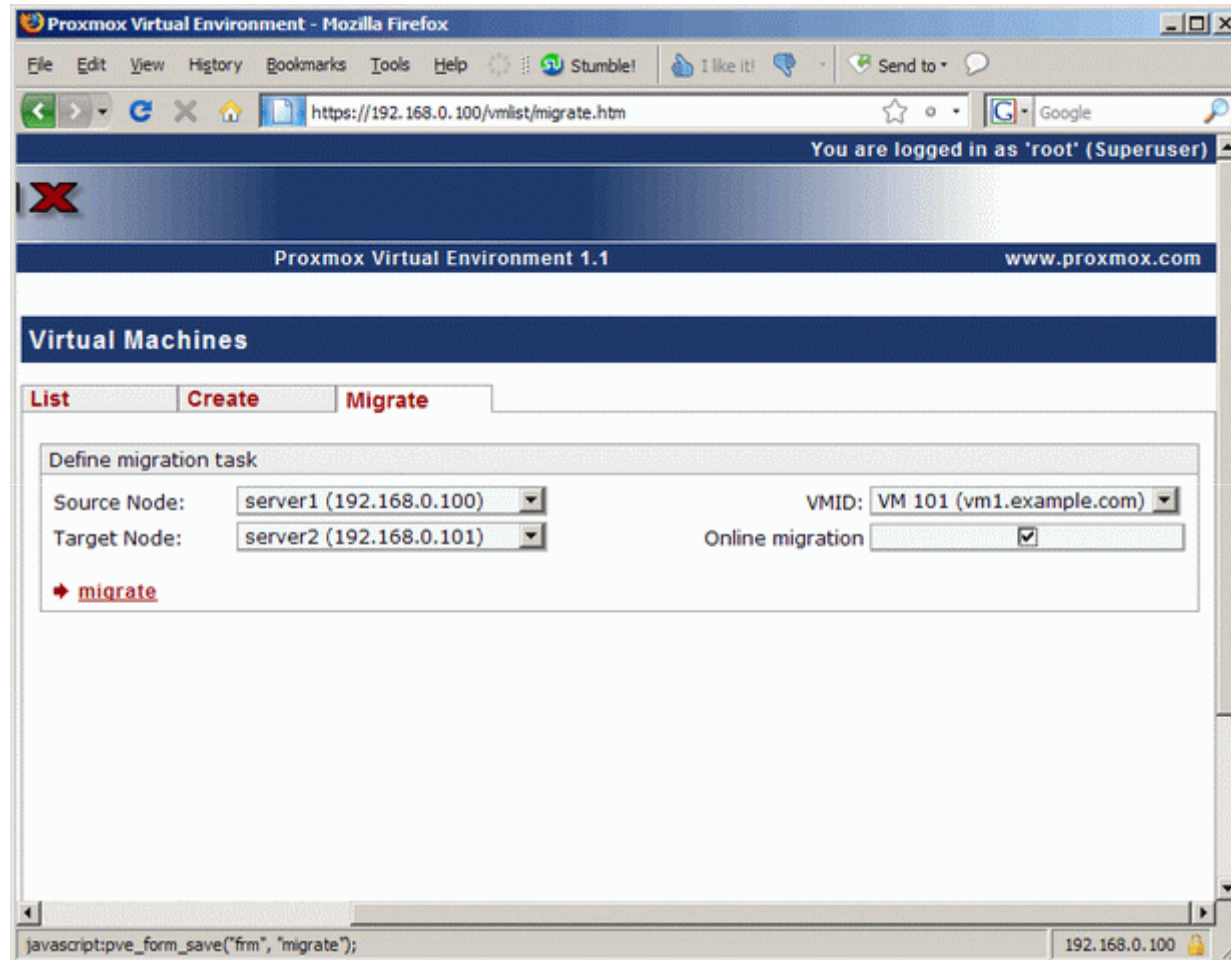
VNC console - Linux virtual machine

Proxmox



VNC console - Windows virtual machine

Proxmox



Virtual machine live migration

Proxmox



The screenshot shows the Proxmox Backup scheduler interface within a Mozilla Firefox browser window. The browser address bar shows the URL `https://192.168.0.100/backup/index.htm`. The page title is "Backup".

The "Jobs" section is active, showing a "Create new job" form. The form fields are:

- Cluster Node: `server1 (192.168.0.100)`
- Destination: `/backup`
- Day of Week: `Mon Tue Wed Thu Fri Sat Sun` (all days are checked)
- Start time: `02 : 00`
- Mode: `snapshot`
- Compress files: `snapshot` (selected from a dropdown menu with options: `snapshot`, `suspend`, `stop`)
- Send email to:
- Include all VMs:

Below the form is a table listing VMs:

	VMID	Status	Name	VM Type	Disk size
<input checked="" type="checkbox"/>	103	running	vm3	qemu	10.00 GB
<input checked="" type="checkbox"/>	104	running	vm4	qemu	32.00 GB

At the bottom of the form, there is a red arrow icon followed by the text "save".

The browser status bar at the bottom shows "Done" and the IP address "192.168.0.100".

Virtual machine backup scheduler

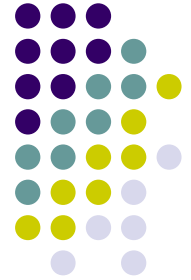
Proxmox evaluation



■ PRO

- Free
- Operating system Debian + Hypervisor layer in 2.5 GB
- Installation: 5 minutes via live CD
- Physical servers clusterization (self-consistent management)
- KVM support and OpenVZ capabilities with templates
- Very fast VM creation both with qcow2 and raw storage
- Easy to add a node in the cluster
- Automatic virtual machine import/export from VMware to Proxmox
- Excellent VNC applet integration, even if the keyboard mapping is always a pain
- Performance: support for 1 Gb eth, iSCSI
- Manageability: WYSIWYG interface

Proxmox evaluation



■ CONTRA

- No user and group management to give access to certain VM to some users
- No support for FibreChannel
- Live Migration only with a shared storage
- Fast Backup only with a local LVM storage
- Dump, not incremental snapshot
 - OK on local LVM disk; freezes VM on NFS
- PXE: doesn't recognize syntax "localboot 0"
 - Impossible to start from HD if Network boot is selected

Proxmox command line



- **Virtual machines configuration file**

- `/etc/qemu-server/<vmID>.conf`

- **Command line**

- `qm start <vmID>` start vm
- `qm stop <vmID>` kill vm (immediate stop)
- `qm shutdown <vmID>` gracefully stop vm (send poweroff)
- `qm reboot <vmID>` reboot vm (shutdown, start)
- `qm reset <vmID>` reset vm (stop, start)
- `qm suspend <vmID>` suspend vm
- `qm resume <vmID>` resume vm
- `qm destroy <vmID>` destroy vm (delete all files)
- `qm startall` start all virtual machines (when onboot=1)
- `qm stopall [timeout]` stop all virtual machines (default timeout is 3 minutes)

- **Import/Export virtual machine**

- `qemu-img convert -O vmdk vm-<vmID>-disk.qcow2 vm-<vmID>-disk.vmdk` export to VMDK (VMware)
- `qemu-img convert -O qcow2 vm-<vmID>-disk.vmdk vm-<vmID>-disk.qcow2` import from VMDK (VMware)

- **Backup (dump)**

- `vzdump --dumpdir /<PATH> --snapshot <vmID>`

- **Live Migration**

- `/usr/bin/ssh -t -t -n -o BatchMode=yes <SOURCE> /usr/sbin/qmigrate --online <DEST> <vmID>`