



oVirt Architecture

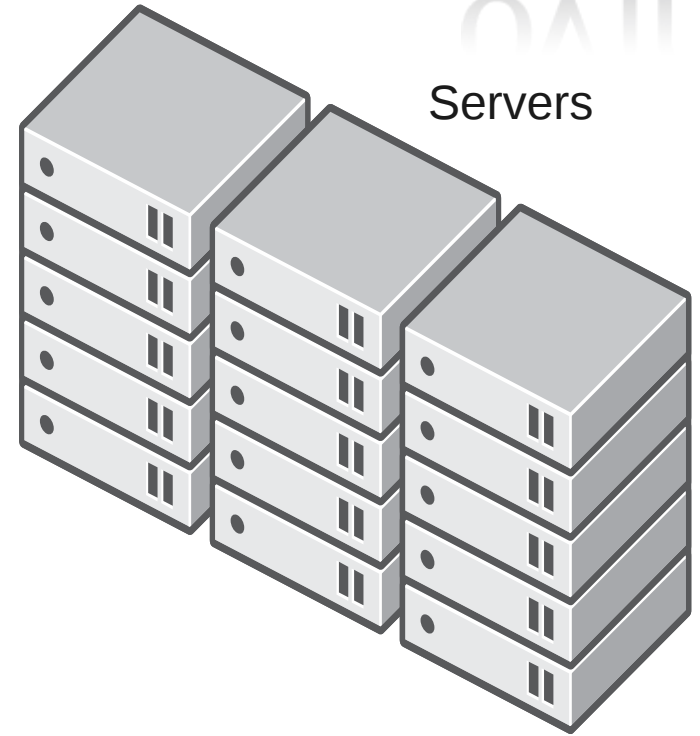
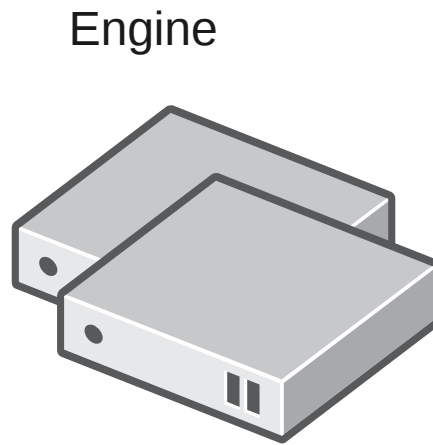
Itamar Heim

Presented here by Dan Kenigsberg
danken@redhat.com

Agenda

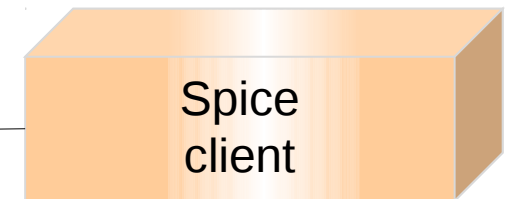
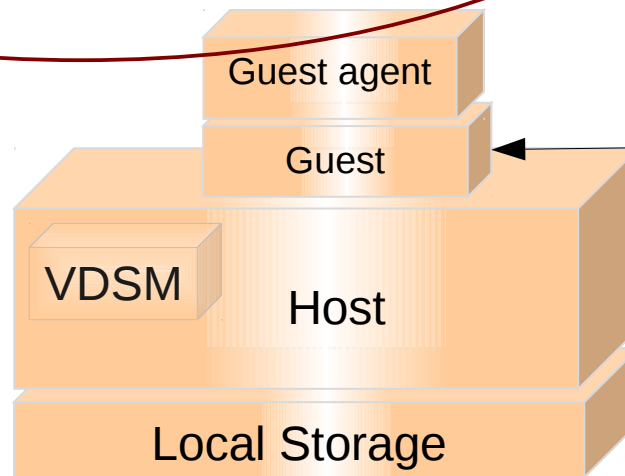
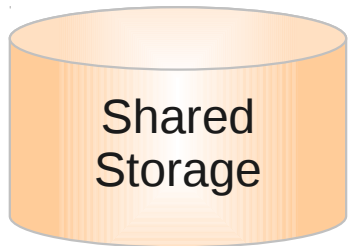
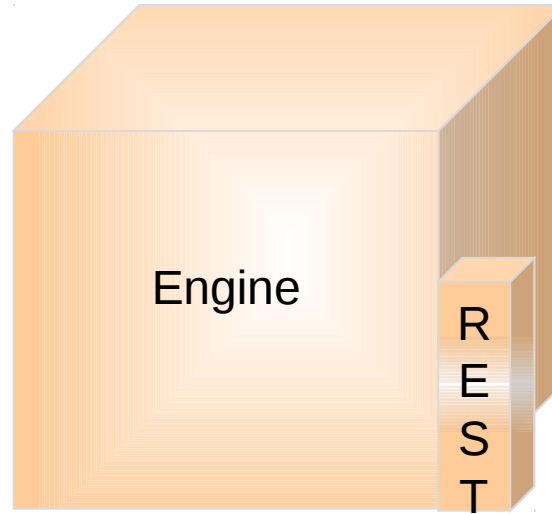
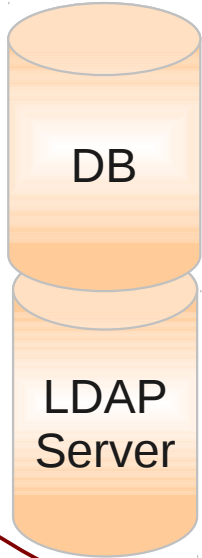
- oVirt Components
 - Engine
 - Clients
 - Host
 - Engine Agent - VDSM
 - Guest
- Storage Concepts
- Data Warehouse & Reports
- User flows

Architecture From 30,000 Feet

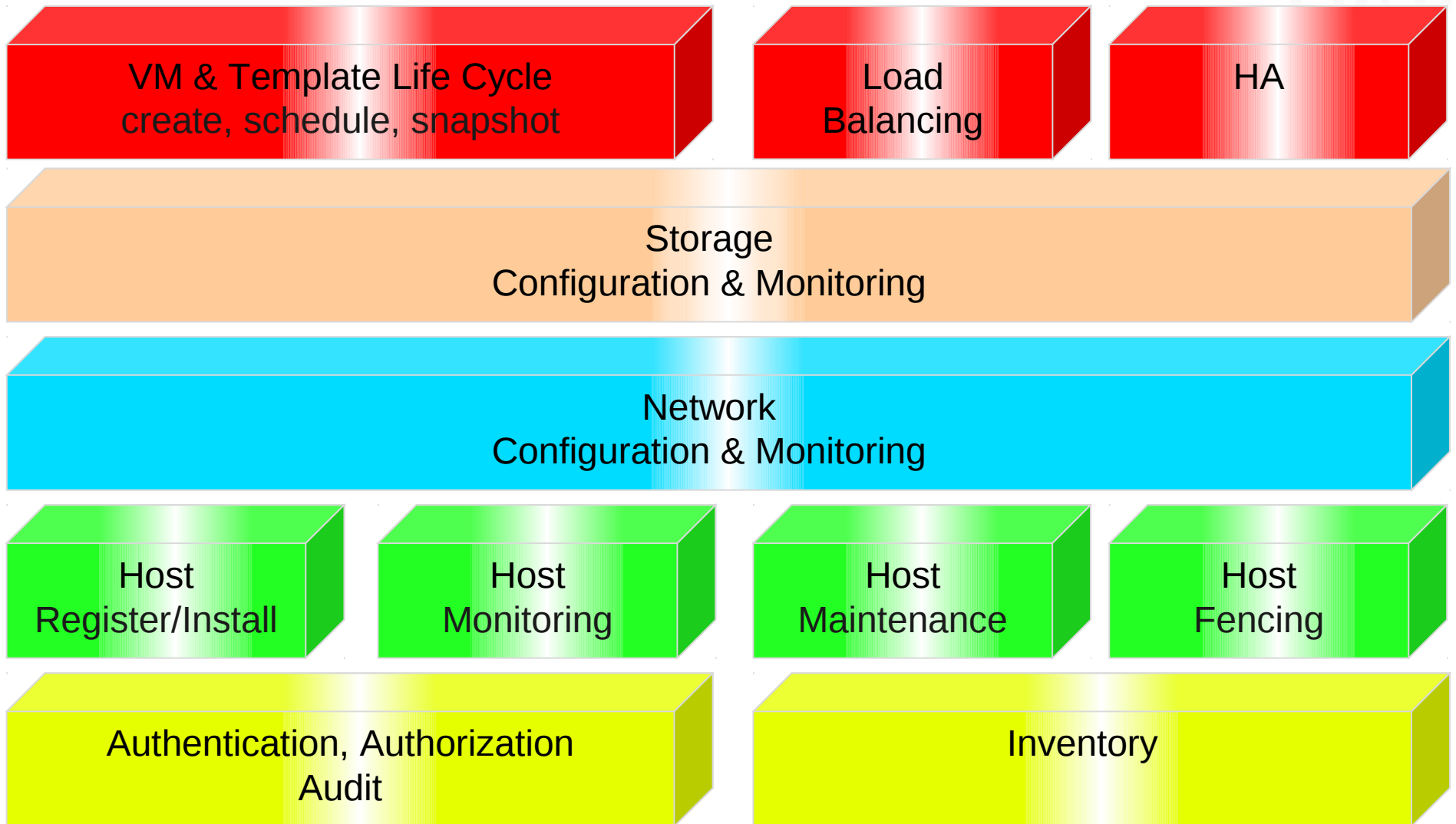


The Real World

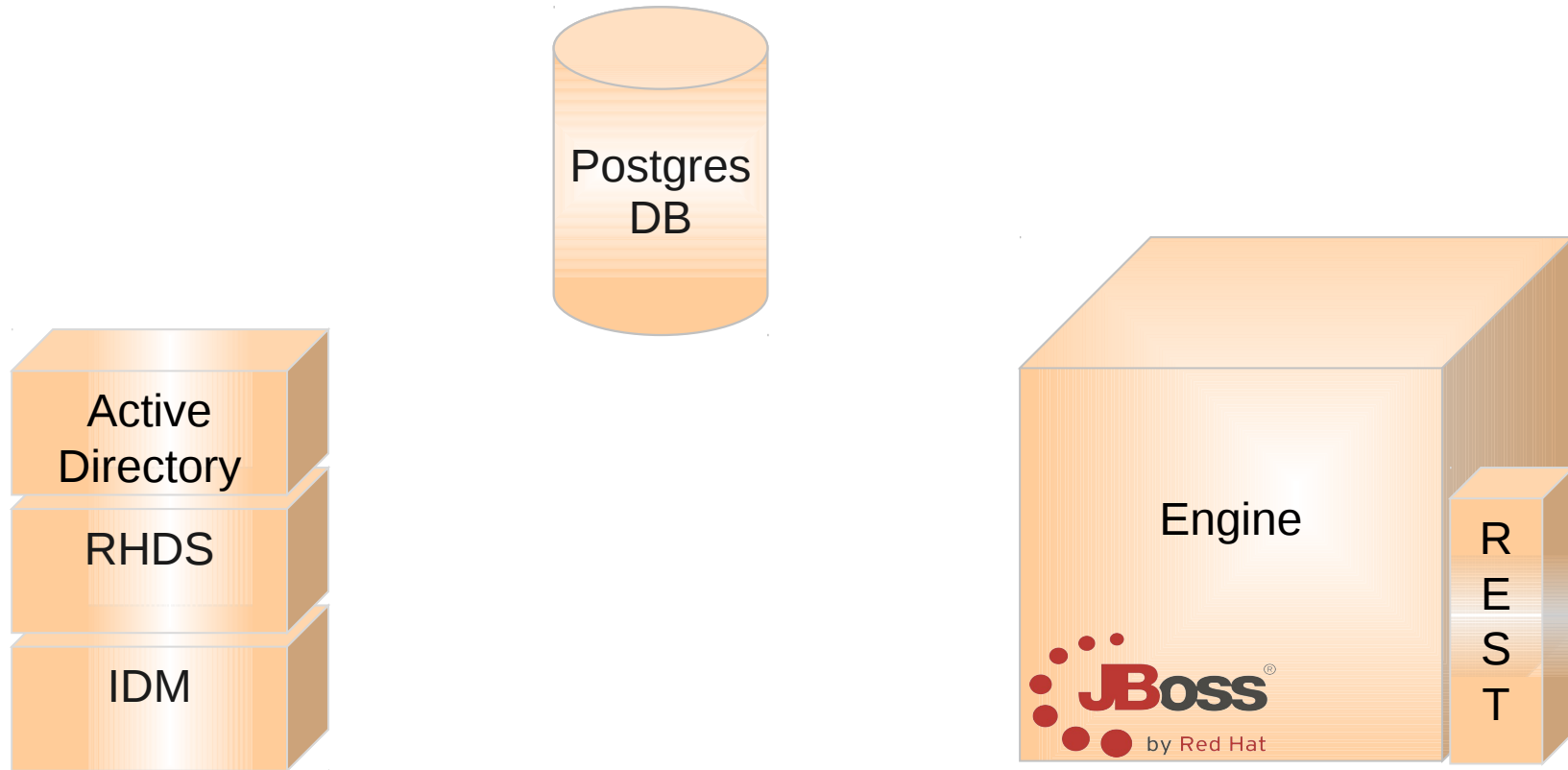
oVirt



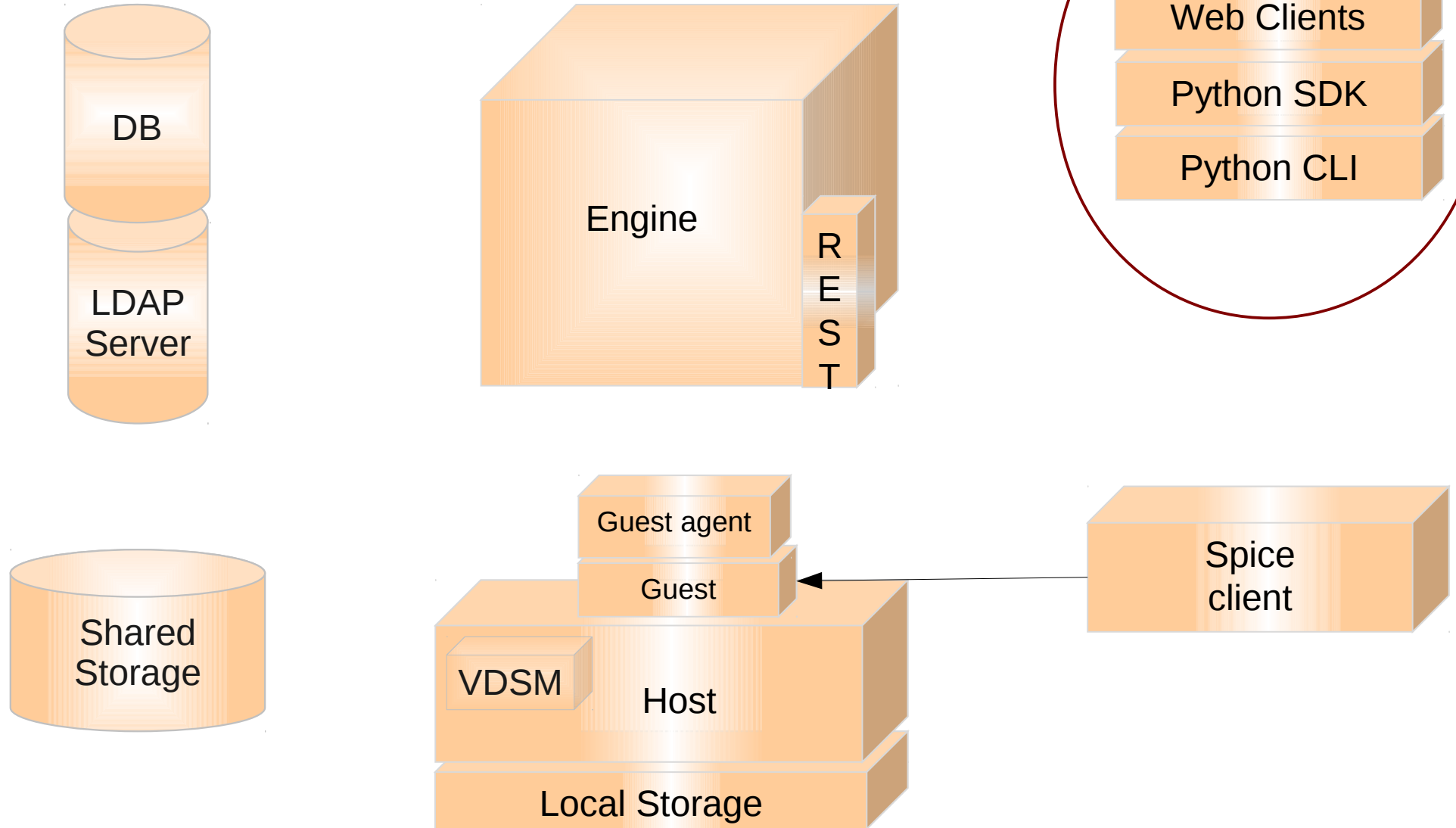
oVirt Engine



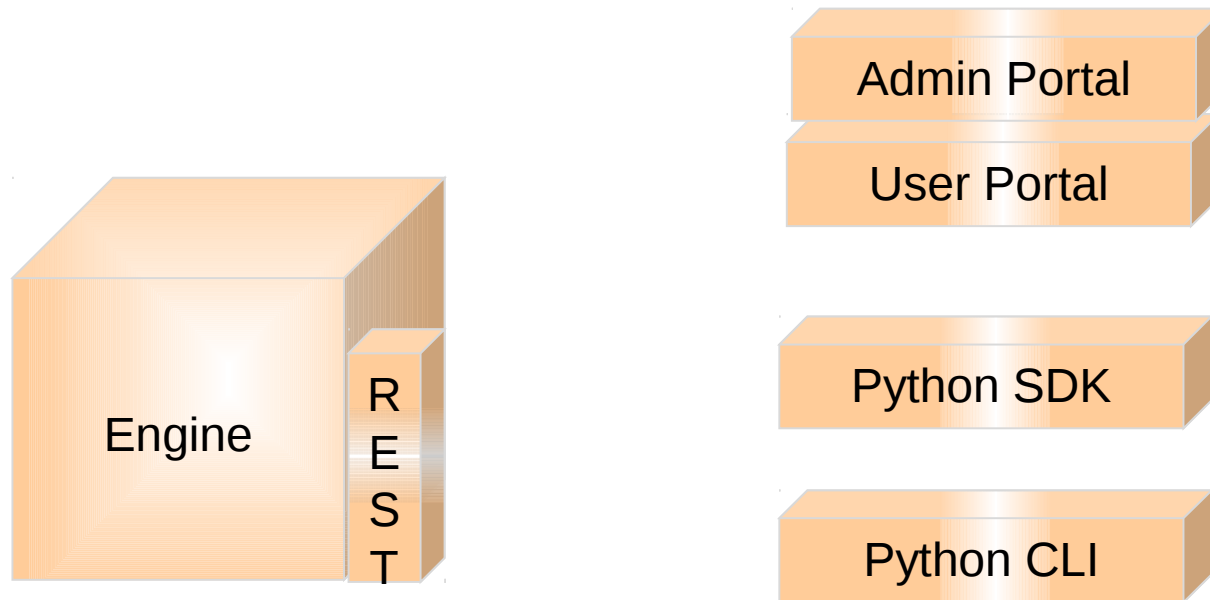
oVirt Engine



The Real World



The Clients



Admin Portal



oVirt Open Virtualization Manager Logged in user: vdcadmin | Configure | Guide | About | Sign Out

Search: Vms: x ★ 🔍

[Data Centers](#)
[Clusters](#)
[Hosts](#)
[Storage](#)
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[Assign Tags](#)
[Guide Me](#)
1-13

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status
demo-vm			cluster-32	demo-dc-32	0%	0%	0%		Down
demo-vm-2			Default	Default	0%	0%	0%		Down
linux-vm			cluster-32	demo-dc-32	0%	0%	0%		Down
nw-filter-vm-1			cluster-31	dc-31	0%	0%	0%		Down
nwfilter-vm-32-1	zeus02		cluster-32	demo-dc-32	0%	0%	0%	Spice	Up
vm-1-dc-30-cluster-3			cluster-30-on-dc-30	dc-30-with-various-cl	0%	0%	0%		Down

[General](#)
[Network Interfaces](#)
[Disks](#)
[Snapshots](#)
[Applications](#)
[Permissions](#)
[Events](#)

Name: demo-vm **Defined Memory:** 512 MB **Origin:** oVirt
Description: **Physical Memory Guaranteed:** 512 MB **Run On:** Any Host in Cl
Template: Blank **Number of CPU Cores:** 1 (1 Socket(s)) **Custom Properties:** Not-Configurec
Operating System: Other Linux **Number of Monitors:** 1 **Cluster Compatibility Version:** 3.2
Default Display Type: Spice **USB Policy:** Disabled

Bookmarks
Tags

Last Message: ✔ 2012-Oct-30, 10:54:53 VM nwfilter-vm-32-1 started on Host zeus02

[Alerts \(1\)](#)
[Events](#)
[Tasks \(0\)](#)

User Portal




oVirt Engine
Logged in user: **masayag** | [Sign Out](#) | [Guide](#) | [About](#)


[Basic](#) [Extended](#)


demo-vm linux-vm




demo-vm

 **Operating System :** OtherLinux

 **Defined Memory :** 512MB

 **Number of Cores :** 1 (1 Socket(s), 1 Core(s) per Socket)

 **Drives :**
some-vm_Disk1: **2GB**

 **Console :** **Spice** [\(Edit\)](#)

Power User Portal



oVirt Engine

Logged in user: **masayag** | [Sign Out](#) | [Guide](#) | [About](#)

Basic

Extended

Virtual Machines

Templates

Resources

Virtual Machines: 0%

Defined VMs: 2
Running VMs: 0

Virtual CPUs: 0%

Defined vCPUs: 2
Used vCPUs: 0

Memory: 0%

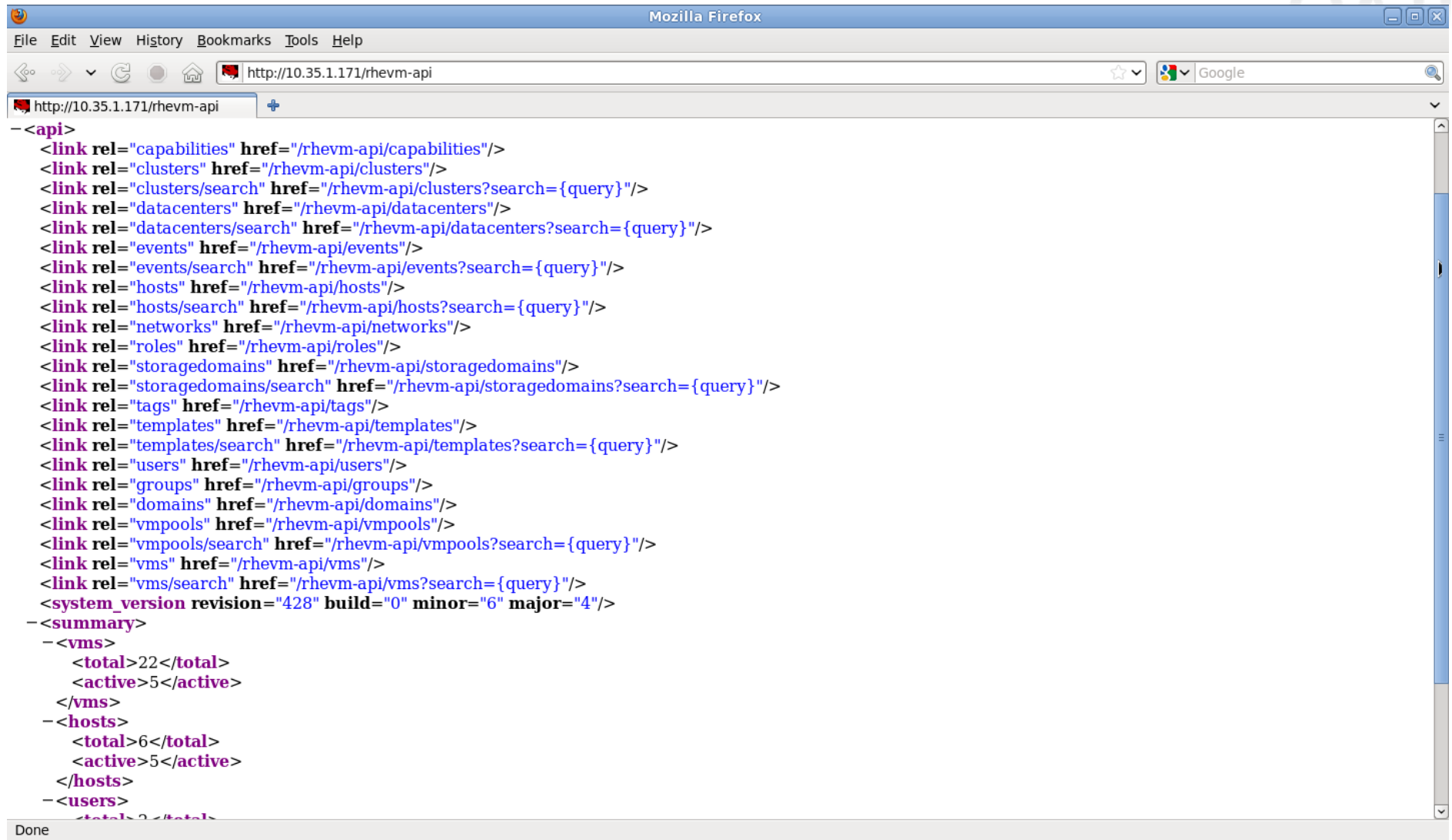
Defined Memory: 2012MB
Memory Usage: 0MB

Storage:

Total Size: 32GB
Number of Snapshots: 2
Total Size: <1GB

Description	Disks	Virtual Size	Actual Size	Snapshots
demo-vm	1	2GB	0GB	1
linux-vm	1	30GB	0GB	1
linux-vm_Disk1	linux-vm_Disk1	30GB	0GB	1

REST API



```

- <api>
  <link rel="capabilities" href="/rhev-api/capabilities"/>
  <link rel="clusters" href="/rhev-api/clusters"/>
  <link rel="clusters/search" href="/rhev-api/clusters?search={query}"/>
  <link rel="datacenters" href="/rhev-api/datacenters"/>
  <link rel="datacenters/search" href="/rhev-api/datacenters?search={query}"/>
  <link rel="events" href="/rhev-api/events"/>
  <link rel="events/search" href="/rhev-api/events?search={query}"/>
  <link rel="hosts" href="/rhev-api/hosts"/>
  <link rel="hosts/search" href="/rhev-api/hosts?search={query}"/>
  <link rel="networks" href="/rhev-api/networks"/>
  <link rel="roles" href="/rhev-api/roles"/>
  <link rel="storagedomains" href="/rhev-api/storagedomains"/>
  <link rel="storagedomains/search" href="/rhev-api/storagedomains?search={query}"/>
  <link rel="tags" href="/rhev-api/tags"/>
  <link rel="templates" href="/rhev-api/templates"/>
  <link rel="templates/search" href="/rhev-api/templates?search={query}"/>
  <link rel="users" href="/rhev-api/users"/>
  <link rel="groups" href="/rhev-api/groups"/>
  <link rel="domains" href="/rhev-api/domains"/>
  <link rel="vmpools" href="/rhev-api/vmpools"/>
  <link rel="vmpools/search" href="/rhev-api/vmpools?search={query}"/>
  <link rel="vms" href="/rhev-api/vms"/>
  <link rel="vms/search" href="/rhev-api/vms?search={query}"/>
  <system_version revision="428" build="0" minor="6" major="4"/>
- <summary>
  - <vms>
    <total>22</total>
    <active>5</active>
  </vms>
  - <hosts>
    <total>6</total>
    <active>5</active>
  </hosts>
  - <users>
    <total>2</total>
  </users>

```

Done

```
#create proxy
api = API(url='http://localhost:8080', username='user@domain', password='password')
```

```
api.
```

- vms
 - Ⓜ __init__(url, username, password, key_file, cert_file, port, s

```
api.vms.
```

- Ⓜ add(vm)
- Ⓜ get(name)
- Ⓜ list(query)

```
#list by query
vms = api.vms.list(query = 'name=python_vm')
```

```
#search vms by property constraint
vms = api.vms.list(memory=1073741824)
```

```
#get by constraints
```

```
vm = api.vms.get(id = '02f0f4a4-9738-4731-83c4-293f3f734782')
```

```
vm.st
```

- Ⓜ start()
- start_time

```
#update stateless ce
```

CLI

AVAILABLE COMMANDS

* action	execute an action on an object
* cd	change directory
* clear	clear the screen
* connect	connect to a RHEV manager
* console	open a console to a VM
* create	create a new object
* delete	delete an object
* disconnect	disconnect from RHEV manager
* exit	quit this interactive terminal
* getkey	dump private ssh key
* help	show help
* list	list or search objects
* ping	test the connection
* pwd	print working directory
* save	save configuration variables
* set	set a configuration variable
* show	show one object
* status	show status
* update	update an object

```
(oVirt cli) > help connect
```

USAGE

```
connect
connect <url> <username> <password>
```

DESCRIPTION

Connect to a RHEV manager. This command has two forms. In the first form, no arguments are provided, and the connection details are read from their respective configuration variables (see 'show'). In the second form, the connection details are provided as arguments.

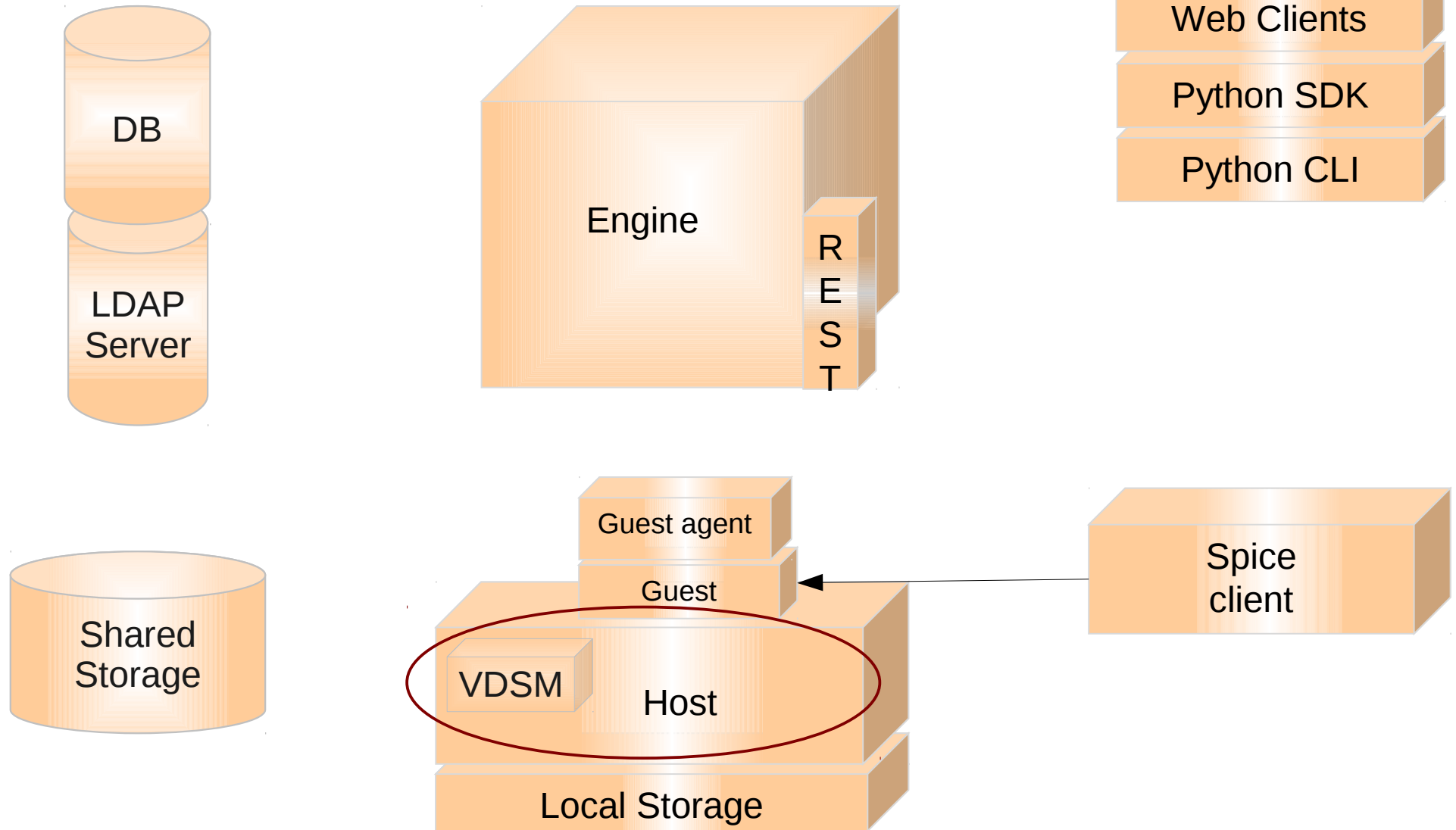
The arguments are:

- * url - The URL to connect to.
- * username - The user to connect as. Important: this needs to be in the user@domain format.
- * password - The password to use.

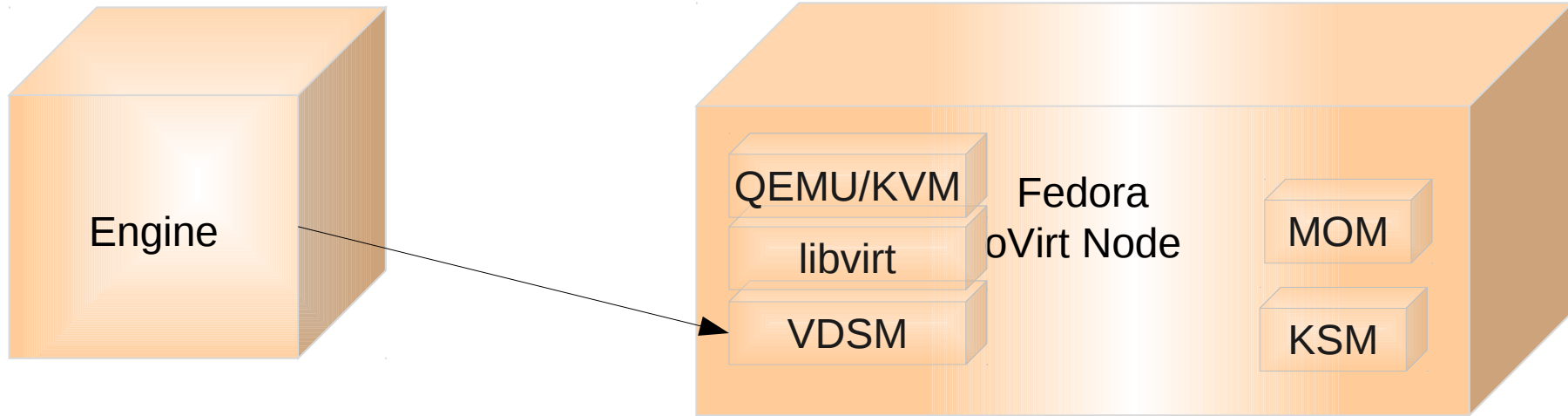


The Real World

oVirt



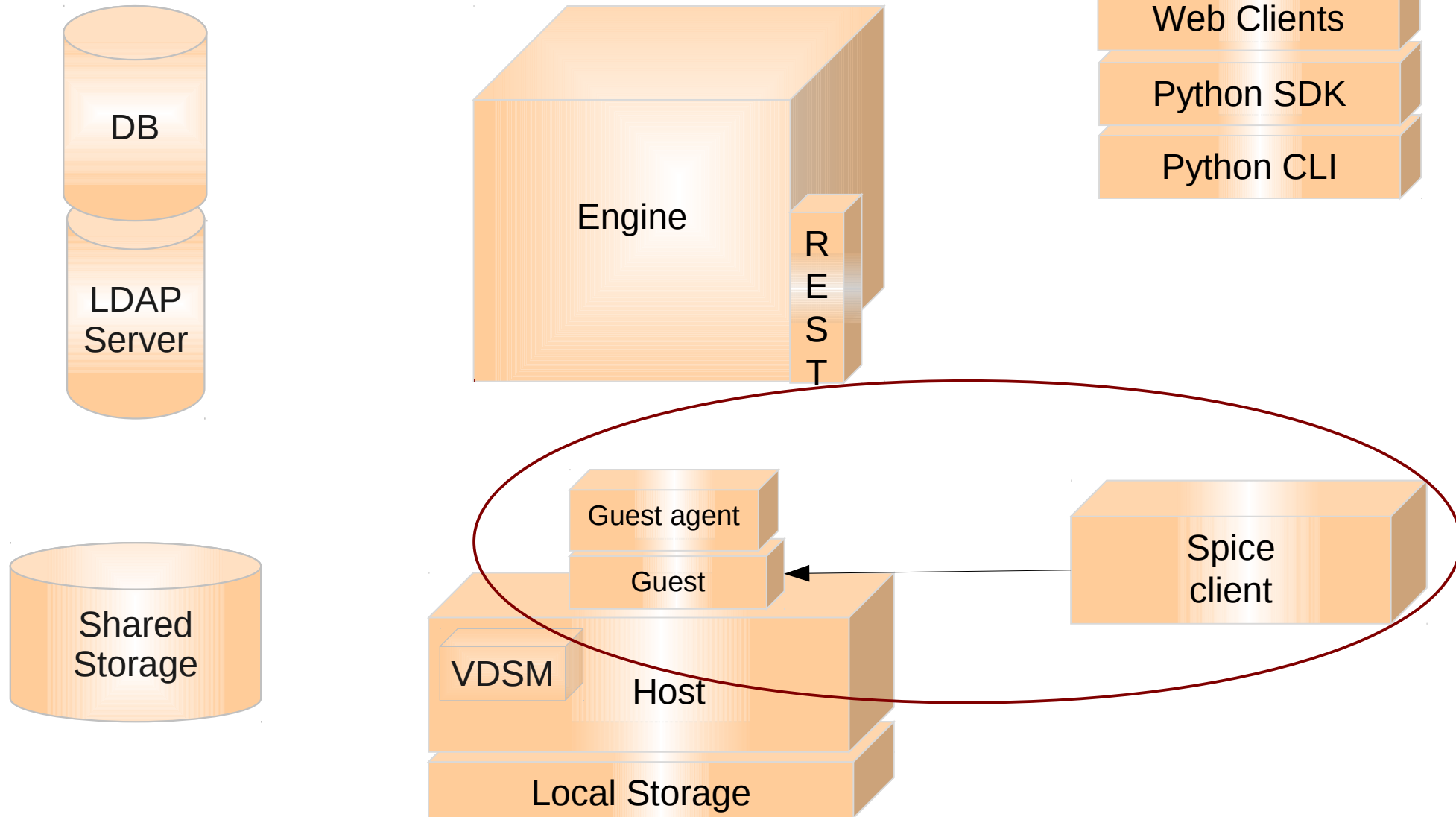
The Host



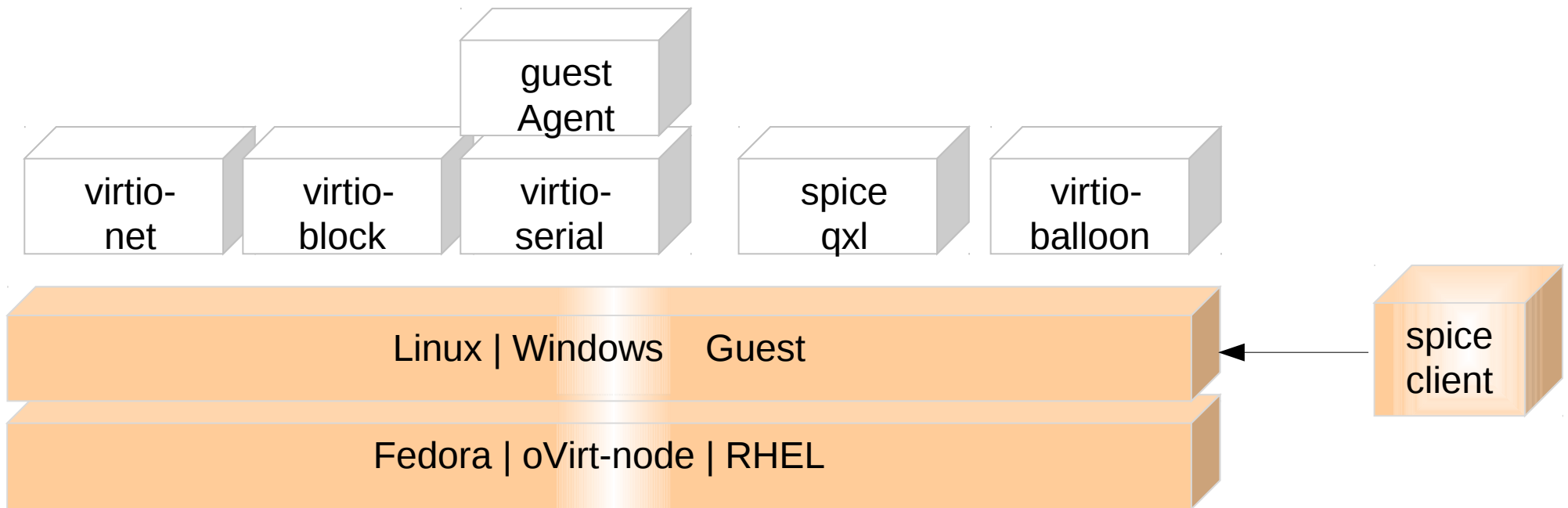
Configuration Monitoring :
Network, Storage, Host, VMs

The Real World

oVirt



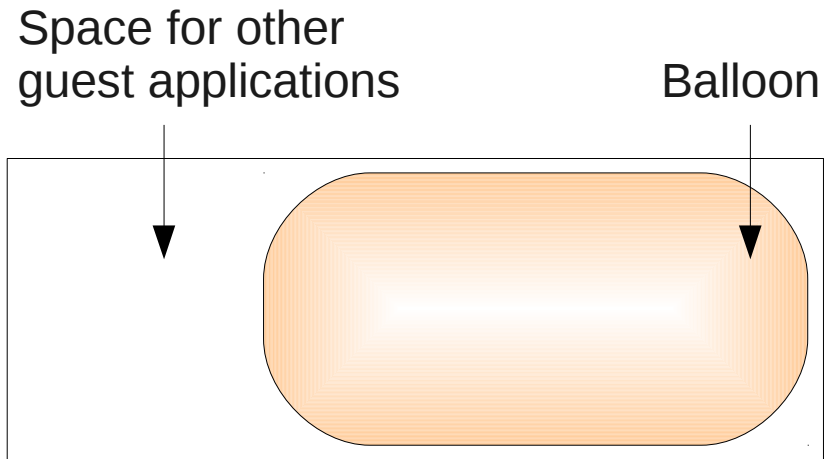
The Guest



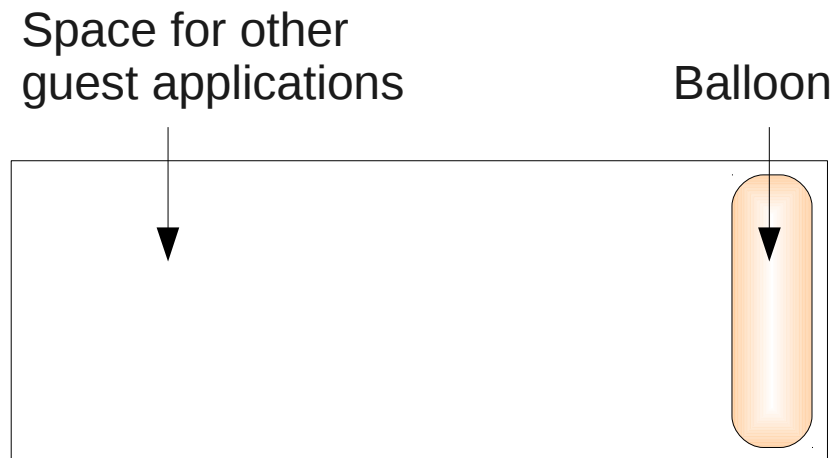
Virtio Balloon

Guest Memory space:

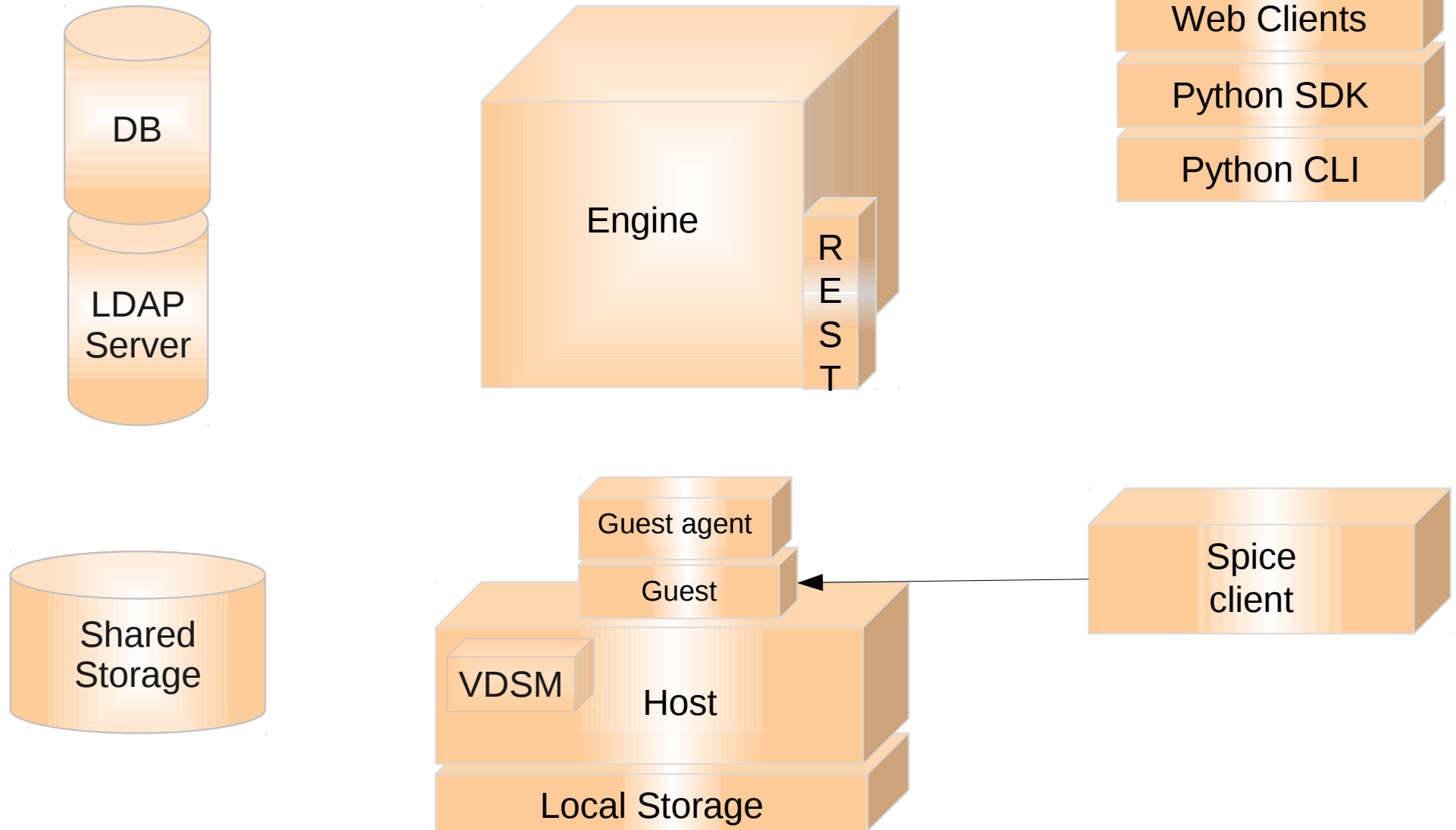
Inflate



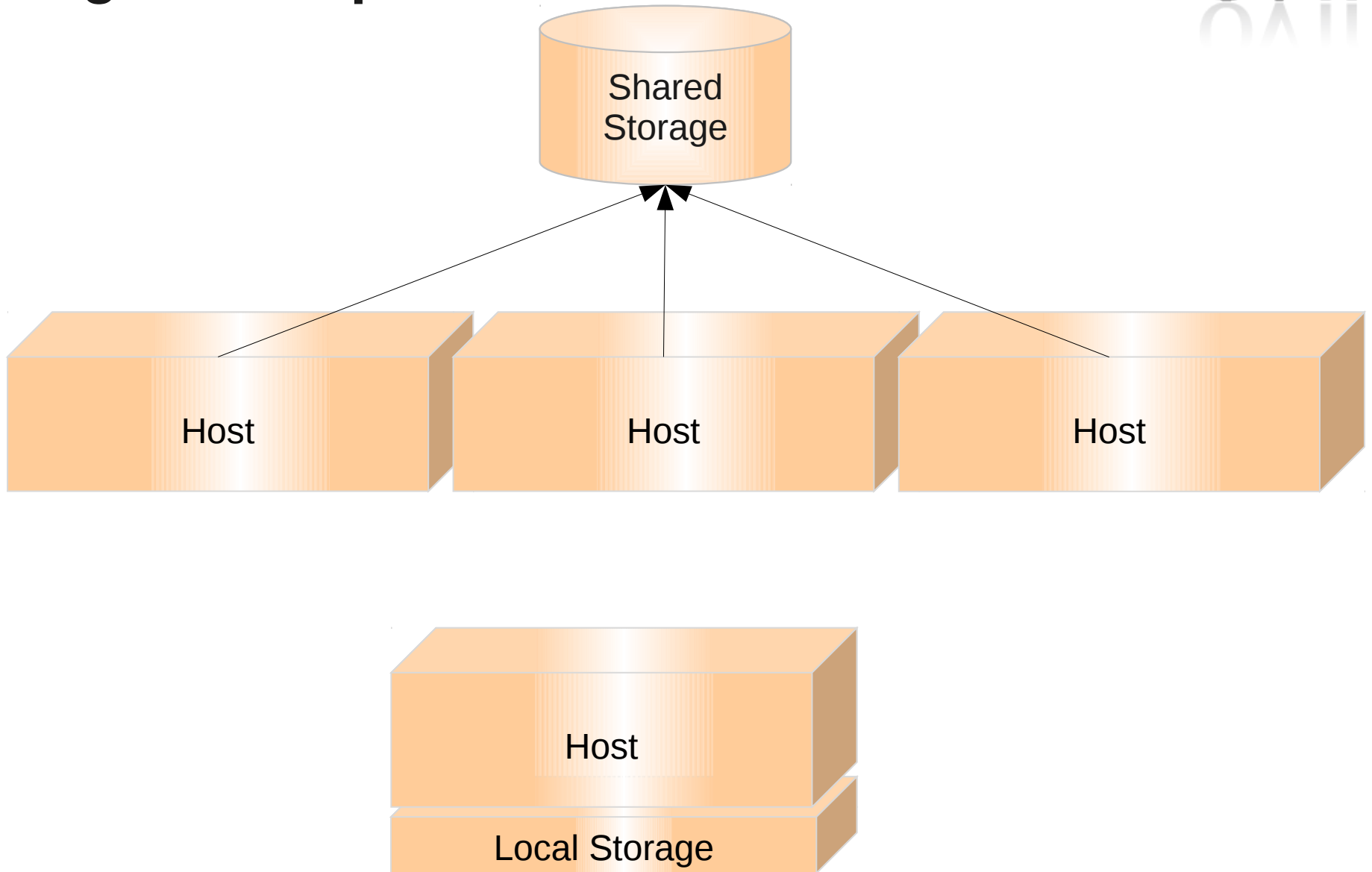
deflate



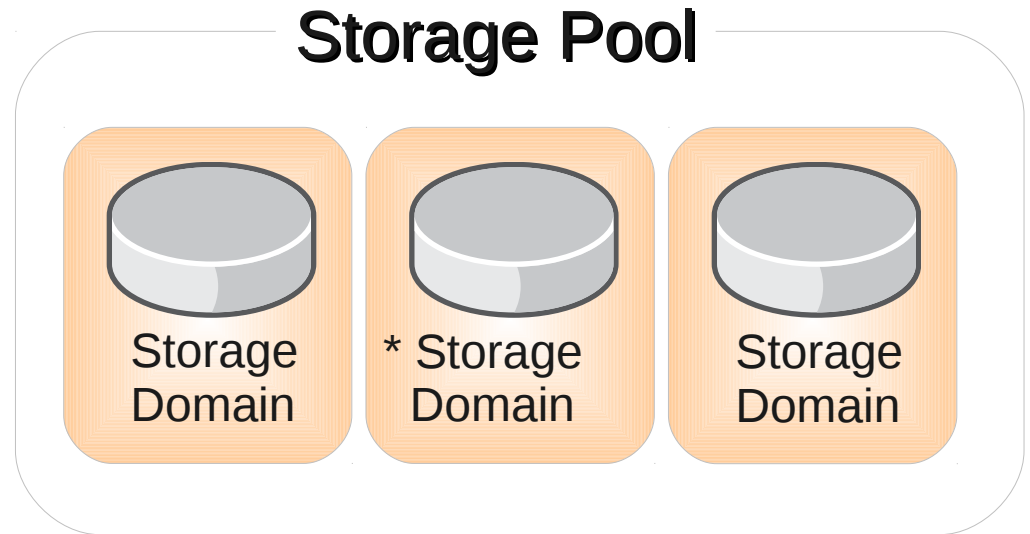
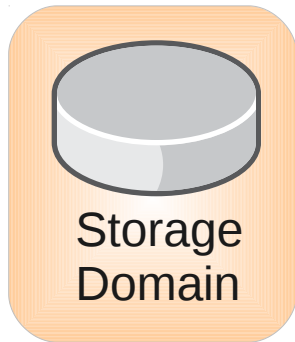
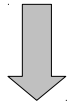
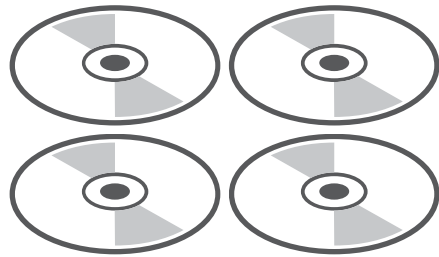
Putting the Pieces Together



Storage Concepts



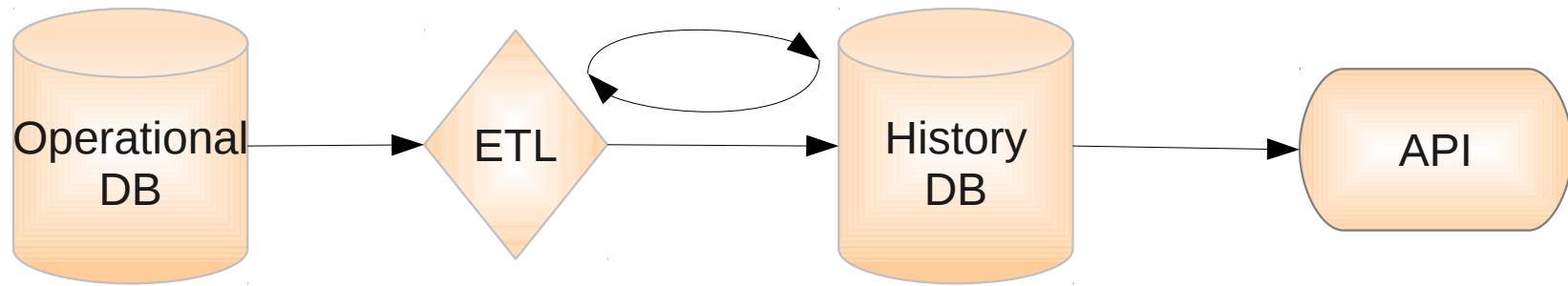
Storage Concepts



* Master Storage Domain



Data Warehouse



Talend Open Studio



The screenshot displays the Talend Open Studio interface. The main workspace shows a job design for 'Job HistoryETL 3.0'. The job is divided into three sections: Prejob, Main, and Postjob. The Prejob section includes components like tPrejob_1, tRowGenerator, tFileDelete_1, tFileInputProperties_1, tContextLoad_1, and tLogRow_2. The Main section contains several subjobs (tJavaFlex_1, tJavaFlex_2, tJavaFlex_3) and components like tWaitForFile_1, tWaitForFile_2, tRowGenerator, and tLogRow_1. The Postjob section includes components like tPostjob_1, tContextLoad_1, and tLogRow_1. The interface also shows a left sidebar with 'Business Models' and 'Job Designs' lists, an 'Outline' view, and a 'Code Viewer'. The bottom status bar indicates '0 errors, 0 warnings, 0 infos'.

Job HistoryETL 3.0

Prejob:

- tPrejob_1
- tRowGenerator
- tFileDelete_1
- tFileInputProperties_1
- tContextLoad_1
- tLogRow_2

Main:

- tJavaFlex_1 (MinimalVersionCheck)
- tJavaFlex_2 (ParallelRun)
- tJavaFlex_3 (Iterate1 (order))
- tWaitForFile_1
- tWaitForFile_2
- tRowGenerator
- tLogRow_1

Postjob:

- tPostjob_1
- tContextLoad_1
- tLogRow_1

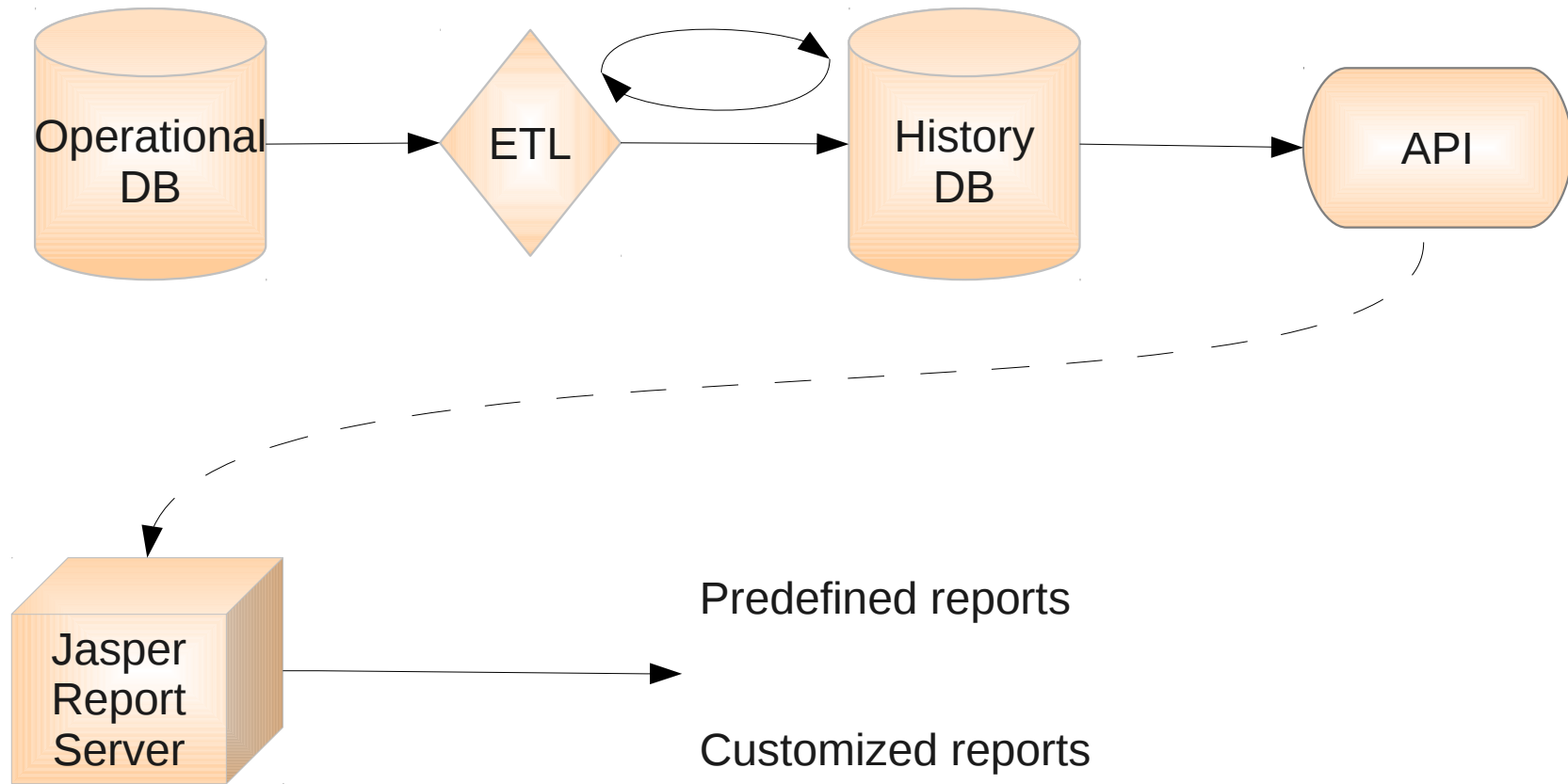
Outline:

- tContextLoad_1
- tFileDelete_1
- tFileInputProperties_1
- tJDBCCConnection_1 (sample_ovirt_histor)
- tJDBCCConnection_2 (engine)
- tJDBCCConnection_3 (hourly_ovirt_histor)
- tJDBCCConnection_4 (daily_ovirt_histor)
- tJDBCCConnection_5 (delete_ovirt_histor)

Status: 0 errors, 0 warnings, 0 infos

Description	Resource
Errors (0 items)	
Warnings (0 items)	
Infos (0 items)	

DWH & Reports



Example Report



Active Virtual Machines by OS in Clusters of Data Center DC_30_IC136_tiger

Criteria: **Datacenter:** DC_30_IC136_tiger **Date Range:** 2011-08-01 - 2011-10-31 **VM Type:** All
Cluster: All **Period:** Quarterly **Show Deleted Virtual Machines:** Yes

Active Virtual Machines by OS (BR18)

* Show Deleted Entities?

* Data Center

* Cluster

* VM Type

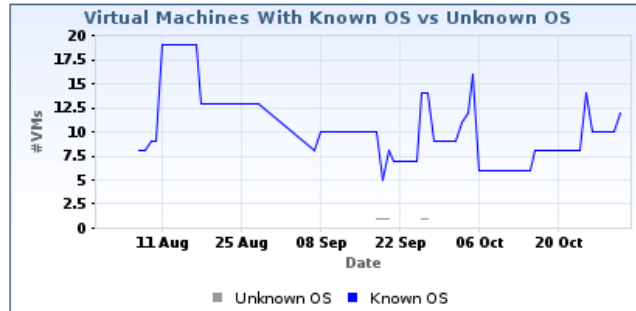
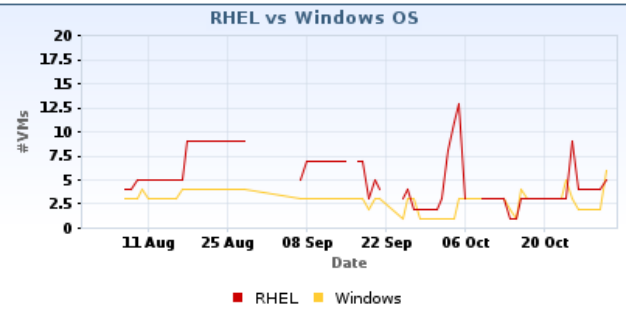
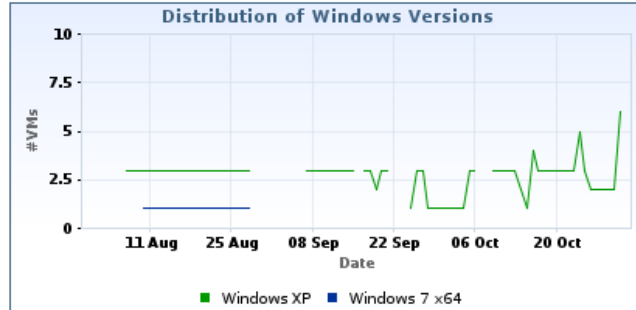
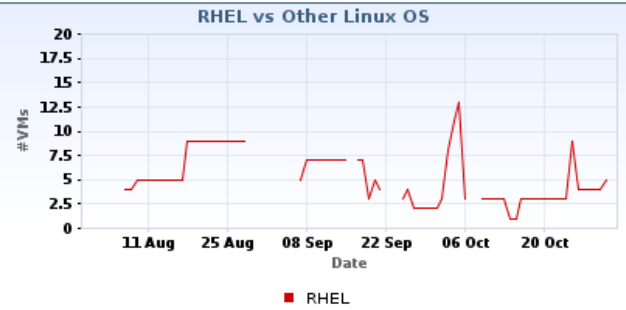
* Period Range

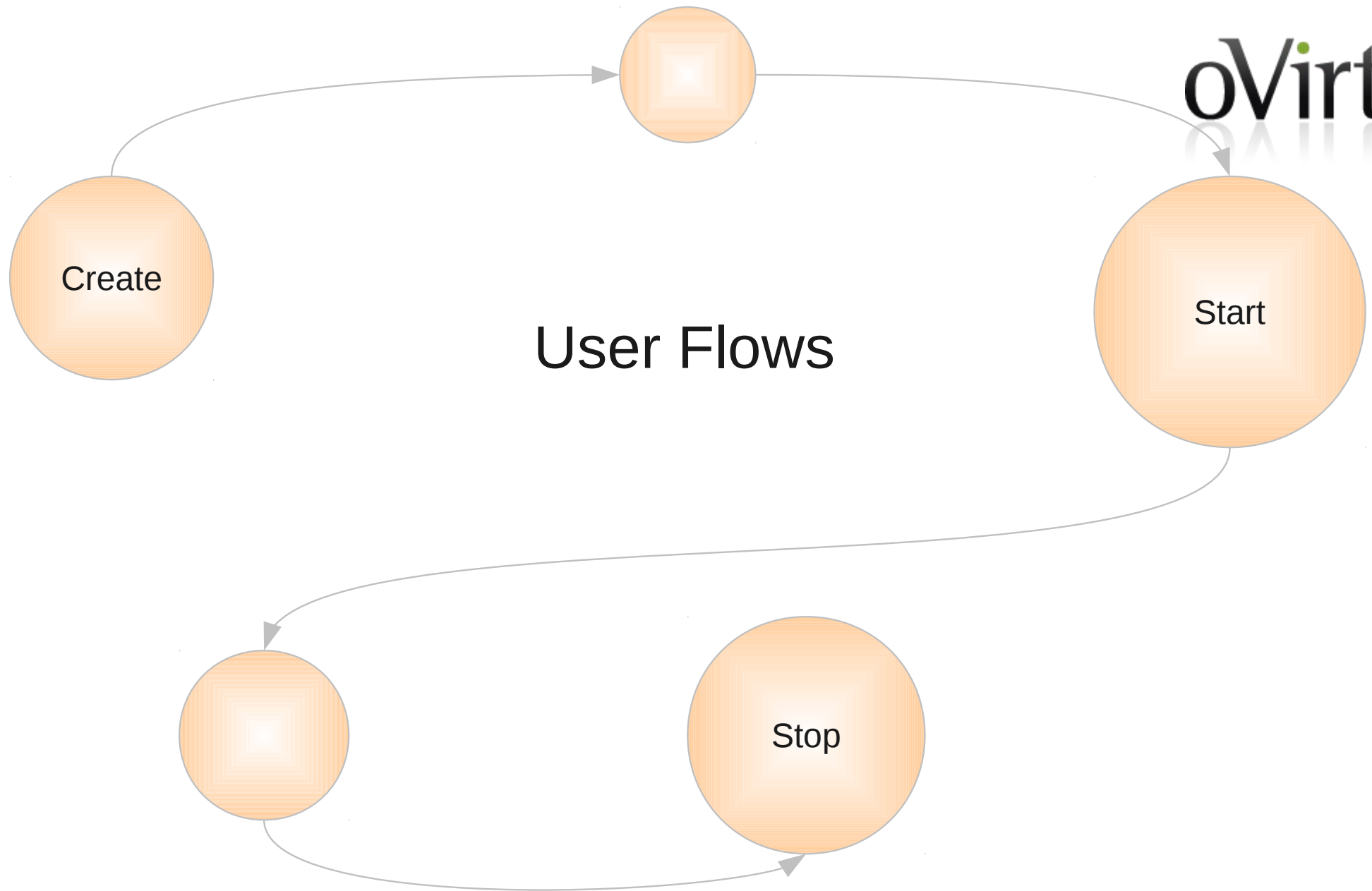
* Select Month

* Start Date

* End Date

Reset





User Flows

Create VM From Template



oVirt Open Virtualization Manager | Logged in user: vdcadmin | Configure | Guide | About | Sign Out

Search: Vms:

New Server Virtual Machine

- General**
- Initial Run
- Console
- Host
- High Availability
- Resource Allocation
- Boot Options
- Custom Properties

Data Center: demo-dc-32
Host Cluster: cluster-32

Name: rhel63_demo_vm
Description: Demo VM
Based on Template: rhel63_demo

Memory Size: 512 MB
Total Virtual CPUs: 2

Advanced Parameters

Cores per Virtual Socket: 1
Virtual Sockets: 2

Operating System: Red Hat Enterprise Linux 6.x x64

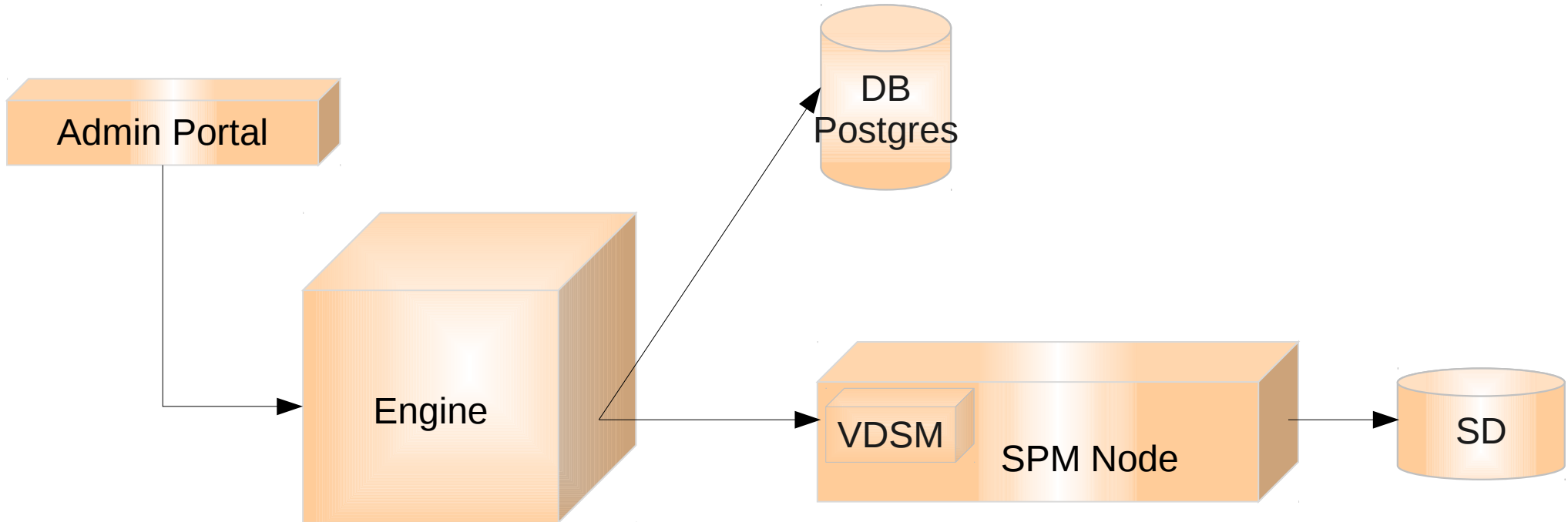
OK Cancel

VM Name	CPU	Network	Display	Status
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down
...	0%	0%		Down

Last Message: ✓ 2012-Oct-30, 10:45:18 Creation of Template rhel63_demo from VM demo-vm has been completed.

Alerts (1) Events Tasks (0)

Create VM From Template



Run a VM



oVirt Open Virtualization Manager

Logged in user: **vdadmin** | Configure | Guide | About | Sign Out

Search: Vms: [x] [star] [magnifying glass]

Data Centers Clusters Hosts **Storage** Disks Virtual Machines Pools Templates Volumes Users Events

New Server New Desktop Edit Remove Run Once [play] [stop] [refresh] Migrate Cancel Migration Make Template Export Change CD Assign Tags Guide Me 1-13 [left] [right]

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status
demo-vm			cluster-32	demo-dc-32	0%	0%	0%		Down
demo-vm-2			Default	Default	0%	0%	0%		Down
linux-vm			cluster-32	demo-dc-32	0%	0%	0%		Down
nw-filter-vm-1			cluster-31	dc-31	0%	0%	0%		Down
nwfilter-vm-32-1	zeus02		cluster-32	demo-dc-32	0%	0%	0%	Spice	Up
vm-1-dc-30-cluster-3			cluster-30-on-dc-30	dc-30-with-various-cl	0%	0%	0%		Down

General **Network Interfaces** Disks Snapshots Applications Permissions Events

New Edit Remove Activate Deactivate

Name	Network Name	Type	MAC	Speed (Mbps)	Rx (Mbps)	Tx (Mbps)	Drops (Pkts)	Port Mirro
nic1	ovirtmgmt	Red Hat VirtIO	00:1a:4a:16:01:52	1000	< 1	< 1	0	
nic3	VLAN_MTU_9000	Red Hat VirtIO	00:1a:4a:16:01:aa	1000	< 1	< 1	0	
nic5	VLAN_MTU_9000	Red Hat VirtIO	00:1a:4a:16:01:ab	1000	< 1	< 1	0	
nic4	VLAN_MTU_9000	Red Hat VirtIO	00:1a:4a:16:01:ac	1000	< 1	< 1	0	
nic2	VLAN_MTU_9000	Red Hat VirtIO	00:1a:4a:16:01:af	1000	< 1	< 1	0	

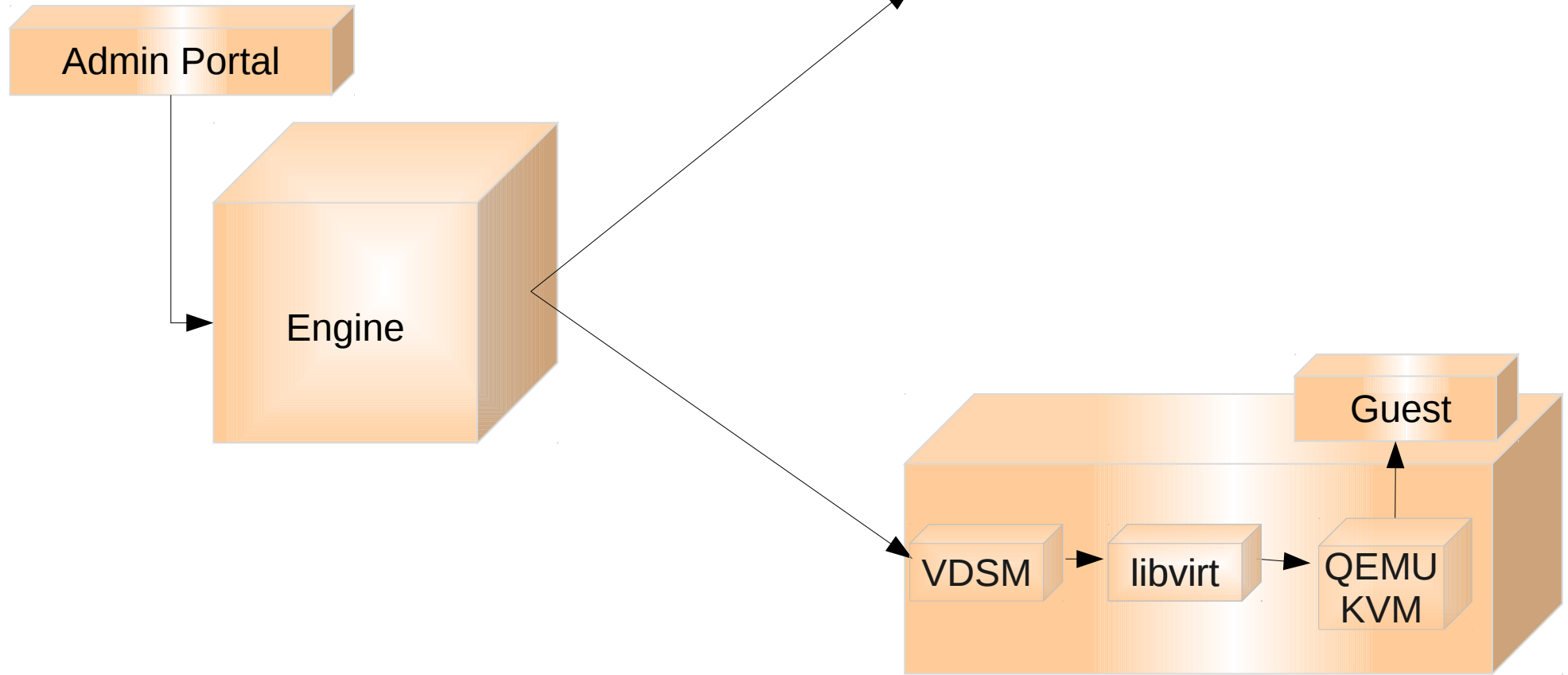
Bookmarks

Tags

Last Message: ✔ 2012-Oct-30, 10:54:53 VM nwfilter-vm-32-1 started on Host zeus02 ! Alerts (1) Events Tasks (0)

Run a VM

Choose a host on which to start the VM



What are Hooks?

- A mechanism for customization
- Allows the administrator to manipulate the VM life cycle
- Points of manipulation
 - Before / after VM start
 - Before / after VM migration in/out
 - On VM stop
 - Etc.

Use Hooks



The screenshot shows the oVirt Open Virtualization Manager interface. A modal dialog titled "Edit Desktop Virtual Machine" is open, displaying the "Custom Properties" tab. The dialog contains a list of properties:

- General**: sndbuf (dropdown), 100 (input field), +, - (buttons)
- Initial Run**: (empty)
- Console**: Please select a key... (dropdown), +, - (buttons)
- Host**: (empty)
- Resource Allocation**: (empty)
- Boot Options**: (empty)
- Custom Properties**: (empty)

The background interface shows a search bar, a tree view with "System" selected, and a table of virtual machines with columns for CPU, Network, Display, and Status. The status of all VMs is "Down".

Start VM With Hooks

Choose a host on which to start the VM

Admin Portal

Engine

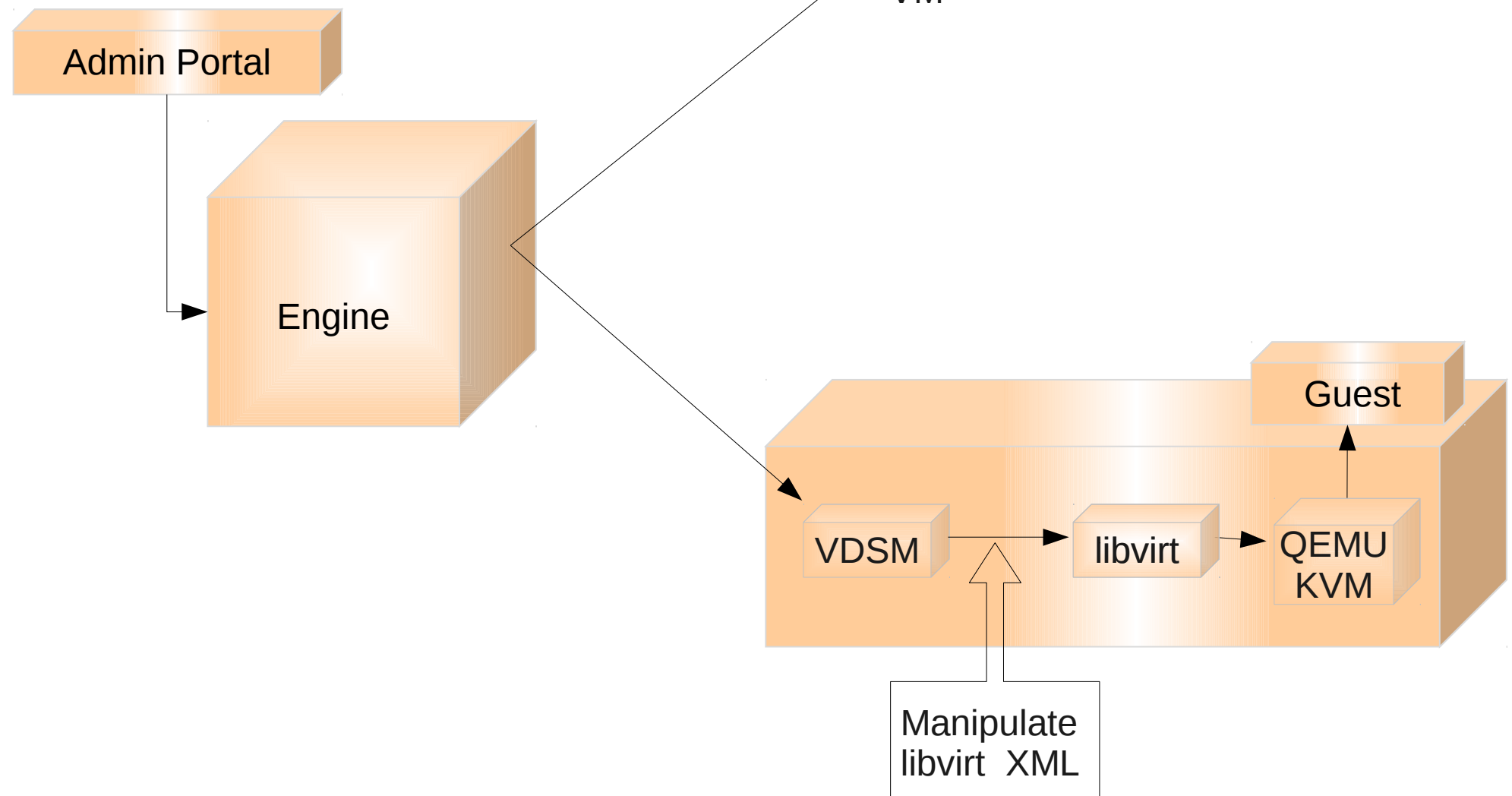
Guest

VDSM

libvirt

QEMU
KVM

Manipulate
libvirt XML



Connect to Guest



oVirt Engine

Logged in user: masayag | Sign Out | Guide | About

Basic

Extended

Virtual Machines

Templates

Resources

New Server | New Desktop | Edit | Remove | Run Once | Change CD | Make Template



rhev-backend-gerrit



sonar (sonar.eng.lab.tlv.redhat.com)



```
sonar:0 - Press shift+f12 to Release Cursor

Red Hat Enterprise Linux Server release 6.2 (Santiago)
Kernel 2.6.32-220.el6.x86_64 on an x86_64

sonar login: _
```

General

Network Interfaces

Virtual Disks

Snapshots

Permissions

Events

Applications

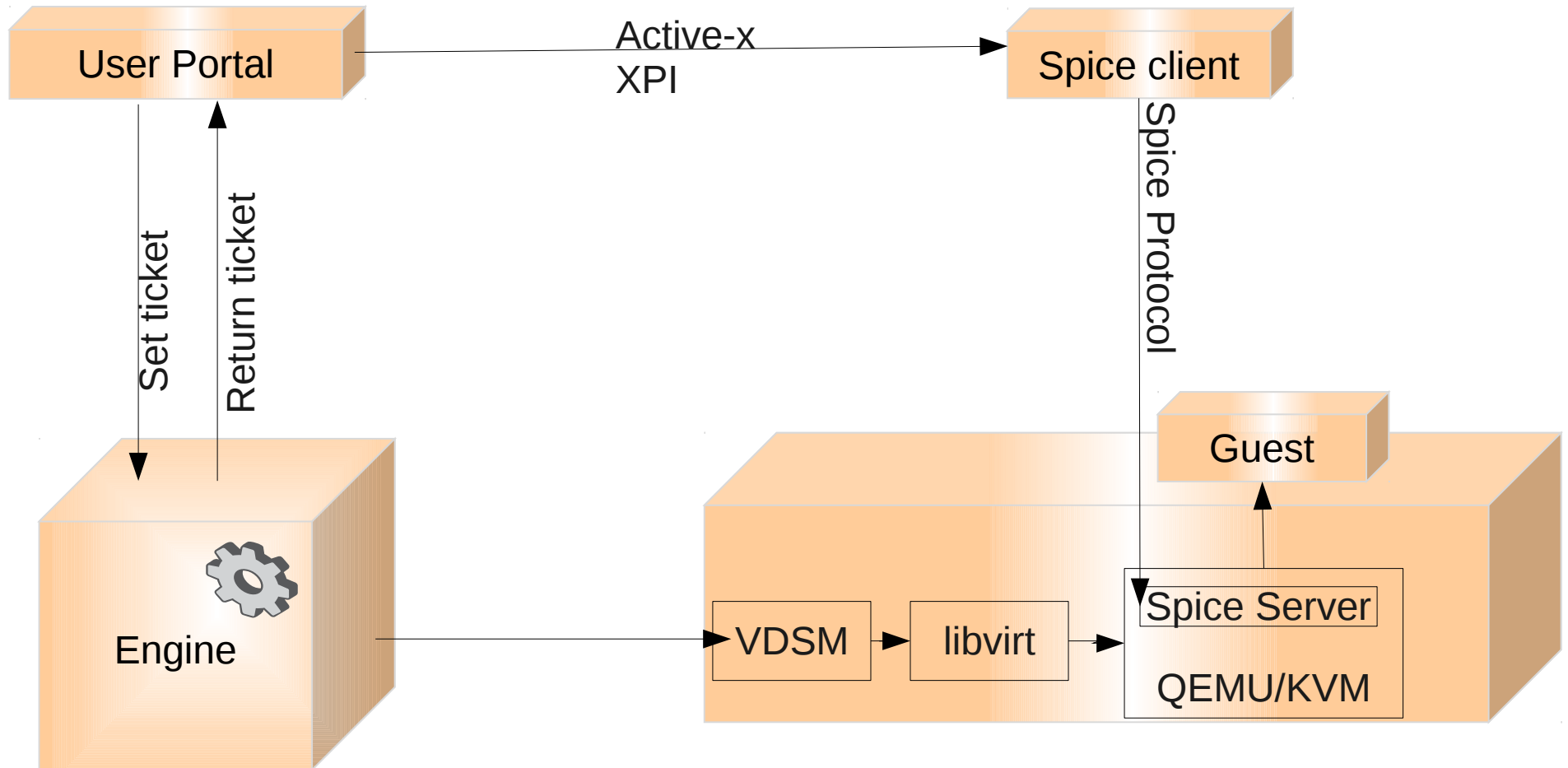
Monitor

Name: sonar
Description: sonar.eng.lab.tlv.redhat.com
Template: Blank
Operating System: Red Hat Enterprise Linux 6.x x64
Default Display Type: Spice
Priority: Low

Defined Memory: 4096 MB
Physical Memory Guaranteed: 1024 MB
Number of CPU Cores: 4 (4 Socket(s), 1 Core(s) per Socket)
Highly Available: false
USB Policy: Enabled
Resides on Storage Domain: RHEV-TLV-STORAGE-FC

Origin: RHEV
Run On: Any Host in Cluster
Custom Properties: Not-Configured

Connect To Guest

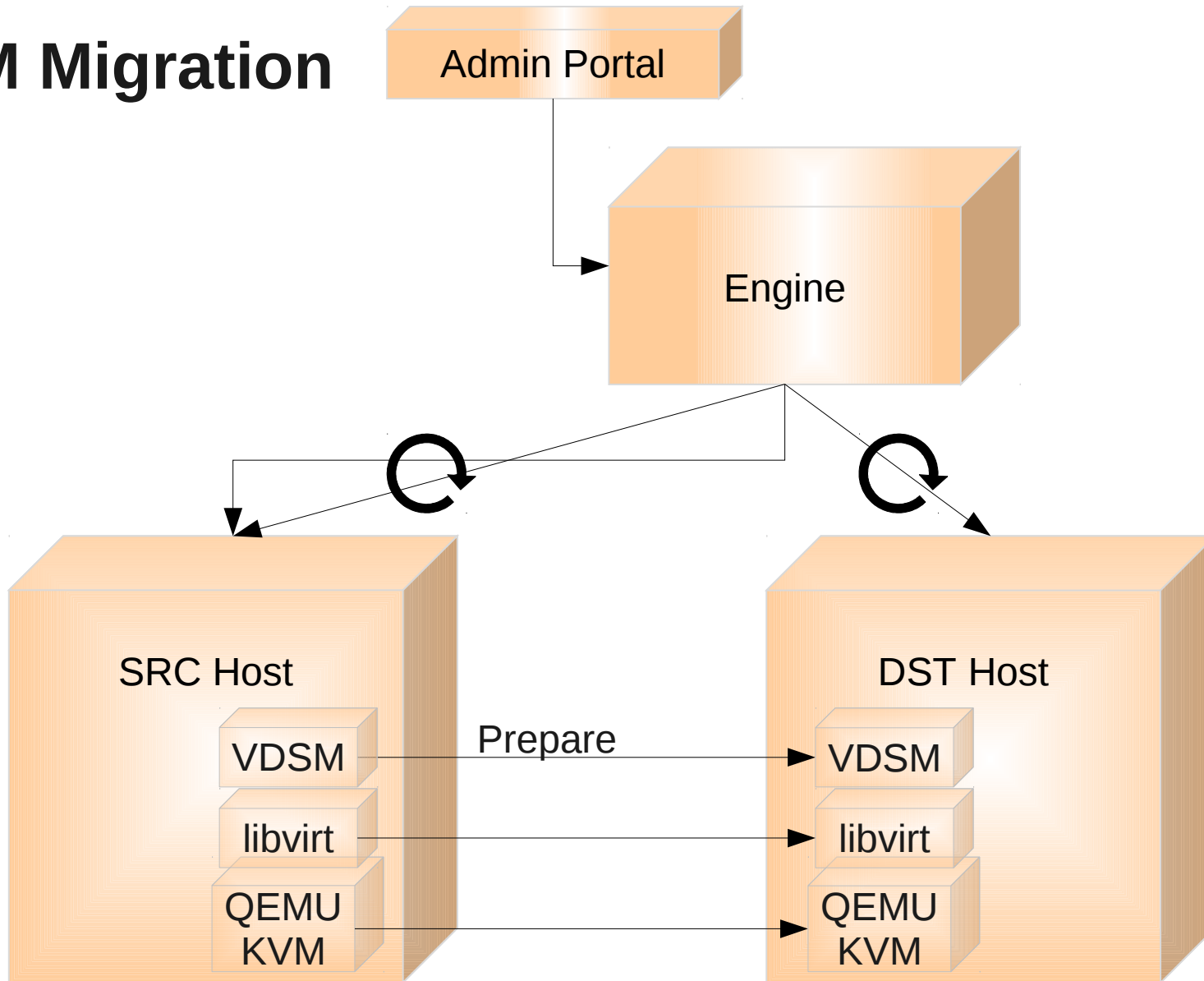


VM Migration



The screenshot displays the oVirt Open Virtualization Manager interface. At the top, the user is logged in as 'vdcadmin'. The main navigation bar includes tabs for Data Centers, Clusters, Hosts, Storage, Disks, Virtual Machines, Pools, Templates, Volumes, Users, and Events. The 'Virtual Machines' tab is active, showing a table of VMs. A red circle highlights the 'Migrate' button in the toolbar. A modal dialog titled 'Migrate Virtual Machine(s)' is open, offering two options: 'Select Host Automatically' (selected) and 'Select Destination Host'. The 'Host' dropdown menu is set to 'modi04'. The background table lists VMs such as 'demo-vm', 'demo-vm-2', 'linux-vm', 'nw-filter-vm-1', 'nwfilter-vm-32-1', and 'vm-1-dc-30-cluster-1'. The status of 'nwfilter-vm-32-1' is 'Power' with 64% CPU usage. The bottom status bar shows a message: '2012-Oct-30, 10:53:51 VM nwfilter-vm-32-1 was started by vdcadmin (Host: zeus02)'. There are also indicators for Alerts (1), Events, and Tasks (1).

VM Migration



Summary

- Review of various oVirt components
- User Action -> Flow in the system
- Everything is open sourced
 - <http://www.ovirt.org>

Get Involved!

- Wiki
 - <http://www.ovirt.org/wiki>
- Mailing lists
 - users@ovirt.org — oVirt Platform user list
 - announce@ovirt.org — oVirt Platform announce list
 - engine-devel@ovirt.org — oVirt-engine devel list
 - node-devel@ovirt.org — oVirt-node devel list
 - vdsm-devel@fedorahosted.org
- IRC
 - [#ovirt@irc.oftc.net](irc://irc.oftc.net/#ovirt)
 - [#vdsm@irc.freenode.net](irc://irc.freenode.net/#vdsm)

oVirt

THANK YOU !

<http://www.ovirt.org>