Manage oVirt Infrastructure with Jenkins

Kiril Nesenko, Infrastructure Maintainer at oVirt
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 ?

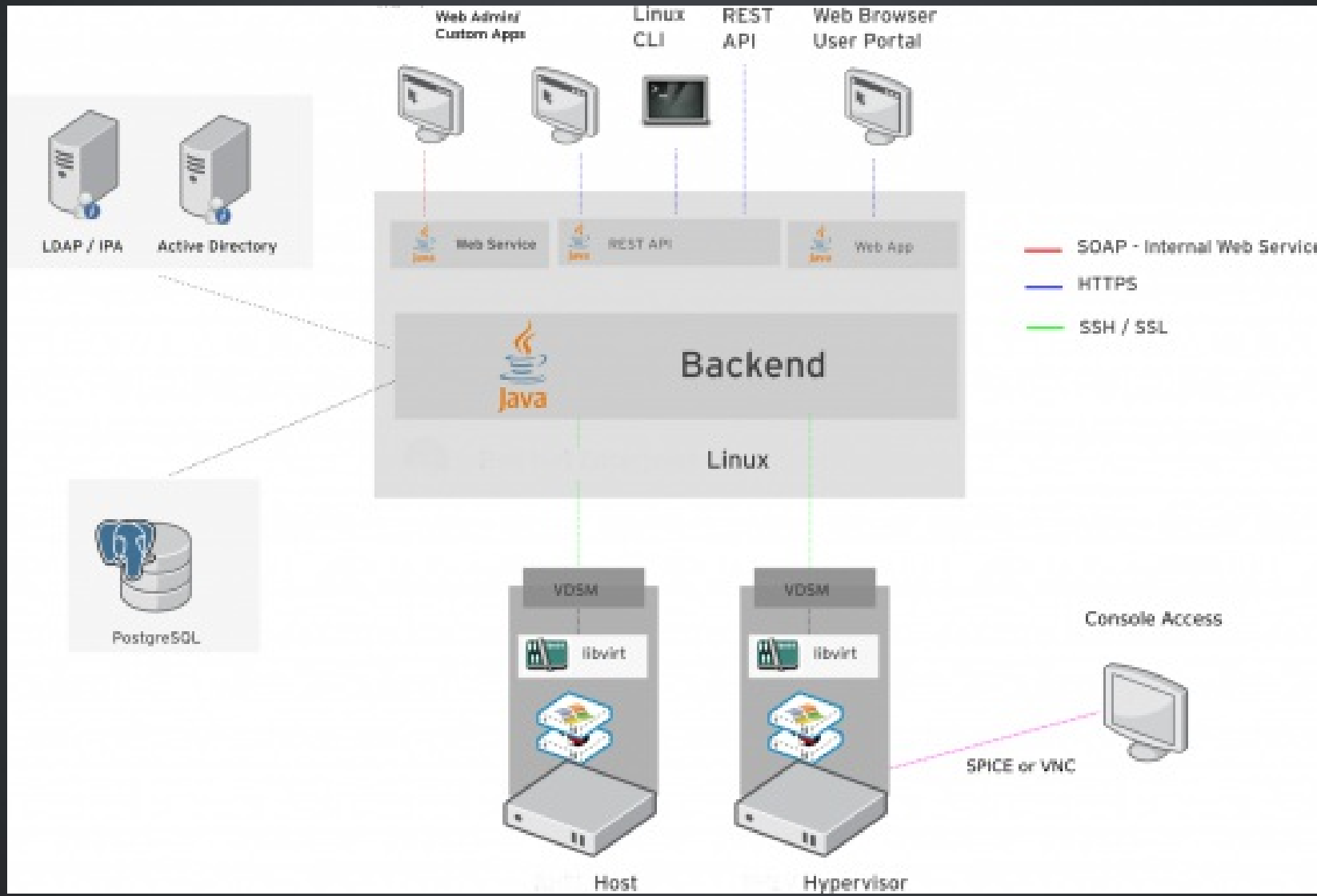
Kiril Nesenko - Infrastructure Maintainer and release engineer. Responsible for release engineering activities for oVirt project.

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

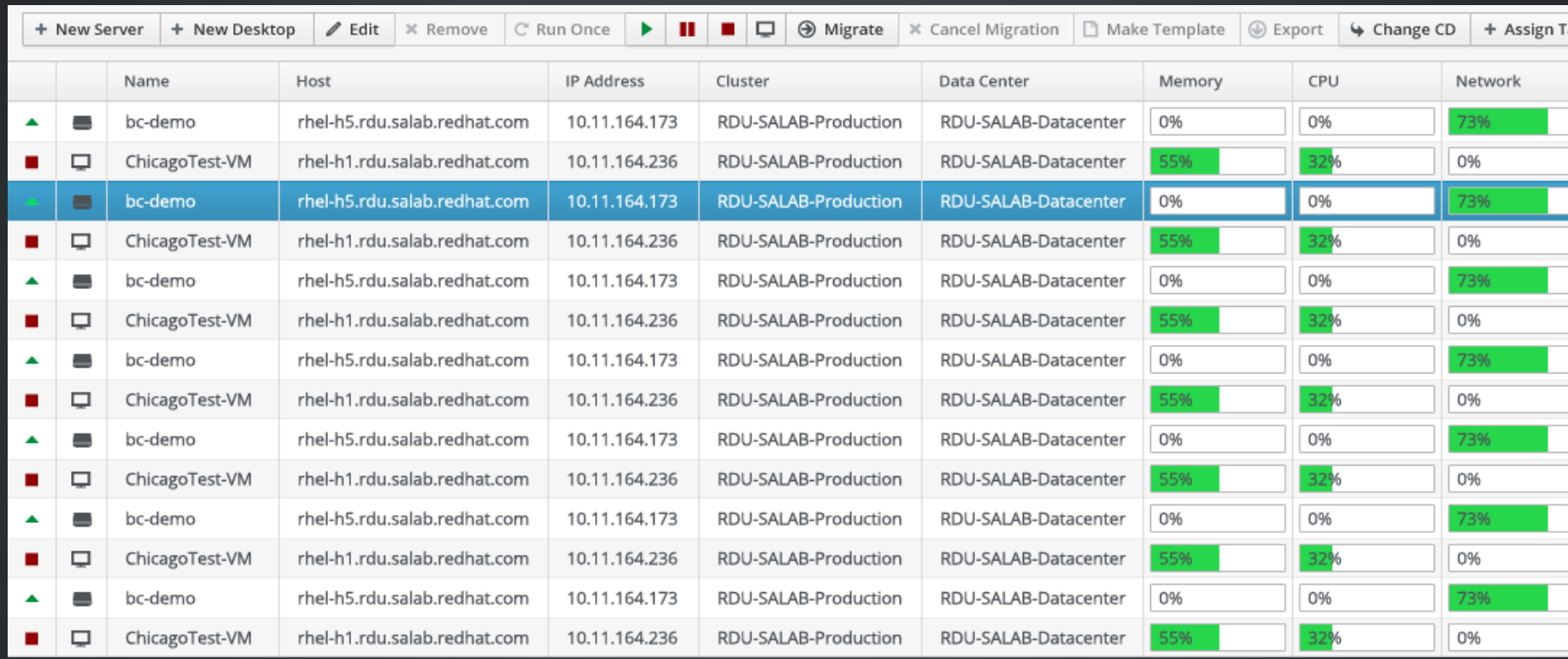
WHAT IS OVIRT

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

OVIRT ARCHITECTURE



OVIRT UI



		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%
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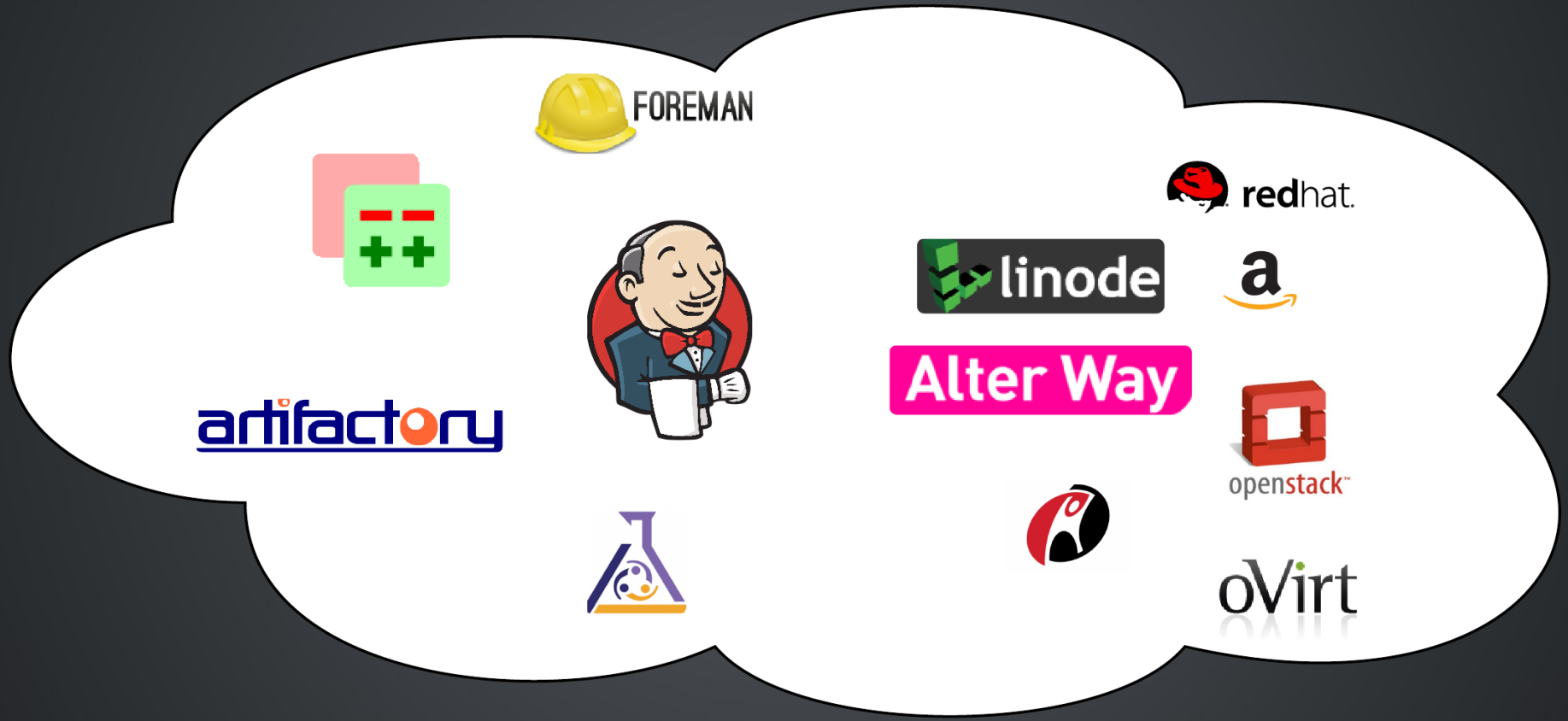
OVIRT INFRASTRUCTURE VIEW



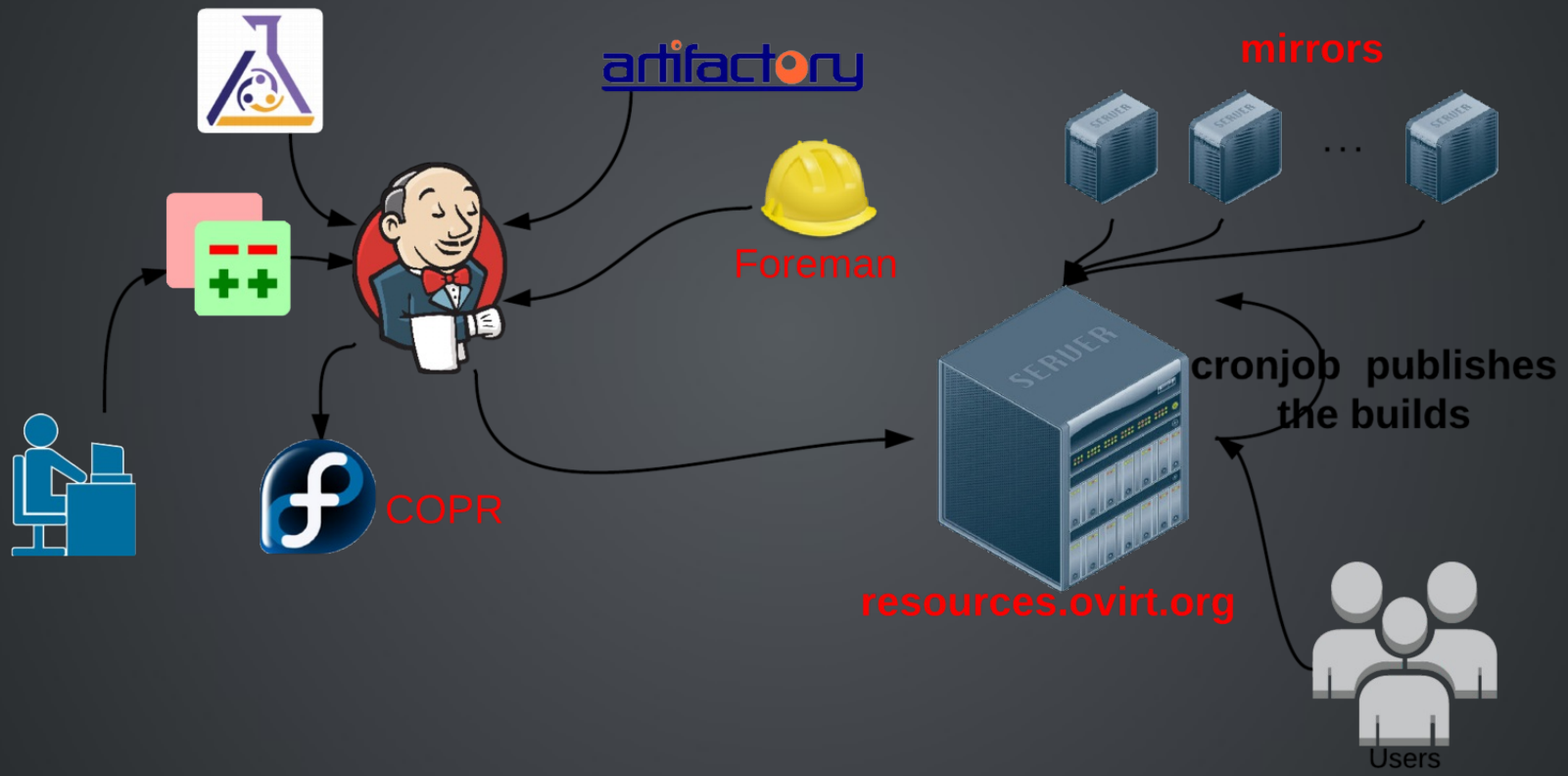
SERVICES

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

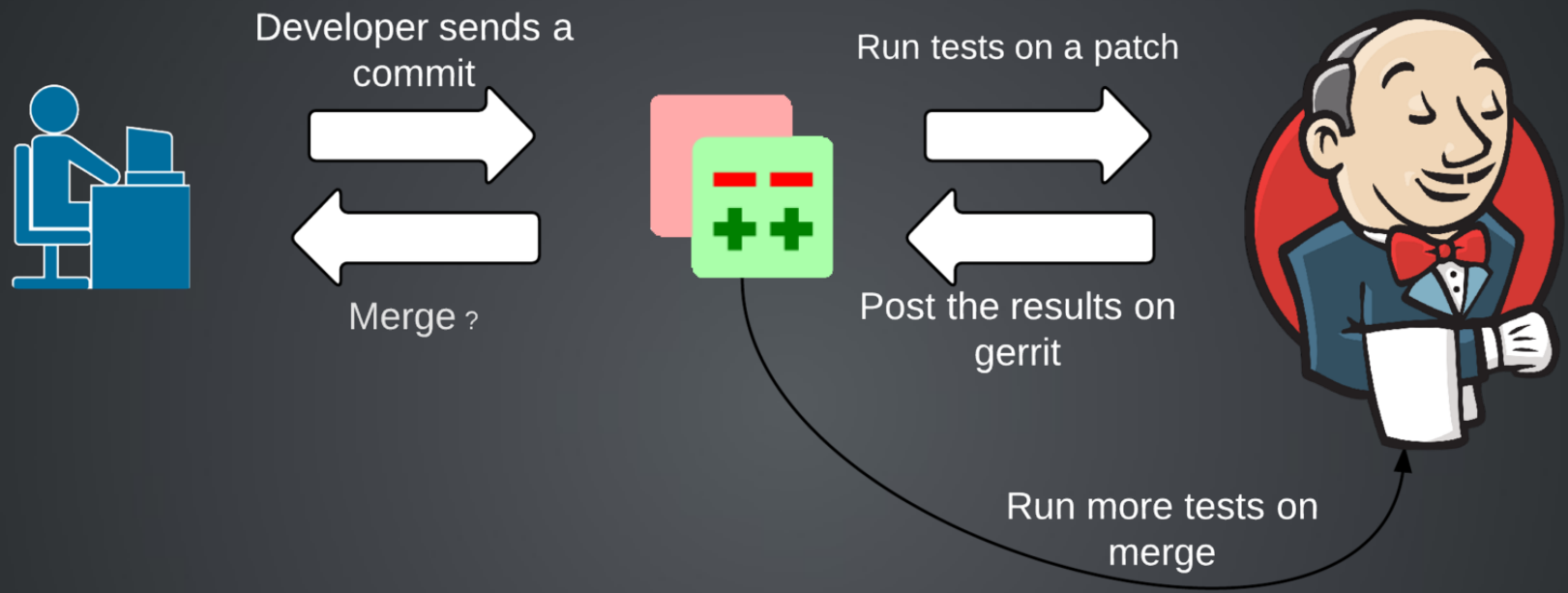
artifactory

oVirt

RELEASE PROCESS

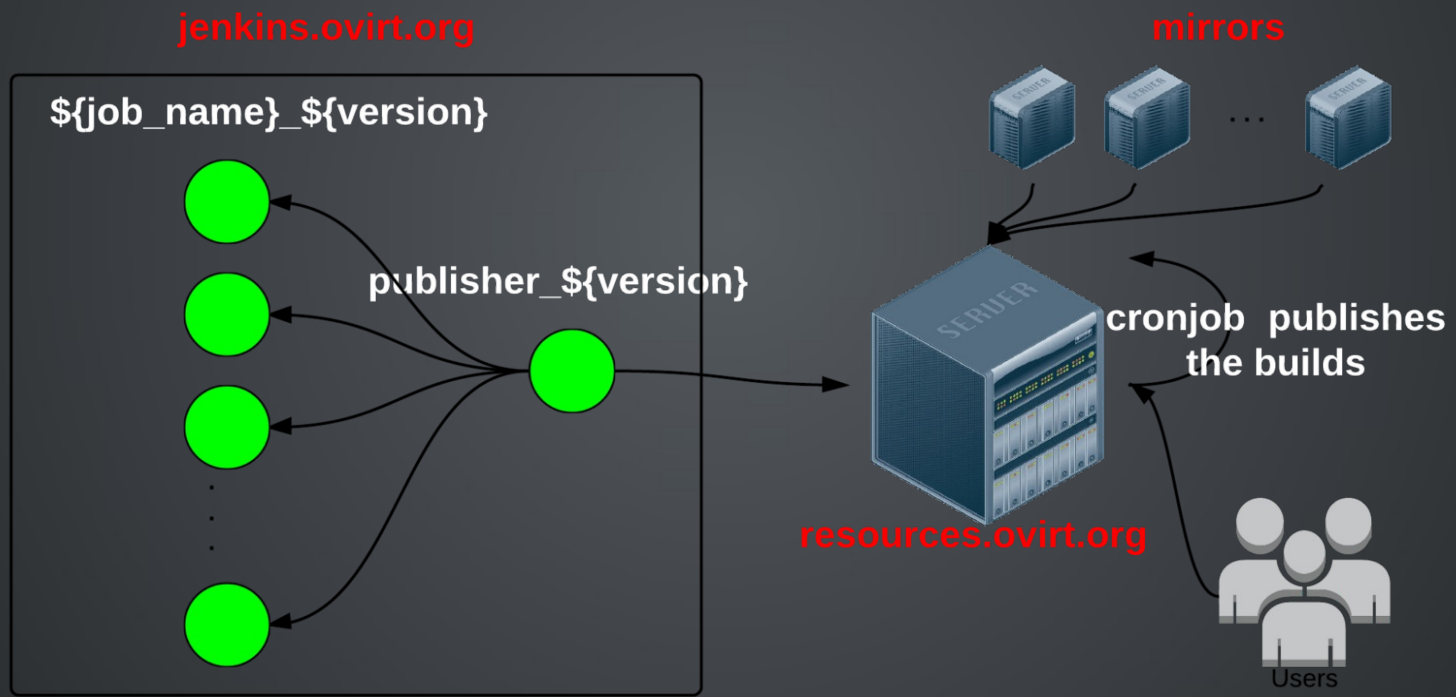


COMMIT LIFE CYCLE

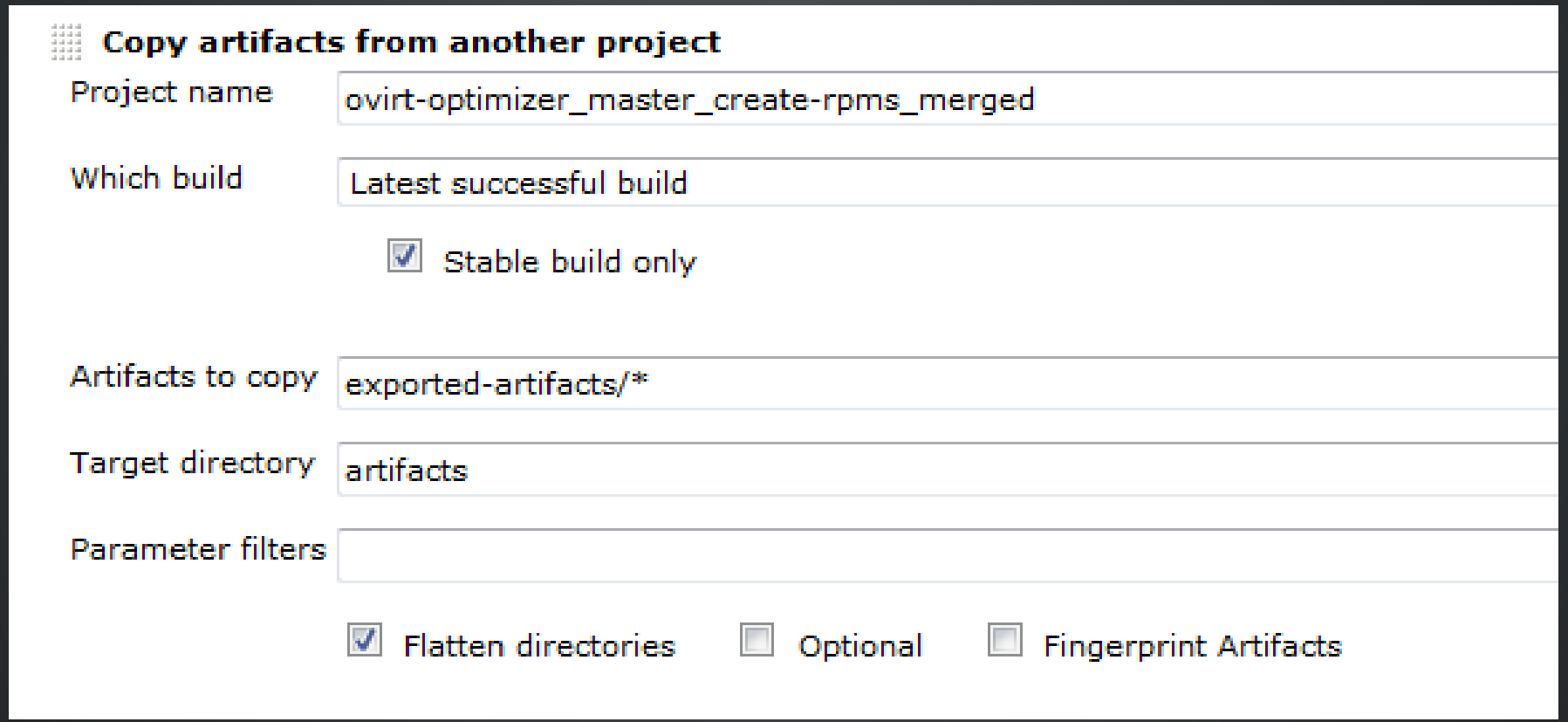


OVIRT CONTINUOUS DELIVERY

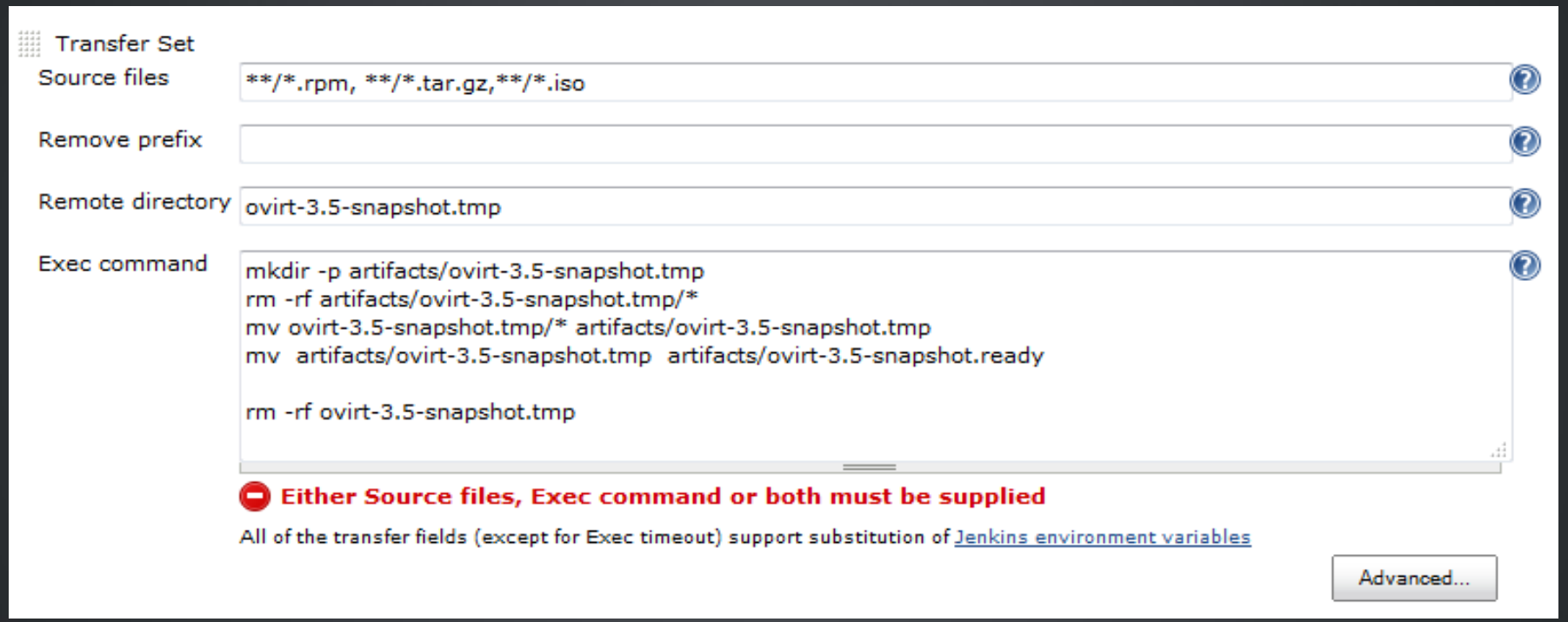
- One publisher per version
- Use a generic script to publish the builds



PUBLISHER JOB

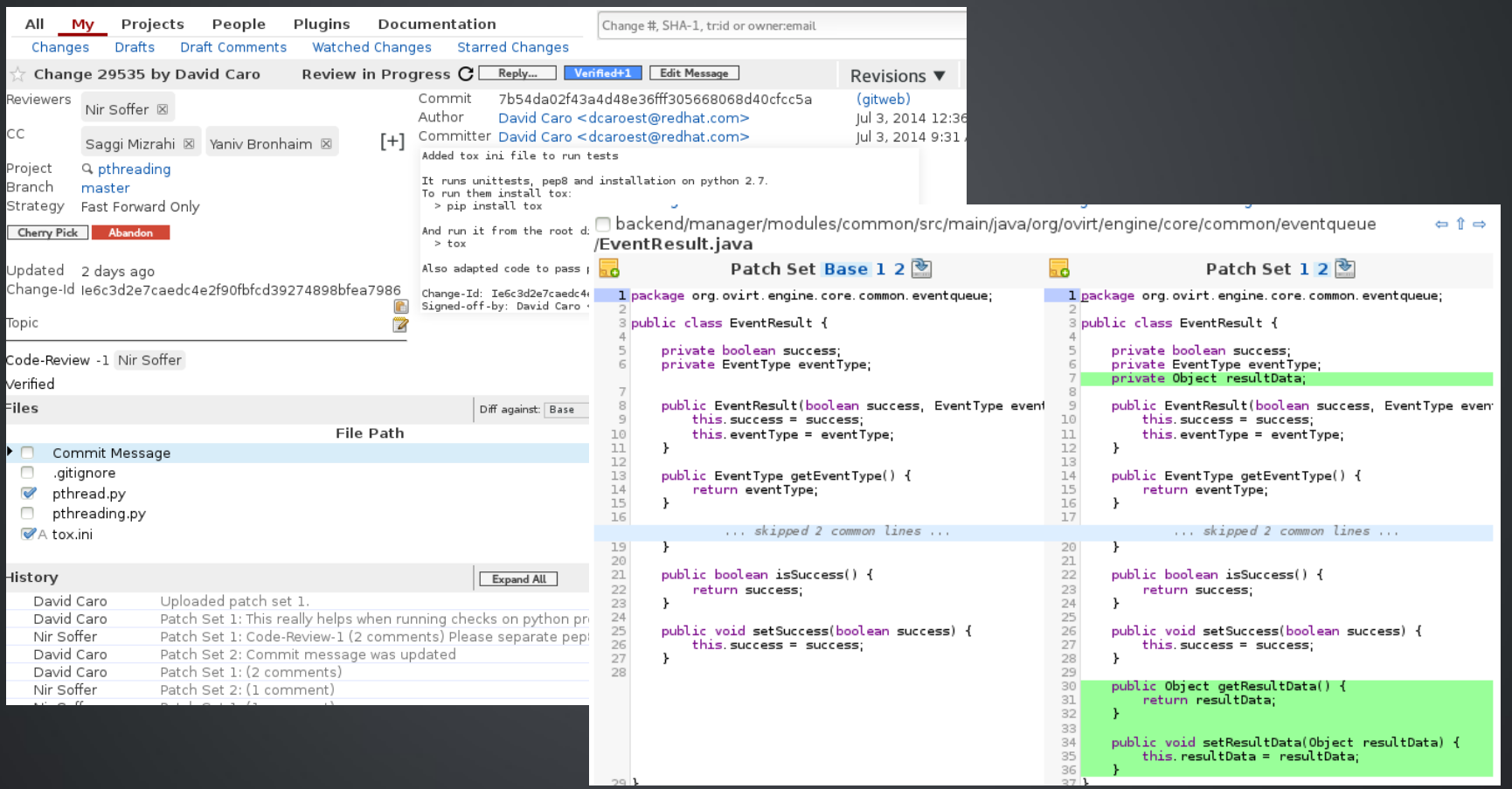


PUBLISHER JOB



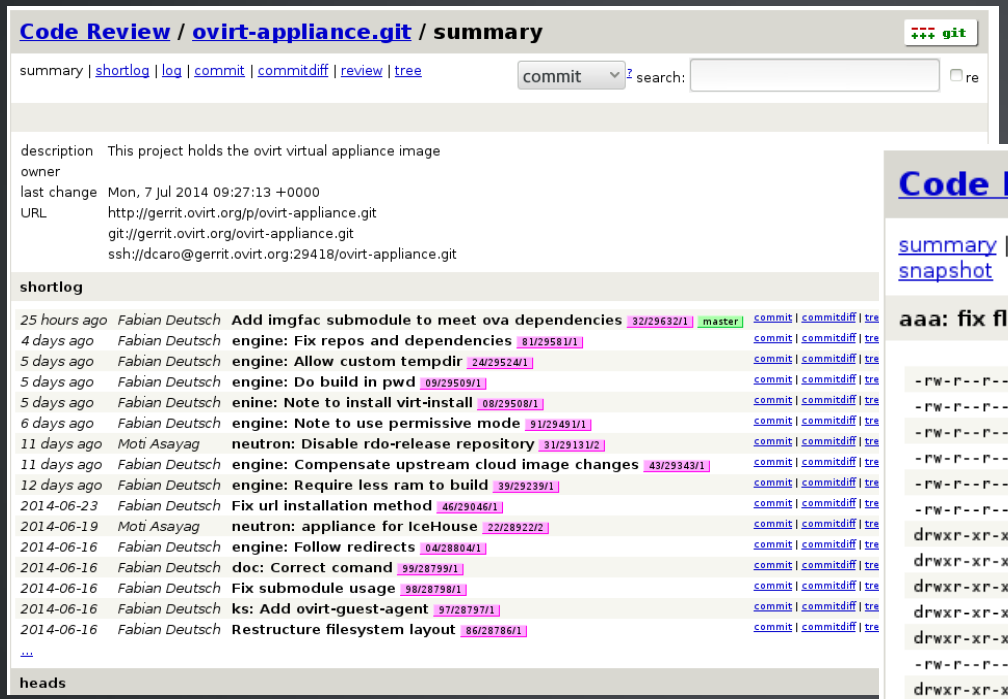
GERRIT

What is Gerrit?



GERRIT: GITWEB

Code hosting (git frontend)



Code Review / ovirt-appliance.git / summary

git

summary | shortlog | log | commit | commitdiff | review | tree

commit search: re

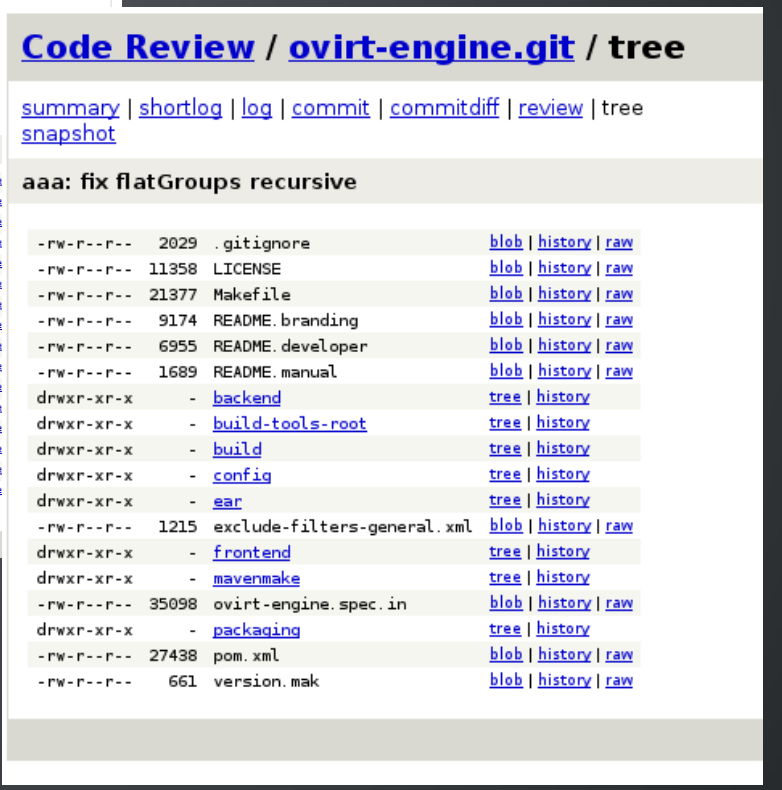
description	This project holds the ovirt virtual appliance image
owner	
last change	Mon, 7 Jul 2014 09:27:13 +0000
URL	http://gerrit.ovirt.org/p/ovirt-appliance.git git://gerrit.ovirt.org/ovirt-appliance.git ssh://dcaro@gerrit.ovirt.org:29418/ovirt-appliance.git

shortlog

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

...

heads



Code Review / ovirt-engine.git / tree

summary | shortlog | log | commit | commitdiff | review | tree
snapshot

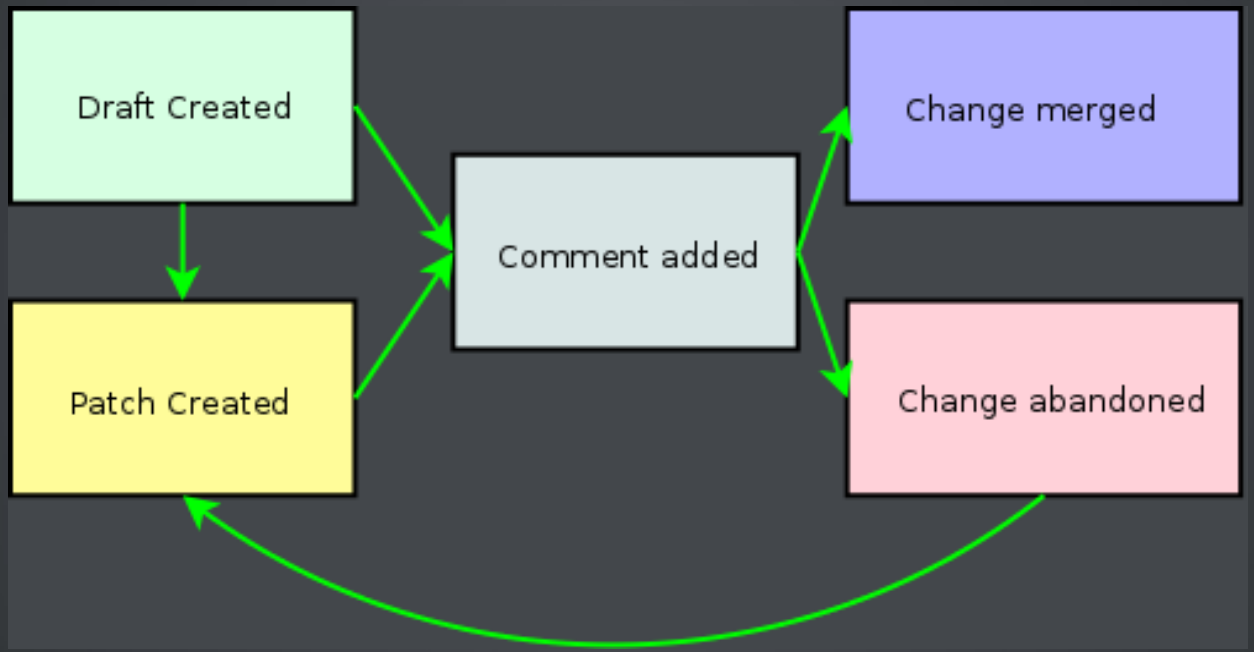
aaa: fix flatGroups recursive

-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

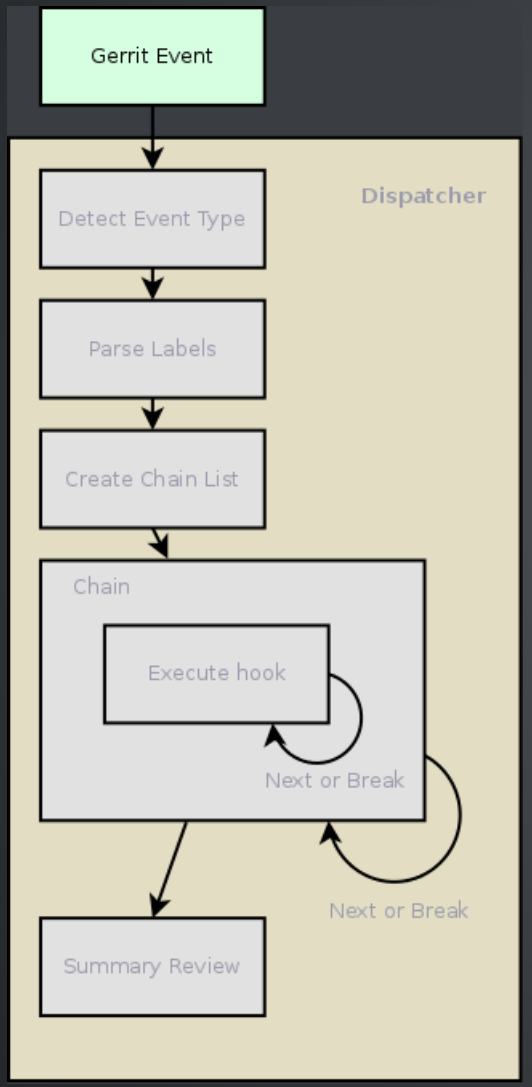
Default gerrit hooks flaws:

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

Solution:

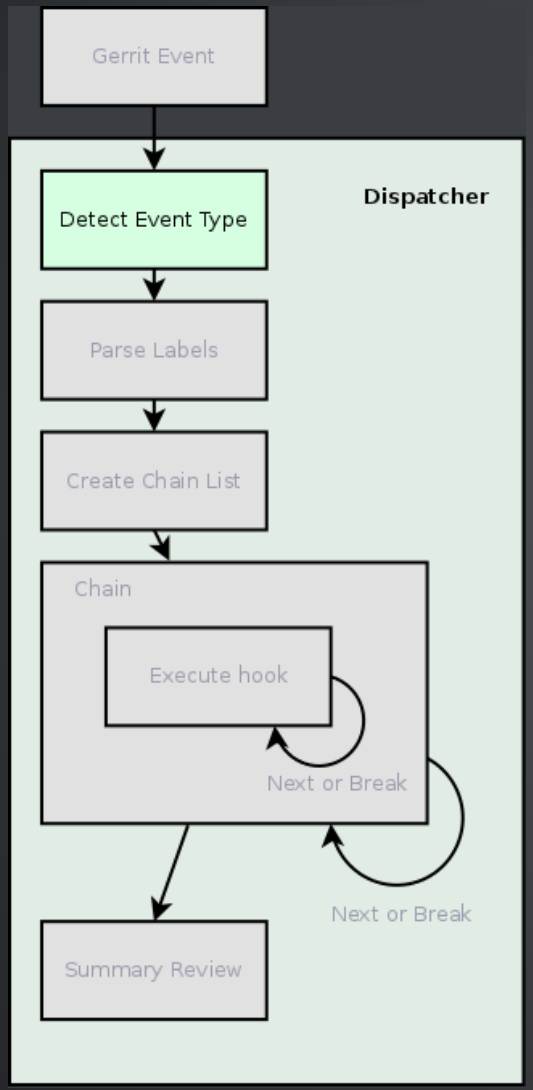
Build a dispatcher!

GERRIT HOOKS: TRIGGER



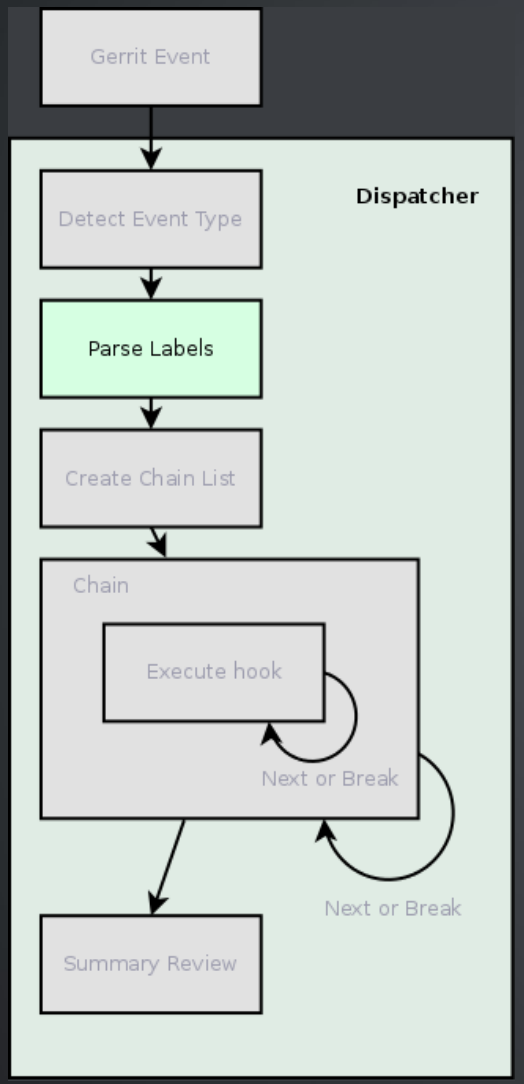
- Patch Created
- Comment Added
- Change Merged
- Change Abandoned
- Reference updated
- (more on newer versions)

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

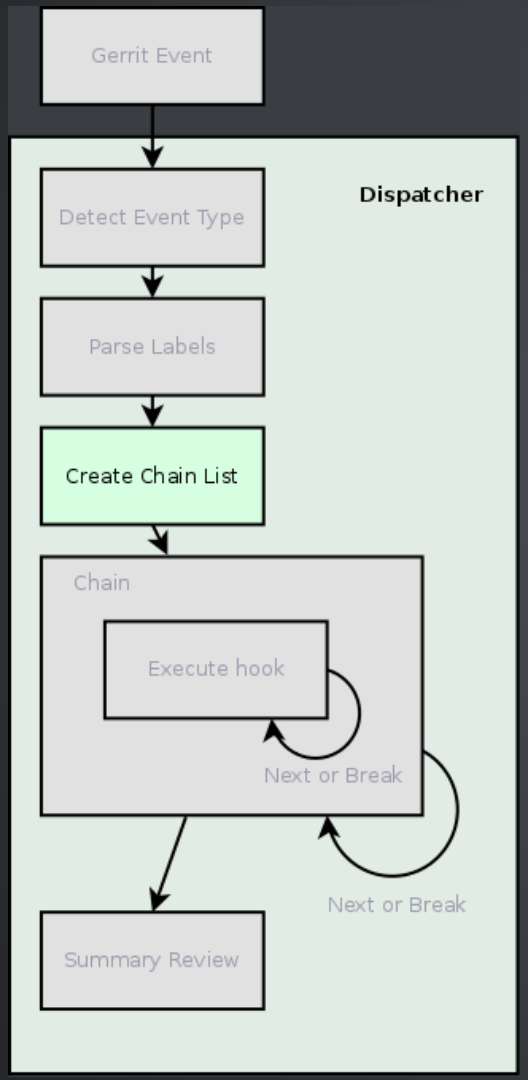
Comment

Example:

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

Rerun-Hooks: all
```

GERRIT HOOKS: CHAINS

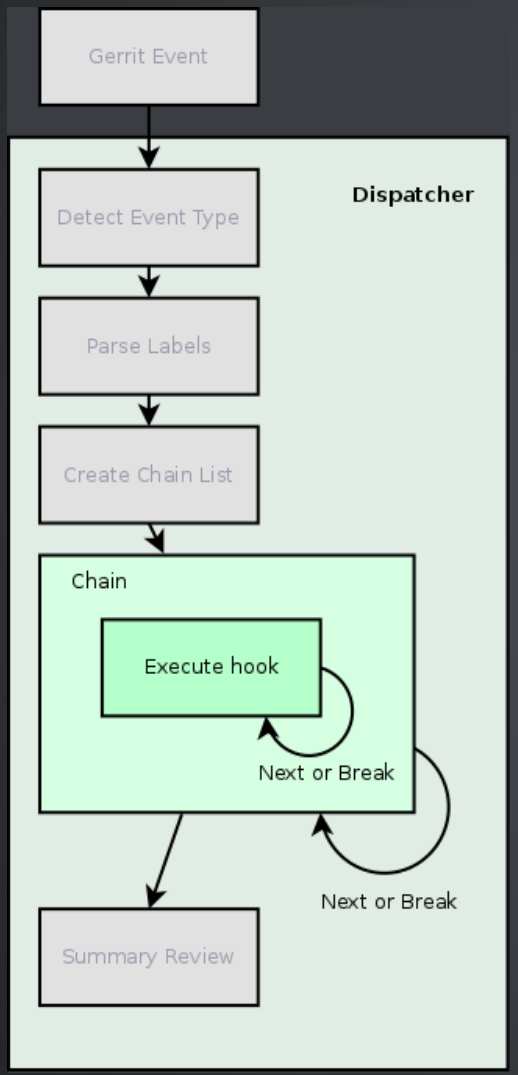


- Using event name
- Chain as second term if wanted
- Hierarchical config files
  - Main one at $gerrit_dir
  - Per project
  - Per event

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

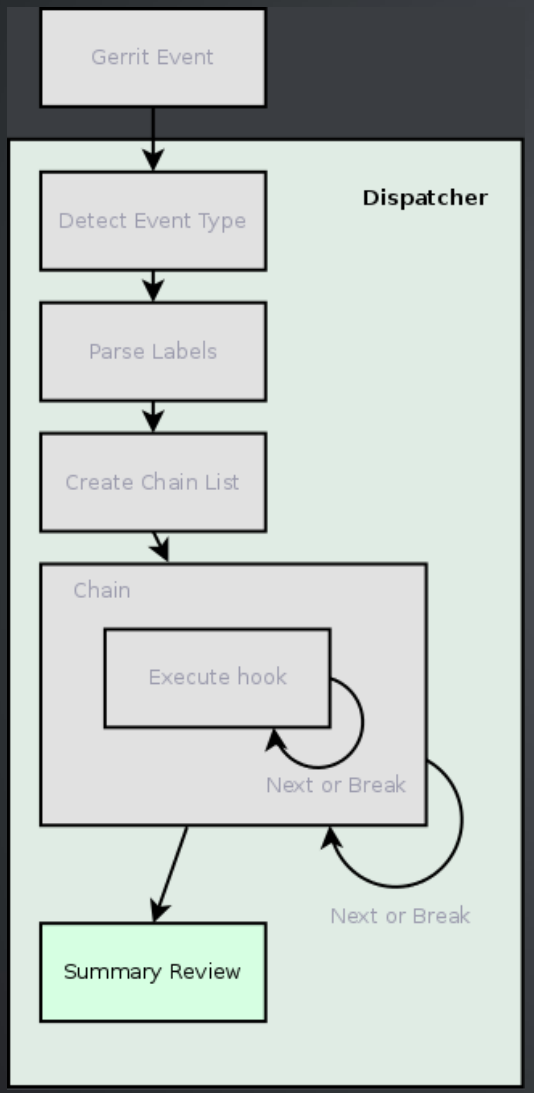
Common stdout format (each section is optional):

```
V:VERIFIED SCORE\n
R:REVIEW SCORE\n
COMMENT
```

Everything to logfile (configurable):

```
INFO::STARTING::change-merged
DEBUG::get_hooks::change-merged on vdsm.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

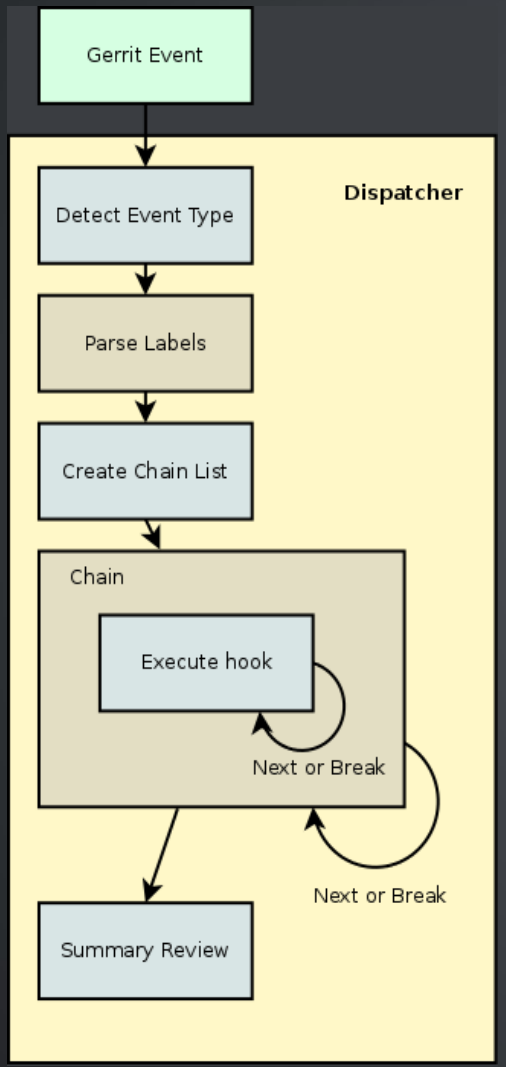
Patch Set 2:

- 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.gi t

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 hierarchicaly into a dict
gerrit = Gerrit(config.get('GERRIT_SRV')) ## Connect to the gerrit instance
```

GERRIT HOOKS: BUGZILLA

Update external tracker in bugzilla

Portal				ort...	
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] RHEV should report which	3

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 project

Test a job configuration before deploying

New branch for project M, duplicate all it's jobs

Add an extra scm to jobs for projects 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
- Configuation 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}-wahtever-{dist}'
```

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

Running at midnigh
On slave-fc19 and slave-fc20
Executing 'make whatever'
Archiving the logs

JENKINS JOB BUILDER

```
- job-group:
    name: projectA
    dist:
        - fc19
        - fc20
        - el6
    jobs:
      - '{name}-wahtever-{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

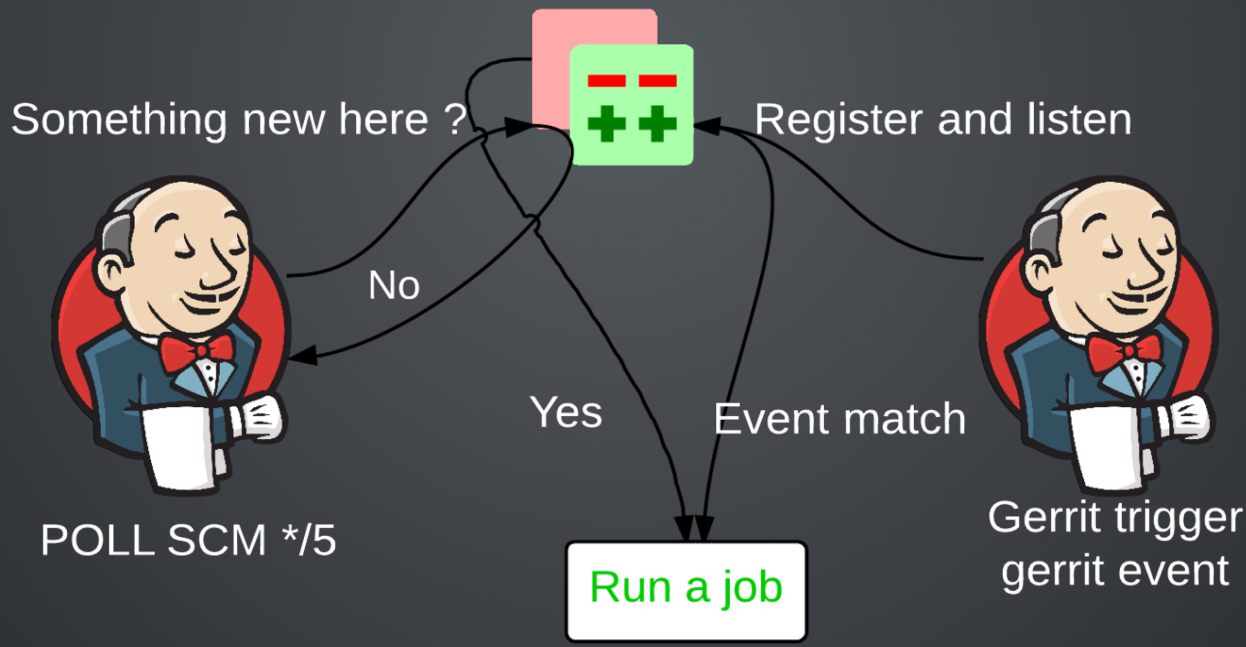
Check job

OVIRT JENKINS JOB TYPES

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

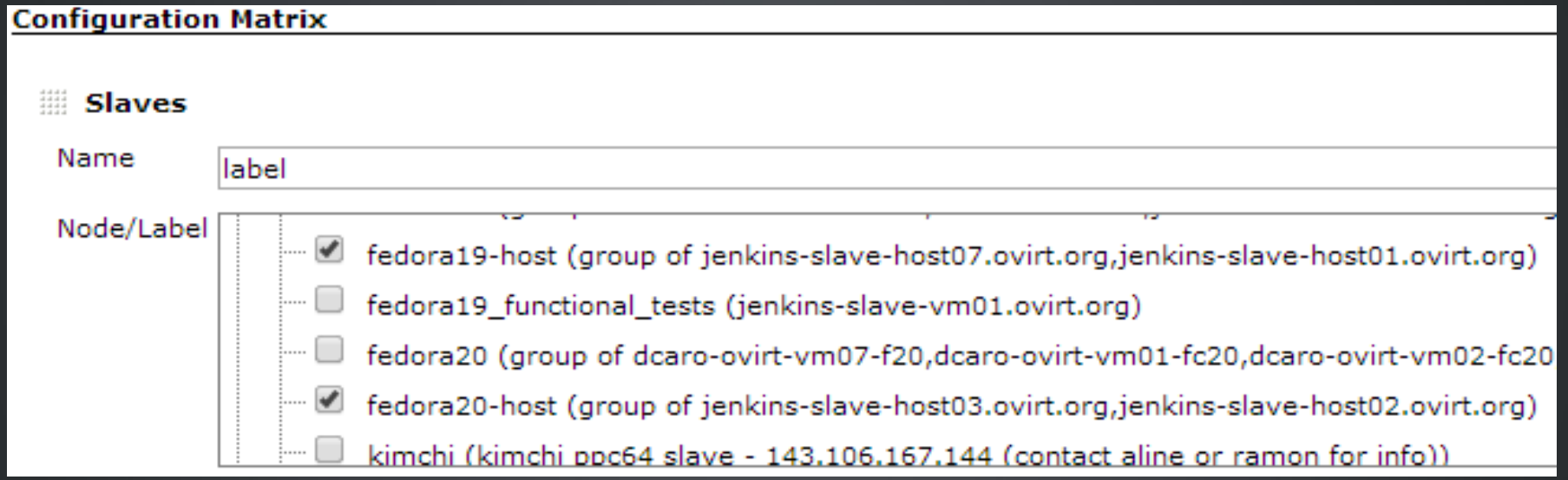
POLL SCM VS GERRIT TRIGGER

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



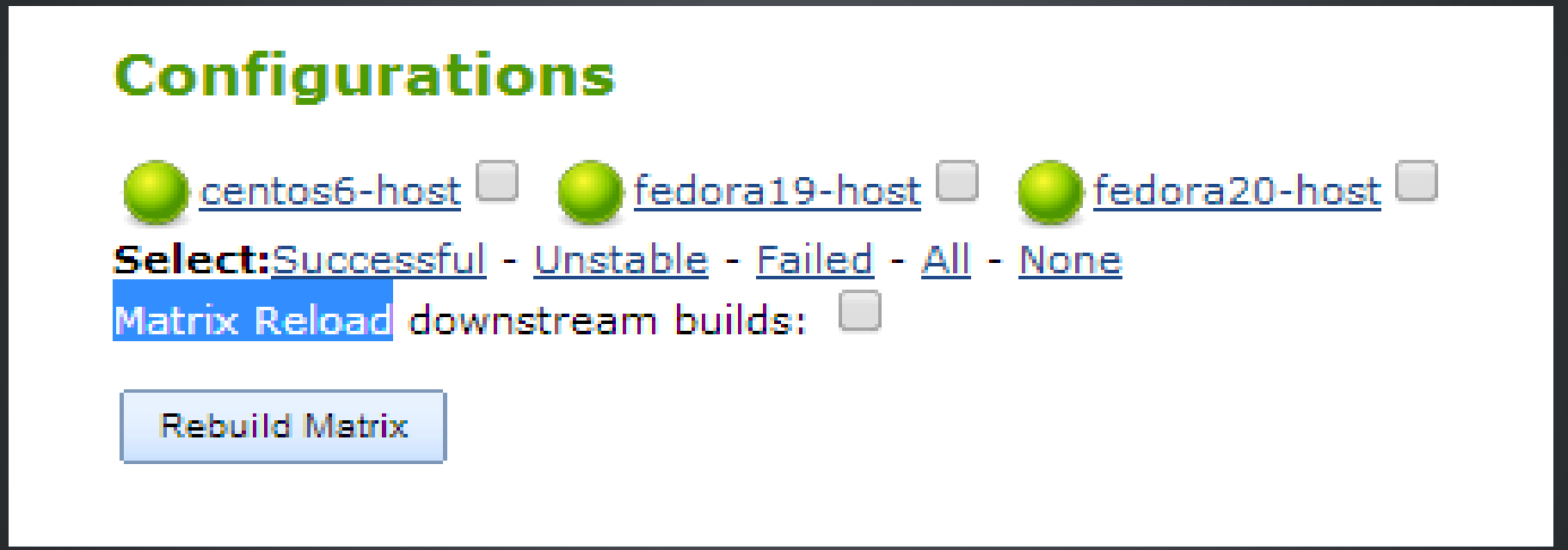
MATRIX JOBS

- Allows to configure the jobs to run on different configurations



MATRIX RELOADED

- Allows to rerun the job on a specific configuration



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/vie
```

COPR JENKINS PLUGIN

Post-build Actions

Build RPM in Copr

API URL	https://copr.fedoraproject.org/
Username	ovirt
Coprname	vdsm_3.5
API login	••••••••••••••••••••••••••••••
API token	••••••••••••••••••••••••••••••
SRPM URL	vdsm-${BUILD_ID}.src.rpm

☑ Prepare SRPM manually

Prepare SRPM

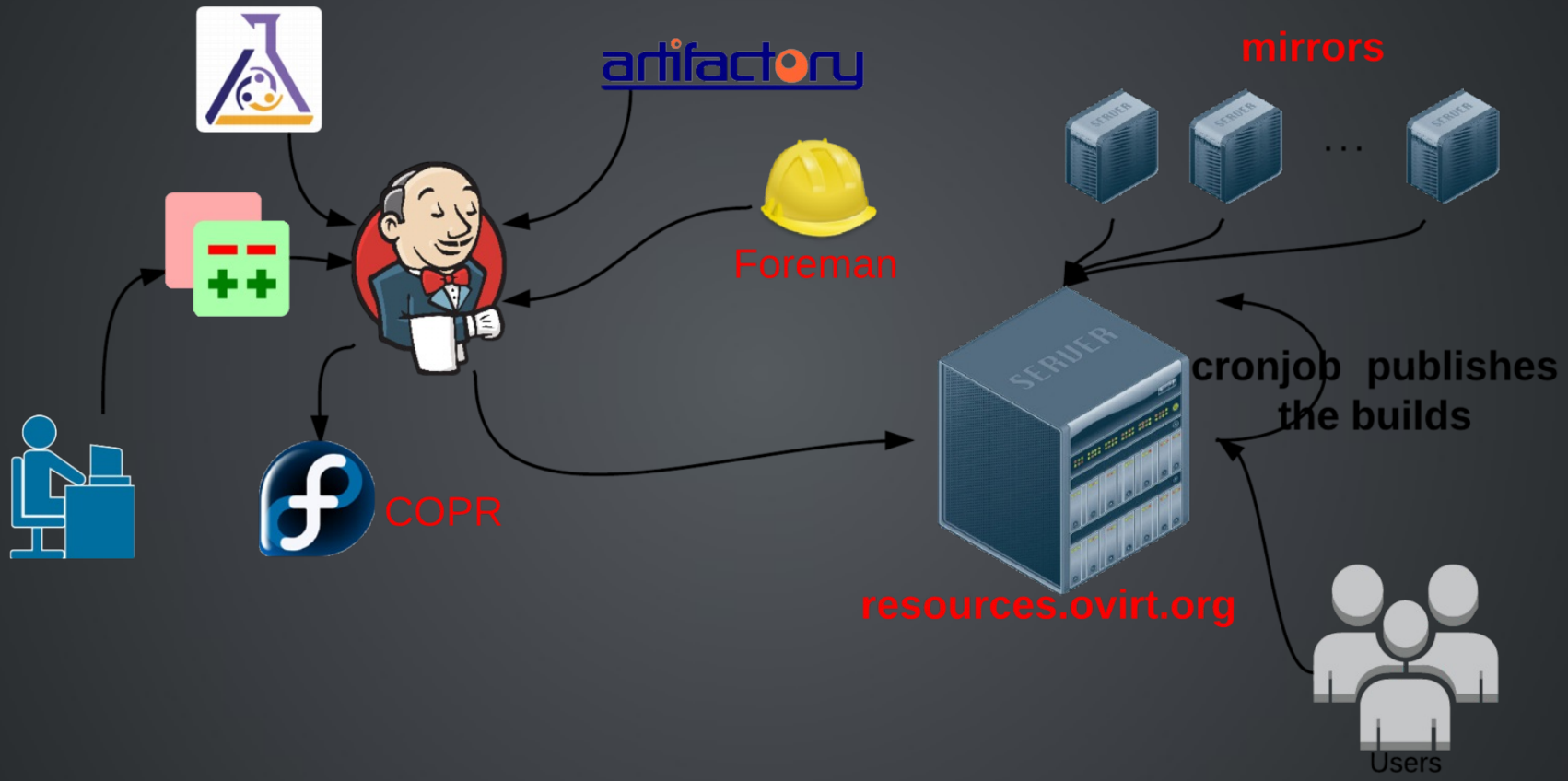
```
sed -i 's/^make check/#make check/g' vdsm.spec.in
./autogen.sh --system --enable-hooks
make dist

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

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