



基于XCP和puppet的虚拟化云平台建设

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竟先

主要概要：

0

服务器虚拟化

1

XCP介绍

2

puppet介绍

3

OVCP开源虚拟化云平台

4

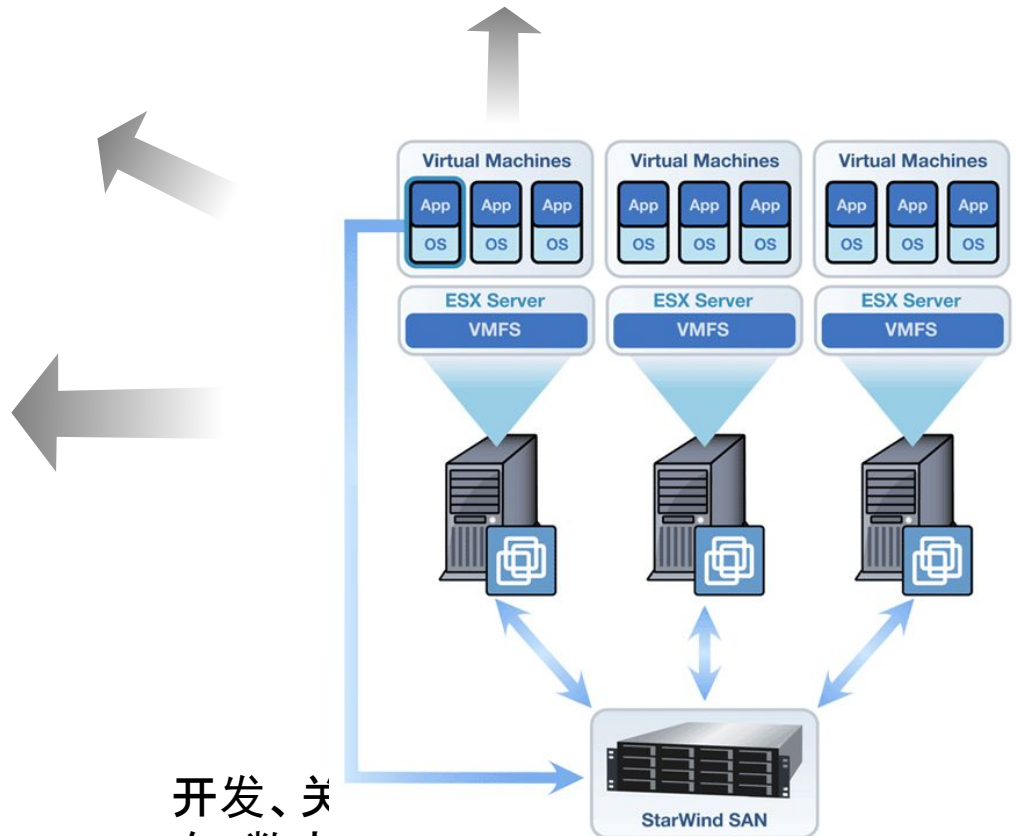
OVCP高级内容

开发、关联、智能、泛
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0.服务器虚拟化

- 1959年，克里斯托弗在报告《大型高速计算机中的时间共享》第一次提到虚拟化技术概念。
- 1965年，IBM公司第一次商业上实现了虚拟化。
- 1999年，VMware在X86平台上实现了虚拟化，并发布了VMware Workstation。
- 2001年，VMware发布了VMware ESX server进入服务器虚拟化市场。
- 1990年，由Keir和Ian Pratt等人在剑桥大学成立了Xenoservert研究项目。
- 2002年，Xen Hypervisor开源化。
- 2006年，Citrix公司获取Xen并发布了XenServer。
- 2009年，Xen.org发布Xen Cloud Platform(XCP)。

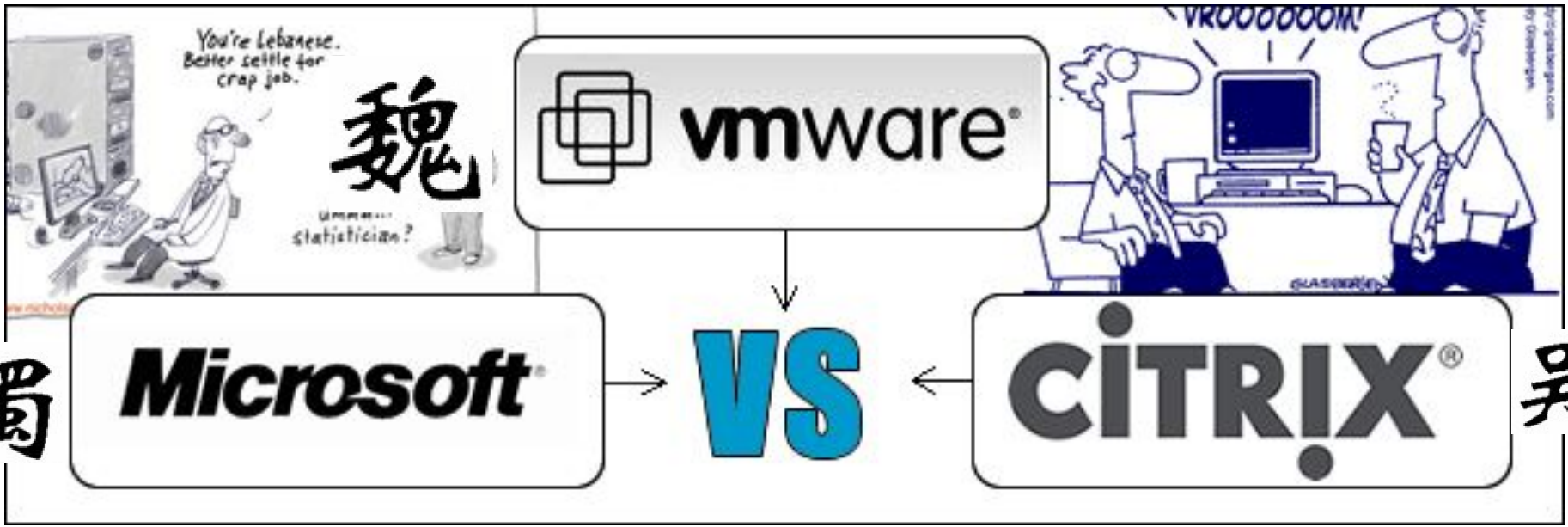
虚拟化带来了什么？



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商用服务器虚拟化之三国争霸

60%



25%



6%

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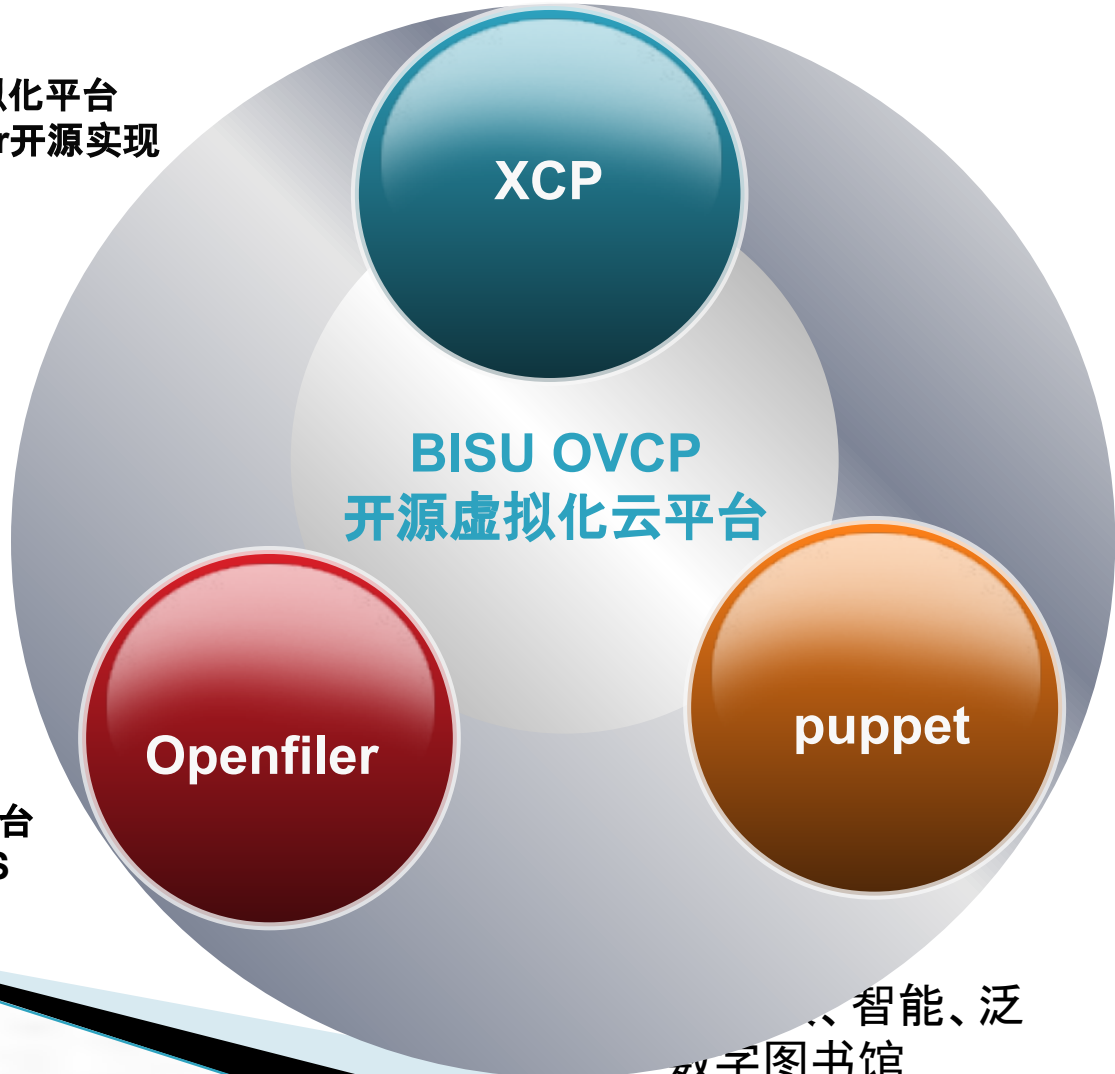
为什么需要开源服务器虚拟化？

	Xen开源虚拟化方案	VMware虚拟化方案
资金	免费	价格较高
性能功能	HVM和PVM性能都很高 缺乏迁移和HA等重要功能	方案很成熟，功能相当完善 但PVM性能不是很高
管理和维护	需要对xen虚拟化非常精通的人才可以进行管理和维护 缺乏商业支持。	有商业支持，不需要精通虚拟化了解即可管理和维护
功能扩展	开放源代码，开发人员可以添加新的功能如支持加密狗，OpenvSwitch等	很难进行功能扩展

OVCP虚拟化云平台解决方案

OVCP: OpenSource Virtualization Cloud Platfrom

基于Xen开源虚拟化平台
商业的XenServer开源实现



开源的存储管理平台
可用于iscsi和NAS

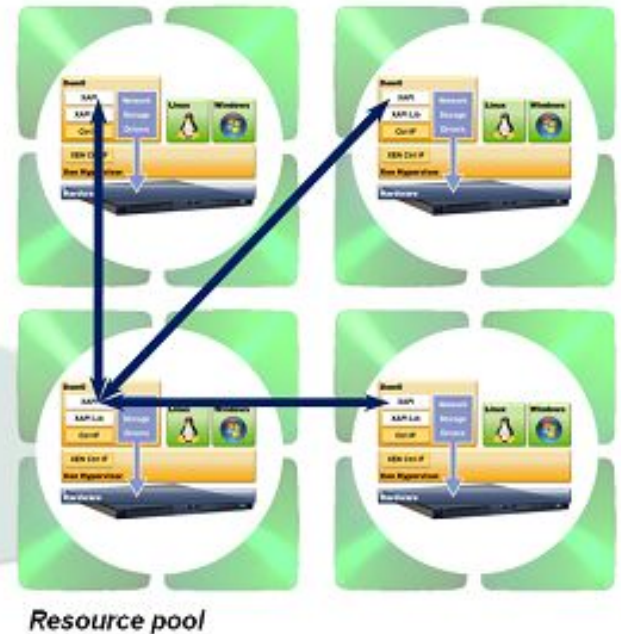
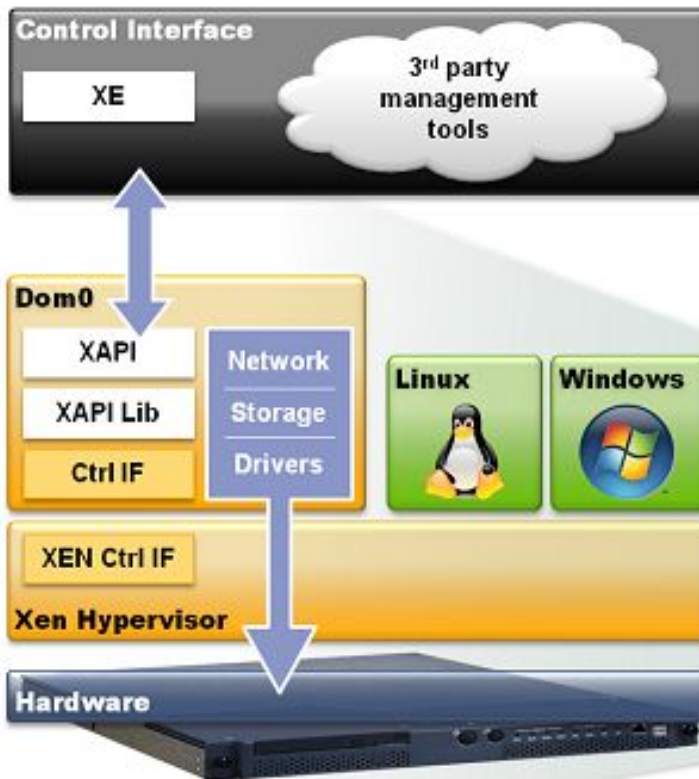
开源的服务器自动化
部署和配置管理工具

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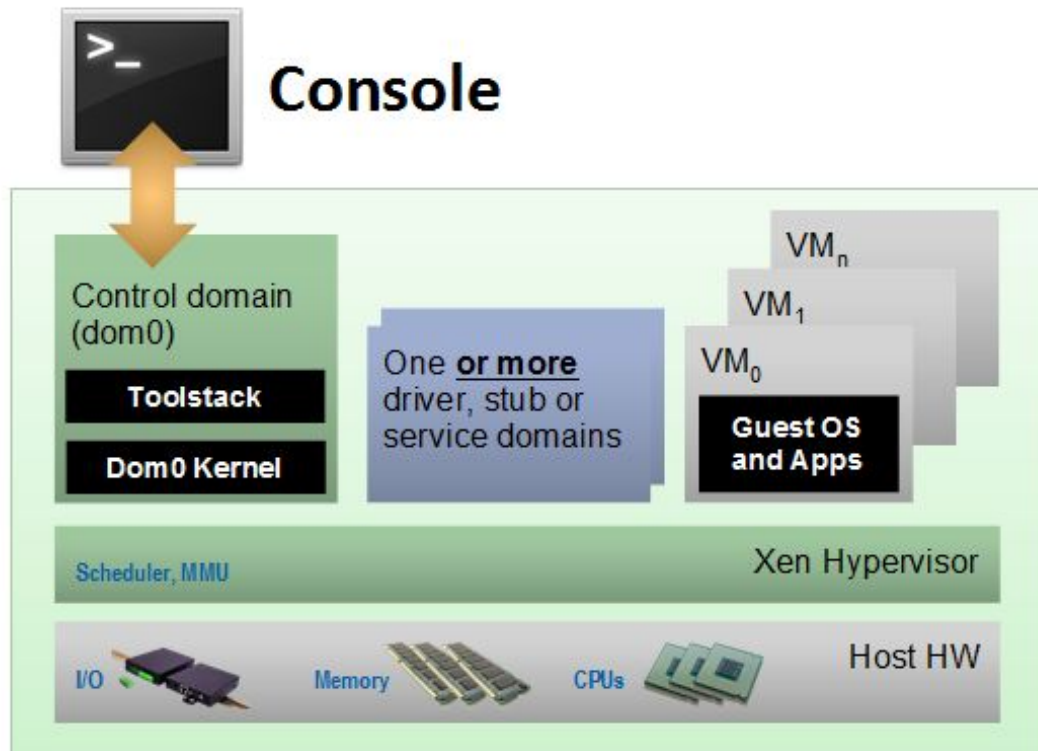
1.XCP介绍

Xen Cloud Platform (简称XCP)

- 开源的企业级服务器虚拟化平台
- 源自Citrix XenServer, 由Xen.org维护
- 遵循GPL v2 协议
- 具有Resource Pool和Live Migration等高级特性



Xen的基本概念



Control Domain : **Dom0**

- Dom0 kernel with drivers
- Xen Management Toolstack
- Trusted Computing Base

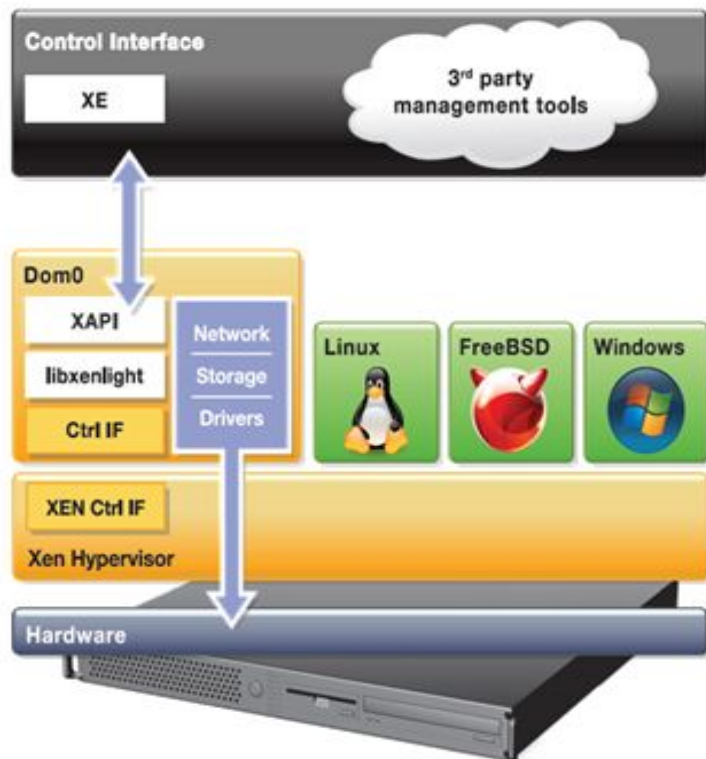
Guest Domains

- Your apps
- E.g. your cloud management stack

Driver/Stub/Service Domain(s)

- A “driver, device model or control service in a box”
- De-privileged and isolated
- Lifetime: start, stop, kill

XCP云计算中应用



cloudstack
open source cloud computing

OpenNebula.org

openstack™

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XCP vs Citrix XenServer

Editions Features	XenServer 5.6 FP1 Free	XenServer 5.6 FP1 standard	Xen Cloud Platform 1.0
Cores per Processor	2	unlimited	unlimited
Distributed virtual switching		✓	✓
VLAN Support		✓	✓
Heterogeneous pools		✓	✓
Share Storage		✓	✓
Memory optimization		✓	✓
Open Source			✓
Web Based Management			✓

XCP 历史版本比较

	XCP 1.0	XCP 1.1	XCP 1.5	XCP 1.6 (beta)
Initial Release	March 2011	October 2011	February 2012 (beta only)	TBA: Q4 2012
Corresponding XS release	5.6 FP1 [Ⓔ]	5.6 SP2 [Ⓔ]	6.0 [Ⓔ]	6.1 [Ⓔ]
Dependencies				
Xen version	?	Xen 3.4.2	Xen 4.1.0	Xen 4.1.2
CentOS	5.x?	CentOS 5.x? (Linux kernel v2.6.32)	5.6 (Linux kernel v2.6.32)	5.7 (Linux kernel v2.6.32.43)
Open vSwitch	?	?	?	1.4.2
Limits (besides those listed for Xen)				
Configuration Limits				1.6 limits [Ⓔ]
Feature				
IntelliCache	✓	✓	✓	✓
Resilient distributed management architecture	✓	✓	✓	✓
VM disk snapshot and revert	✓	✓	✓	✓
XenCenter management	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓
Conversion tools	✓	✓	✓	✓
Heterogeneous pools	✓	✓	✓	✓
Dynamic Memory Control	✓	✓	✓	✓
Performance alerting and reporting	✓	✓	✓	✓
Host power management	✓	✓	✓	✓
Live memory snapshot and revert	✓	✓	✓	✓
Web self-service with delegated admin ²⁾	✓	✓	✓	✓
Site recovery	✓	✓	✓	✓
Open vSwitch	✓	✓	✓(default)	✓(default)
GPU Pass-Through			✓	✓
GUID Partition Table			✓	✓
NIC Bonding			✓	✓
IPv6				✓
LACP Bonding				✓
XenMotion [®] live Migration				✓
Windows Drivers Installable via Windows Update				✓
Templates				
Additional Templates	?	?	Ubuntu 10.04, Debian Squeeze, Oracle EL 6.0, SLES 10 SP4	Ubuntu 12.04, RHEL/CentOS 6.2, Oracle EL 6.1 & 6.2, Windows 8

XCP源码及源程序

Xen Cloud Platform 1.6 Beta is available New

Xen.org is happy to announce that XCP 1.6 Beta is available! For a list of features see the [1.6 release notes](#). This release supersedes the XCP 1.5 beta release. A few months ago, the XCP team decided to concentrate their efforts on fixing internal build system issues so that we could release new XCP versions more efficiently. We will be recommending that XCP 1.5 beta users upgrade to XCP 1.6 final when it is released.

For more information go to the [XCP 1.6 Beta download page](#).

Xen Cloud Platform 1.1

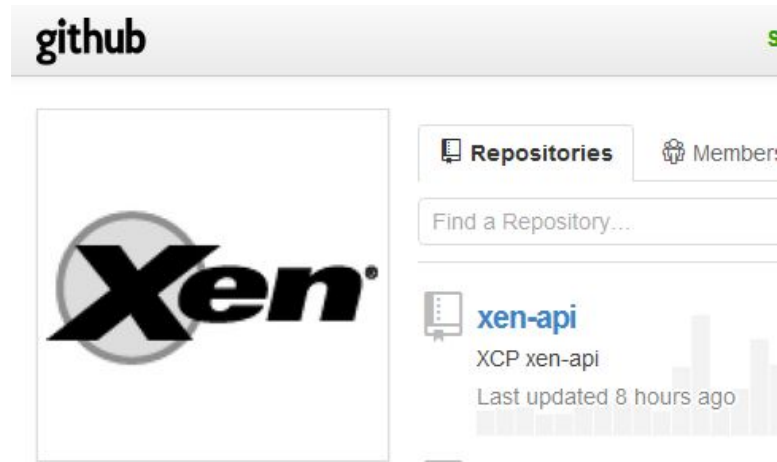
For more information go to the [XCP 1.1 download page](#).

Security updates are available! New

Xen Cloud Platform 1.0

For more information go to the [XCP 1.0 download page](#).

Security updates are available! New



XCP Packages in Linux

XCP traditionally comes as an ISO that is installed on a bare metal server. in Debian and Ubuntu. For more information see:

- [XCP toolstack on a Debian-based distribution](#)
- [XCP in Debian Wheezy](#)
- [XCP in Ubuntu Server LTS 12.04](#)
- [Project Zeus: XCP on Fedora and CentOS](#)

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2.puppet介绍



什么是puppet

- 数据中心自动化配置和管理软件
- 可用于管理Linux、Unix、Mac和Windows
- 遵循GPL v2 协议* (2.7.0), 基于ruby 语言开发
- 简单易懂的语言表达系统, 用库实现配置
- 基于C/S架构, 配置客户端和服务端, 也可以独立运行
- puppet 对于系统管理员是抽象, 只依赖于ruby与facter.

*注:2.7.0以后遵循 Apache2.0协议

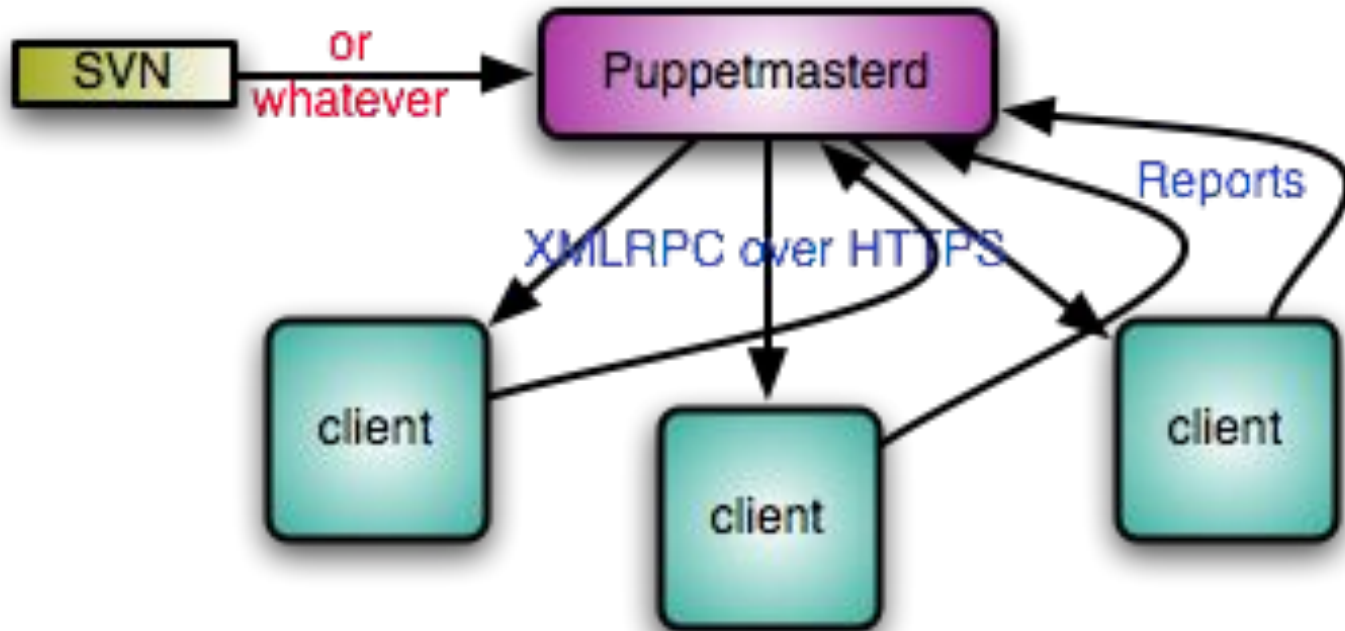
成功案例

- 2007年, google使用puppet管理超过6000台mac电脑
- 开源社区Fedora使用puppet管理服务器
- 国内外各大知名IT企业逐步从cfengine转移到puppet上



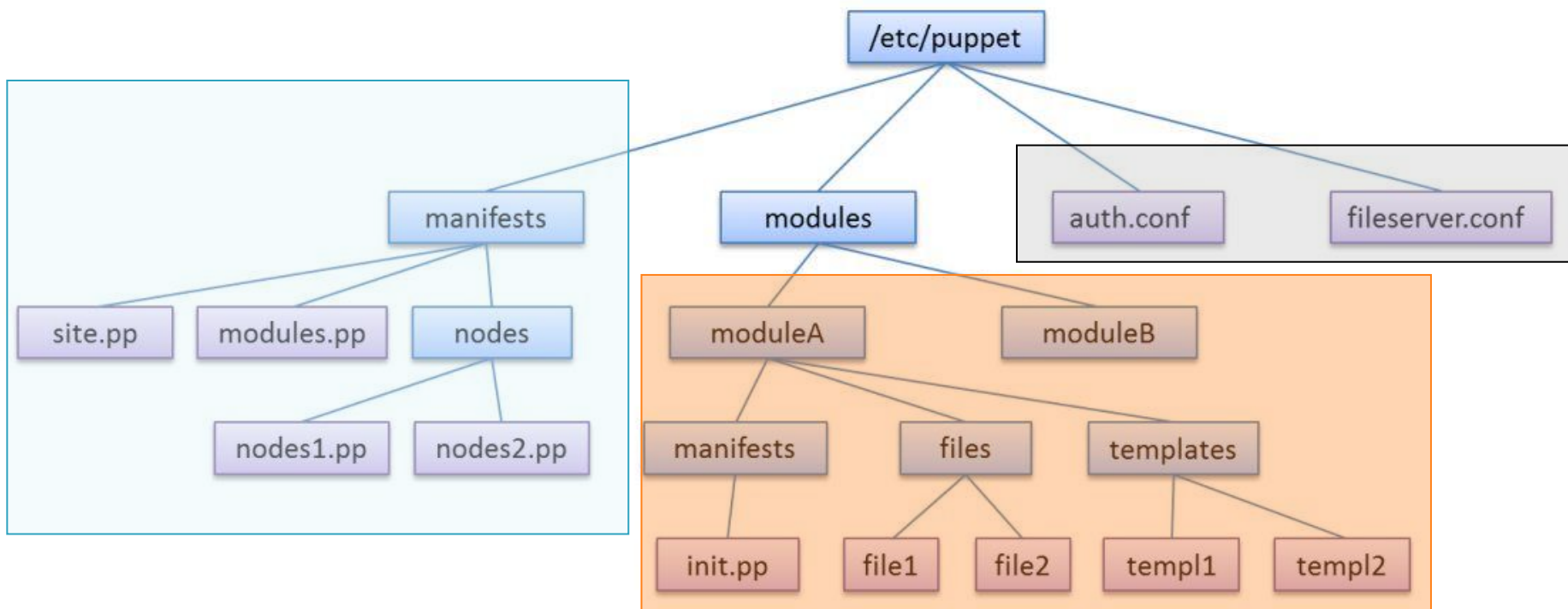
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puppet整体架构



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puppet master 目录结构



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puppet的语法

- puppet使用ruby编写,语法上也与ruby类似
- puppet把需要管理的内容抽象成资源,每种资源有不同的属性, puppet语言就是用来描述这些资源的属性和资源之间的关系。

```
file {  
  "/tmp/test":  
    content=>"hello\n",  
    mode => 0644;  
}
```

e.g. 创建文件test

```
package {  
  ["gcc", "make"]:  
    ensure => installed;  
}
```

e.g. 安装gcc和make

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puppet基于web管理工具 Dashboard



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puppet开源版和企业版对比

开源版	企业版
	用户图形接口
内置Ec2模块	内置Ec2模块
	内置Vmware vms
	配置管理-发现和克隆
配置管理-操作系统	配置管理-操作系统
	配置管理-用户账户管理
管理应用	管理应用
内置300+模块	内置300+模块
	统一跨平台组件安装
	自动配置审记, 依赖包在一个目录下
	业务流程自动化
网络技术社区支持	网络技术社区支持
	7*24 小时技术支持, 平滑升级和维护支持

3.OVCP开源虚拟化云平台

OVCP (OpenSource Virtualization Cloud Platfrom)
完全基于开源软件建设的虚拟化云平台。



基于Xen开源虚拟化平台
XenServer开源版本

XCP

BISU OVCP
开源虚拟化云平台

Openfiler

开源的存储管理平台
SAN和NAS开源实现

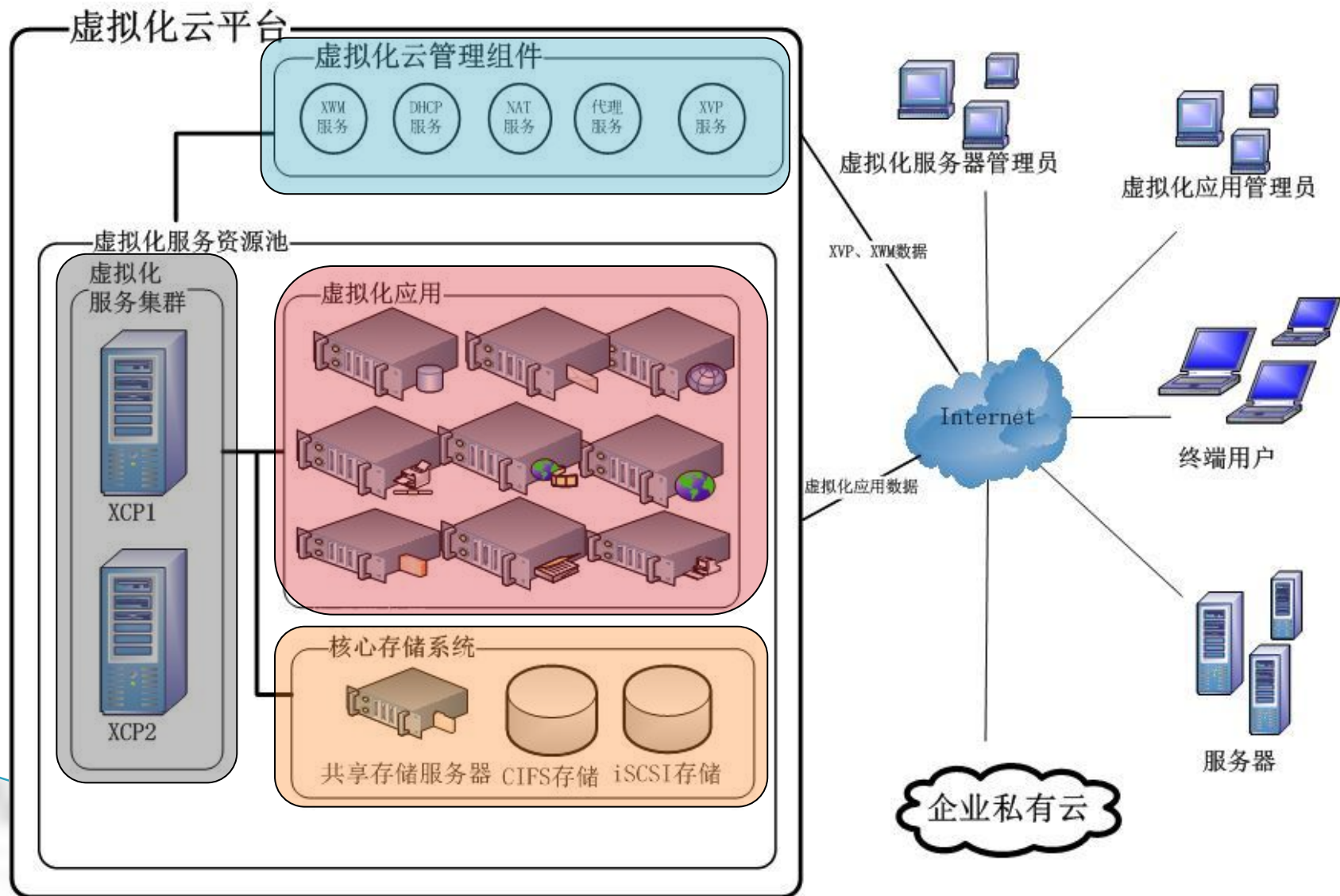
puppet

开源的服务器自动化
配置和管理工具

- 遵循GPLv2协议开源
- 可升级为商业版本
- 产品成熟, 文档齐全

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3.1 OVCP虚拟化云平台整体结构图



开源虚拟化云平台硬件和软件配置

	硬件		软件
服务器	HP ProLiant DL580 G5*3	操作系统	Debian 6.0
CPU	Xeon X7460 (2.4GHZ)*4	虚拟化平台	XCP 1.0 (XenServer 5.6.1)
内存	4GB*16/4GB*16/2GB	Xen版本	Xen 3.4.2
硬盘	73GB*2/73GB*2/146GB*8	puppet版本	puppet 2.7 facet, dashboard
网络	NC373i 1000MB*2	其他软件	XenCenter 5.6.1 XVP、XenWebManager

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3.2 安装和管理 XCP

```
XCP 1.0.0                20:35:05                xcp2
----- Configuration -----
Customize System
Status Display
Network and Management Interface
Authentication
Virtual Machines
Disks and Storage Repositories
Resource Pool Configuration
Hardware and BIOS Information
Keyboard and Timezone
Remote Service Configuration
Backup, Restore and Update
Technical Support
Reboot or Shutdown
Local Command Shell

HP
ProLiant DL580 G5

XCP 1.0.0-42052c

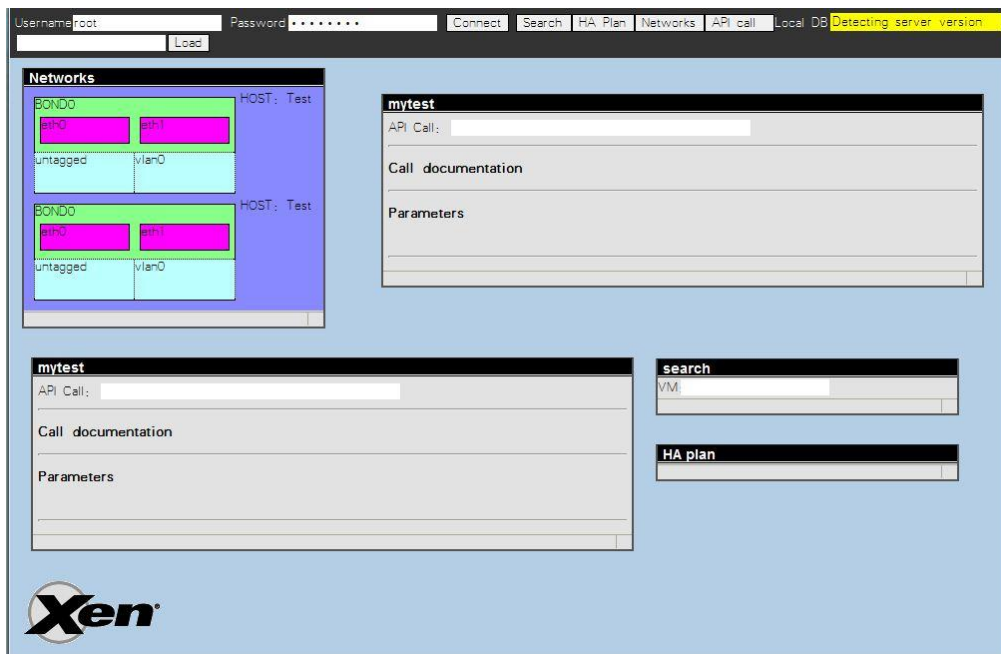
Management Network Parameters

Device          eth2
IP address      211.71.202.33
Netmask        255.255.255.128
Gateway        211.71.202.126

Press <Enter> to display the SSL key
fingerprints for this host

<Enter> OK <Up/Down> Select          <Enter> Fingerprints <F5> Refresh
```

修改xapi使用XenCenter代替XCP自带Web管理接口



XCP的web管理接口

```
#!/bin/bash
/etc/init.d/xapi stop
echo "Doing backup of xapi executable.."
cp -v /opt/xensource/bin/xapi
/opt/xensource/bin/xapi.original
echo "Applying patch.."
/usr/bin/perl -pi -e 's/1\.0\.0/5.6.1/g'
/opt/xensource/bin/xapi
echo "Applied"
/etc/init.d/xapi start
```

修改xapi的shell脚本

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用XenCenter建立和管理XCP资源池



The screenshot shows the XenCenter interface with the 'BISU OVCP Overview' page selected. The left sidebar shows a tree view of the resource pool. The main area displays a table of VMs with columns for Name, CPU Usage, Used Memory, Disks, Network, Address, and Uptime.

Name	CPU Usage	Used Memory	Disks (avg / max KBs)	Network (avg / max KBs)	Address	Uptime
BISU OVCP 北二外开源虚拟化云平台	-	-	-	-	-	-
xcp2.lib.bisu Default install of XenServer	2% of 8 CPUs	5491 of 49149 MB	-	1/3	211.71.202.33, 192...	1 day 15 hours 37 minutes
PM-debian6-squid_VOD_DNS	0% of 1 CPU	XenServer Tools out of date (version 1.0 installed)	-	-	211.71.202.34	1 day 0 hours 28 minutes
win7-puppet-agent	1% of 1 CPU	484 of 2048 MB	0/0	0/0	192.168.100.112	17 hours 9 minutes
xcp1.lib.bisu Default install of XenServer	0% of 8 CPUs	4719 of 49149 MB	-	1/3	211.71.202.32	23 hours 39 minutes
puppet-agent-debian6	-	-	-	-	-	-
win08r2-puppet-agent	0% of 2 CPUs	380 of 2048 MB	0/0	0/0	192.168.100.111	17 hours 24 minutes
xp-puppet-agent	1% of 1 CPU	218 of 1024 MB	0/0	0/0	192.168.100.107	17 hours 48 minutes
xvppliance Xen VNC Proxy Appliance	0% of 1 CPU	XenServer Tools out of date (version 5.5 installed)	-	-	192.168.100.108	17 hours 21 minutes
CIFS ISO library 160 CIFS ISO Library [\\211.71.202.16...	-	-	-	-	211.71.202.160	-
CIFS ISO library 162 CIFS ISO Library [\\211.71.202.16...	-	-	-	-	211.71.202.162	-
iSCSI virtual disk storage iSCSI SR [211.71.202.35 (iqn.2006...	-	-	-	-	211.71.202.35	-
CentOS 5 (32-bit)_PVM	-	-	-	-	-	-
Debian6_X64	-	-	-	-	-	-
Red Hat Enterprise Linux 6 (32-bit)	-	-	-	-	-	-
Windows 7 (32-bit)	-	-	-	-	-	-
Windows Server 2008 R2 (64-bit)	-	-	-	-	-	-
Windows XP SP3 Installs Windows XP Service Pack...	-	-	-	-	-	-

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3.3 建立核心存储

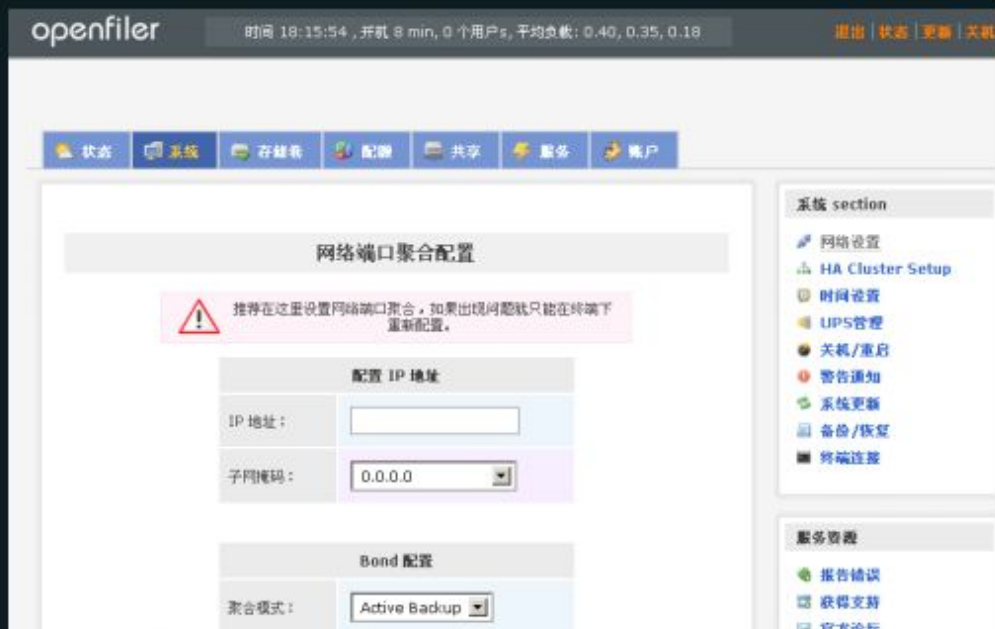
Openfiler开源的能把标准x86/64架构的系统变成一个强大的NAS、SAN存储和IP存储网关，为管理员提供一个强大的管理平台，并能应付未来的存储需求。

依赖如VMware, Virtual Iron和Xen服务器虚拟化技术，Openfiler也可部署为一个虚拟机。

控制您的存储设备

开源存储管理平台

- ✓ 集成 SAN 和 NAS 等多种功能
- ✓ 高可用性故障切换功能
- ✓ 块级别的远程复制和灾难恢复
- ✓ 功能强大的网页管理界面
- ✓ 本地化语种使设置更方便



NFS网络优化	增强的CIFS选项	多网卡绑定	高级iSCSI设置
NFS客户端访问调优，优化了多用户写入、同步、端口等	高级CIFS共享配置，对应用程序的兼容性更强	可创建多网卡的绑定配置，以提高数据的传输性能	可创建多个iSCSI目标和LUN，并且可以建立数据快照

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在XCP资源池中使用iSCSI

The screenshot shows the configuration page for 'iSCSI virtual disk storage'. It includes tabs for 'General', 'Storage', 'Maps', and 'Logs'. The 'Storage General Properties' section is active, showing details for the storage configuration. The 'General' section includes fields for Name, Description, Tags, Folder, Type, Size, SCSI ID, and UUID. The 'Status' section shows the State as 'OK' and connections for 'xcp2.lib.bisu' and 'xcp1.lib.bisu'. The 'Multipathing' section shows that both connections are 'Not active'.

iSCSI virtual disk storage

General Storage Maps Logs

Storage General Properties

Properties [Expand all](#) [Collapse all](#)

General

Name:	iSCSI virtual disk storage
Description:	iSCSI SR [211.71.202.35 (iqn.2006-01.com.openfiler:tsn.df39c8a9e123)]
Tags:	<None>
Folder:	<None>
Type:	LVM over iSCSI
Size:	167.4 GB used of 260.7 GB total (168.3 GB allocated)
SCSI ID:	14f504e46494c45523150664864422d4f7070552d49755a56
UUID:	b0ccff03-79cc-fb23-053d-6aecc851e9b0

Status

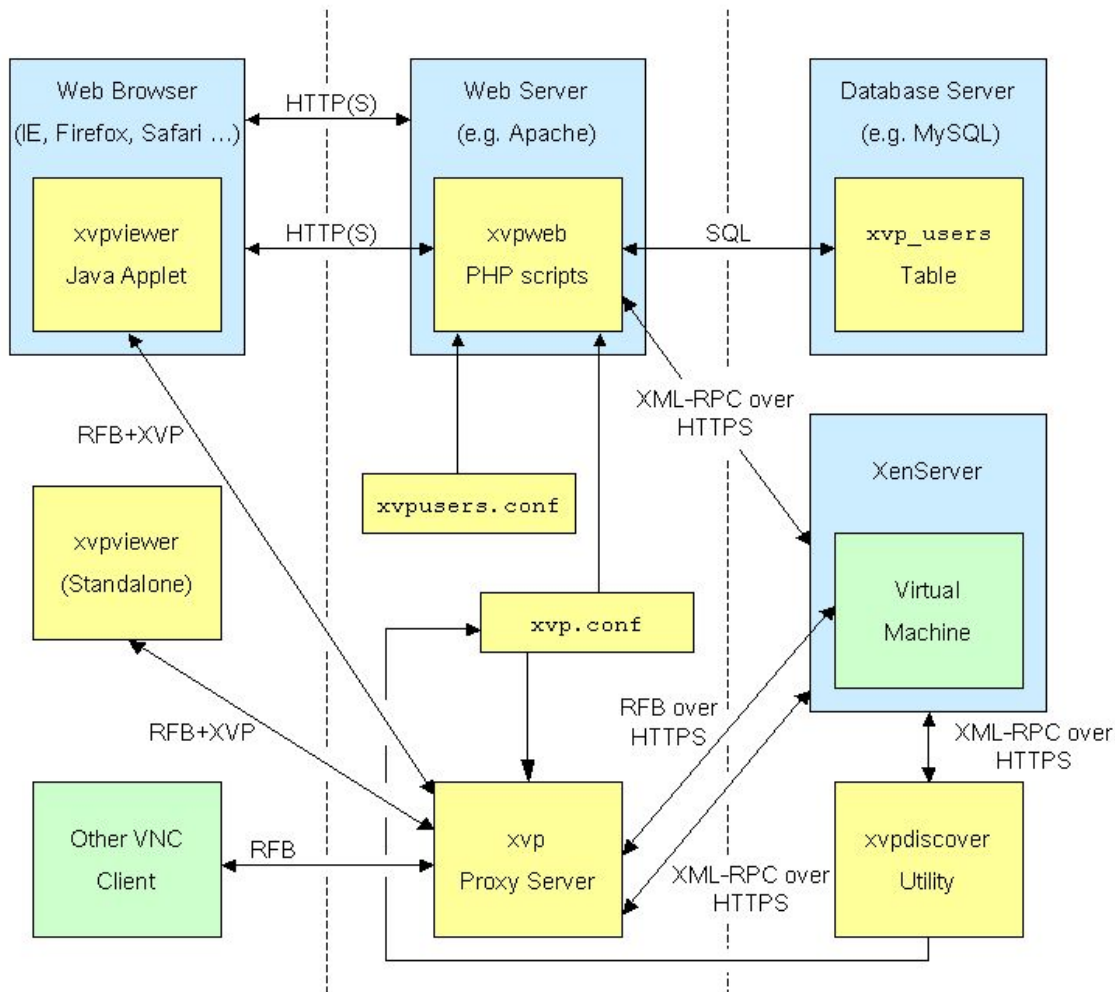
State:	OK
xcp2.lib.bisu:	Connected
xcp1.lib.bisu:	Connected

Multipathing

xcp2.lib.bisu:	Not active
xcp1.lib.bisu:	Not active

3.4 云模式管理XCP

XVP: 基于 VNC 和 Web 管理 Citrix XenServer 和 Xen Cloud Platform 的平台



xvappliance
xvp
xvpviewer
xvpweb
xvpdiscover
xvptag

1. 广泛的浏览器支持
2. 支持Active Directory
3. 基于Web安全可靠

能、泛

XVP管理XCP

xvp™ Xen Pool Status
Last updated Fri May 13 2011 16:04:06 CST
updates automatically - do not use refresh button

Pool XCP Host

Server Hosts

Host	Status	Free Space
XCP2	Running as master	44.1/48.0 GB free
XCP1	Running as slave	37.8/48.0 GB free

Virtual Machines

VM Name	Status	Uptime	Memory
iscsi_CentOS 5 (32-bit)_PVM	Running	22 days, 13:16	1.0 GB
iscsi_XenServer SDK 5.6.1_pvm	Running	22 days, 14:18	0.5 GB
Openfiler_Windows Server 2003 (32-bit)_hvm (1)	Running	22 days, 13:09	1.0 GB
openfiler_Windows XP SP3_pvm (1)	Running	6 days, 20:47	1.0 GB
XCP1_Debian 6.0 (64-bit)_pvm (1)	Running	21 days, 14:25	2.0 GB
XCP1_Debian5.0 (32-bit)_pvm (1)	Running	10 days, 9:57	0.5 GB
XCP1_Demo Linux VM (debian4)_pvm (1)	Running	18 days, 6:03	0.3 GB
XCP1_RHEL6 (32-bit)_PVM (1)	Running	22 days, 13:20	2.0 GB
XCP2_Windows 7 (32-bit)_pvm (1)	Running	17 days, 6:55	2.0 GB
xvp XVPAppliance	Running	4 days, 10:05	1.0 GB

XVP Viewer - VM Console - Openfiler_Windows Server 2003 (32-bit)_hvm (1)

```
Microsoft Windows [版本 5.2.3790]
(C) 版权所有 1985-2003 Microsoft Corp.

C:\Documents and Settings\Administrator>ping g.cn

Pinging g.cn [74.125.71.160] with 32 bytes of data:

Reply from 74.125.71.160: bytes=32 time=41ms TTL=45
Reply from 74.125.71.160: bytes=32 time=41ms TTL=45

Ping statistics for 74.125.71.160:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 41ms, Maximum = 41ms, Average = 41ms
Control-C
^C
C:\Documents and Settings\Administrator>
```

XVP Viewer - VM Console - iscsi_CentOS 5 (32-bit)_PVM

```
PING g.cn (74.125.71.160) 56(84) bytes of data:
64 bytes from hx-in-f160.1e100.net (74.125.71.160): icmp_seq=1 ttl=45 time=40.9
ms
64 bytes from hx-in-f160.1e100.net (74.125.71.160): icmp_seq=2 ttl=45 time=40.7
ms

--- g.cn ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 40.713/40.813/40.913/0.100 ms
[root@localhost ~]#
```

XenWebManager是使用Python实现的基于Web的XenCenter的开源实现。

The screenshot displays the XenWebManager web interface. The top navigation bar includes menus for File, View, Pool, Server, VM, Storage, Templates, Tools, Window, and Help. Below this is a toolbar with buttons for 'Add Server', 'New Storage', 'New VM', 'Start', 'Shut Down', 'Reboot', 'Suspend', 'Resume', and a status indicator 'No System Alerts'.

The main content area is titled 'XCP Host' and features tabs for 'General', 'Search', 'Maps', and 'Logs'. The 'Overview' section contains a table with the following columns: Server, CPU Usage, Used Memory, Disks (avg / max KBs), Network (avg / max KBs), Address, and Uptime.

Server	CPU Usage	Used Memory	Disks (avg / max KBs)	Network (avg / max KBs)	Address	Uptime
XCP1 <i>Default install of XenServer</i>	0% of 8 cpus	21% used of 48.00G	-	0/0 0/0	211.71.202.31	04 days 10 hours
openfiler_Windows XP SP3_pvm (1)	0% of 1 cpus	23% of 1.00G	1/47 0/0	0/0 0/0	192.168.22.242	04 days 1
XCP1_RHEL6 (32-bit)_PVM (1)	0% of 2 cpus	9% of 2.00G	1/5 0/0	0/0 0/0		04 days 1
XVPApliance Xen VNC Proxy Appliance	13% of 1 cpus	54% of 1.00G	5/34 0/6	1/33 10/355	192.168.22.1 211.71.202.9	04 days 1
XCP1_Debian5.0 (32-bit)_pvm (1)	0% of 1 cpus			XenServer tools not installed	-	10 ho
XCP1_Demo Linux VM (debian4)_pvm (1)	0% of 1 cpus	19% of 256.00M	0/9 0/0	0/0 0/0		09 ho
XCP1_Debian 6.0 (64-bit)_pvm (1)	0% of 2 cpus	9% of 2.00G	0/6 0/0	0/0 0/0	192.168.22.243	03 days 1
Openfiler_Windows Server 2003 (32-bit)_hvm (1)	0% of 1 cpus	18% of 1.00G	3/37 0/0	0/0 0/0	192.168.22.241	04 days 1
iscsi_CentOS 5 (32-bit)_PVM	0% of 1 cpus	42% of 1.00G	3/17 0/0	0/0 0/0	192.168.22.244	04 d
XCP2 <i>Default install of XenServer</i>	1% of 8 cpus	3% used of 48.00G	-	0/0 0/0	211.71.202.32	04 days 11 hours
iscsi_XenServer SDK 5.6.1_pvm	6% of 1 cpus	40% of 512.00M	2/3 0/0	0/0 0/0		04 days 18 ho

3.5 自动部署和管理虚拟机

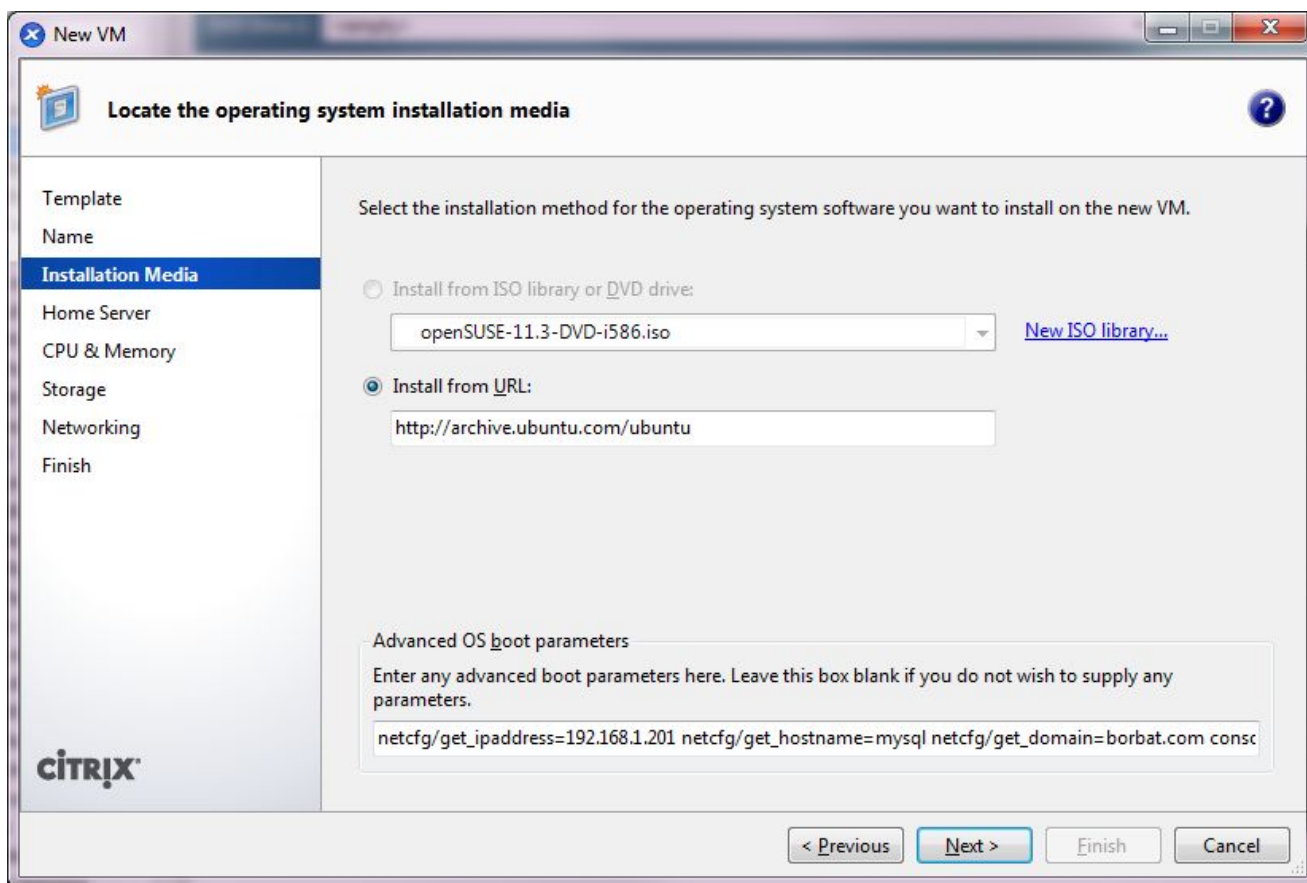


10+VM



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puppet自动化部署虚拟机



```
console=hvc0
debian-installer/locale=en_US
console-setup/layoutcode=us
console-setup/ask_detect=false
```

配置相关信息

```
interface=eth0
netcfg/get_hostname=mysql
netcfg/get_domain=borbat.com
netcfg/disable_dhcp=true
netcfg/get_ipaddress=192.168.1.201
netcfg/get_netmask=255.255.255.0
netcfg/get_gateway=192.168.1.1
netcfg/get_nameservers=4.2.2.1
```

配置初始网络

从网络安装Ubuntu

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修改pp脚本实现自动化部署

```
d-i mirror/country string manual
d-i mirror/http/hostname string archive.ubuntu.com
d-i mirror/http/directory string /ubuntu
d-i mirror/http/proxy string
```

设置Ubuntu更新用的镜像站点

```
d-i clock-setup/utc boolean true
d-i time/zone string US/Eastern
d-i clock-setup/ntp boolean true
d-i clock-setup/ntp-server string 0.pool.ntp.org
```

设置时钟和ntp服务器

```
d-i passwd/root-login boolean true
d-i passwd/make-user boolean false
d-i passwd/root-password password mypassword
d-i passwd/root-password-again password mypassword
#d-i passwd/root-password-crypted password [MD5 hash]
d-i user-setup/allow-password-weak boolean true
d-i user-setup/encrypt-home boolean false
```

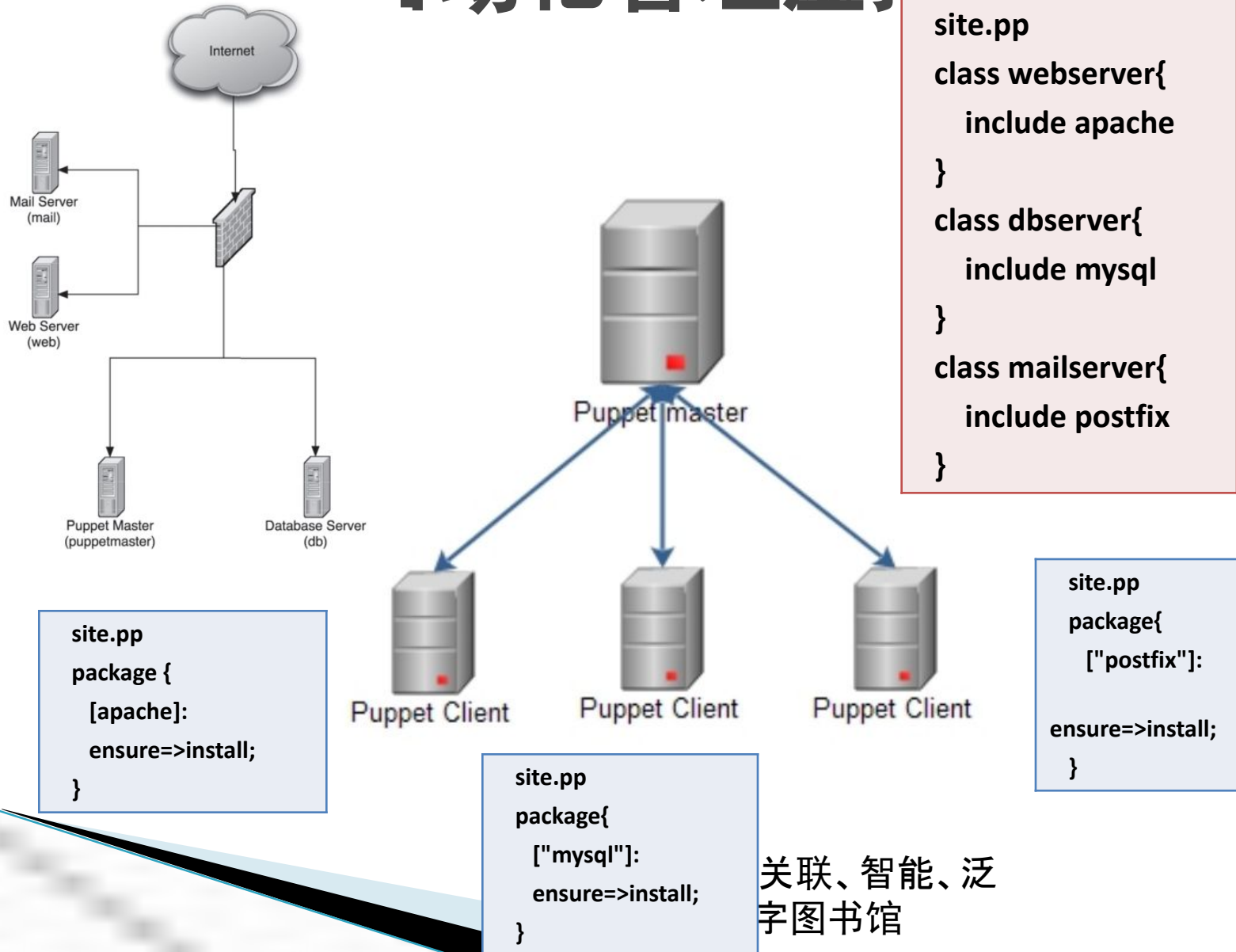
设置登入root用户密码

```
d-i partman-auto/method string regular
d-i partman-auto/choose_recipe select atomic
d-i partman/default_filesystem string ext3
d-i partman/confirm_write_new_label boolean true
d-i partman/choose_partition select finish
d-i partman/confirm boolean true
d-i partman/confirm_nooverwrite boolean true
```

partman分区信息设置

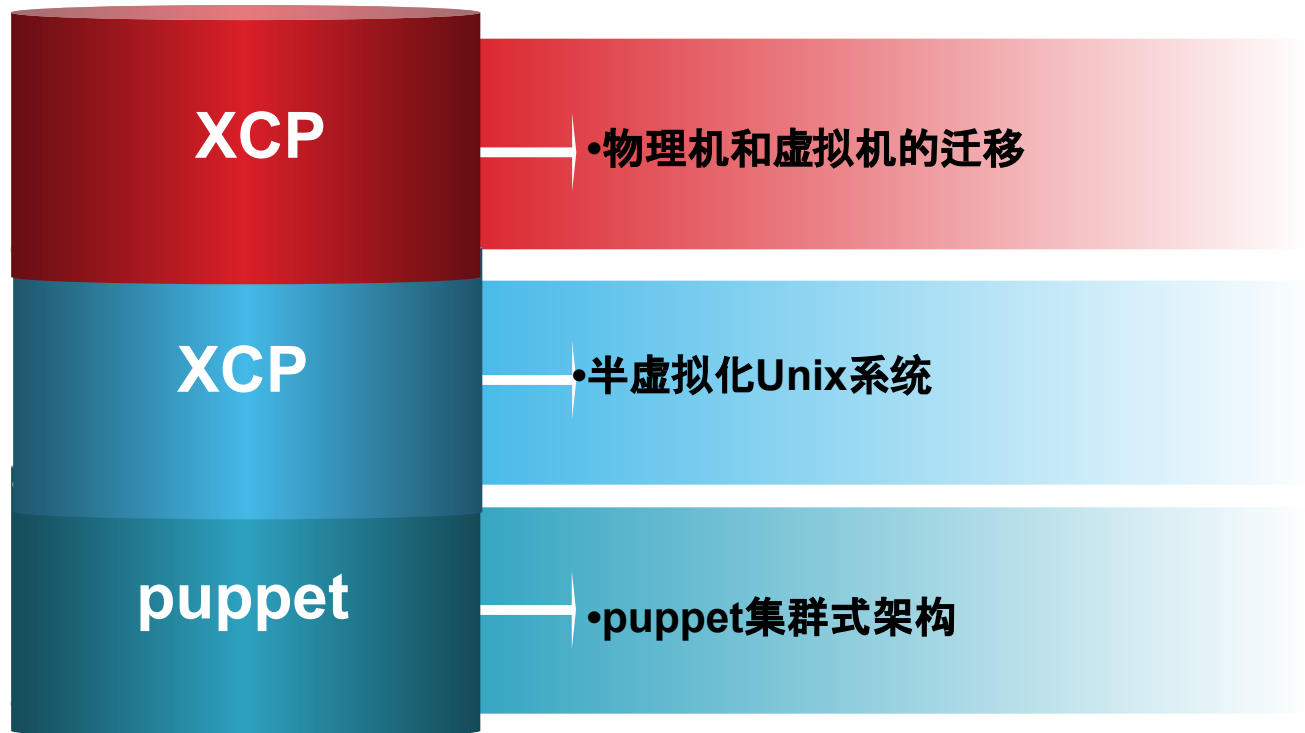
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ninnet 自动化管理虚拟机



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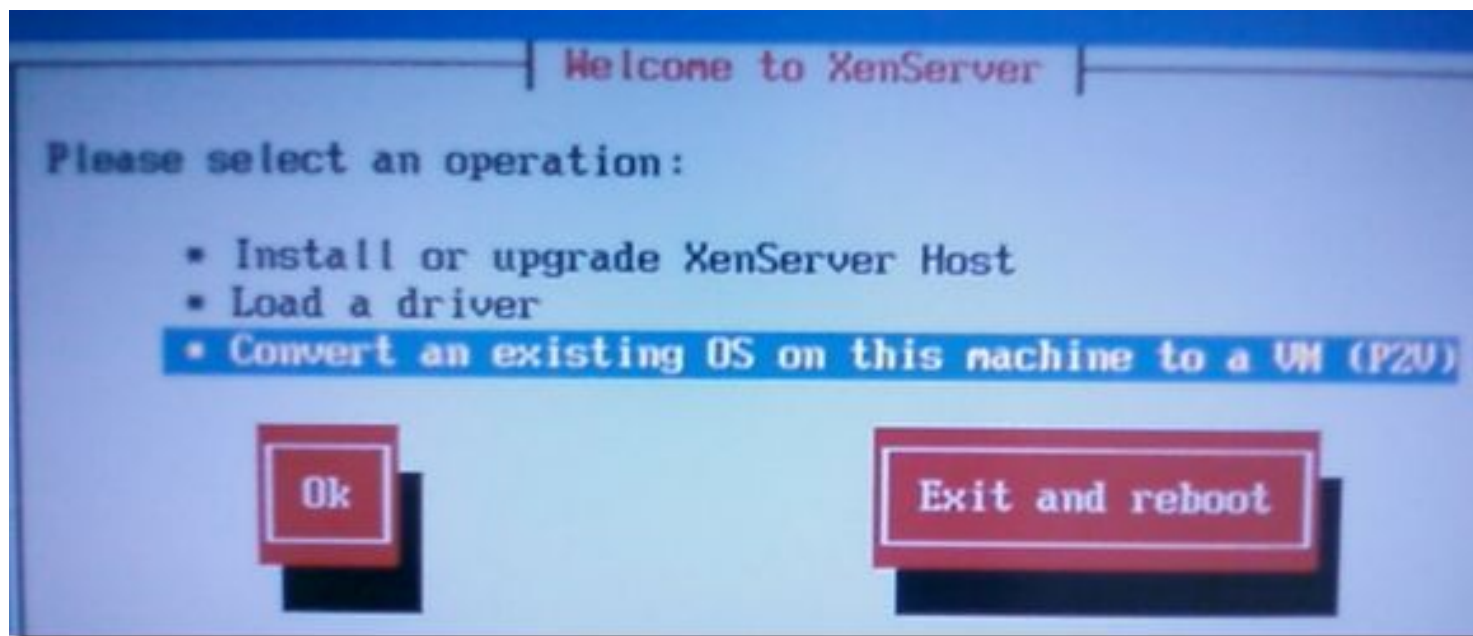
4.OVCP高级内容



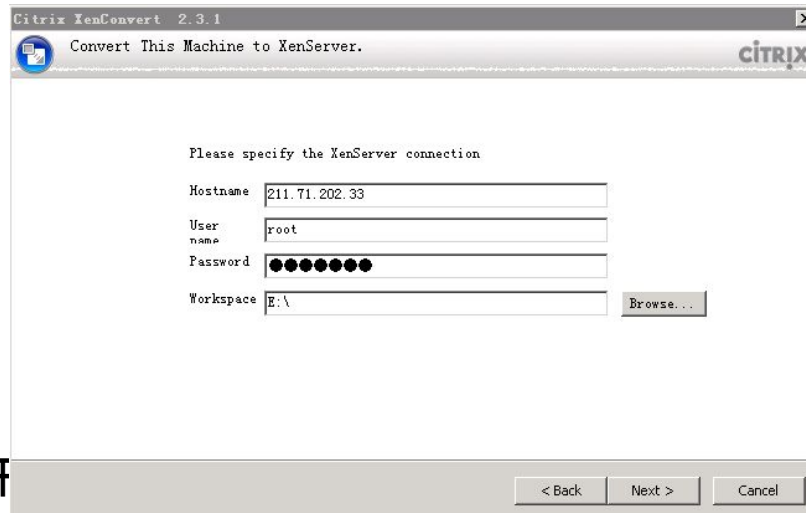
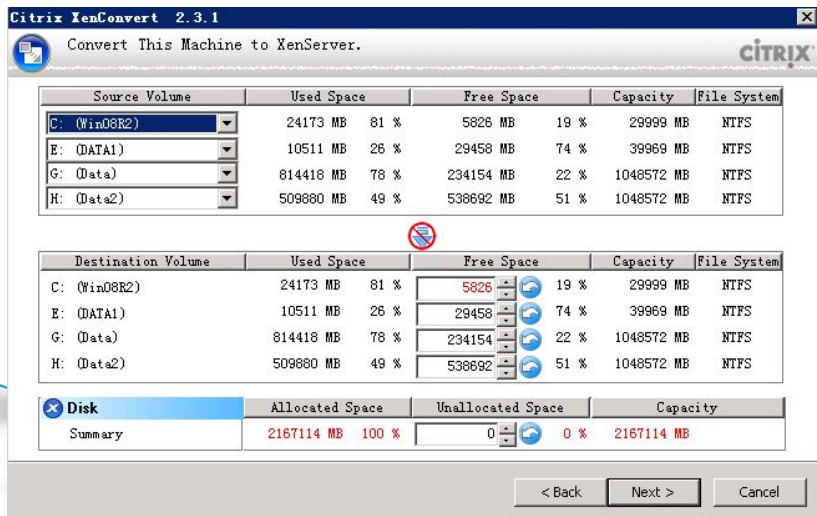
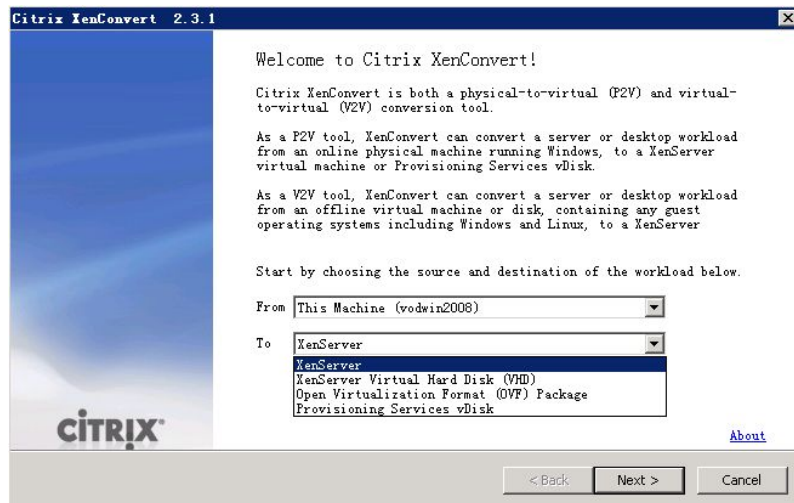
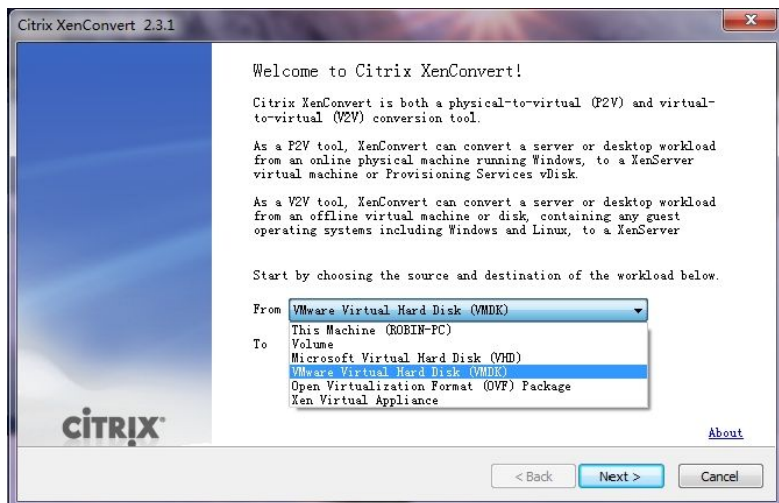
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4.1 物理机和虚拟机的迁移

迁移Linux物理机



迁移Windows物理机和虚拟机



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4.2半虚拟化Unix系统

半虚拟化Solaris目的:为Sun小机Solaris10系统上Metalib甚至Aleph迁移到OVCP平台上铺平道路。

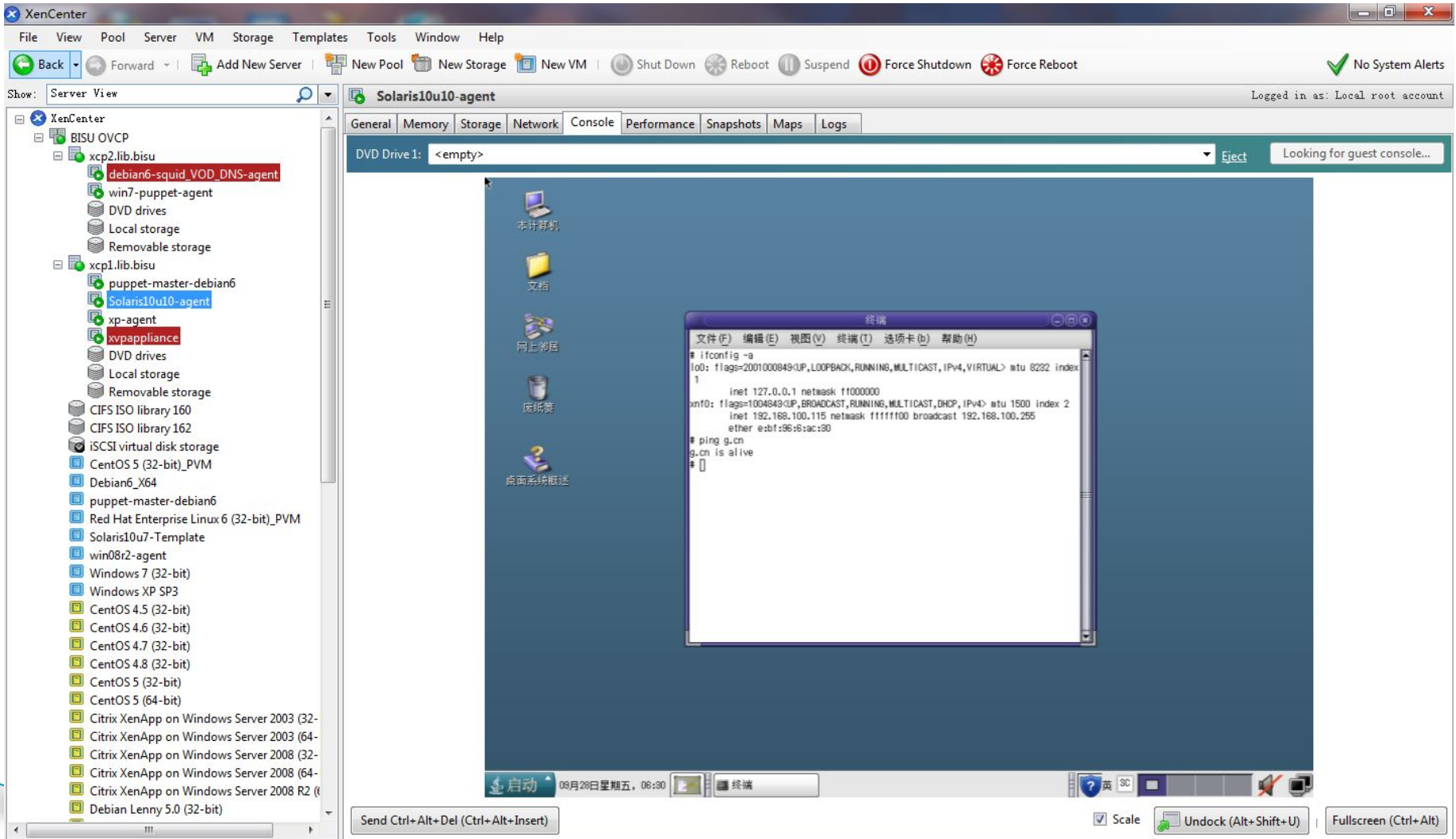
- **Solaris**

We have provided a trivial template to get around a bug with XenServer/Solaris that would otherwise prevent the guest running at full speed. It runs Solaris on XenServer using Sun's own hybrid drivers described [here](#). *"Performance of PV drivers in HVM domain looks similar to that of a fully PV guest domain"*. Download the template, import it as a custom template, and you are ready to start creating Solaris VMs with better performance than standard.

[\[Download\] Solaris 10 Template \(32KB\)](#)

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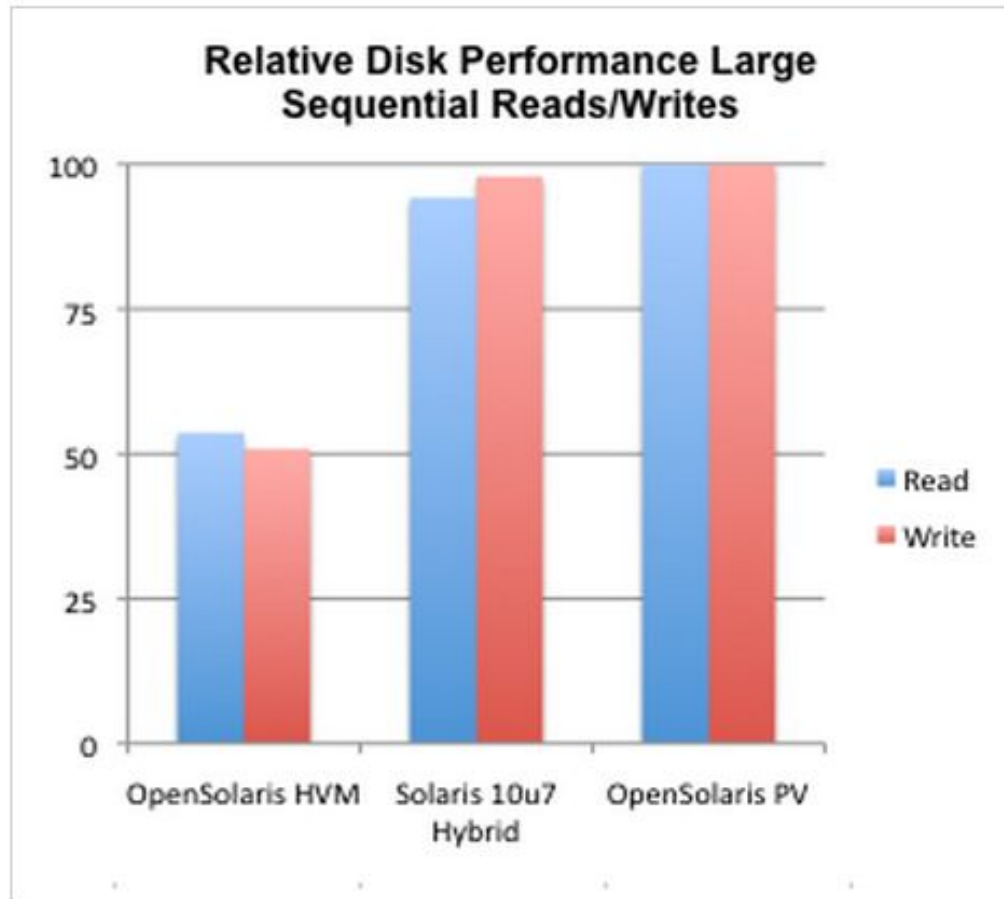
Solaris 10 半虚拟化安装效果



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Solaris 10全虚拟化和半虚拟化性能比较

Solaris Vs OpenSolaris (PV) Performance on XenServer



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4.3 puppet集群式架构

Puppet 集群核心思想:

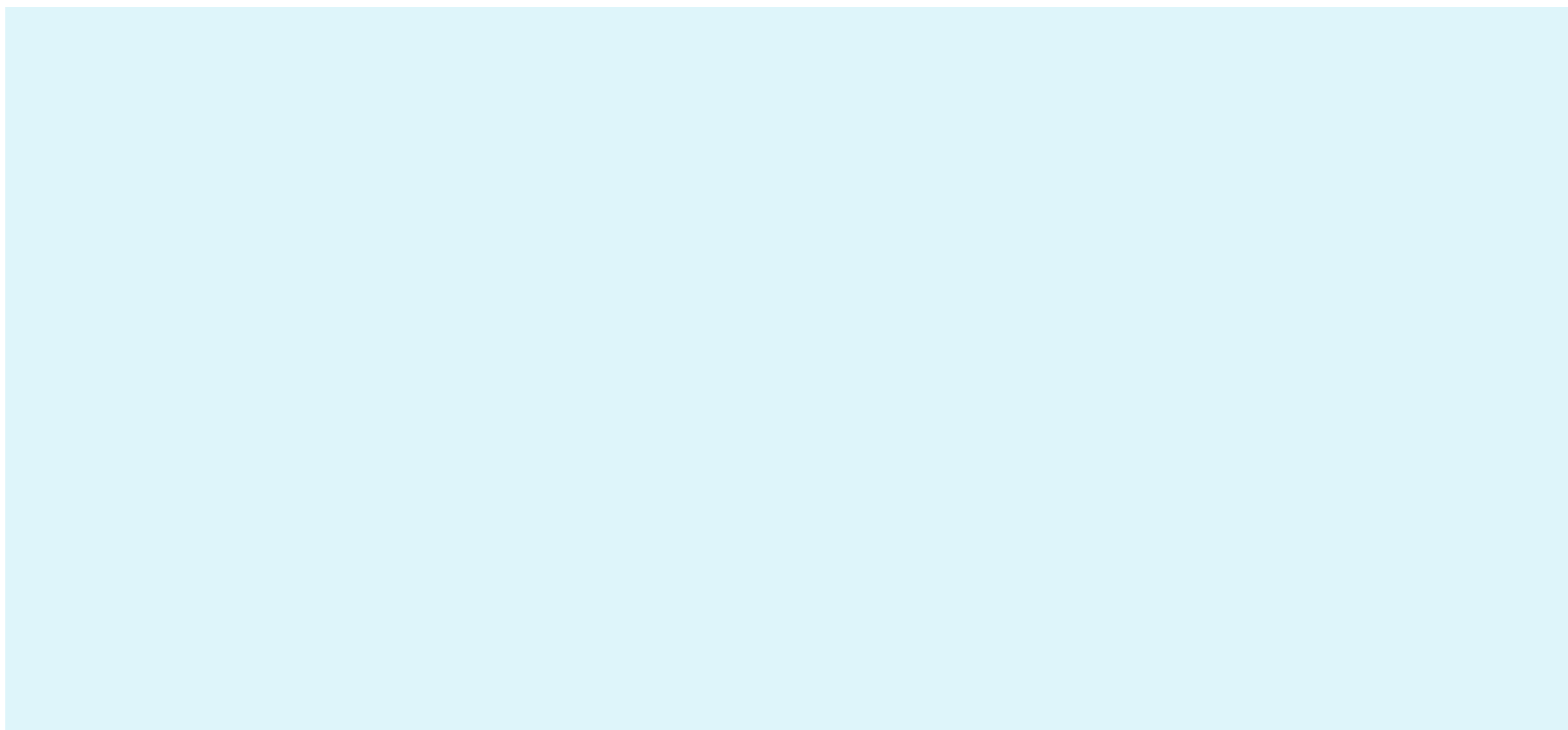
1). puppetmaster 集群

- 分担puppetmaster来自于客户端的请求压力, 可以采取Active , Active 模式.
- 采取反向代理模式, 将来自于8140的端口请求分散到多台puppetmaster

2). puppet ssl 证书集群 puppet CA

- 分担puppetmaster来自于客户端ssl证书的请求压力, 采取Active, Standby模式.

puppetmaster 集群架构图



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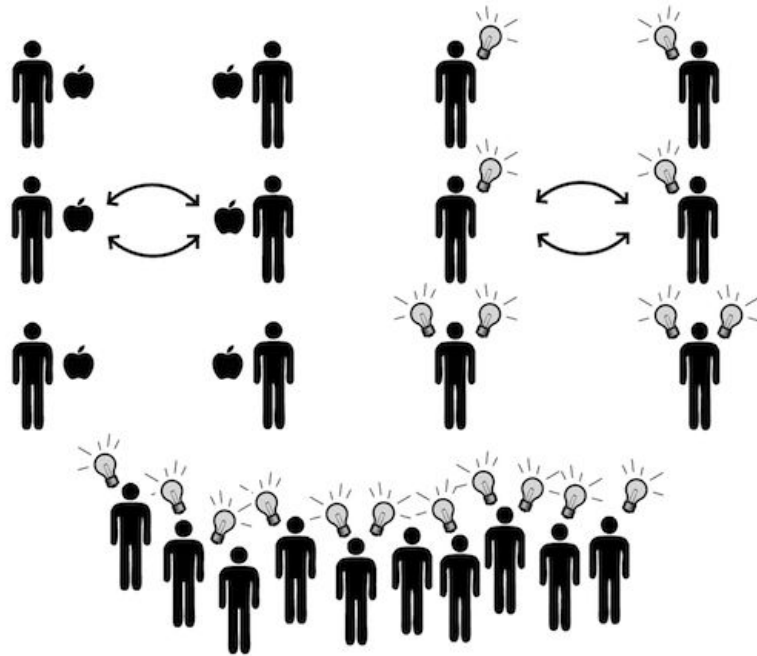
未来工作

- 1.将OVCP云平台从实验环境升级为生产环境, 主要是网络环境和存储的改造
- 2.将Metalib从Sun小机上迁移到OVCP云平台上
- 3.将XCP1.0->XCP1.6 (XenServer 6.1,Xen4.1.2)
- 4.更加深入研究和使用的puppet, 如将其加入到基于Web的云平台管理中, 使用puppet来管理Windows和Linux物理服务器, 使用puppet来管理Windows和Mac桌面电脑

参考文献

- 《基于XCP的虚拟化云平台建设研究》
- 《精通puppet配置管理工作》(《Pro. puppet》)
- 《puppet 2.7 Cookbook》
- 《puppet Docs》
- <http://www.xen.org/>
- <http://www.openfiler.com/>
- <http://puppetlabs.com/>

推广开源软件



“

If you have an apple and I have an apple and we exchange apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas.

”



Thank You!

Q&A

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