

Manage oVirt Infrastructure with Jenkins



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Eyal Edri, RHEV CI Team Lead at Red Hat

oVirt
<http://ovirt.org>

July 16, 2014

#jenkinsconf

AGENDA

- Introduction
- What is oVirt
- Basic view of oVirt Infrastructure
- Release flow
- Gerrit hooks
- Jenkins jobs types
- Jenkins jobs builder
- Publishing builds to a repository server
- Future plans
- Questions

INTRODUCTION

- Who are we ?

Kiril Nesenko - Infrastructure Maintainer and release engineer.
Responsible for release engineering activities for oVirt project.

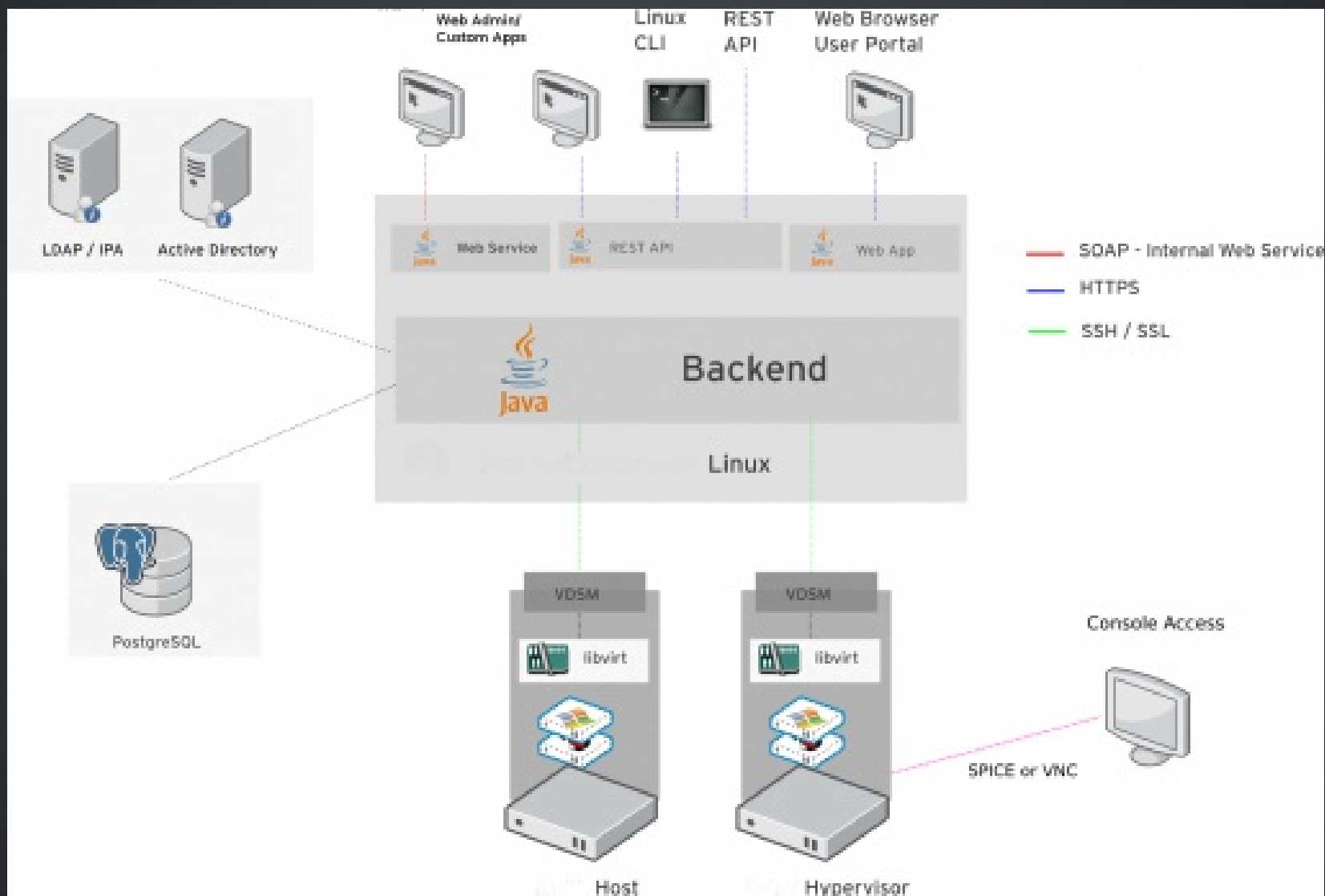
Eyal Edri - Infrastructure Maintainer at oVirt and CI team lead at Red Hat.

WHAT IS OVIRT

- oVirt is a virtual data center manager
- Delivers powerful management of multiple virtual machines on multiple hosts
- Uses KVM, libvirt and vdsd.
- Can be installed on Fedora, CentOS or RHEL

The logo for oVirt, featuring the word "oVirt" in a dark, sans-serif font. The dot above the "i" is a small, bright green circle. The logo is centered and has a subtle reflection effect below it.

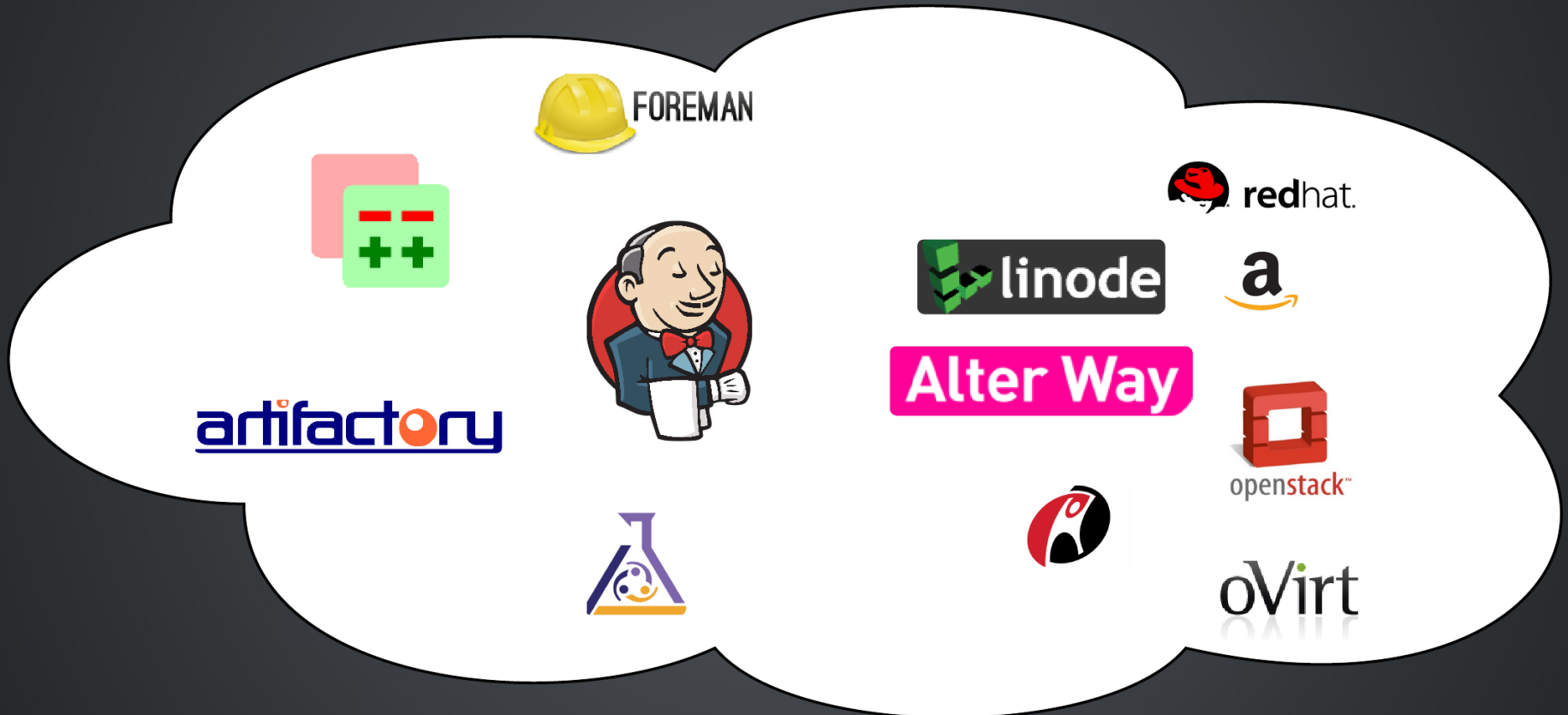
OVIRT ARCHITECTURE



OVIRT UI

<div> + New Server + New Desktop Edit Remove Run Once Migrate Cancel Migration Make Template Export Change CD Assign T </div>										
		Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	
▲	🖥	bc-demo	rhel-h5.rdu.salab.redhat.com	10.11.164.173	RDU-SALAB-Production	RDU-SALAB-Datacenter	0%	0%	73%	
■	🖥	ChicagoTest-VM	rhel-h1.rdu.salab.redhat.com	10.11.164.236	RDU-SALAB-Production	RDU-SALAB-Datacenter	55%	32%	0%	
▲	🖥	bc-demo	rhel-h5.rdu.salab.redhat.com	10.11.164.173	RDU-SALAB-Production	RDU-SALAB-Datacenter	0%	0%	73%	
■	🖥	ChicagoTest-VM	rhel-h1.rdu.salab.redhat.com	10.11.164.236	RDU-SALAB-Production	RDU-SALAB-Datacenter	55%	32%	0%	
▲	🖥	bc-demo	rhel-h5.rdu.salab.redhat.com	10.11.164.173	RDU-SALAB-Production	RDU-SALAB-Datacenter	0%	0%	73%	
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▲	🖥	bc-demo	rhel-h5.rdu.salab.redhat.com	10.11.164.173	RDU-SALAB-Production	RDU-SALAB-Datacenter	0%	0%	73%	
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OVIRT INFRASTRUCTURE VIEW



SERVICES

- Provisioning: *Foreman*
- Configuration: *Puppet*
- Artifacts (mirror): *Artifactory*
- Source Control: *git*
- Code Review: *gerrit*
- CI: *Jenkins*
- Slaves: *VMs + Bare Metal hosts*
- Virtualization: *oVirt, OpenStack*



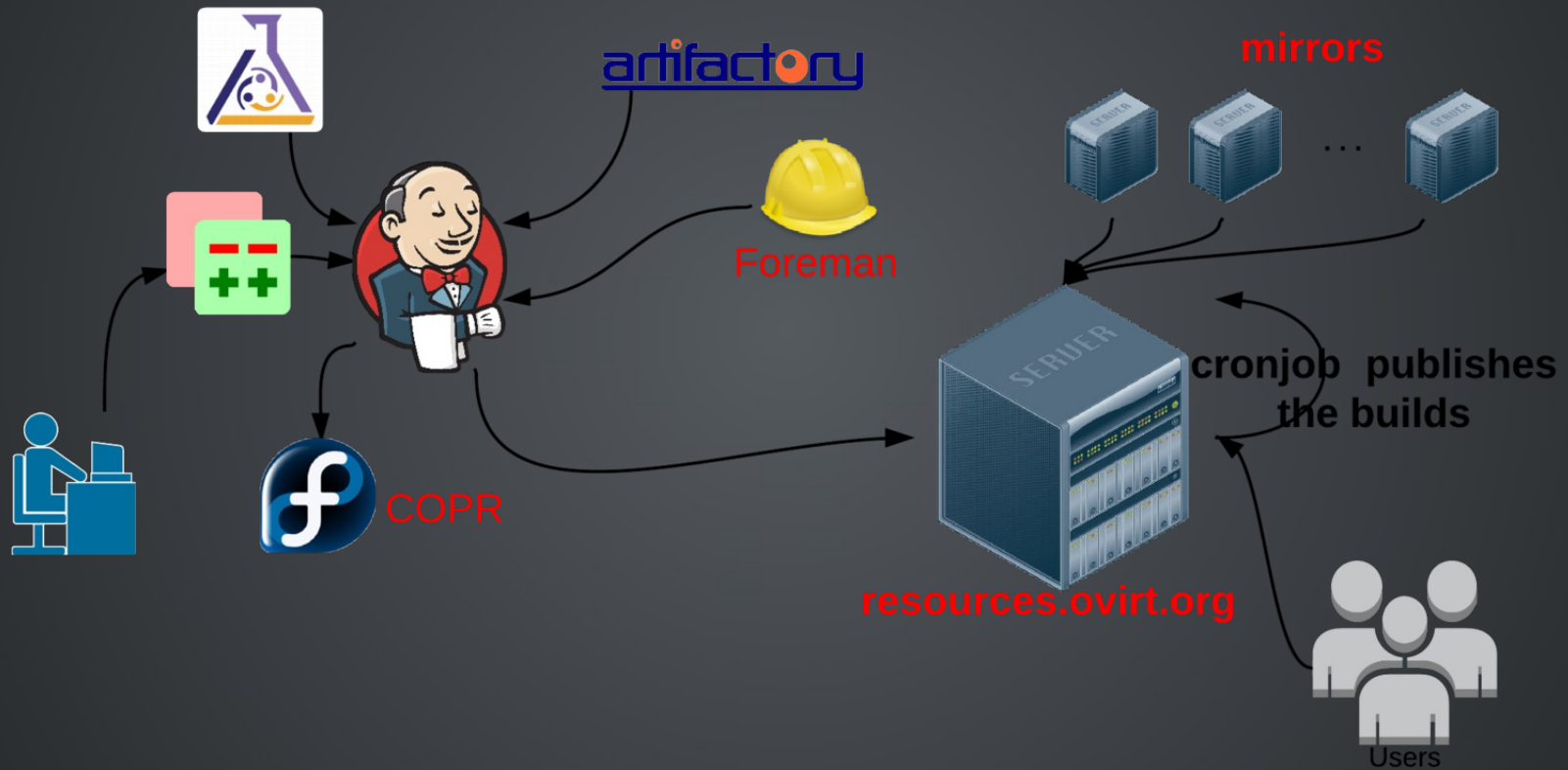
FOREMAN



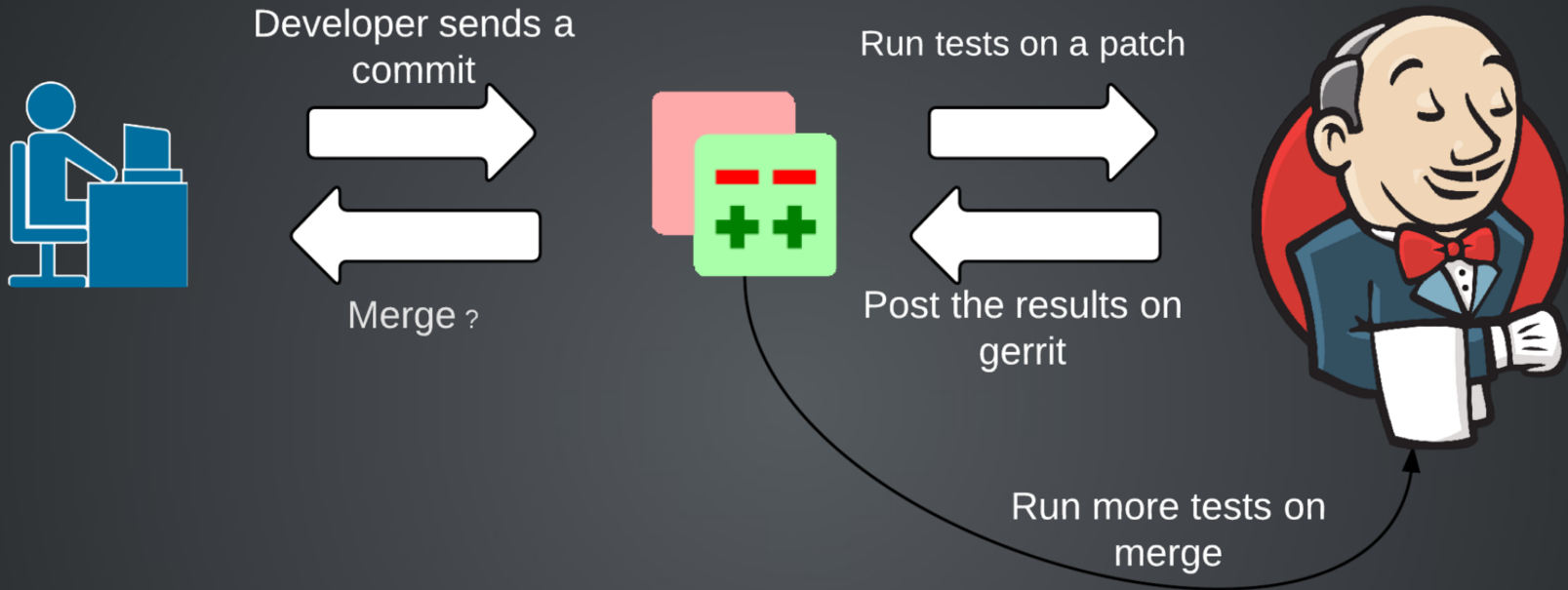
oVirt



RELEASE PROCESS

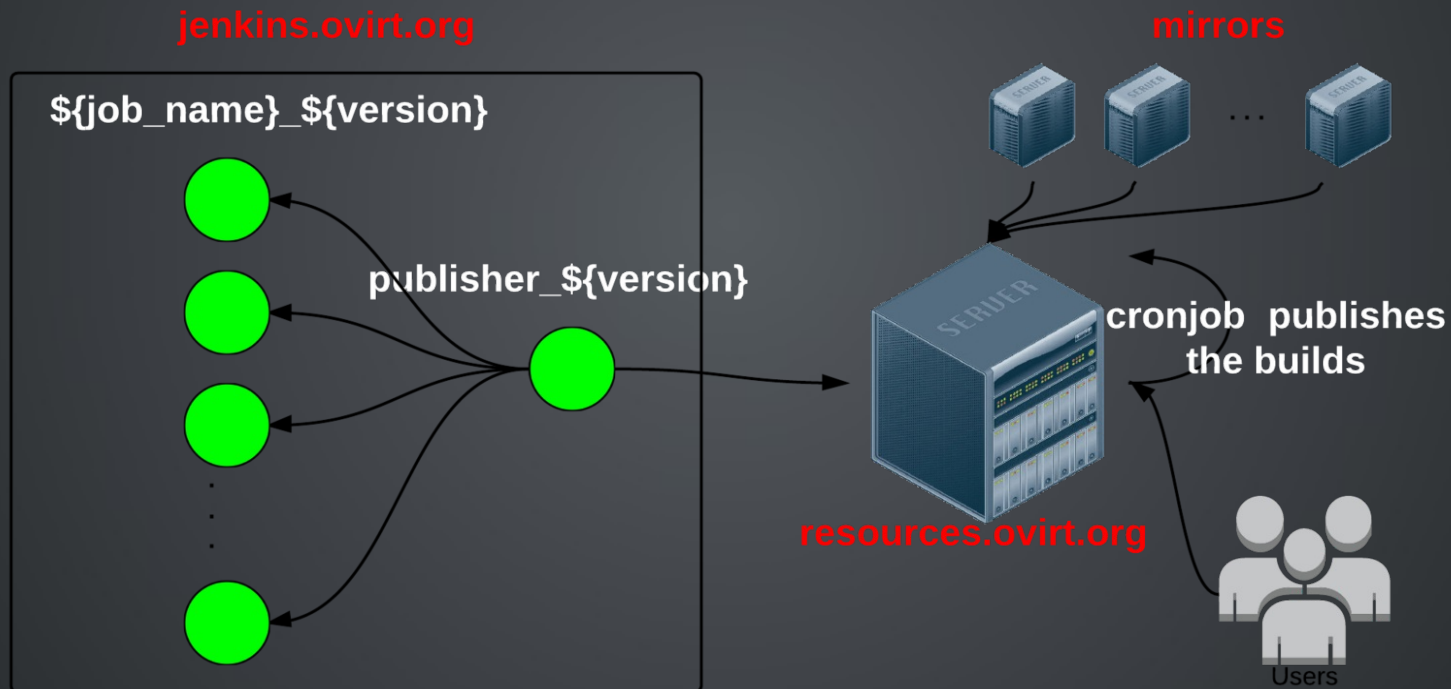


COMMIT LIFE CYCLE



OVIRT CONTINUOUS DELIVERY

- One publisher per version
- Use a generic script to publish the builds



PUBLISHER JOB



Copy artifacts from another project

Project name

ovirt-optimizer_master_create-rpms_merged

Which build

Latest successful build



Stable build only

Artifacts to copy

exported-artifacts/*

Target directory

artifacts

Parameter filters



Flatten directories



Optional



Fingerprint Artifacts

PUBLISHER JOB

Transfer Set

Source files ?

Remove prefix ?

Remote directory ?

Exec command ?

 **Either Source files, Exec command or both must be supplied**

All of the transfer fields (except for Exec timeout) support substitution of [Jenkins environment variables](#)

Advanced...

GERRIT

What is Gerrit?

The screenshot displays the Gerrit web interface for a code review. The top navigation bar includes links for 'All', 'My', 'Projects', 'People', 'Plugins', and 'Documentation'. Below this, there are tabs for 'Changes', 'Drafts', 'Draft Comments', 'Watched Changes', and 'Starred Changes'. The main header shows 'Change 29535 by David Caro' with a 'Review in Progress' status and buttons for 'Reply...', 'Verified+1', and 'Edit Message'. A search bar for 'Change #, SHA-1, trid or owner:email' is also present.

On the left sidebar, the 'Reviewers' section lists 'Nir Soffer' and 'Saggi Mizrahi'. The 'CC' section lists 'Yaniv Bronhaim'. The 'Project' is 'ptreading' and the 'Branch' is 'master'. The 'Strategy' is 'Fast Forward Only'. There are buttons for 'Cherry Pick' and 'Abandon'. The 'Updated' time is '2 days ago' and the 'Change-Id' is 'Ie6c3d2e7caedc4e2f90bfcd39274898bfea7986'. The 'Topic' is 'ptreading'. The 'Code-Review -1' section shows 'Nir Soffer' as the reviewer. The 'Files' section lists 'Commit Message', '.gitignore', 'ptreading.py', and 'tox.ini'. The 'History' section shows a list of actions: 'David Caro Uploaded patch set 1.', 'David Caro Patch Set 1: This really helps when running checks on python pr', 'Nir Soffer Patch Set 1: Code-Review-1 (2 comments) Please separate pepi', 'David Caro Patch Set 2: Commit message was updated', 'David Caro Patch Set 1: (2 comments)', 'Nir Soffer Patch Set 2: (1 comment)', and 'Nir Soffer Patch Set 1: (1 comment)'.

The main content area shows the 'Patch Set Base 1 2' for the file 'backend/manager/modules/common/src/main/java/org/ovirt/engine/core/common/eventqueue/EventResult.java'. The patch set is 'Base 1 2'. The code diff shows the following changes:

```
1 package org.ovirt.engine.core.common.eventqueue;
2
3 public class EventResult {
4     private boolean success;
5     private EventType eventType;
6     private Object resultData;
7
8     public EventResult(boolean success, EventType event
9         this.success = success;
10        this.eventType = eventType;
11    }
12
13    public EventType getEventType() {
14        return eventType;
15    }
16
17    ... skipped 2 common lines ...
18
19    public boolean isSuccess() {
20        return success;
21    }
22
23    public void setSuccess(boolean success) {
24        this.success = success;
25    }
26
27    public Object getResultData() {
28        return resultData;
29    }
30
31    public void setResultData(Object resultData) {
32        this.resultData = resultData;
33    }
34
35 }
```

GERRIT: GITWEB

Code hosting (git frontend)

Code Review / [ovirt-appliance.git](#) / **summary**

[summary](#) | [shortlog](#) | [log](#) | [commit](#) | [commitdiff](#) | [review](#) | [tree](#)

commit search: re

description This project holds the ovirt virtual appliance image

owner

last change Mon, 7 Jul 2014 09:27:13 +0000

URL <http://gerrit.ovirt.org/p/ovirt-appliance.git>
<git://gerrit.ovirt.org/ovirt-appliance.git>
<ssh://dcaro@gerrit.ovirt.org:29418/ovirt-appliance.git>

shortlog

25 hours ago	Fabian Deutsch	Add imgfac submodule to meet ova dependencies 32/29632/1 master	commit commitdiff tree
4 days ago	Fabian Deutsch	engine: Fix repos and dependencies 81/29581/1	commit commitdiff tree
5 days ago	Fabian Deutsch	engine: Allow custom tempdir 24/29524/1	commit commitdiff tree
5 days ago	Fabian Deutsch	engine: Do build in pwd 09/29509/1	commit commitdiff tree
5 days ago	Fabian Deutsch	engine: Note to install virt-install 08/29508/1	commit commitdiff tree
6 days ago	Fabian Deutsch	engine: Note to use permissive mode 91/29491/1	commit commitdiff tree
11 days ago	Moti Asayag	neutron: Disable rdo-release repository 31/29131/2	commit commitdiff tree
11 days ago	Fabian Deutsch	engine: Compensate upstream cloud image changes 43/29343/1	commit commitdiff tree
12 days ago	Fabian Deutsch	engine: Require less ram to build 39/29239/1	commit commitdiff tree
2014-06-23	Fabian Deutsch	Fix url installation method 46/29046/1	commit commitdiff tree
2014-06-19	Moti Asayag	neutron: appliance for IceHouse 22/28922/2	commit commitdiff tree
2014-06-16	Fabian Deutsch	engine: Follow redirects 04/28804/1	commit commitdiff tree
2014-06-16	Fabian Deutsch	doc: Correct comand 99/28799/1	commit commitdiff tree
2014-06-16	Fabian Deutsch	Fix submodule usage 98/28798/1	commit commitdiff tree
2014-06-16	Fabian Deutsch	ks: Add ovirt-guest-agent 97/28797/1	commit commitdiff tree
2014-06-16	Fabian Deutsch	Restructure filesystem layout 86/28786/1	commit commitdiff tree

[...](#)

heads

Code Review / [ovirt-engine.git](#) / **tree**

[summary](#) | [shortlog](#) | [log](#) | [commit](#) | [commitdiff](#) | [review](#) | [tree](#) | [snapshot](#)

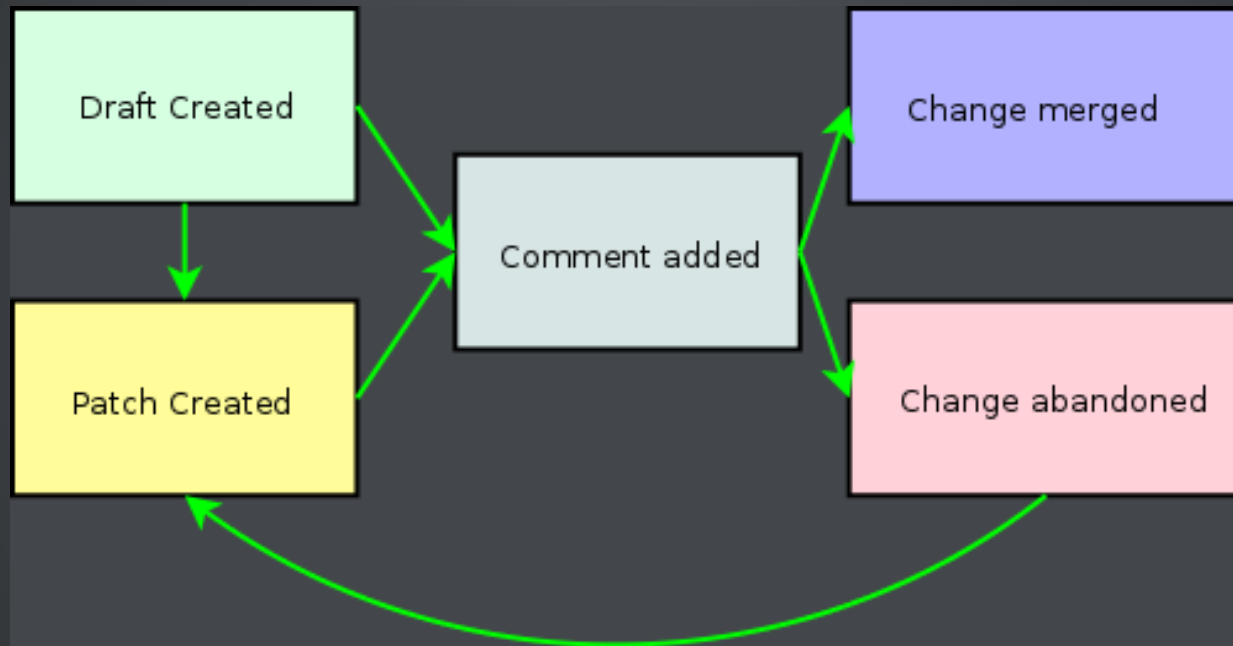
aaa: fix flatGroups recursive

-rw-r--r--	2029	.gitignore	blob history raw
-rw-r--r--	11358	LICENSE	blob history raw
-rw-r--r--	21377	Makefile	blob history raw
-rw-r--r--	9174	README.branding	blob history raw
-rw-r--r--	6955	README.developer	blob history raw
-rw-r--r--	1689	README.manual	blob history raw
drwxr-xr-x	-	backend	tree history
drwxr-xr-x	-	build-tools-root	tree history
drwxr-xr-x	-	build	tree history
drwxr-xr-x	-	config	tree history
drwxr-xr-x	-	ear	tree history
-rw-r--r--	1215	exclude-filters-general.xml	blob history raw
drwxr-xr-x	-	frontend	tree history
drwxr-xr-x	-	mavenmake	tree history
-rw-r--r--	35098	ovirt-engine.spec.in	blob history raw
drwxr-xr-x	-	packaging	tree history
-rw-r--r--	27438	pom.xml	blob history raw
-rw-r--r--	661	version.mak	blob history raw

GERRIT HOOK

What is a hook?

For each workflow step (event) a script gets executed



GERRIT HOOKS

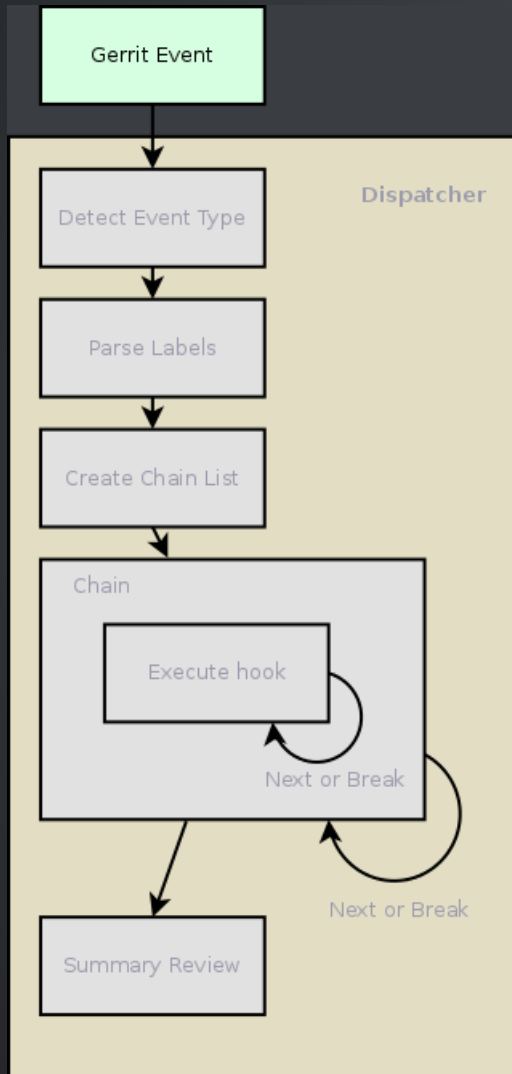
Default gerrit hooks flaws:

- 1 event <-> 1 hook
- Same hook for all projects
- Fire and forget, no interaction

Solution:

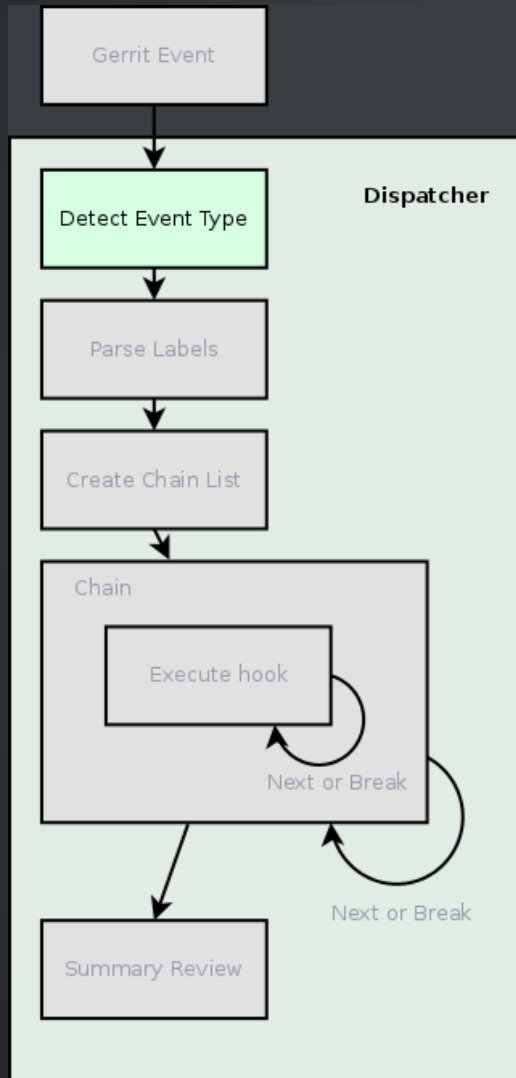
Build a dispatcher!

GERRIT HOOKS: TRIGGER



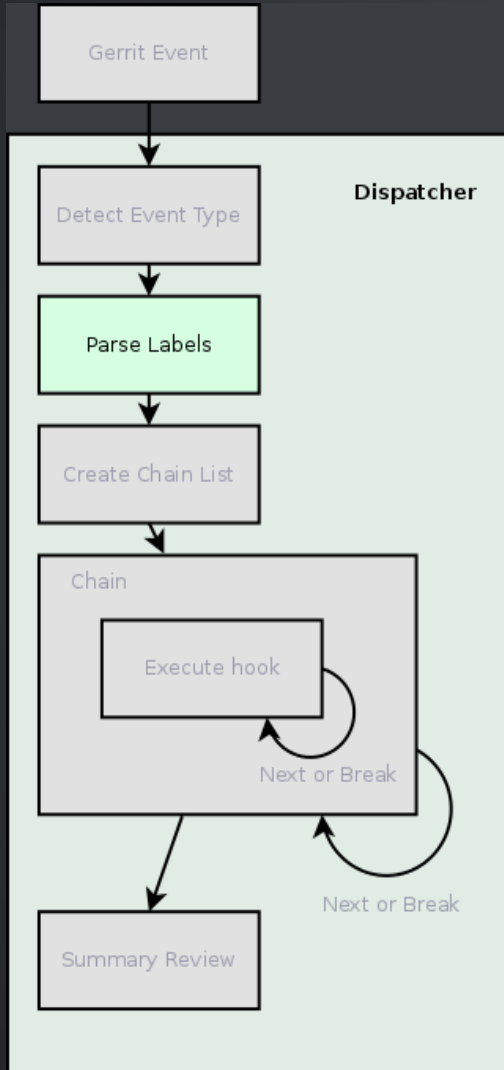
- Patch Created
- Comment Added
- Change Merged
- Change Abandoned
- Reference updated
- (more on newer versions)

GERRIT HOOKS: EVENT TYPE



- By parameters passed
- We will be able to detect custom events:
 - Maintainer approved
 - Tests passed
 - Maintainer blocked
 - ...

GERRIT HOOKS: LABELS



What?

Label: label content

Where?

Commit message

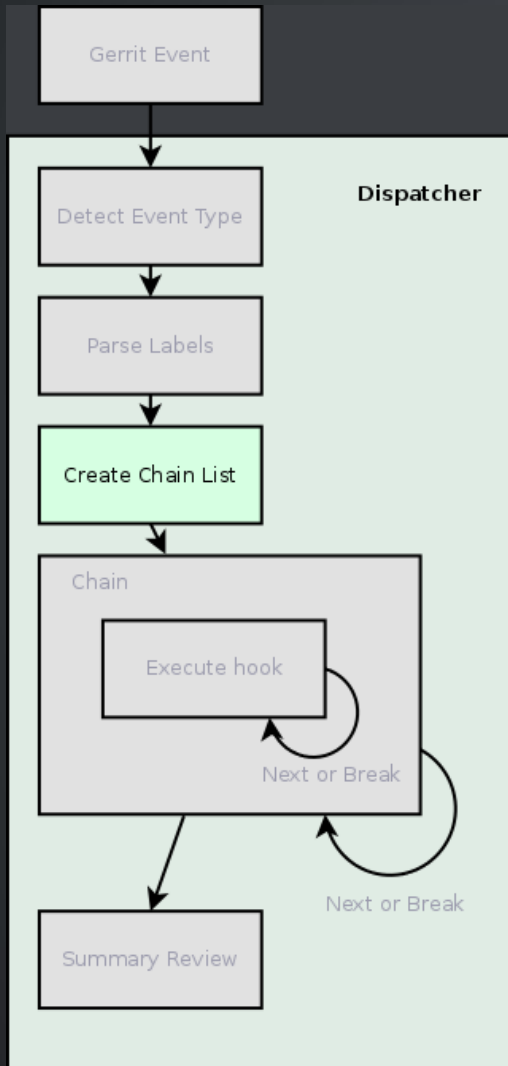
Comment

Example:

```
Bug-Url: http://mytracker/bugid
```

```
Rerun-Hooks: all
```

GERRIT HOOKS: CHAINS

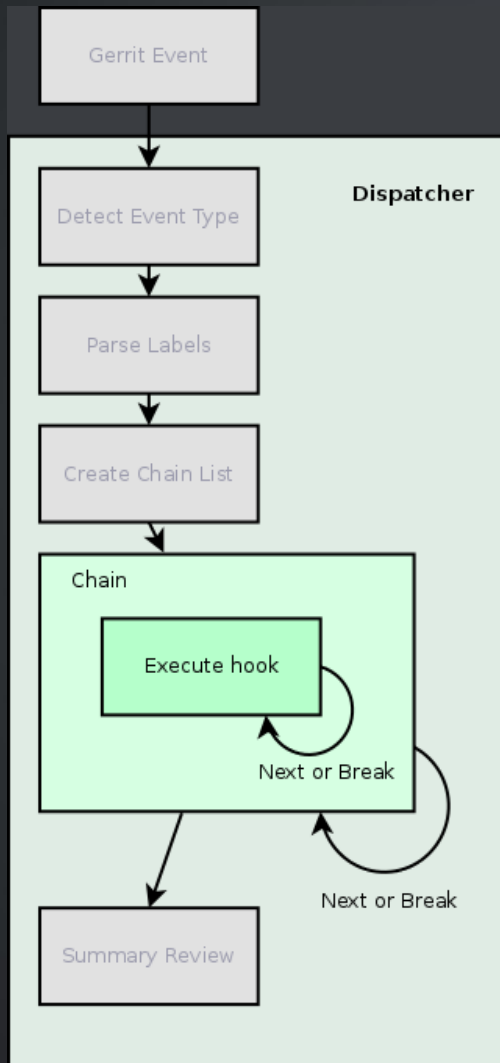


- Using event name
- Chain as second term if wanted
- Hierarchical config files
 - Main one at `$gerrit_dir`
 - Per project
 - Per event

Hook name template:

```
${event}.${chain}.${hook_name}  
${event}.${hook_name}  
${event}
```

GERRIT HOOKS: EXECUTION



Each hook can:

- Break it's hook chain
- Break whole execution

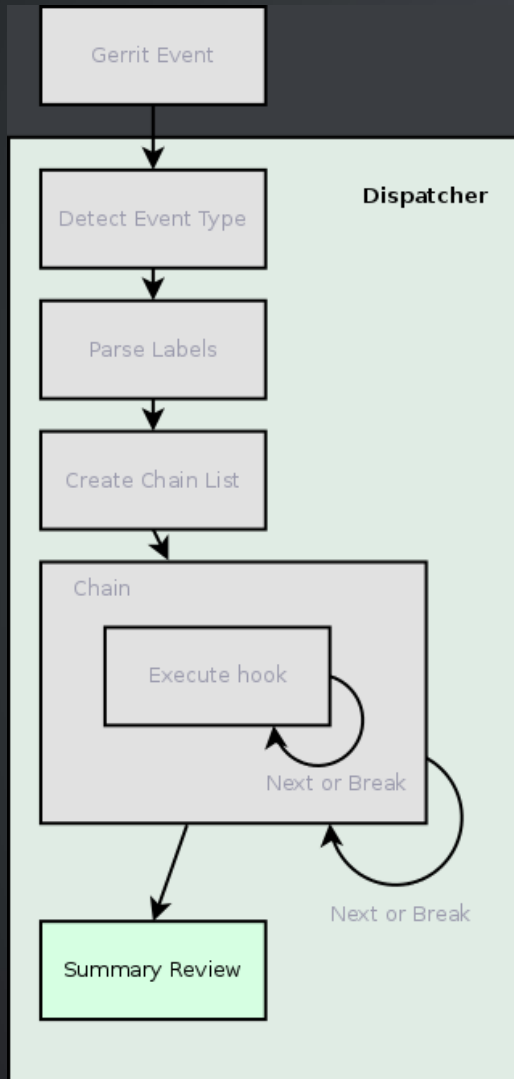
Common stdout format
(each section is optional):

```
V:VERIFIED SCORE\nR:REVIEW SCORE\nCOMMENT
```

Everything to logfile (configurable):

```
INFO::STARTING::change-merged
DEBUG::get_hooks::change-merged on vdsms.git/hooks
INFO:::AVAILABLE HOOKS::[
    'change-merged.set_MODIFIED',
    'change-merged.update_tracker']
```

GERRIT HOOKS: REVIEW



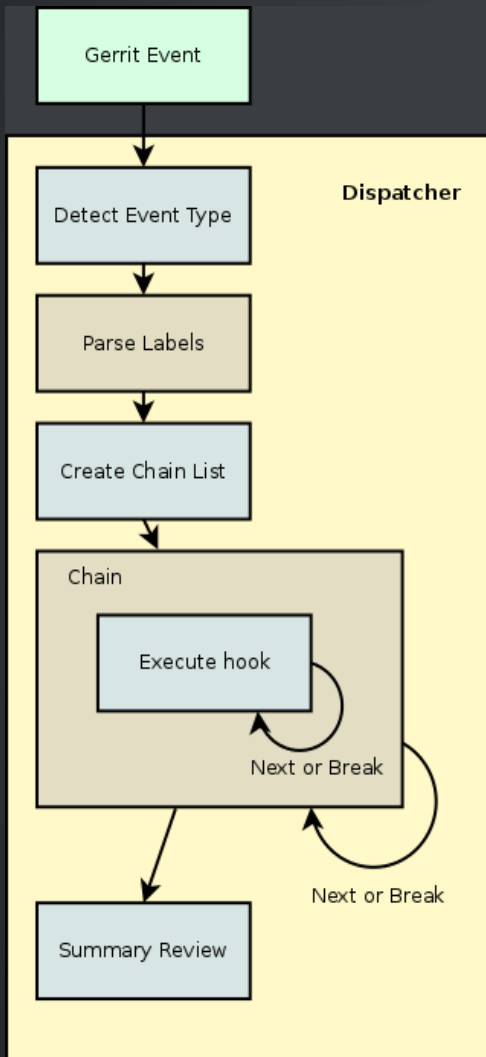
Sum of all the reviews:

- negative ones prevail over positives
- no vote means no change
- 0 means reset negative value

Execution summary of all the hooks:

```
Oved Ourfali Patch Set 2: Patch Set 1 was rebased
Oved Ourfali Change has been successfully merged into the git repository.
gerrit-hooks
Patch Set 2:
• Update tracker::#1113075::OK
• Check Bug-Url::OK
• Check Public Bug::#1113075::OK, public bug
• Check Product::#1113075::OK, Correct product Red Hat Enterprise Virtualization Manager
• Check TR::#1113075::OK, correct target release 3.4.1
• Check merged to previous::OK, change not open on any previous branch
gerrit-hooks Patch Set 2: * Update tracker::#1113075::OK * Set MODIFIED::bug 1113075:::#11
oVirt Jenkins CI S...Patch Set 2: Build Failed http://jenkins.ovirt.org/job/ovirt_engine_3.4_unit_tests_ger
```

GERRIT HOOKS: SOURCE CODE



- Git:
 - `git clone git://gerrit.ovirt.org/gerrit-admin`
- Web:
 - `http://gerrit.ovirt.org/gitweb?p=gerrit-admin.git`

Patches are always welcome!

GERRIT HOOKS: LIBS

Some simple generic libs available for the hooks:

- Bugzilla
- Gerrit
- Configuration
- Tools

Bash lib usage example:

```
source bz.sh
source gerrit.sh
gerrit.parse_params "$@" # Sets the parameters into global vars
# get the bug ids in the commit message of the commit passed as
# parameter (--commit SHA)
bug_ids=$(bz.get_bug_id "$commit")
```

Python lib usage example:

```
from gerrit import Gerrit
from config import load_config
config = load_config() ## Loads the config hierarchically into a dict
gerrit = Gerrit(config.get('GERRIT_SRV')) ## Connect to the gerrit instance
```

GERRIT HOOKS: BUGZILLA

Update external tracker in bugzilla

Portal				of L...	1
oVirt gerrit	28859	master	MERGED	core: Report unreachable domain names when setting host as non operational	N
Red Hat Customer	01062402	4 (Low)	Waiting on	[RFE] BLUE / should report which	2

Modify bug status when first patch sent

automation@ovirt.org 2014-06-25 07:56:28 EDT
External Bug ID: oVirt gerrit 29195
automation@ovirt.org 2014-06-25 07:56:44 EDT
Status: NEW → POST

Modify bug status when all patches merged

automation@ovirt.org 2014-07-11 23:01:29 EDT
Status: POST → MODIFIED

JENKINS JOB BUILDER

Problems with manual configuration

- Hard to maintain
- Hard to track
- Hard to review
- Hard to change common settings

Some tasks soon become quite painful:

Disable all the jobs for a

Test a job configuration before

deploying

New branch for project M, duplicate all it's

jobs A, B and

C

...

JENKINS JOB BUILDER



Jenkins job Builder to the rescue!

JENKINS JOB BUILDER

Some plugins that helped along the way:

- Configuration deduplication:
Configuration slice
- Multijobs config changes:
Matrix configurations
- Configuration change management:
Job Config history
- Manage jobs statuses:
Scriptler

JENKINS JOB BUILDER

- Developed by OpenStack folks (Kudos!!)
- Configuration as code (yaml format)
- Easy to review changes (on Gerrit!)
- Code/config de-duplication
- Include external shell/groovy/... scripts
- Test before deploying
- Easier to organize (per directory, per file)
- Serves as backup (easily replicate on another jenkins)

JENKINS JOB BUILDER

```
- job-template:
  name: '{name}-whatever-{dist}'
  node: 'slave-{dist}'
  triggers:
    - timed: '@midnight'
  builders:
    - shell: make whatever
  publishers:
    - archive:
        artifacts: '*.log'
```

```
- job-group:
  name: projectA
  dist:
    - fc19
    - fc20
  jobs:
    - '{name}-whatever-{dist}'
```

- This will create the jobs:
 - projectA-whatever-fc19
 - projectA-whatever-fc20

Running at midnight

On slave-fc19 and slave-fc20

Executing 'make whatever'

Archiving the logs

JENKINS JOB BUILDER

```
- job-group:  
  name: projectA  
  dist:  
    - fc19  
    - fc20  
    - e16  
  jobs:  
    - '{name}-whatever-{dist}'
```

Oh! But I want to add a new
distro, el6

And a cleanup after

```
- job-template:  
  name: '{name}-whatever-{dist}'  
  node: 'slave-{dist}'  
  triggers:  
    - timed: '@midnight'  
  builders:  
    - shell: make whatever  
    - shell: make clean  
  publishers:  
    - archive:  
      artifacts: '*.log'
```


JENKINS JOB BUILDER

Official Openstack links:

Docs: [*Latest build docs*](#)

Code: [*Https git repo*](#)

oVirt links

[*Git yaml code tree*](#)

[*Deploy job*](#)

[*Check job*](#)

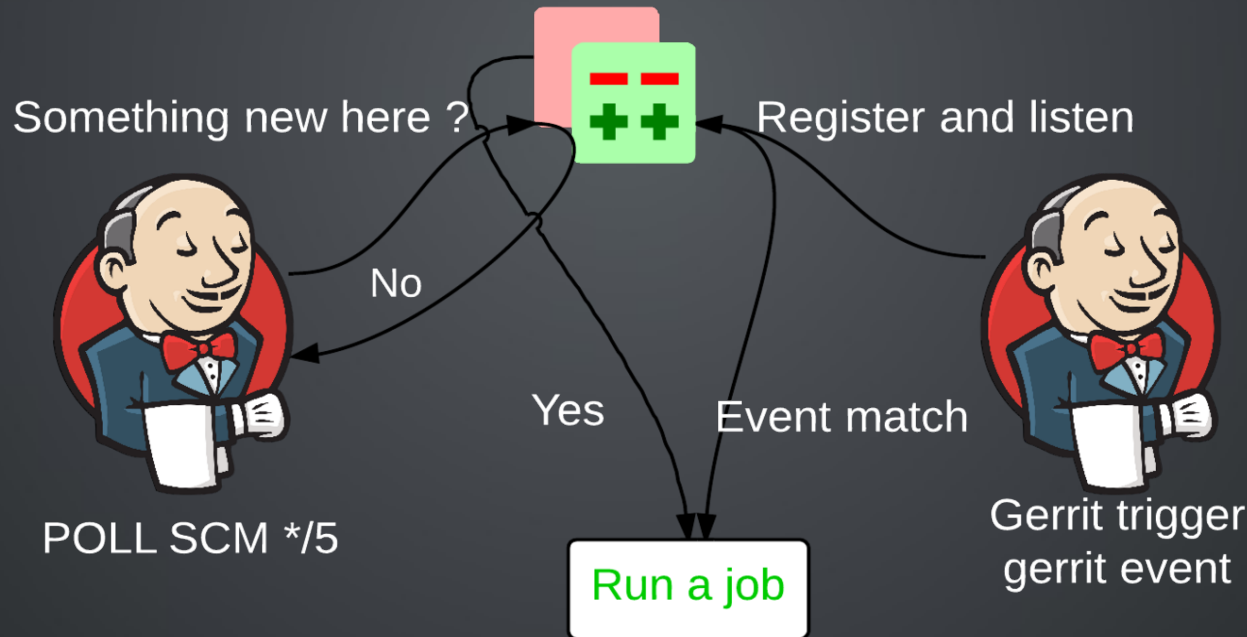
OVIRT JENKINS JOB TYPES

- Triggered only on patch sets
- Triggered only on merges
- Matrix jobs
- COPR jobs



POLL SCM VS GERRIT TRIGGER

- We use gerrit trigger plugin instead of poll SCM
- Allows to test patches before merge
- Reduces the load on the gerrit server



MATRIX JOBS

- Allows to configure the jobs to run on different configurations

Configuration Matrix

Slaves

Name

label

Node/Label

- | | |
|-------------------------------------|----------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | fedora19-host (group of jenkins-slave-host07.ovirt.org,jenkins-slave-host01.ovirt.org) |
| <input type="checkbox"/> | fedora19_functional_tests (jenkins-slave-vm01.ovirt.org) |
| <input type="checkbox"/> | fedora20 (group of dcara-ovirt-vm07-f20,dcara-ovirt-vm01-fc20,dcara-ovirt-vm02-fc20) |
| <input checked="" type="checkbox"/> | fedora20-host (group of jenkins-slave-host03.ovirt.org,jenkins-slave-host02.ovirt.org) |
| <input type="checkbox"/> | kimchi (kimchi ppc64 slave - 143.106.167.144 (contact aline or ramon for info)) |

MATRIX RELOADED

- Allows to rerun the job on a specific configuration

Configurations

 [centos6-host](#) ☐  [fedora19-host](#) ☐  [fedora20-host](#) ☐

Select: [Successful](#) - [Unstable](#) - [Failed](#) - [All](#) - [None](#)

[Matrix Reload](#) downstream builds: ☐

Rebuild Matrix

COPR

- Created by Fedora folks
- Is an easy to use automatic build system providing a package repository as its output
- Reduces the load on jenkins slaves
- CLI + Jenkins plugin

```
yum -y install copr-cli  
copr-cli build vdsm http://jenkins.ovirt.org/view
```

COPR JENKINS PLUGIN

Post-build Actions

Build RPM in Copr

API URL

Username

Coprname

API login

API token

SRPM URL

☒ Prepare SRPM manually

Prepare SRPM

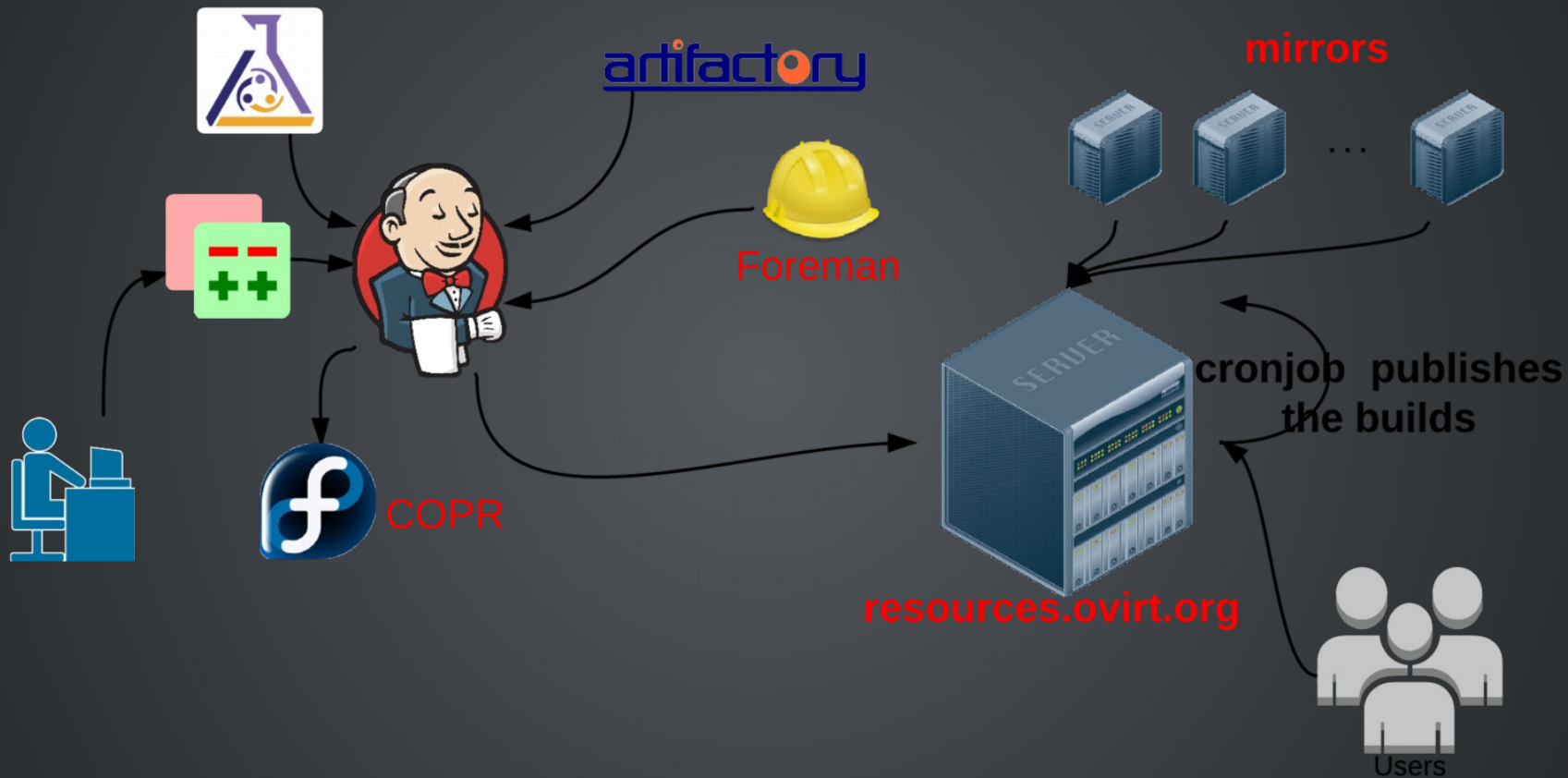
```
sed -i 's/^make check/#make check/g' vdsm.spec.in
./autogen.sh --system --enable-hooks
make dist

SUFFIX="${BUILD_NUMBER}"
rpmbuild -D "_topdir $(pwd)/rpmbuild" -D "with_hooks 1" -D "release_suffix ${SUFFIX}" -ts *.gz

find rpmbuild -name '*src.rpm' -exec cp {} vdsm-${BUILD_ID}.src.rpm \;
```

☒ Wait for Copr to finish the build

RELEASE PROCESS



CURRENT PROBLEMS/FUTURE SOLUTIONS

Scarce resources

- Moving to a new infrastructure
- OS1 (openstack) slaves

Jobs management and control

- Move all jobs to yaml
- Get developers to help write/maintain jobs

Leverage manual procedures

- Automate the official release + signing packages
- Automate gerrit config/project creation

CURRENT PROBLEMS/FUTURE SOLUTIONS

Isolate test environments

- Docker/mock on all simple builds
- One slave per job on complex builds
 - Provisioning of slaves on demand

Leverage package builds

- Build on Copr (has jenkins plugin!)

QUESTIONS ?



USEFUL LINKS

[oVirt](#)

[oVirt gerrit](#)

[oVirt Jenkins](#)

[Copr](#)

[Jenkins Job Builder Code](#)

[Jenkins Job Builder Docs](#)

[YAML code tree](#)

CONTACT US

Kiril Nesenko: nesenko@gmail.com
Eyal Edri: eedri@redhat.com

The logo for oVirt, featuring the word "oVirt" in a dark, serif font. The dot above the "i" is a small, bright green circle. The logo is centered and has a subtle reflection effect below it.

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