



Packit: upstream ⇔ downstream

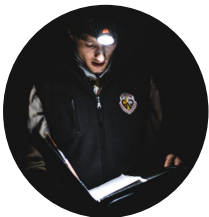
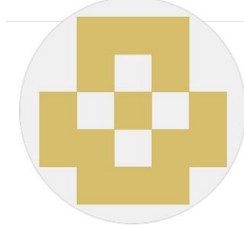
Linux Day Milano

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Sr. Principal Software Engineer

October 22th









































What's Packit?

A **Continuous Integration (CI) solution** for upstream projects using RPMs but also a **Command Line Interface (CLI) tool**

- ▶ The CI upstream service works both with *github.com* and *gitlab.com*
- ▶ Used by abrt, anaconda, avocado, beaker, beakerlib, cockpit, convert2rhel, dnf, nmstate, OpenScap, packit, podman, systemd, tmt, and many more

Goals

- ▶ validate upstream changes downstream
- ▶ bringing upstream releases to downstream

Trigger	Time Sub...	SRPM	Built by	RPM builds
 avocado-framework/avocado#5086	a minute ago	 success	 Copr	 fedora-rawhide-x86_64  fedora-34-x86_64  fedora-35-x86_64 1 more
 avocado-framework/avocado#5085	15 minutes ago	 success	 Copr	 fedora-33-x86_64  fedora-rawhide-x86_64  fedora-34-x86_64 1 more
 osbuild/osbuild#862	17 minutes ago	 success	 Copr	 fedora-35-x86_64  fedora-rawhide-s390x  epel-8-x86_64 17 more
 rhinstaller/anaconda#3672	21 minutes ago	 failure	 none	
 psss/tmt#935	25 minutes ago	 success	 Copr	 epel-8-x86_64  fedora-34-x86_64  fedora-rawhide-x86_64 2 more
 fedora-iot/greenboot#60	28 minutes ago	 success	 Copr	 fedora-34-x86_64  fedora-35-x86_64  fedora-33-x86_64 1 more
 systemd/systemd#21170	28 minutes ago	 success	 Copr	 fedora-rawhide-aarch64  fedora-rawhide-x86_64

How the code gets to Fedora Linux users?

Upstream -> user

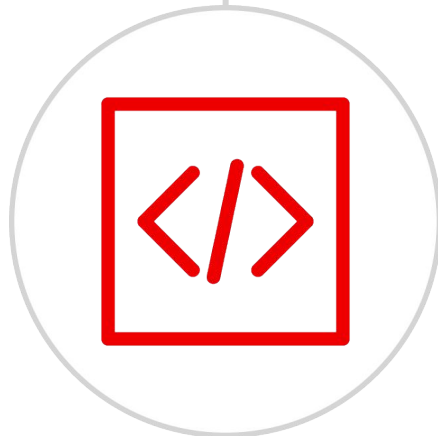


Upstream
GitHub, GitLab,...



User
dnf install my-application

Upstream -> user



Upstream

majamassarini / teamcity-messages Public

forked from JetBrains/teamcity-messages

<> Code Issues Pull requests 1 Actions Projects Security Insights Settings

master 11 branches 26 tags

Go to file

Add file

Code

This branch is 3 commits ahead, 20 commits behind JetBrains:master.

Contribute

Sync fork

majamassarini Fix downstream project name

ba98a05 on Feb 23 669 commits

.idea	Upgrade to support latest versions, remove outdated code, fix tests.	3 years a
.teamcity	Update TC Kotlin DSL and apply patch	10 months a
examples	Reformat code to make it greener	9 years a
teamcity	1.30	10 months a
tests	Fix pytest-flake8 test as package currently doesn't support flake8 < 4	10 months a
twisted/plugins	JetBrains#198 Anything may arrive from trial, do not assume it is reg...	4 years a
.gitattributes	PyCharm environment	9 years a
.gitignore	Retry writes to stream on a EAGAIN IOError (JetBrains#213)	4 years a
.packit.yaml	Fix downstream project name	8 months a

Upstream -> user



Copr
= a build system

► copr.fedorainfracloud.org

- “Copr is an easy-to-use automatic build system providing a **package repository as its output.**”
- A Personal Package Archive (PPA) alternative

The screenshot shows the TeamCity web interface for the project 'mmassari / teamcity-messages'. The interface includes a navigation bar with links for Overview, Packages, Builds, Modules, Monitor, and Settings. The main content area displays the project description, installation instructions, and active releases. The 'Active Releases' section contains a table with columns for Release, Architectures, and Repo Download.

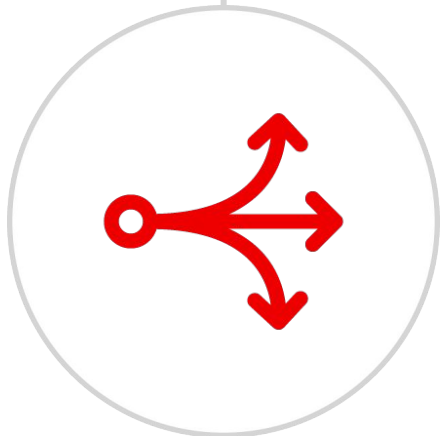
Release	Architectures	Repo Download
Fedora 36	x86_64 (0)*	Fedora 36 (5 downloads)
Fedora 37	x86_64 (0)*	Fedora 37 (1 downloads)
Fedora rawhide	x86_64 (37)*	Fedora rawhide (17 downloads)

* Total number of packages downloaded in the last seven days.

Start Discussion 0 replies

Other Actions: Fork this project (0), Report Abuse

Upstream -> user



DistGit
= Distribution Git

- A collection of **repos for almost every package** (RPM package)
- Every Pagure repo "has" **sources, patches and metadata** (in a SPEC file)

The screenshot shows the 'python-teamcity-messages' package page on the Fedora Package Sources website. The page includes a sidebar with navigation links (Overview, Files, Commits, Branches, Forks, Releases) and monitoring status (Disabled, Orphan). The main content area shows the package description, dependencies (py.test, nose, Django, unittest, Trial, Flake8, Behave, PyLint), and a table of releases.

Release	Stable version	Version in testing
Fedora 38	python-teamcity-messages-1.30-3.fc37	
Fedora 37	python-teamcity-messages-1.30-3.fc37	
Fedora 36	python-teamcity-messages-1.30-1.fc36	

► src.fedoraproject.org

Upstream -> user



Lookaside cache
= archive database

Upstream -> user



Koji
= The Fedora build system

► koji.fedoraproject.org

- **SRPM** (metadata + sources + patches)→
RPM (architecture and version specific)

fedora^f
buildsystem

Packages

Summary Packages Builds Tasks Tags Build Targets Users Hosts Reports Search API

Information for package **python-teamcity-messages**

Name python-teamcity-messages
ID 35148

Builds 1 through 5 of 5

NVR	Built by	Finished ▼
python-teamcity-messages-1.30-3.fc38	mmassari	2022-10-16 16:59:58
python-teamcity-messages-1.30-3.fc37	releng	2022-07-22 22:56:25
python-teamcity-messages-1.30-2.fc37	thrnciar	2022-06-13 15:23:02
python-teamcity-messages-1.30-1.fc36	mmassari	2022-02-10 10:34:48
python-teamcity-messages-1.30-1.fc37	mmassari	2022-02-10 08:13:31

Builds 1 through 5 of 5

Tags 1 through 6 of 6

Name ▲	Owner	Included?	Extra Arches
f36	mmassari	✓	
f36-Beta	mmassari	✓	
f37	mmassari	✓	
f37-Beta	mmassari	✓	
f38	mmassari	✓	
module-package-list	mmassari	✓	

Tags 1 through 6 of 6

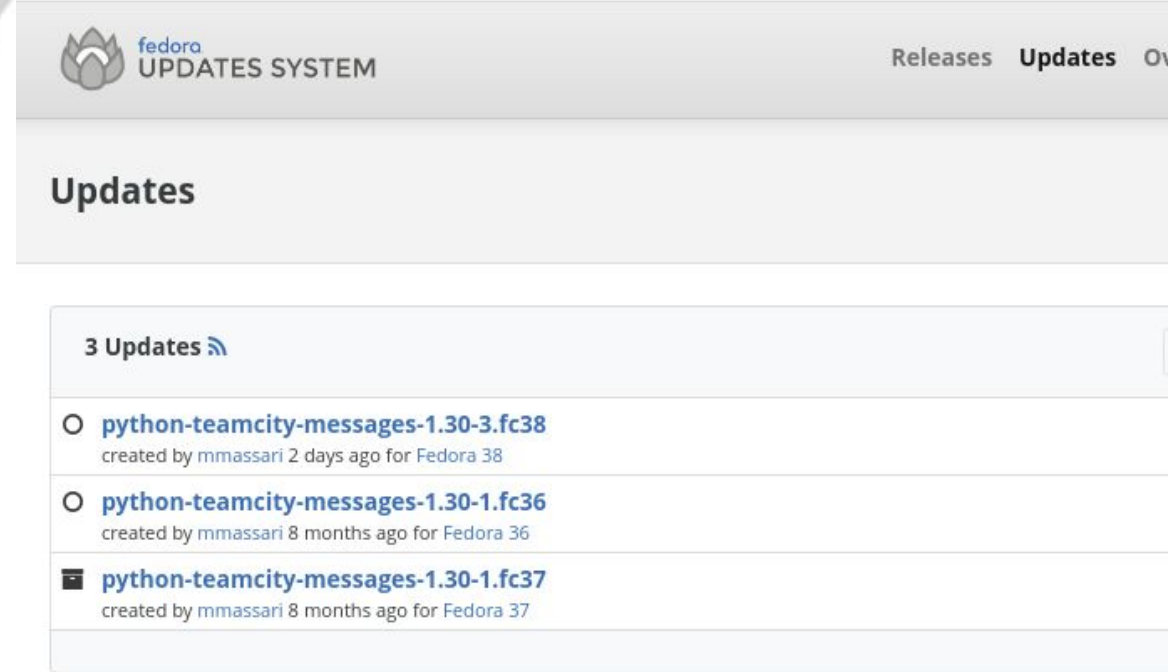
Upstream -> user



Bodhi =
The Fedora updates system

- **Karma system**

► bodhi.fedoraproject.org

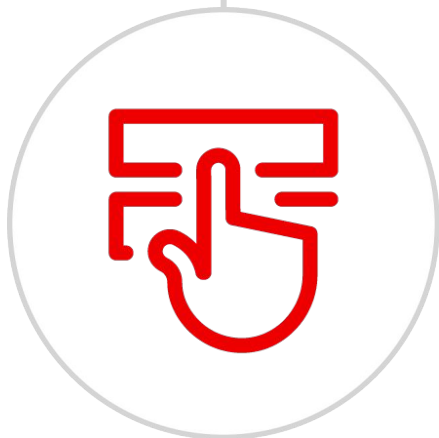


Upstream -> user



User

dnf, yum, gnome-software



Upstream -> user



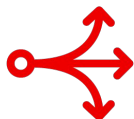
Upstream

GitHub, GitLab,...



Lookaside cache

Archive database



Distribution git

Pagure



Build system

Koji



Update system

Bodhi

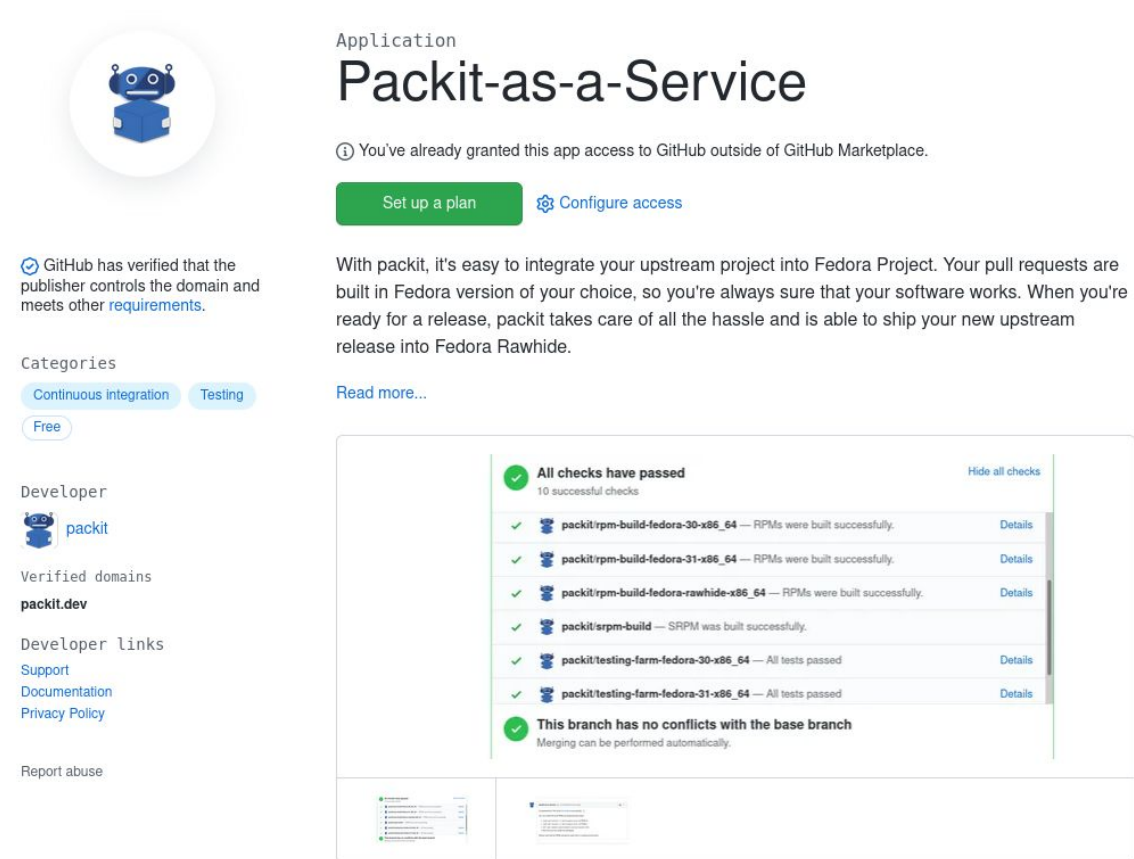


User

dnf, yum, gnome-software,...

Packit as a CI solution

- ▶ Enable interaction with Packit on a git forge
 - Github – enable our [Github app](#)
 - Gitlab – manually configure a webhook
- ▶ Namespace needs to be allowed
 - Fedora contributors who have a valid Fedora Account System (FAS) account
- ▶ Add a config file (.packit.yaml) to your repository together with the RPM spec file (spec file not needed when only tests are configured)



The screenshot shows the GitHub application page for Packit-as-a-Service. At the top, there's a blue robot icon. Below it, a message states: "GitHub has verified that the publisher controls the domain and meets other requirements." The page lists categories: "Continuous integration" and "Testing", and a "Free" price tag. The developer is listed as "packit". Under "Verified domains", "packit.dev" is shown. "Developer links" include "Support", "Documentation", and "Privacy Policy". A "Report abuse" link is at the bottom. On the right, the "Application" section is titled "Packit-as-a-Service". It includes a note: "You've already granted this app access to GitHub outside of GitHub Marketplace." Below this are two buttons: "Set up a plan" (green) and "Configure access" (blue). A paragraph explains: "With packit, it's easy to integrate your upstream project into Fedora Project. Your pull requests are built in Fedora version of your choice, so you're always sure that your software works. When you're ready for a release, packit takes care of all the hassle and is able to ship your new upstream release into Fedora Rawhide." A "Read more..." link is provided. A large green checkmark indicates "All checks have passed" (10 successful checks). A table lists the checks with their details links:

Check Name	Status	Details
packit/rpm-build-fedora-30-x86_64 — RPMs were built successfully.	✓	Details
packit/rpm-build-fedora-31-x86_64 — RPMs were built successfully.	✓	Details
packit/rpm-build-fedora-rawhide-x86_64 — RPMs were built successfully.	✓	Details
packit/srpm-build — SRPM was built successfully.	✓	
packit/testing-farm-fedora-30-x86_64 — All tests passed	✓	Details
packit/testing-farm-fedora-31-x86_64 — All tests passed	✓	Details
This branch has no conflicts with the base branch	✓	Merging can be performed automatically.

Examples: create a toolbox container

```
[maja@fedora ~]$ toolbox create --distro fedora --release 36
Created container: fedora-toolbox-36
```

```
Enter with: toolbox enter
```

```
[maja@fedora ~]$ toolbox enter fedora-toolbox-36
```

```
●[maja@toolbox ~]$ sudo dnf install packit gh vim
```

```
We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:
```

- #1) Respect the privacy of others.
- #2) Think before you type.
- #3) With great power comes great responsibility.

```
Fedora 36 - x86_64
```

```
Fedora 36 openh264 (From Cisco) - x86_64
```

```
Fedora Modular 36 - x86_64
```

```
▣ Fedora 36 - x86_64 - Updates
```

```
34% [=====▶=====]
```



2.5 MB/s		81 MB	00:32
1.5 kB/s		2.5 kB	00:01
779 kB/s		2.4 MB	00:03
] 1.6 MB/s		10 MB	00:12 ETA

Examples: packit init

```
[maja@fedora ~]$ toolbox enter fedora-toolbox-36
[maja@toolbox ~]$ gh auth login --with-token < ~/github_token.txt
[maja@toolbox ~]$ git clone https://github.com/majamassarini/knx-stack.git
Cloning into 'knx-stack'...
remote: Enumerating objects: 1068, done.
remote: Counting objects: 100% (289/289), done.
remote: Compressing objects: 100% (134/134), done.
remote: Total 1068 (delta 201), reused 162 (delta 155), pack-reused 779
Receiving objects: 100% (1068/1068), 202.55 KiB | 1.88 MiB/s, done.
Resolving deltas: 100% (419/419), done.
[maja@toolbox ~]$ cd knx-stack
[maja@toolbox knx-stack]$ git checkout linuxday-2022
branch 'linuxday-2022' set up to track 'origin/linuxday-2022'.
Switched to a new branch 'linuxday-2022'
[maja@toolbox knx-stack]$ ls
CHANGELOG.txt  COPYING  README.md  daemon  docs  knx_stack  python-knx-stack.spec  setup.py
[maja@toolbox knx-stack]$ vi python-knx-stack.spec
[maja@toolbox knx-stack]$ git checkout -b linuxday-2022-init
Switched to a new branch 'linuxday-2022-init'
[maja@toolbox knx-stack]$ packit init
█
```



Examples: packit custom copr build

```
2022-10-17 14:00:03.346 upstream.py      INFO  Picking version '0.9.2' found in spec file.
2022-10-17 14:00:07.330 api.py           INFO  Directory with sources: /home/maja/knx-stack
2022-10-17 14:00:07.537 command_handler.py INFO  Nothing to clean.
2022-10-17 14:00:07.537 api.py           INFO  We will operate with COPR owner mmassari.
2022-10-17 14:00:07.537 copr_helper.py   INFO  Trying to get mmassari/knx-stack Copr project. The project will be created if it does not exist.
Build id: 4948537, repo url: https://copr.fedorainfracloud.org/coprs/build/4948537/
[maja@toolbox knx-stack]$ git add .packit.yaml
[maja@toolbox knx-stack]$ git commit -m "Add custom copr job to .packit.yaml"
[linuxday-2022-custom-copr 3c4893f] Add custom copr job to .packit.yaml
1 file changed, 12 insertions(+)
[maja@toolbox knx-stack]$ gh pr create --base linuxday-2022 --fill
Warning: 8 uncommitted changes
? Where should we push the 'linuxday-2022-custom-copr' branch? majamassarini/knx-stack

Creating pull request for linuxday-2022-custom-copr into linuxday-2022 in majamassarini/knx-stack

remote:
remote:
To https://github.com/majamassarini/knx-stack.git
* [new branch]      HEAD -> linuxday-2022-custom-copr
branch 'linuxday-2022-custom-copr' set up to track 'origin/linuxday-2022-custom-copr'.
https://github.com/majamassarini/knx-stack/pull/19
[maja@toolbox knx-stack]$ gh pr view
linuxday 2022 custom copr #19
Open • majamassarini wants to merge 2 commits into linuxday-2022 from linuxday-2022-custom-copr • less than a minute ago • +26 -0

  • Add .packit.yaml
  • Add custom copr job to .packit.yaml

View this pull request on GitHub: https://github.com/majamassarini/knx-stack/pull/19
[maja@toolbox knx-stack]$
```



Examples: packit custom release suffix

```
Already on 'linuxday-2022-custom-copr'
Your branch is up to date with 'origin/linuxday-2022-custom-copr'.
[maja@toolbox knx-stack]$ git checkout -b linuxday-2022-release-suffix
Switched to a new branch 'linuxday-2022-release-suffix'
[maja@toolbox knx-stack]$ vi .packit.yaml
[maja@toolbox knx-stack]$ git add .packit.yaml
[maja@toolbox knx-stack]$ git commit -m "Add custom release suffix"
[linuxday-2022-release-suffix 15e13ed] Add custom release suffix
1 file changed, 2 insertions(+)
[maja@toolbox knx-stack]$ gh pr create --base linuxday-2022 --fill
Warning: 8 uncommitted changes
? Where should we push the 'linuxday-2022-release-suffix' branch? majamassarini/knx-stack

Creating pull request for linuxday-2022-release-suffix into linuxday-2022 in majamassarini/knx-stack

remote:
remote:
To https://github.com/majamassarini/knx-stack.git
 * [new branch]      HEAD -> linuxday-2022-release-suffix
branch 'linuxday-2022-release-suffix' set up to track 'origin/linuxday-2022-release-suffix'.
https://github.com/majamassarini/knx-stack/pull/20
[maja@toolbox knx-stack]$ gh pr view
linuxday 2022 release suffix #20
Open • majamassarini wants to merge 3 commits into linuxday-2022 from linuxday-2022-release-suffix • less than a minute ago • +28 -0

  • Add .packit.yaml
  • Add custom copr job to .packit.yaml
  • Add custom release suffix

View this pull request on GitHub: https://github.com/majamassarini/knx-stack/pull/20
[maja@toolbox knx-stack]$
```



To have this happen automatically for branches without a tracking upstream, see 'push.autoSetupRemote' in 'git help config'.

```
●[maja@toolbox teamcity-messages]$ git push --set-upstream origin linuxday-2022
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Delta compression using up to 8 threads
Compressing objects: 100% (11/11), done.
Writing objects: 100% (12/12), 2.34 KiB | 2.34 MiB/s, done.
Total 12 (delta 6), reused 2 (delta 1), pack-reused 0
remote: Resolving deltas: 100% (6/6), completed with 1 local object.
remote:
remote: Create a pull request for 'linuxday-2022' on GitHub by visiting:
remote:   https://github.com/majamassarini/teamcity-messages/pull/new/linuxday-2022
remote:
To https://github.com/majamassarini/teamcity-messages.git
 * [new branch]   linuxday-2022 -> linuxday-2022
branch 'linuxday-2022' set up to track 'origin/linuxday-2022'.
●[maja@toolbox teamcity-messages]$ packit propose-downstream --local-content . 1.32
Proposing update of the following branches: rawhide
2022-10-17 14:44:24.031 upstream.py      INFO   Version in spec file is '1.30'.
2022-10-17 14:44:24.031 api.py          WARNING Version '1.30' in spec file is outdated.
2022-10-17 14:44:24.032 api.py          INFO   Using 'rawhide' dist-git branch.
2022-10-17 14:44:33.990 distgit.py      INFO   Archive 'teamcity-messages-1.32.tar.gz' found in lookaside cache (skipping upload).
2022-10-17 14:44:36.325 distgit.py      INFO   Downloading archive: teamcity-messages-1.32.tar.gz
2022-10-17 14:44:51.448 distgit.py      INFO   About to upload to lookaside cache.
2022-10-17 14:44:53.449 logging.py      INFO   File already uploaded: /tmp/packit-dist-gitj3ogsuao/teamcity-messages-1.32.tar.gz
2022-10-17 14:44:53.452 logging.py      INFO   All sources were already uploaded.
2022-10-17 14:44:57.955 base_git.py     INFO   Pushing changes to remote 'fork' using refspect '1.32-rawhide-update'.
2022-10-17 14:45:07.579 base_git.py     INFO   Push summary: [new branch]

2022-10-17 14:45:13.210 distgit.py      INFO   PR created: https://src.fedoraproject.org/rpms/python-teamcity-messages/pull-request/38
●[maja@toolbox teamcity-messages]$ e
```





Upstream

<https://github.com/majamassarini/teamcity-messages>



Lookaside cache

Archive database



Distribution git

<https://src.fedoraproject.org/rpms/python-teamcity-messages>



Build system

<https://koji.fedoraproject.org/koji/packageinfo?packageID=35148>



Update system

<https://bodhi.fedoraproject.org/updates/?search=python-teamcity-messages>



User

`dnf install python-teamcity-messages`

[Fedora Packaging Guidelines](#)

[New Package Process for New Contributors](#)

[Create a new Fedora Account \(FAS\)](#)

[Create an API token for COPR](#) builds (~/.config/copr)

[Create an API token for Pagure](#) (~/.config/packit.yaml)

[~/.config/packit.yaml docs](#)



Documentation

[Dashboard](#)[User Documentation](#) ▼[About Packit](#)[Onboarding Guide](#)[Packit Service](#)[Testing Farm](#)[FAQ](#)[Source-git](#) ▶[Configuration](#)[Packit CLI](#) ▶[Actions](#)[Generated code in upstream
archives](#)[Blog Posts](#) ▶[Development Documentation](#) ▶[Status page](#)

Documentation

- [About](#) - Key principles of Packit.
- [Onboarding Guide](#) - How to start using Packit.
- [Packit Service](#) - GitHub App that helps you continuously ensure that your project work in Fedora OS.
- [Testing Farm](#) - Guide to Packit's service for running tests.
- [Frequently Asked Questions](#) - Whys, Whats, contacts.
- [Source-git](#) - Source-git concept and how to work with it.
- [Configuration for packit](#) - Configuration file description.
- [Packit CLI](#) - Commands description.
- [Actions](#) - Further customize Packit's behaviour.
- [Generated code in upstream archives](#) - When your release tarballs contain generated code and you need to patch it downstream.

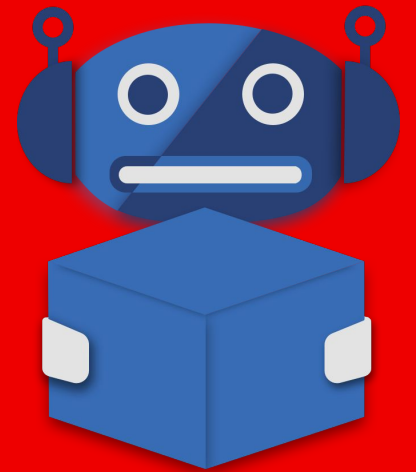
▶ packit.dev

Dashboard

Copr Builds	Koji Builds	SRPM Builds	Test Runs	Propose Downstream
Trigger	Chroots			Time Submitt... Copr Bu
ansible-community/molecule#3554	✓ fedora-35-x86_64			6 minutes ago 446020
teemtee/tmt#1202	✗ fedora-35-x86_64 ✗ epel-9-x86_64 ✗ fedora-36-x86_64 ✗ epel-8-x86_64 ✗ fedora-rawhide-x86_64 ✗ fedora-34-x86_64			16 minutes ago 446019
ansible-community/molecule#3552	✓ fedora-35-x86_64			26 minutes ago 446018
ansible-community/molecule#3551	✓ fedora-35-x86_64			27 minutes ago 446018
ansible-community/molecule#3542	✓ fedora-35-x86_64			27 minutes ago 446018
osbuild/osbuild#1030	✓ fedora-rawhide-aarch64 ✓ fedora-34-x86_64 ✓ fedora-rawhide-ppc64le ✓ fedora-35-s390x ✓ centos-stream-8-aarch64 ✓ fedora-rawhide-x86_64 ✓ fedora-35-ppc64le ✓ fedora-34-ppc64le ✓ fedora-36-ppc64le ✓ fedora-34-aarch64 ✓ fedora-35-aarch64 ✓ fedora-36-s390x ✓ fedora-rawhide-s390x ✓ epel-8-aarch64 ✓ fedora-36-x86_64 ✓ centos-stream-9-aarch64 ✓ centos-stream-9-x86_64 ✓ fedora-35-x86_64 ✓ centos-stream-8-x86_64 ✓ fedora-36-x86_64 ✓ epel-8-x86_64 ✓ fedora-36-aarch64 ✓ fedora-34-aarch64 ✓ fedora-35-s390x			31 minutes ago 446018
osbuild/osbuild#1041	✓ centos-stream-8-x86_64 ✓ fedora-35-x86_64 ✓ fedora-rawhide-ppc64le ✓ fedora-36-aarch64 ✓ fedora-34-s390x ✓ centos-stream-8-aarch64 ✓ centos-stream-9-aarch64 ✓ epel-8-aarch64 ✓ fedora-35-aarch64 ✓ centos-stream-9-x86_64 ✓ fedora-36-x86_64 ✓ fedora-rawhide-ppc64le ✓ fedora-34-x86_64 ✓ fedora-35-ppc64le ✓ fedora-rawhide-s390x ✓ fedora-36-ppc64le ✓ epel-8-x86_64 ✓ fedora-rawhide-aarch64 ✓ fedora-34-aarch64 ✓ fedora-35-s390x			46 minutes ago 446017
osbuild/osbuild-composer#2692	✓ fedora-rawhide-s390x ✓ fedora-34-x86_64 ✓ centos-stream-9-x86_64 ✓ fedora-rawhide-x86_64 ✓ fedora-34-ppc64le ✓ fedora-34-s390x ✓ centos-stream-9-aarch64 ✓ fedora-34-aarch64 ✓ centos-stream-8-aarch64 ✓ fedora-35-x86_64 ✓ centos-stream-9-x86_64 ✓ fedora-rawhide-s390x			46 minutes ago 446017

► dashboard.packit.dev

Thank you for coming



<https://packit.dev/>