The Challenge:

Testing the oVirt Project

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Agenda

- Introduction
- The Problem – How to test a Virtualization project
- The Solution – Integration & Provisioning
- The Building Blocks
  - **oVirt** – the open virtualization project
  - **Puppet** – configuration management
  - **Foreman** – machine life cycle management
- Jenkins job test case
- Videos & screenshots
- Summary
- Q&A

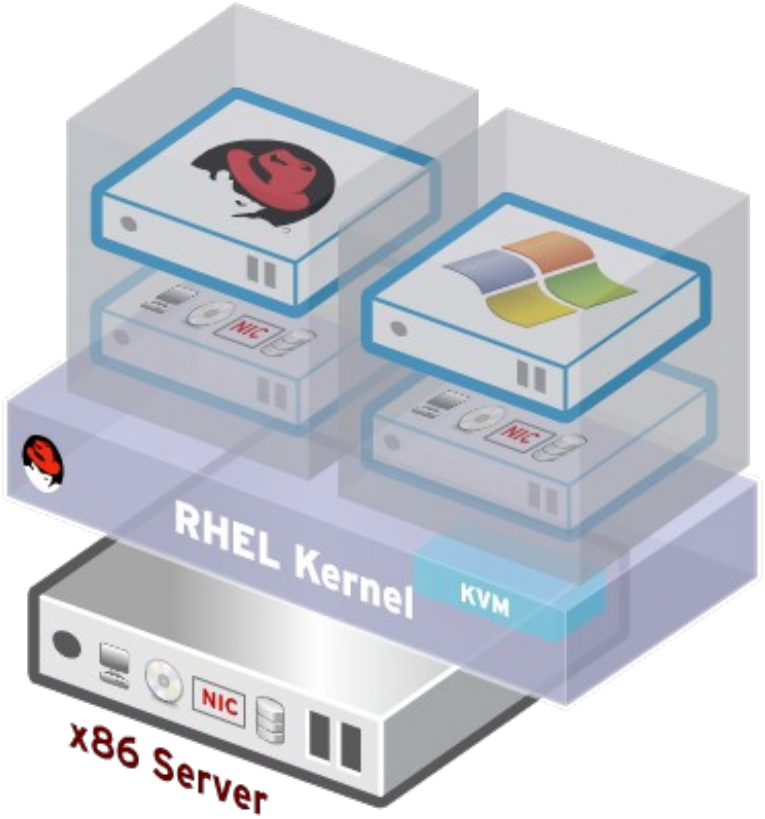
Introduction

- Tired of spending time installing Jenkins slaves all day?
- Can't get budget from your manager to buy new hosts?
- Do you sleep in the network room waiting for hosts to be installed?
- Does your jenkins environment keep growing ?

You need a Provisioning Framework!

The Complexity of testing a virtualization project...

Physical & Virtual Servers



Multiple teams collaboration and effort (IT, ENG, QA, Integration)

Hours of manual work

Small complexity matrix for testing oVirt/RHEVM

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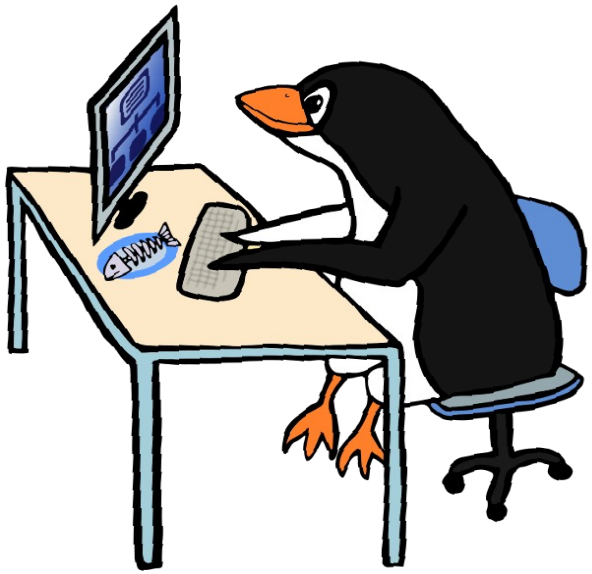
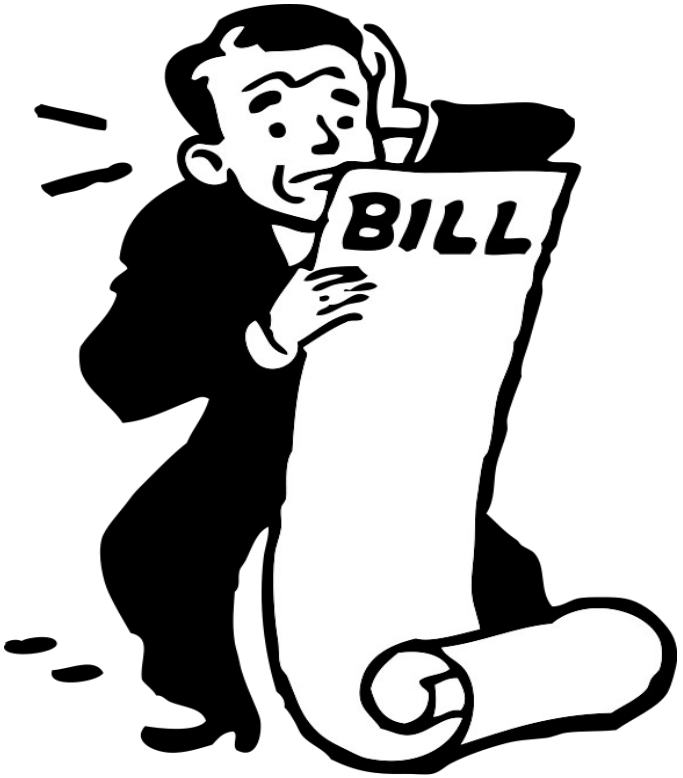
	OVIRT	RHEVM 3.0	RHEVM 3.1
Project Version	Ovirt 3.1	RHEVM 3.0	RHEVM 3.1
Host OS	Fedora 16/17	RHEL 6.2/6.3	RHEL 6.3
Manager OS	Fedora 16	RHEL 6.2/6.3	RHEL 6.3
Engine git	gerrit.ovirt.org	rhevm:master	engine:build
Jboss Version	7.1 AS	5.1.2 EAP	6.0 EAP
JDK Vesrion	OpenJDK 1.7.0	Sun JDK 6.0	OpenJDK 1.7.0
Maven Version	3.0.X	2.2.1	3.0.x
Vdsm-* rpm	4.9.6-0.63.git258c..	4.9-112.10.el6.x86_64	4.9.6-6.el6.x86_64
Libvirt-* rpm	0.9.10-2.fc16	0.9.4-23.el6_2.4	0.9.10-9.el6

Why bother changing our CI testing framework?



Time Consuming



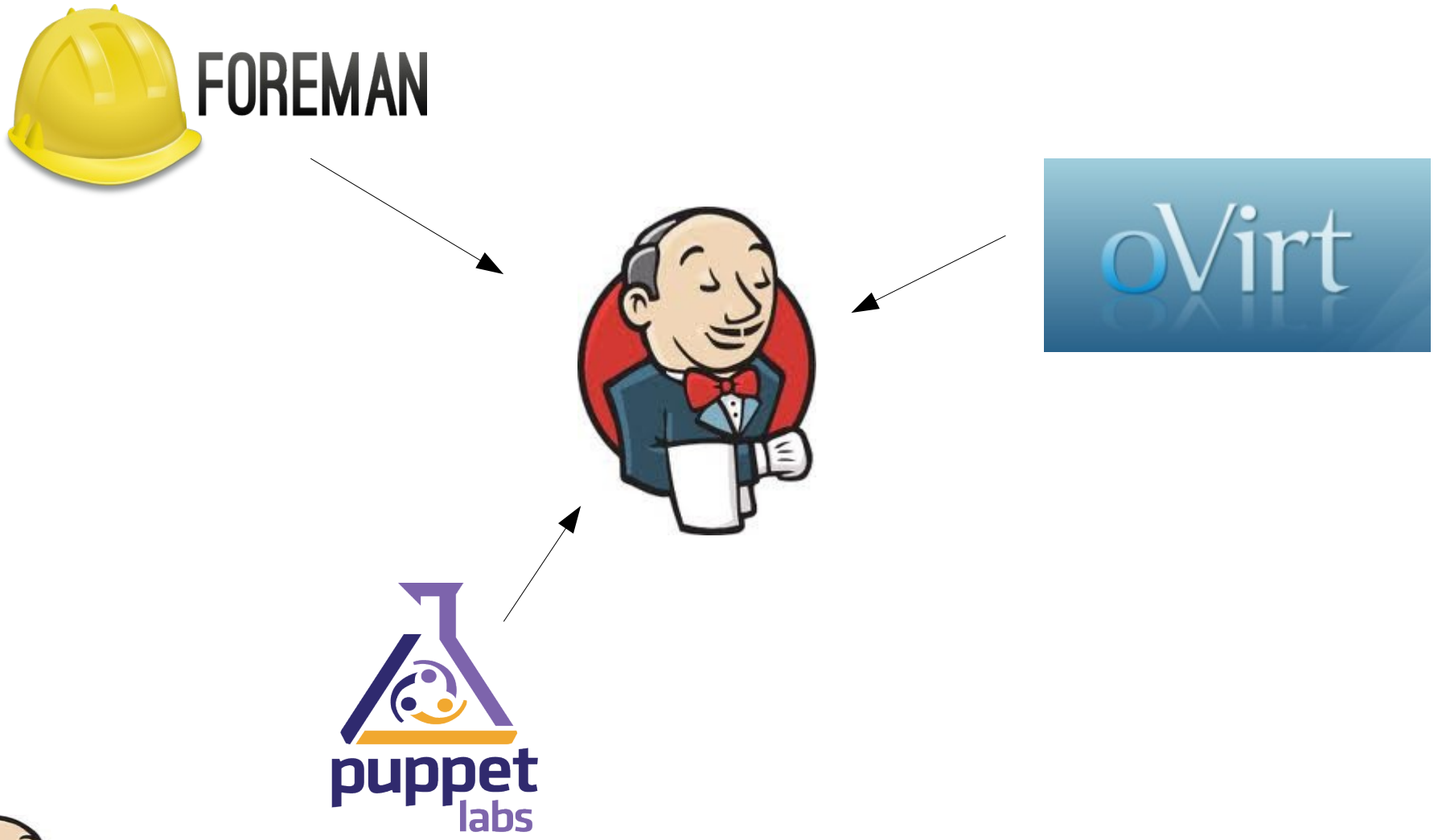
Costly

Error Prone

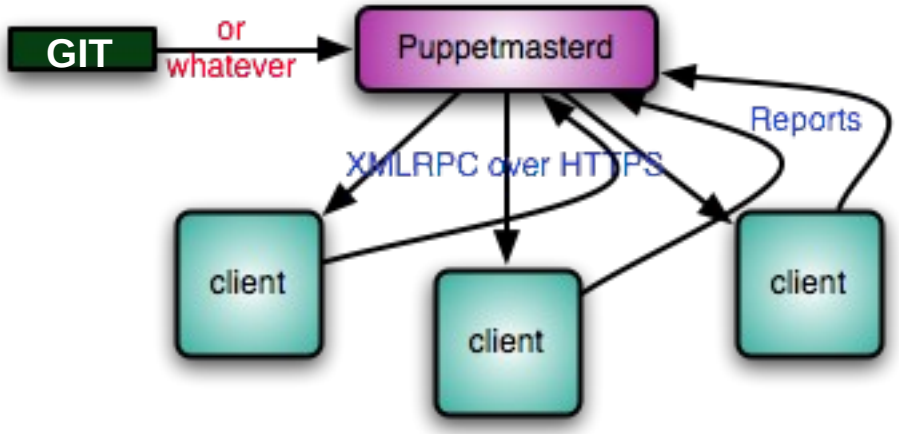
- We combined **Foreman**, **Puppet** & **oVirt** with custom python code to build a testing framework for Jenkins.

  - **Foreman** was used for provisioning the hosts or VMs
  - **Puppet** configured hosts with our needed profiles.
  - **oVirt** enabled us to create VMs for running the tests.

Framework: Building Blocks



Client – Server implementation



'Adding users', 'installing packages', and 'updating server configurations'

Facter produces a profile of each host, and makes system information available to Puppet as variables.

Puppet: Resources

- T
- R
  p

```
1  class ntpd {
2    include ntpd::params
3
4    package { "ntp":
5        ensure => latest,
6    }
7
8    service{"ntpd":
9      ensure     => running,
10     enable     => true,
11     hasstatus  => true,
12     hasrestart => true,
13   }
14
15   file {"/etc/ntp.conf":
16     content  => template("ntpd/ntp.conf"),
17     mode     => 644,
18   }
19 }
```

Foreman: Machine Life Cycle Management

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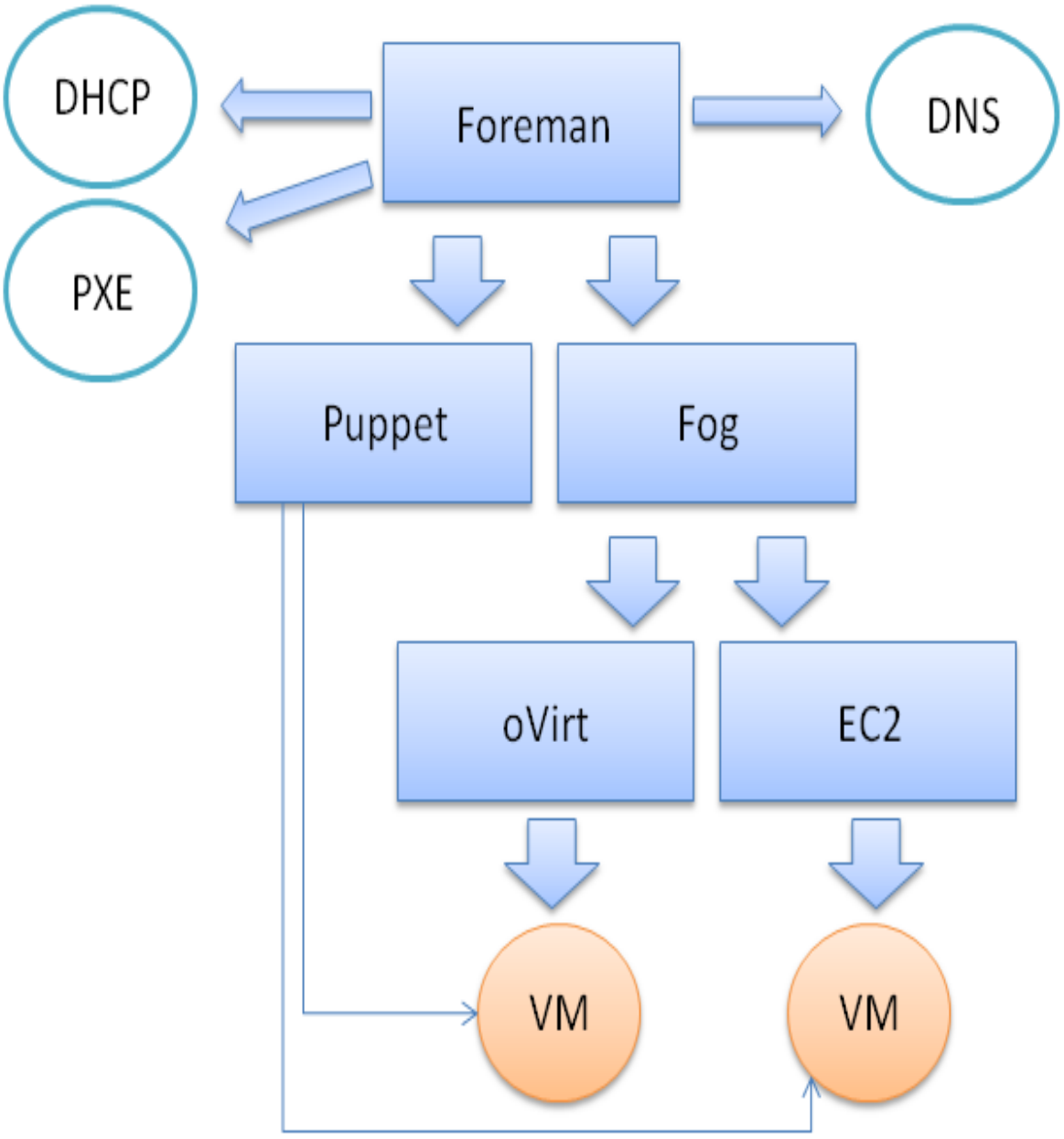
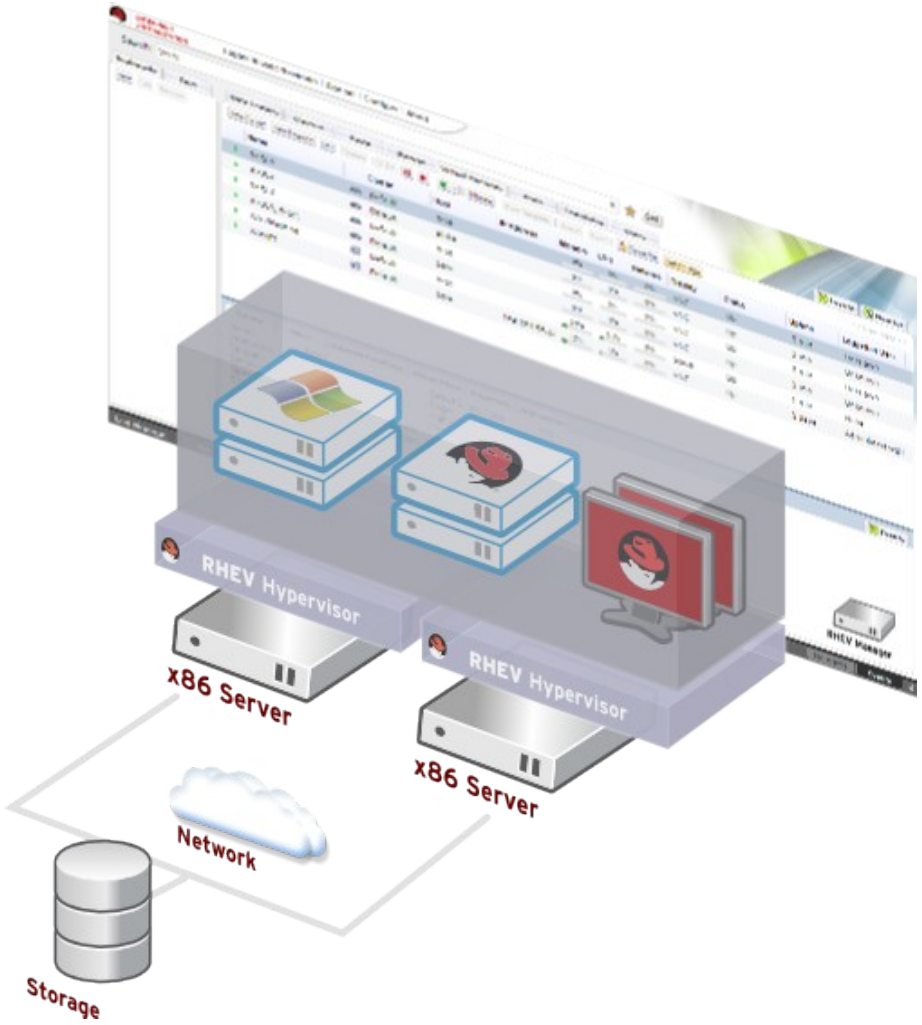


FOREMAN

oVirt: Create and Manage Virtual Machines

- Large scale, centralized management solution for server and desktop virtualization
- an opensource alternative to vCenter/vSphere
- Has multiple APIs:
  - Python SDK
  - Ruby gem
  - Ovirt CLI
  - REST



So what was the goal of this framework...

To be able to *test a complex virtualization project* in Jenkins with limited resources, time and effort.

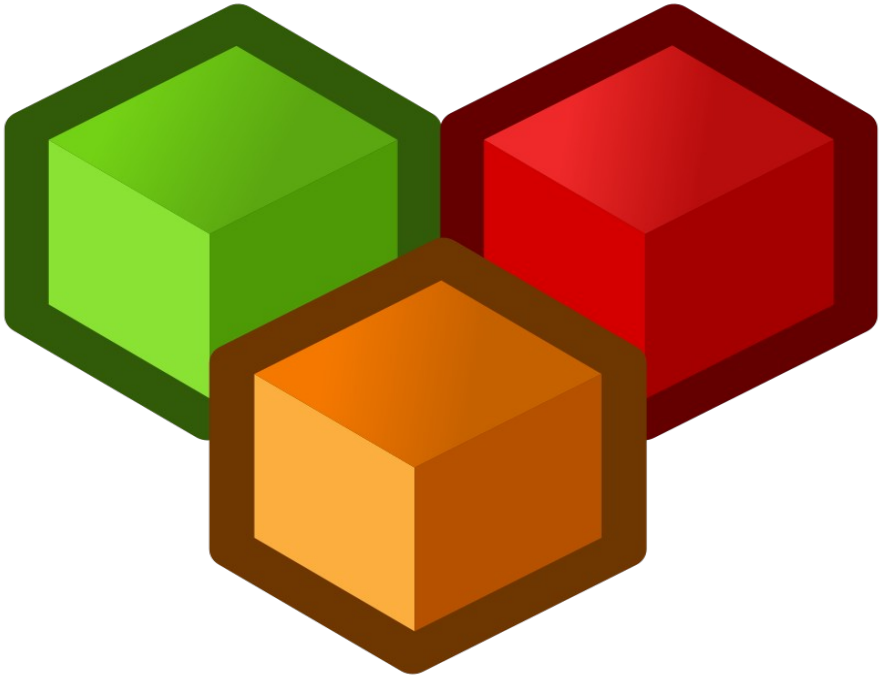
And do it in a ***reproducible*** and ***scalable*** way.

OK,

So how do all these projects integrate with **Jenkins**?

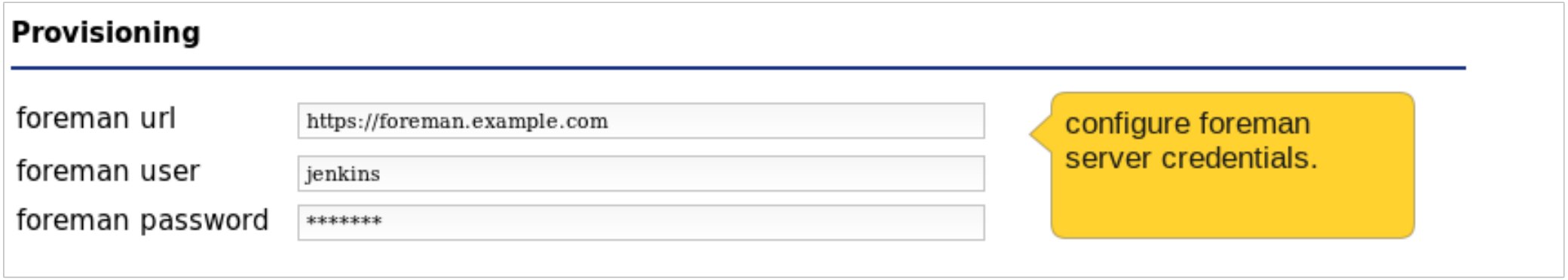
Jenkins Integration: Foreman Plugin

- You guessed it... ,it had to be a ***Jenkins plugin.***
- A ***Jenkins Foreman Plugin*** that will enable any job to request a resource (host or vm) with a specific profile.



Jenkins Foreman Plugin Mock-up: configure screen

- Configure foreman server details in Jenkins.
- All cloud related info will be set inside foreman



Foreman Plugin Mock

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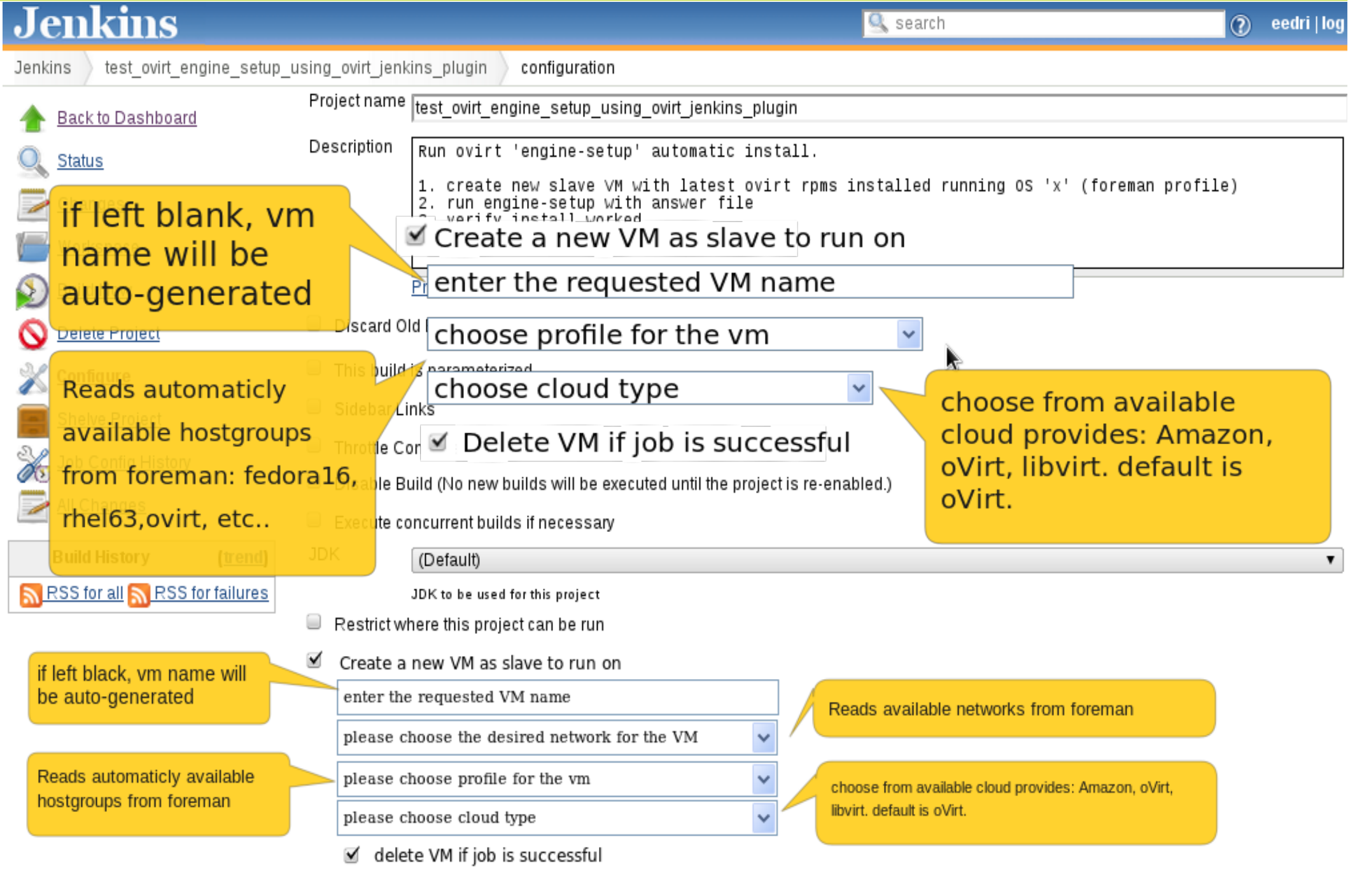
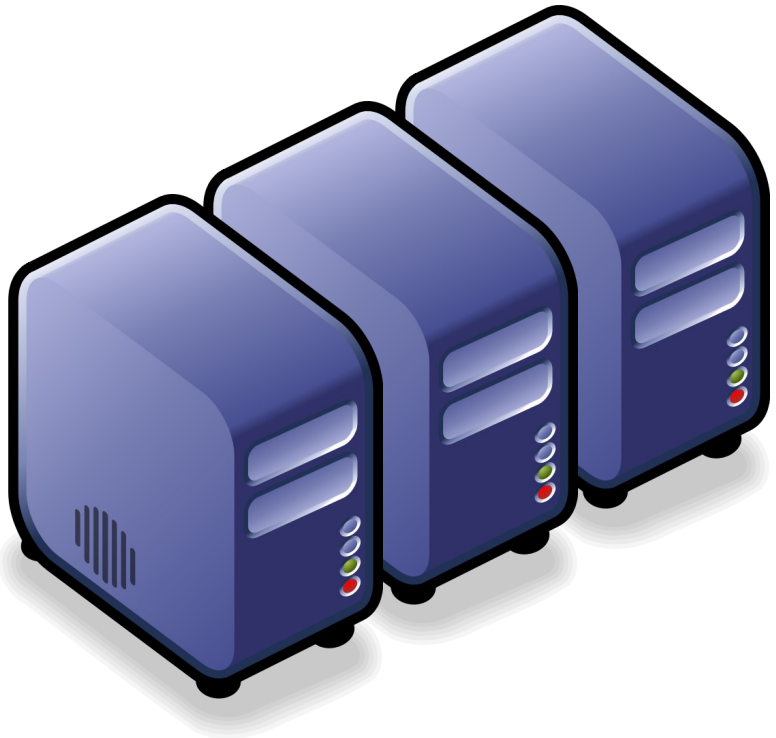


- Foreman 'Physical Hosts Pool Feature'



RESERVED

FREE

Provision Host CLI


```
Usage: provision_host.py [options]

Options:
  -h, --help            show this help message and exit
  -n AMOUNT, --num-of-hosts=AMOUNT
                        number of hosts for provisioning, default is 1
  -p PROVISION_PROFILE, --profile=PROVISION_PROFILE
                        provisioning profile name to use on host, use '-s'
                        option to see list of profiles
  -s, --show-profiles   list of profile names available for provisioning
  -d, --debug           show debug messages on stdout
  -l, --list-hosts      list current free hosts and profiles
  -r, --list-reserved-hosts
                        list current reserved hosts and reason/failure
  -f HOSTS_TO_FREE, --free-host-list=HOSTS_TO_FREE
                        csv list of hosts to free for provisioning
  -o OUTPUT_FILENAME, --output-file=OUTPUT_FILENAME
                        outfile file to write a csv list of hosts ready for
                        use afer provisioning
```

Host Pool: show profiles

- Show me the list of available ***profiles*** to use (which are in fact 'host-groups' in foreman)

```
./provision_host.py -s
2012-06-07 17:29:40,495 - provision_host - INFO - Initializing ssh client..
2012-06-07 17:29:40,495 - provision_host - INFO - Retrieving list of provisioning profiles...

Available profiles for provisioning:
*****************************************
P-RHEL63-CANDIDATE
P-RHEL62-BASE
P-F16-OVIRT-DEV-LATEST
P-RHEL63-RHEVM3.1-DEV-LATEST
P-RHEL62-RHEVM3.0-Z
P-F16-BASE
P-F17-BASE
P-RHEL63-RHEVM3.1-HOST
*****************************************
```

Framework: Screen-shots – Command Line Interface

- Show me the list of available ***hosts*** in pool currently free for use

```
./provision_host.py -l
2012-06-07 17:32:15,739 - provision_host - INFO - Initializing ssh client..
2012-06-07 17:32:15,739 - provision_host - INFO - Retrieving list of available hosts for provisioning...

Available hosts for provisioning:
****************************************
cinteg27.ci.lab.tlv.redhat.com
cinteg31.ci.lab.tlv.redhat.com
cinteg32.ci.lab.tlv.redhat.com
cinteg33.ci.lab.tlv.redhat.com
cinteg34.ci.lab.tlv.redhat.com
cinteg35.ci.lab.tlv.redhat.com
cinteg36.ci.lab.tlv.redhat.com
cinteg37.ci.lab.tlv.redhat.com
cinteg38.ci.lab.tlv.redhat.com
cinteg40.ci.lab.tlv.redhat.com
****************************************
```

Provision Host: show reserved hosts

- Show me the list of ***reserved hosts*** in pool currently used. (due to job/debug/error/static assignment)

```
./provision_host.py -r
2012-06-07 17:39:29,411 - provision_host - INFO - Initializing ssh client..
2012-06-07 17:39:29,411 - provision_host - INFO - Retrieving list of reserved hosts ...

Reserved hosts:

Name                    Reason:
************************************************
cinteg04.ci.lab.tlv.redhat.com      staticly assigned for rest api tests
cinteg05.ci.lab.tlv.redhat.com      in debugging to verify bug #555943
cinteg06.ci.lab.tlv.redhat.com      testing f17  (eedri)
cinteg15.ci.lab.tlv.redhat.com      error rebooting server cinteg15.ci.lab.tlv.redhat.com: [Errno 111] Connection refused
cinteg28.ci.lab.tlv.redhat.com      host cinteg28.ci.lab.tlv.redhat.com failed to be installed:
cinteg39.ci.lab.tlv.redhat.com      used for network 3.1 tests (static)
cinteg40.ci.lab.tlv.redhat.com      taken to run jenkins job ${JOB_NAME}, running build ${BUILD_NUM} @ [21-06-12 14:30:33]
************************************************
```

Framework: Screen-shots – Command Line Interface

- Request 1 host with profile 'P-RHEL63-CANDIDATE'

```
./provision_host.py -p P-RHEL63-CANDIDATE -n 1
2012-06-07 17:50:40,894 - provision_host - INFO - Host List: ["cinteg27.ci.lab.tlv.redhat.com"]
2012-06-07 17:50:43,867 - provision_host - INFO - sending 'build' cmd to host cinteg27.ci.lab.tlv.redhat.com to prepare provisioning
2012-06-07 17:50:44,708 - provision_host - INFO - Connecting to host cinteg27.ci.lab.tlv.redhat.com via ssh
2012-06-07 17:53:48,573 - provision_host - INFO - Retrieving host report data for cinteg27.ci.lab.tlv.redhat.com
2012-06-07 18:00:22,341 - provision_host - INFO - host cinteg27.ci.lab.tlv.redhat.com completed succesfully provisioning with profile P-RHEL63-CANDIDATE
2012-06-07 18:02:07,713 - provision_host - WARNING - host cinteg27.ci.lab.tlv.redhat.com is not reachable via ssh yet, retrying 2, sleeping for 30 sec

**********HOSTS READY FOR USE ************
hosts:cinteg27.ci.lab.tlv.redhat.com
*****************************************
```

Client requests '1' physical host with 'RHEL 6.3' profile

Foreman finds 'cinteg27' server avaliable

Foreman applies new profile to the server & start provisioning

Client polls foreman for status

Client verifies ssh access to host

Host is ready to use with new profile (RESERVED)

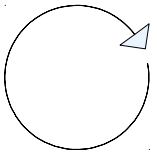
Example Flow Diagram

2 **Patch is reviewed, verified and approved**

Gerrit code Review

Reviewer	Verified	Code-Review
Eyal Edri	✓	✓

3 **merge patch in the ovirt-engine master branch**



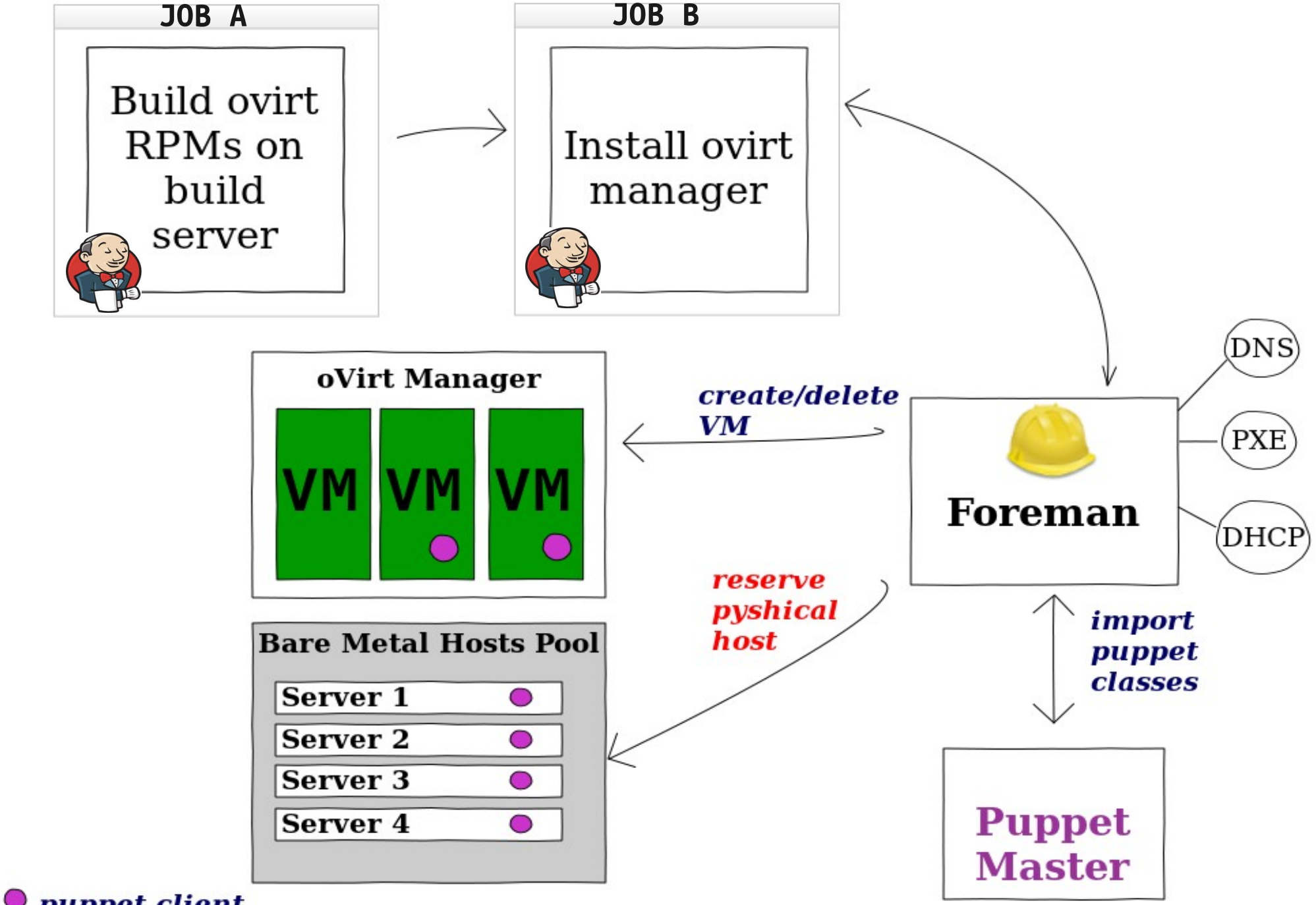
Poll SCM

4 **Found new commit -> trigger job A**

oVirt contributor

1 **Sends a git patch in ovirt-engine for review**

Example Flow Diagram in Jenkins



LIVE DEMO

- Foreman provisioning
- Ovirt UI
- Foreman CLI code

Foreman web server provisioning..

- installing webserver via foreman

oVirt: How does it look like?

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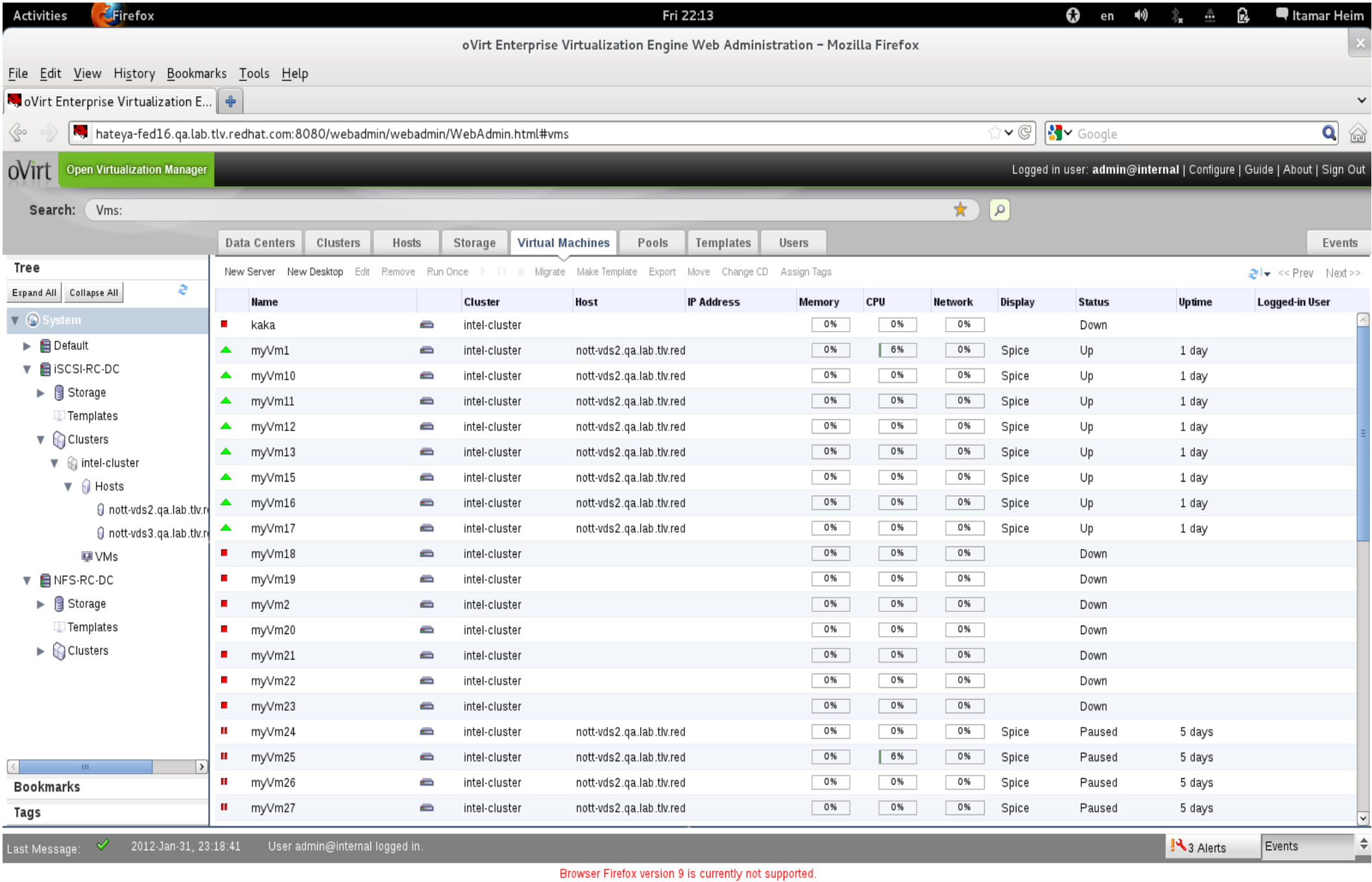
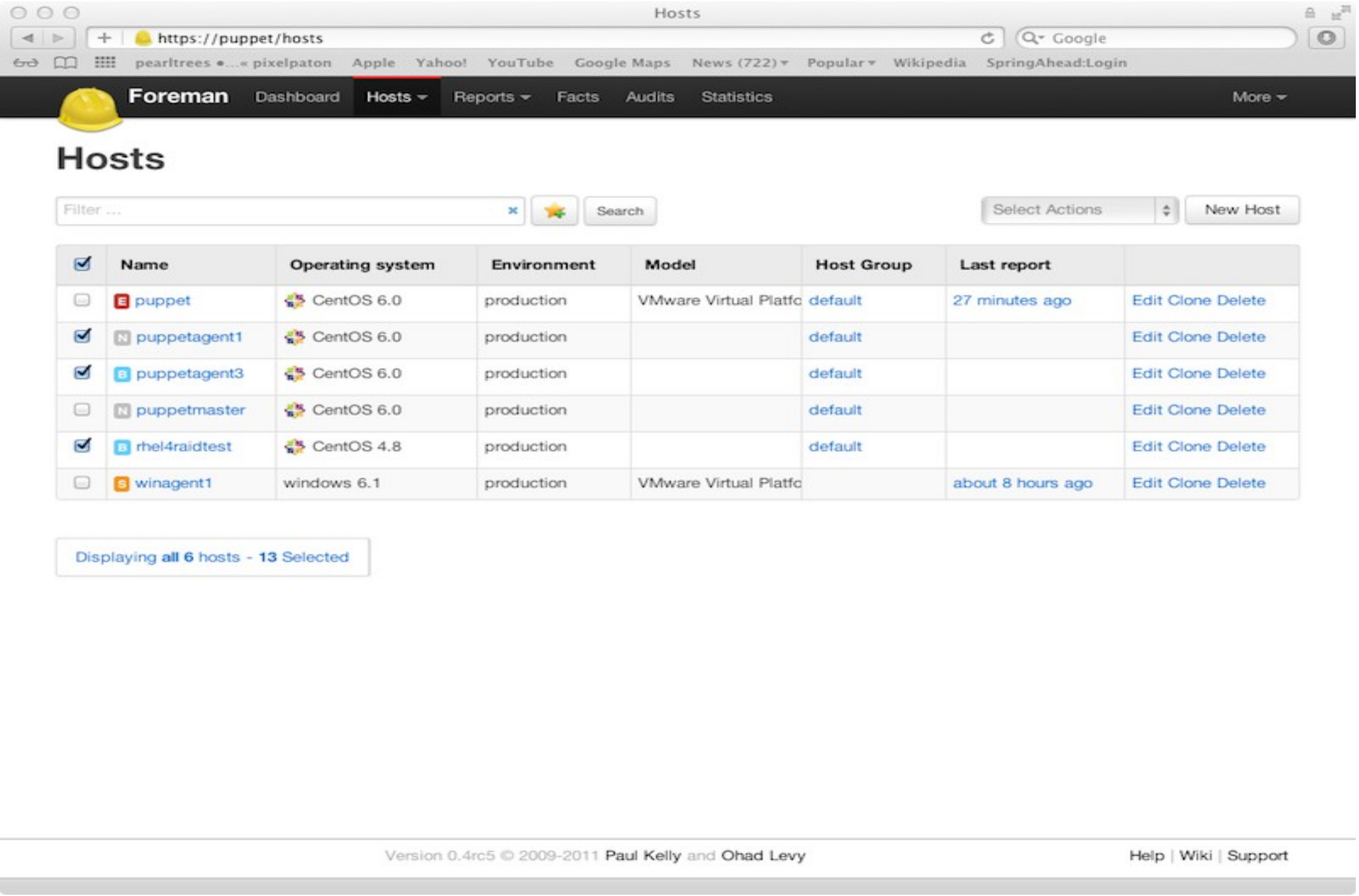


Framework: Screen-shots - Hosts view



Framework: Screen-shots - Host-group view

Build a host-group by selecting existing **puppet** classes

Foreman Dashboard Hosts Reports Facts Audits Statistics More Admin

Edit Hostgroup

Primary | Puppet Classes | Network | Operating System | Parameters

Included Classes

- koji_repos –
- libvirt –
- libvirt::config –
- libvirt::install –
- libvirt::service –
- nightly_repos –
- vdsm-cli-nightly –
- vdsm-cli-nightly::install –
- vdsm-nightly –
- vdsm-nightly::install –
- vdsm-nightly::service –
- autofs
- base
- puppet::cron
- ganglia
- motd
- myselinux
- ntpd
- myselinux::params
- ntpd::params
- puppet
- ssh
- vim
- yum

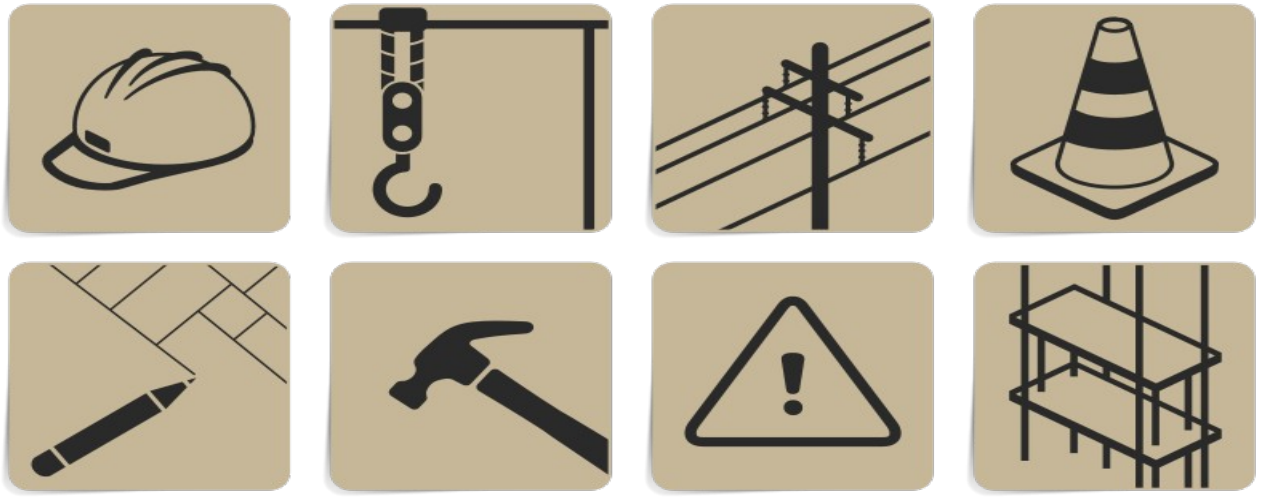
Available Classes

- ant
- apache
- autofs
- automation_repos
- base
- brew_repos
- console
- device-mapper-multipath
- epel-repos
- foreman
- foreman_proxy
- ganglia
- git
- iptables
- iscsi-initiator-utils
- java-openjdk
- jenkins-jnlp-slave
- koji_repos
- libvirt
- maven3
- motd
- myselinux
- nightly_repos
- ntpd
- ovirt-engine
- ovirt_31
- ovirt_repos
- passenger
- postgres
- puppet
- python-dateutil
- python-paramiko
- python-tools
- qemu
- redhat-brew-repos
- redhat-yum-repos
- rhel_63_repos
- rhel_repos
- rhevm-atf
- rhevm_30
- rhevm_31
- rhn
- rpm-tools
- ruby_packages
- rubygem-json
- ruth-agent-nightly
- ruth-nightly
- ssh
- ssh-authorized-keys
- stable-repos
- staf
- stdlib
- sudoers
- tftp
- users
- users-ssh
- vdsm
- vdsm-bootstrap
- vdsm-bootstrap-nightly
- vdsm-cli
- vdsm-cli-nightly
- vdsm-cli-rhevm-30
- vdsm-cli-stable
- vdsm-fixed
- vdsm-hook-faqemu
- vdsm-nightly
- vdsm-rhevm-30
- vdsm-rhevm-30-repos
- vdsm-stable
- vim
- xinetd
- yum

Cancel Submit

Framework: Screen-shots - Hosts Statistics

- Jenkins Foreman plugin
- Foreman (Jenkins) slaves manager plugin
- Jenkins Custom Testing Plugin
- Control Jenkins jobs via puppet (job as a resource)
- Extending Jenkinsapi python library



Summary: Join the fun – Contribute!

- You can get into the action and join any of those projects, patches are welcome :)

Foreman	https://github.com/theforeman/foreman
oVirt	http://www.ovirt.org/project/community/
Puppet	http://www.ovirt.org/project/community/

Summary: Links

- http://ovirt.org
- http://theforeman.org
- http://puppetlabs.com/community/overview/
- http://jenkins-ci.org
- https://github.com/eedri/foreman

Still awake..? Good!

Any Questions?

Summary: Thanks

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Still got questions?

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#ovirt, #theforeman, #jenkins