



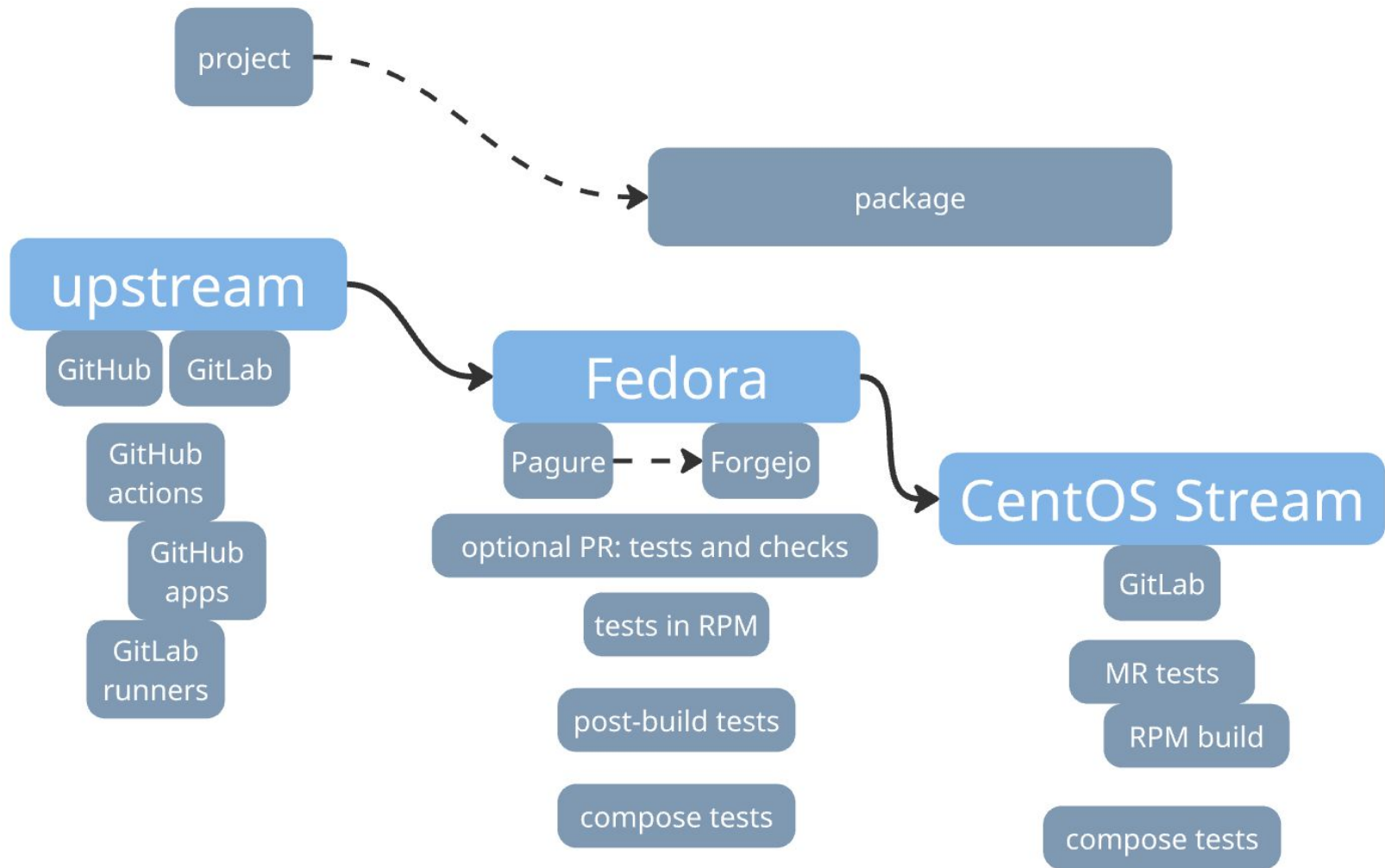
# From Code to Distribution: Building a Complete Testing Pipeline

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PTE PO @ RH

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(Senior Software Engineer)  
tmt team @ RH

# Agenda

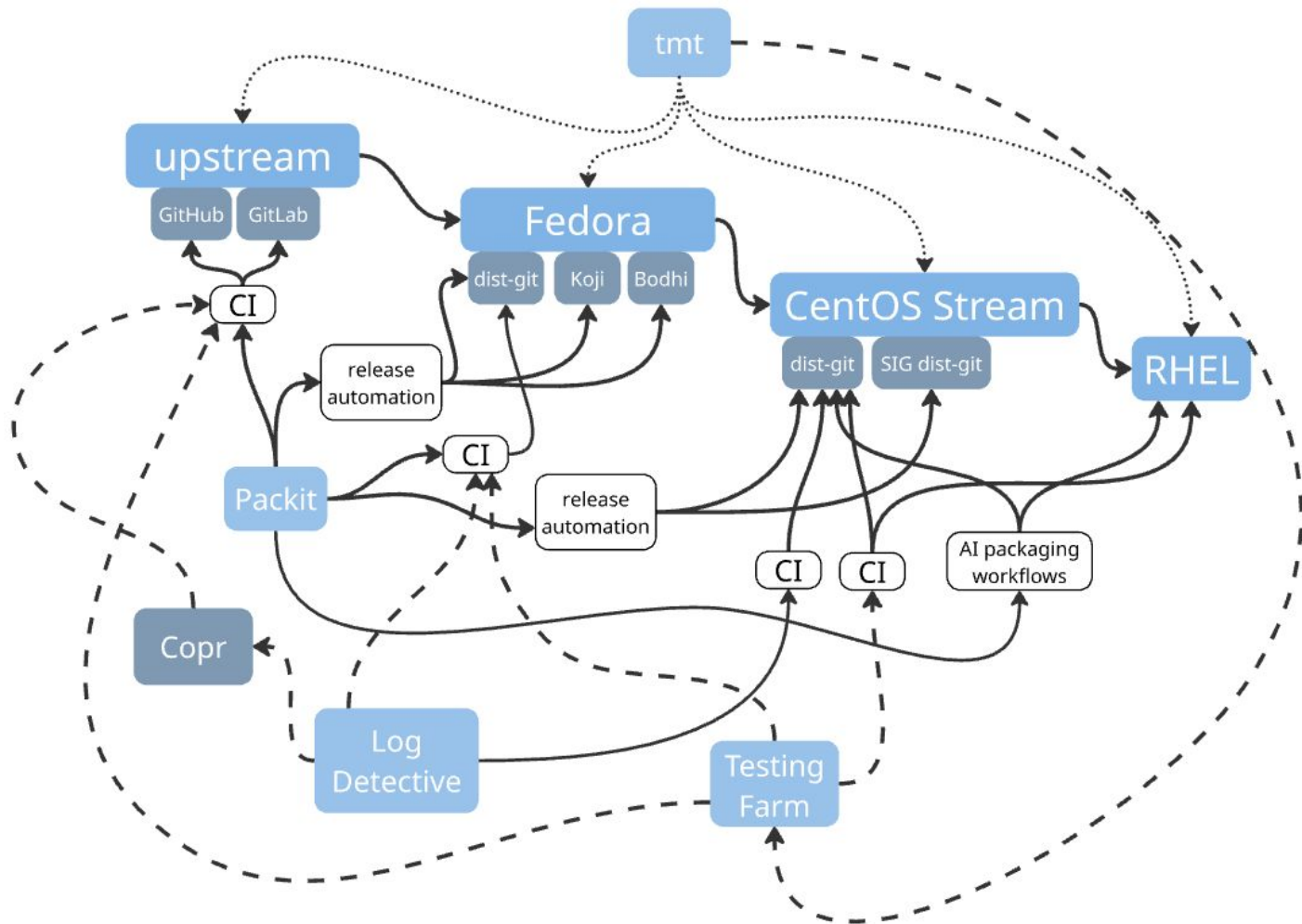
- Flow of code
- Packaging and Testing Experience projects
- Shifting left
- Test sharing
- Collaboration



# Packaging and Testing projects

+ Experience





# unification

## upstream

GitHub

GitLab

## Fedora

dist-git

Koji

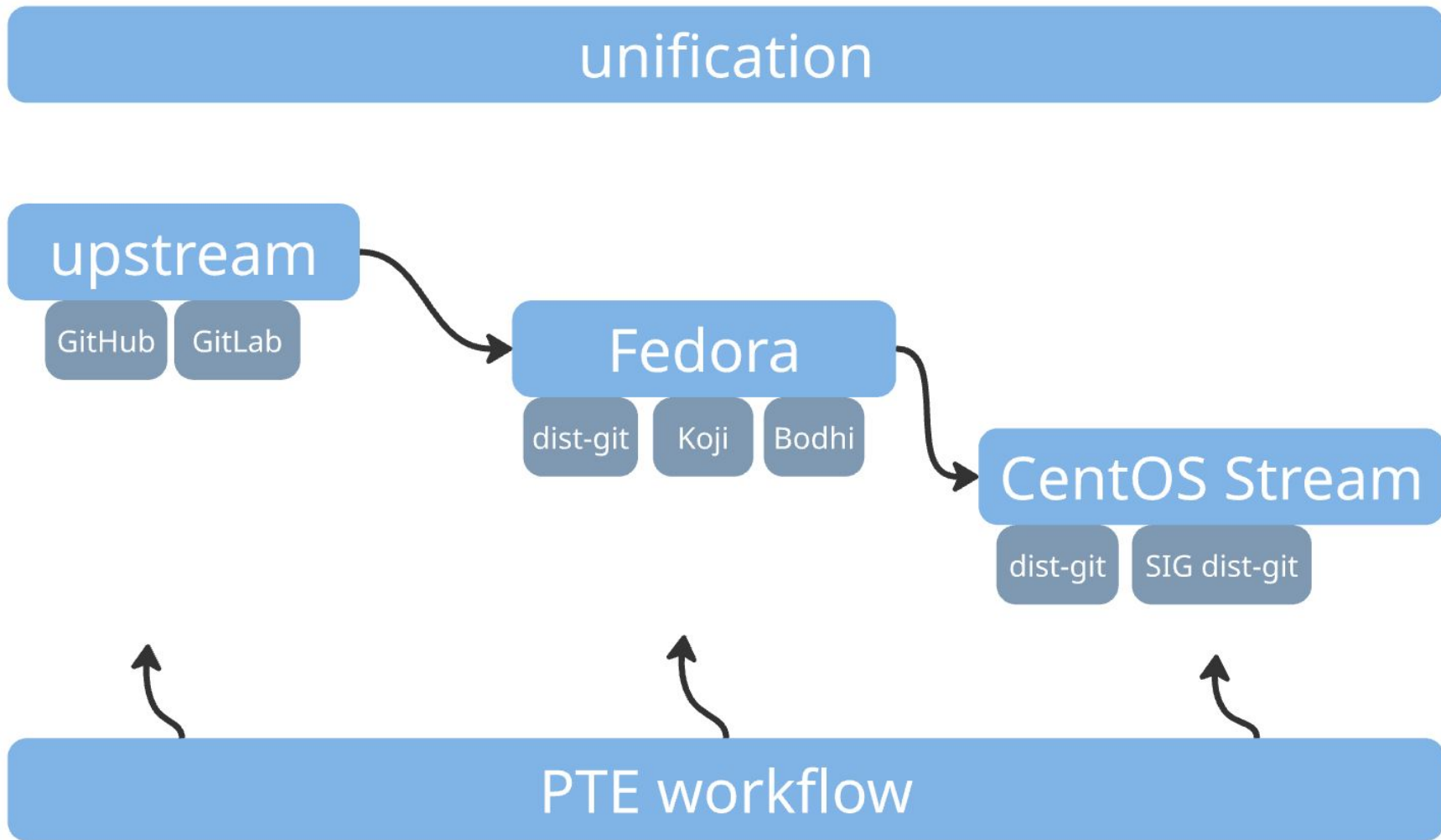
Bodhi

## CentOS Stream

dist-git

SIG dist-git

## PTE workflow





# Copr

<https://copr.fedorainfracloud.org/>

Copr hosts 35,838 projects from  
8,734 Fedora users

Showing 1 to 3 of 3 items					
Name ^	Last Build Version	Last Build Submitted	Last Build Status	Automatic Build	Actions
<a href="#">atuin</a>	18.6.1-1	26 days ago	<span>failed</span>	Disabled	-
<a href="#">rust-axum-server</a>	0.7.2-1	5 months ago	<span>succeeded</span>	Disabled	-
<a href="#">rust-interim</a>	0.2.1-1	5 months ago	<span>succeeded</span>	Disabled	-
Show 25 entries					
1 of 1					

## Quick Enable

```
#> dnf copr enable lecris/atuin
```

[More info about enabling Copr repositories](#)

# Log Detective

<https://logdetective.com/>

Paste a link to your failed RPM build log.

## Instructions

- ☒ We fetched a random sample from our collected data set
- ☐ Go through all snippets and either upvote or downvote them
- ☐ Is the explanation why did the build fail correct?
- ☐ Is the explanation how to fix the issue correct?
- ☐ Submit

### builder-live.log

[backend.log](#) [build.log](#)

```
RelWithDebInfo/
Deployment/
Deployment/
Development/
Development/
20/21 Test #20: test_ruby_libdnf5_utils/test_patterns.rb .....***Not Run 0.00 s
      Start 21: test_copr
21/21 Test #21: test_copr ..... Passed 0.03 s

57% tests passed, 9 tests failed out of 21

Total Test time (real) = 1.95 sec

The following tests FAILED:
 12 - test_ruby_libdnf5_base/test_base.rb (Not Run)
 13 - test_ruby_libdnf5_base/test_case.rb (Not Run)
 14 - test_ruby_libdnf5_logger/test_loggers.rb (Not Run)
 15 - test_ruby_libdnf5_repo/test_file_downloader.rb (Not Run)
 16 - test_ruby_libdnf5_repo/test_package_downloader.rb (Not Run)
 17 - test_ruby_libdnf5_repo/test_repo.rb (Not Run)
 18 - test_ruby_libdnf5_rpm/test_package_query.rb (Not Run)
 19 - test_ruby_libdnf5_rpm/test_package_query_set_operators.rb (Not Run)
 20 - test_ruby_libdnf5_utils/test_patterns.rb (Not Run)

Errors while running CTest
error: Bad exit status from /var/tmp/rpm-tmp.unFRDQ (%check)

RPM build errors:
  Bad exit status from /var/tmp/rpm-tmp.unFRDQ (%check)
Finish: rpmbuild dnf5-5.2.10.0-2.fc43.src.rpm
Finish: build phase for dnf5-5.2.10.0-2.fc43.src.rpm
INFO: chroot_scan: 1 files copied to /var/lib/copr-rpmbuild/results/chroot_scan
INFO: /var/lib/mock/fedora-rawhide-x86_64-1741087211.456179/root/var/log/dnf5.log
INFO: chroot_scan: creating tarball /var/lib/copr-rpmbuild/results/chroot_scan.tar.gz
/bin/tar: Removing leading '/' from member names
ERROR: Exception(/var/lib/copr-rpmbuild/results/dnf5-5.2.10.0-2.fc43.src.rpm) Config(fedora-rawh
INFO: Results and/or logs in: /var/lib/copr-rpmbuild/results
INFO: Cleaning up build root ('cleanup_on_failure=True')
Start: clean chroot
INFO: Unmounting tmpfs.
Finish: clean chroot
ERROR: Command failed:
# /usr/bin/systemd-nsproxy -q -M ec9af141fd814a06a7662034669d845e -D /var/lib/mock/fedora-rawh
Copr build error: Build failed
```

Interesting snippets:

Add

You can edit existing snippets. This will automatically upvote them.

Snippet 1

Snippet 2

Snippet 3

Snippet 4

Snippet 5

Build command has failed.



### Why did the build fail?

Executable required for tests #12 - #20 has not been found during execution of the test suite. This caused the test suite to fail, which led to



### How to fix the issue?

Ensure that all tests of package can be executed on the machine used for build.



Ready to submit the results?

Submit



# Log Detective

<https://logdetective.com/>



**Log Detective** @group\_8794173\_bot\_029d2e92d461920a3695e55137a87774 2 days ago

Reporter



Resolved 2 days ago by Siddhesh Poyarekar

The package gcc-toolset-15-gcc build has experienced an issue. Please know that the explanation was provided by AI and may be incorrect.

## ▼ Description

The RPM build failed during the ``%prep`` phase because a patch could not be applied cleanly. The patch seems to be already applied or reversed, as indicated by the message "Reversed (or previously applied) patch detected!". This resulted in hunks being ignored and saved to a reject file ('libada/Makefile.in.rej').

To resolve this, examine the patch file and the `libada/Makefile.in` file to determine if the patch is necessary or if it needs to be updated or removed. If the patch is necessary, regenerate it against the current source code.

## ► Snippets

## ► Logs

## ► Help

This explanation was provided by AI (Log Detective). Always review AI generated content prior to use. Was the provided feedback accurate and helpful?

Please vote with 👍 or 👎 to help us improve.

*If this Log Detective report contains harmful content, please use the [Gitlab reporting feature for harmful content](#) and contact the [Log Detective developers](#).*

Edited 2 days ago by Log Detective

## ▼ Collapse replies



**Siddhesh Poyarekar** @siddhesh\_p 2 days ago

Author

Developer



updated.

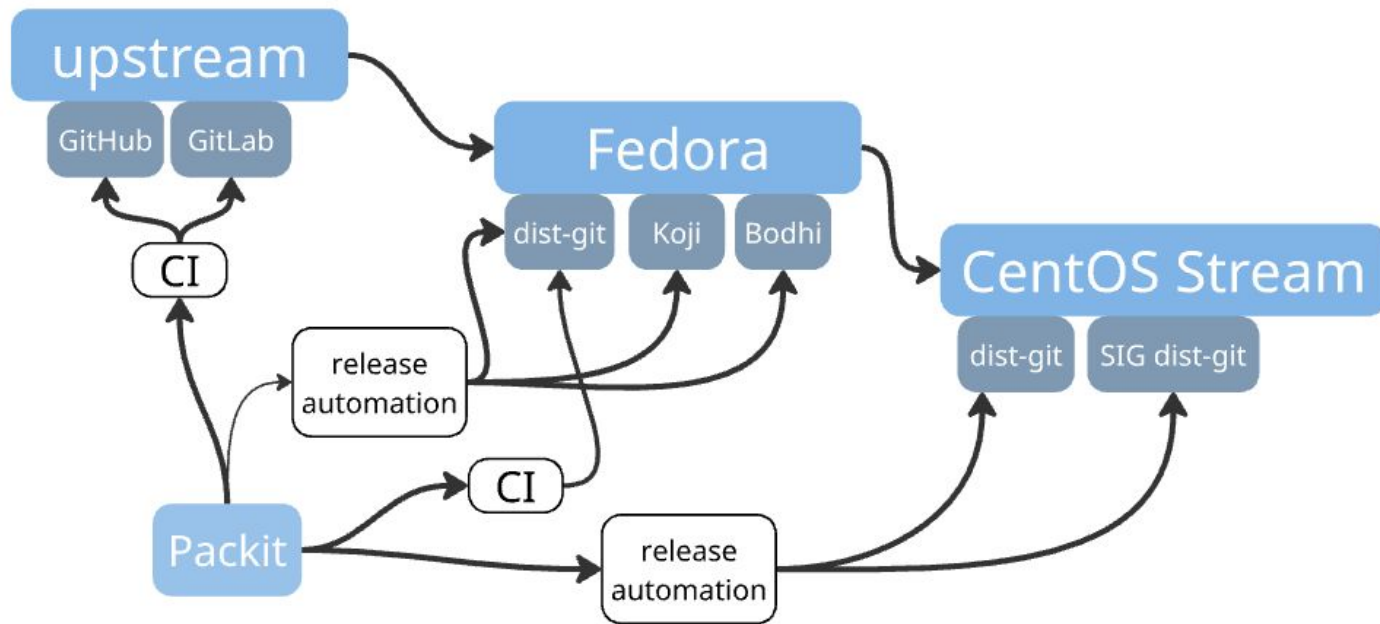
Reply...

Reopen thread



# Packit

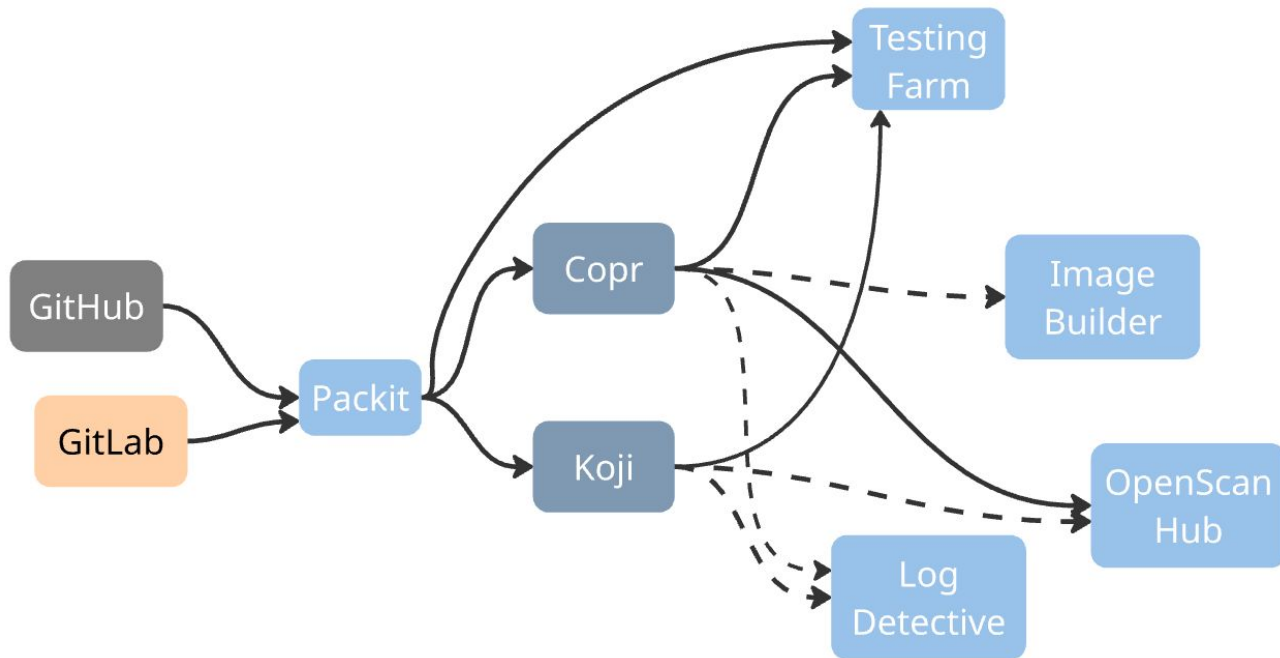
<https://packit.dev/>





# Packit as a CI

<https://packit.dev/>





# Tmt

<https://tmt.readthedocs.io/>

- Manage tests and testing environments
  - What tests to run
  - Distro, container, packages to install
- The same in CI and locally
- Share and reuse test definitions

```
/plan:
  prepare:
    how: install
    package:
      - hello
  execute:
    how: tmt

/tests:
  /smoke:
    test: hello --version
  /pytest:
    test: pytest
```



# Testing-farm


<https://testing-farm.io/>

- Run tmt tests in the cloud
- Provide requested hardware (from tmt)
- Display run results



**failed**

☒ Show passed tests

▼ /installability   
x86\_64 Fedora-Rawhide

[Go to Logs and Artifacts](#)

► /prepare

▼ /installability/installability

[data/viewer.html](#)

**Installability**

Legend:

SKIP

OK

INFO

VERIFY

BAD

update

downgrade

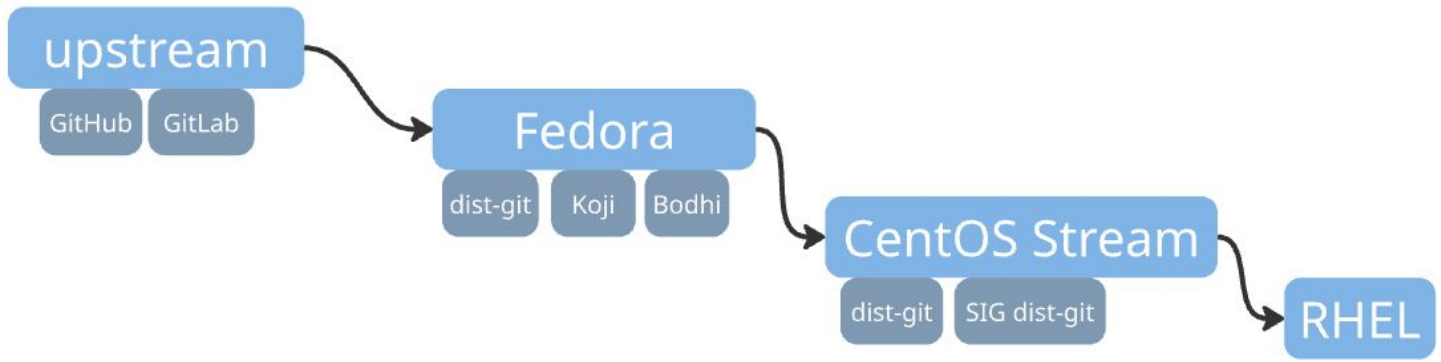
remove

download build

**install**

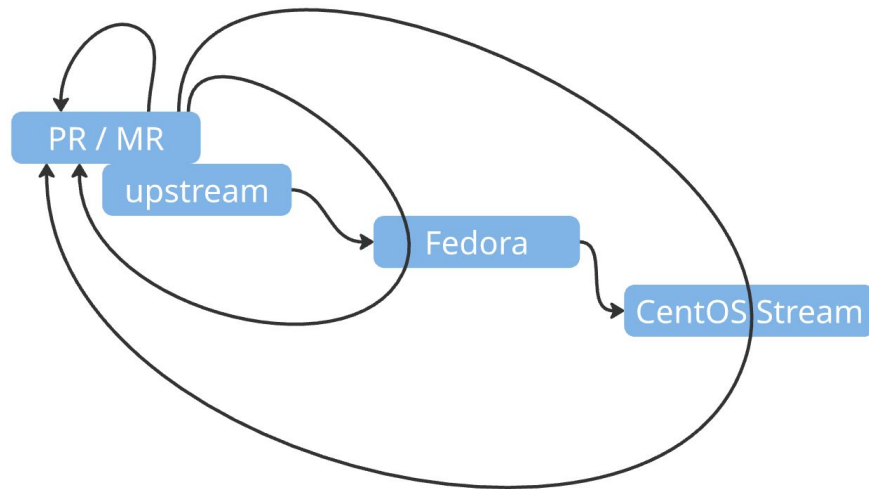
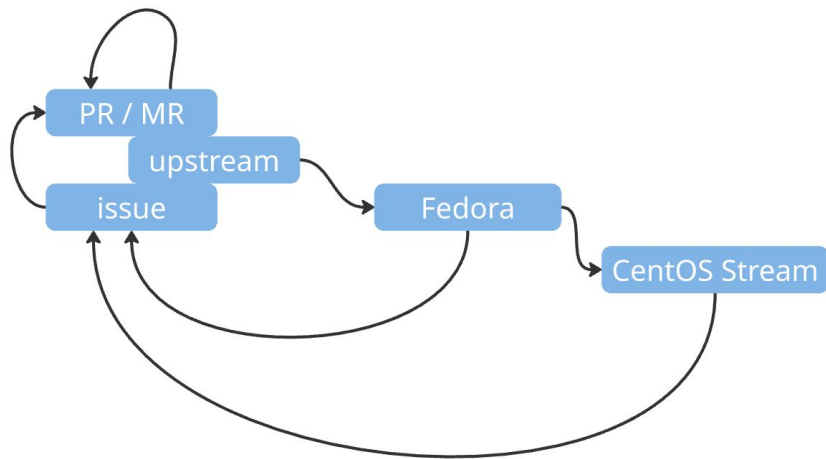
# Shifting left





<<< shift-left

# Shifting left

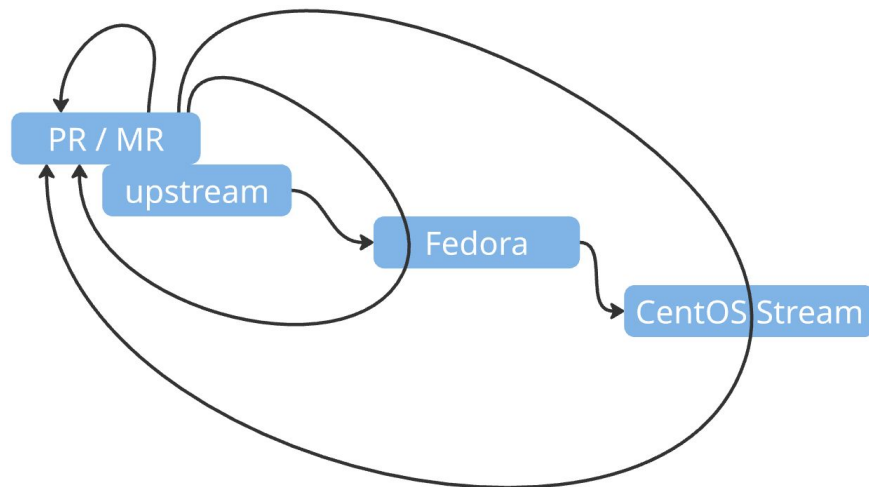




# Shifting left

*TEST*

→ provide tests and testing infrastructure

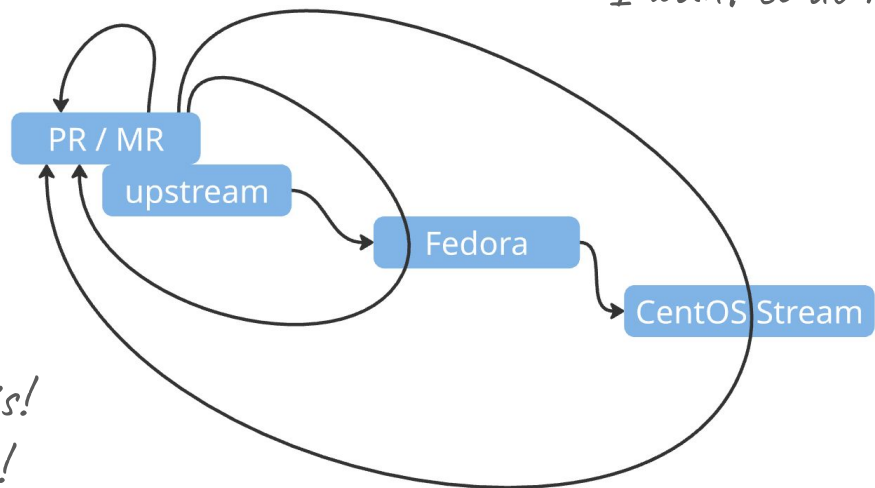


*VERIFY*

→ provide environment

# Shifting left

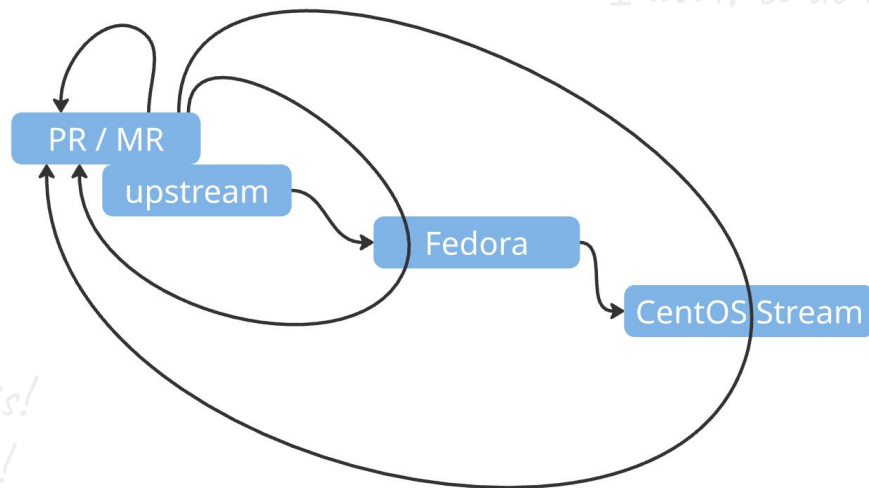
*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



*More work for us!  
I don't understand this!  
I don't want this here!*

# Shifting left

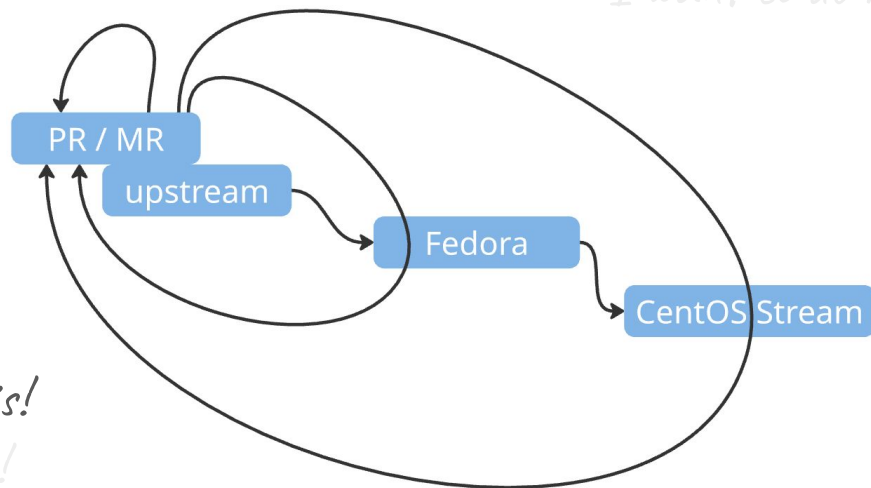
*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



*More work for us!  
I don't understand this!  
I don't want this here!*

# Shifting left

*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



*More work for us!  
I don't understand this!  
I don't want this here!*



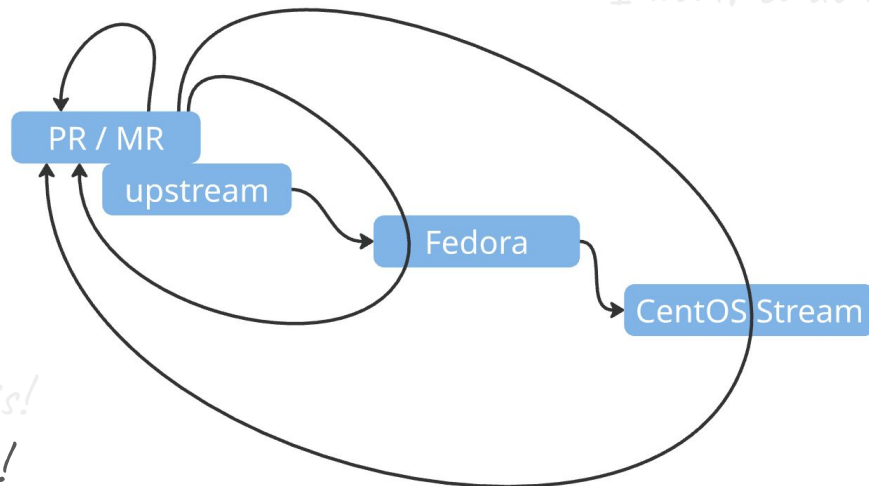
packit-as-a-service bot commented last week

Cockpit tests failed for commit [5112e97](#) . @martinpitt, @jelly, @mvollmer please check.



# Shifting left

*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



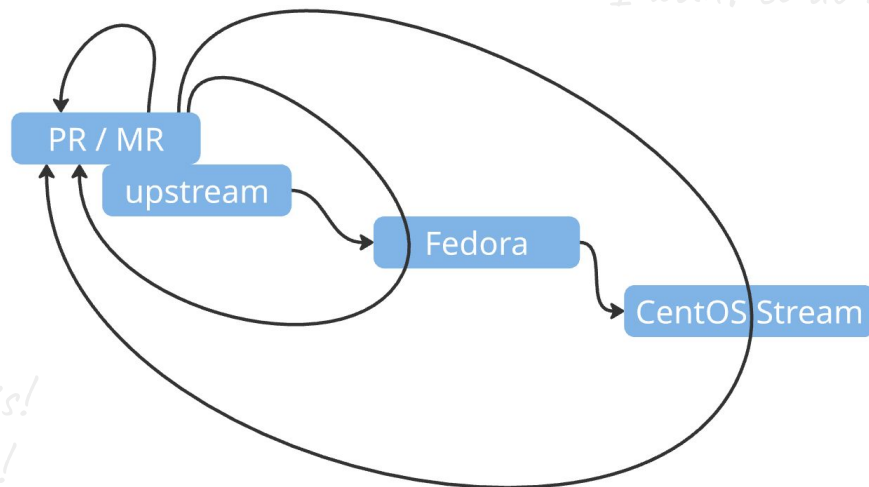
*More work for us!  
I don't understand this!  
I don't want this here!*

# Shifting left

*We don't trust these people!*

*I want to do real "stuff", no upstream!*

*Too many upstreams...*

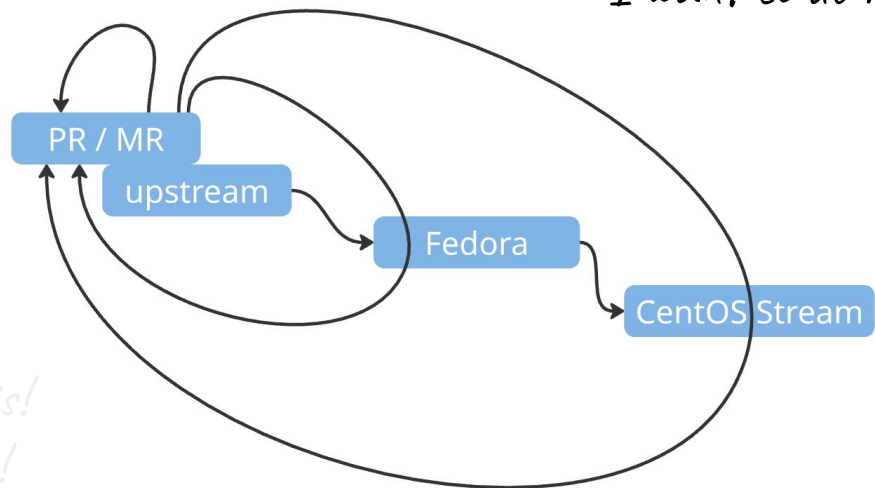


*More work for us!*

*I don't understand this!*

*I don't want this here!*

# Shifting left

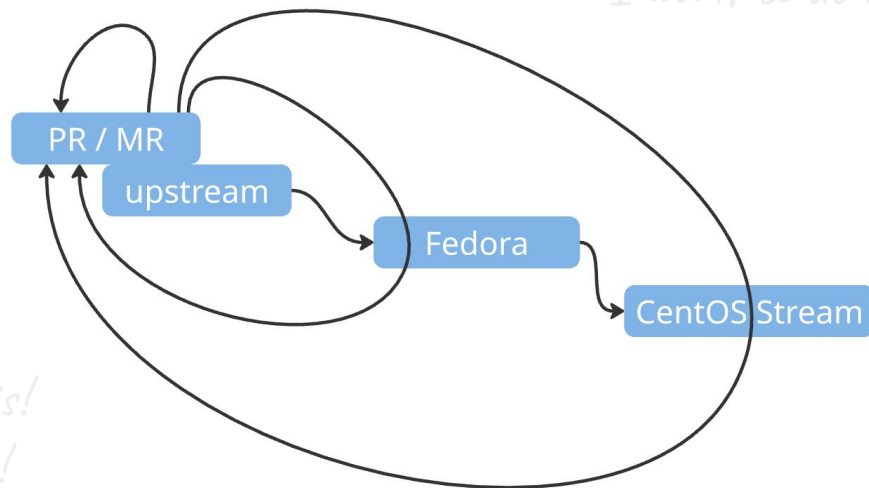


*We don't trust these people!*  
*I want to do real "stuff", no upstream!*  
*Too many upstreams...*

*More work for us!*  
*I don't understand this!*  
*I don't want this here!*

# Shifting left

*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



*More work for us!  
I don't understand this!  
I don't want this here!*



# Test sharing (shifting left in practice)



# Sharing tests with tmt

From upstream to downstream

- Just install the package, packit/Fedora-CI will pass the package to test
- Bypass limitation of test environment, e.g. no internet connection in spec file tests
- Can use test files from the source (git repo, srpm, etc.)

```
/plan:
  prepare:
    how: install
    package:
      - hello
  execute:
    how: tmt

/tests:
  /smoke:
    test: hello --version
  /pytest:
    test: pytest
```

# Sharing tests with tmt

Across packages

- Import common tests/plans, e.g. rpminspect, installability
- Reverse dependency tests (import tests from other packages)

```
/rpminspect:
  plan:
    import:
      name: /rpminspect
      url: https://github.com/fedora-ci/rpminspect-pipeline/
/rpmlint:
  plan:
    import:
      name: /plans/rpmlint
      url: https://github.com/packit/tmt-plans/
```

# Example: scikit-build-core (definition)

Files

main

Go to file

▼

.distro

>

.fmf

>

plans

▼

tests

smoke.fmf

python-scikit-build-core.spec

>

.fmf

scikit-build-core / .distro / tests / smoke.fmf

LecrisUT ci: tmt tests improvements (#899)

Code

Blame

9 lines (8 loc) · 189 Bytes

```
1  # Common test variables
2  tag: [ smoke ]
3  tier: 0
4  path: /
5
6  # Define tests
7  /version:
8      summary: Read version
9      test: python3 -c "import scikit_build_core; print(scikit_build_core.__version__)"
```

# Example: scikit-build-core (definition)

Files

main

Go to file

tests

api/simple\_pure/.cmake/api/v1

packages

utils

conftest.py

main.fmf

plans.fmf

test\_auto.py

test\_broken\_fallback.py

test\_build\_cli.py

test\_builder.py

test\_cmake\_setup.py



scikit-build-core / tests / main.fmf


LecrisUT ci: Add more integration tests in Fedora (#800)

Code Blame 17 lines (17 loc) · 469 Bytes



















```
1 /pytest:
2   summary: Run pytest tests
3   tag: [ pytest ]
4   # TODO: filter only for network marked tests
5 /all:
6   summary: All pytest
7   # TODO: Find a better way to deal with lack of git data
8   path: /
9   test: |
10      # Fake a git archive
11      cat << EOF > .git_archival.txt
12      node: 47431d4eefbac9c3a7c49e62c73e624b932023eb
13      node-date: 2025-02-27T16:18:39-05:00
14      describe-name: v0.11.0
15      EOF
16      # Actually run pytest
17      python3 -m pytest
```

# Example: scikit-build-core (upstream)

jwlawson/actions-setup-cmake from 2...  51a6bb0 · 3 days ago  902 Commits

**All checks have passed** 

61 successful checks

		testing-farm:main:centos-stream-10-aarch64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:centos-stream-10-x86_64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-42-aarch64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-42-x86_64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-43-aarch64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-43-x86_64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-rawhide-aarch64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-rawhide-x86_64:downstream - Tests passed ...	<a href="#">Details</a>
		testing-farm:main:fedora-rawhide-x86_64:upstream - Tests passed ...	<a href="#">Details</a>

# Example: scikit-build-core (upstream)



**passed**

▶ /plans/examples 🔍  
■ x86\_64 🌐 Fedora-Rawhide

▼ /plans/smoke 🔍  
■ x86\_64 🌐 Fedora-Rawhide

[Go to Logs and Artifacts](#)



▼ /tests/smoke/version

[testout.log](#)


0.11.7.dev41+g51a6bb0

# Example: scikit-build-core (upstream)



▼ /tests/plans/pytest   
■ x86\_64  Fedora-Rawhide

[Go to Logs and Artifacts](#)

▼ /tests/pytest/all 


[testout.log](#)

```
===== test session starts =====
platform linux -- Python 3.14.2, pytest-9.0.2, pluggy-1.6.0
installed packages of interest: hatch-fancy-pypi-readme==25.1.0 packaging==26.0 pathspec==1.0.4 pip==25.3 scikit_build_core==0.11.0 setuptools==80.10.2 setuptools
sysconfig platform: linux-x86_64
rootdir: /var/ARTIFACTS/work-pytestnv84kp8f/tests/plans/pytest/discover/default-0/tests
configfile: pyproject.toml
testpaths: tests
plugins: xdist-3.8.0, subprocess-1.5.3
collected 473 items

tests/test_auto.py ..... [ 4%]
tests/test_broken_fallback.py .... [ 4%]
tests/test_build_cli.py ..... [ 6%]
tests/test_builder.py .....XS..... [ 12%]
tests/test_cmake_ast.py ..... [ 20%]
```



# Example: scikit-build-core (downstream)

 Pull-Request has been merged by lecris		6 months ago
<b>Packit - scratch build - rawhide</b> RPM build succeeded.	<b>success</b>	Fri, 27 Jun 2025 04:59:41 GMT
<b>Fedora CI - scratch build</b> Package tests for 47cb951a: passed	<b>success</b>	Fri, 27 Jun 2025 05:01:49 GMT
<b>Packit - custom test(s) - rawhide</b> Error ...	<b>error</b>	Fri, 27 Jun 2025 05:04:28 GMT
<b>Packit - installability test(s) - rawhide</b> Tests passed ...	<b>success</b>	Fri, 27 Jun 2025 05:05:20 GMT
<b>Fedora CI - installability</b> Package tests for 47cb951a: passed	<b>success</b>	Fri, 27 Jun 2025 05:06:31 GMT
<b>Fedora CI - dist-git test</b> Package tests for 47cb951a: passed	<b>success</b>	Fri, 27 Jun 2025 05:07:55 GMT
<b>Zuul</b> Jobs result is success	<b>success</b>	Fri, 27 Jun 2025 05:11:14 GMT
<b>Build completed</b> Built as python-scikit-build-core-0.11.5-1.fc43	<b>success</b>	Mon, 21 Jul 2025 10:16:43 GMT

# Example: scikit-build-core (downstream)



▶ /plans/examples 🔑  
■ x86\_64 🌐 Fedora-Rawhide

▼ /plans/smoke 🔑  
■ x86\_64 🌐 Fedora-Rawhide

[Go to Logs and Artifacts](#)

▼ /tests/smoke/version 🔑

[testout.log](#)

0.11.5

# Example: scikit-build-core (downstream)



▼ /installability

x86\_64 Fedora-Rawhide

[Go to Logs and Artifacts](#)

▶ /prepare

▼ /installability/installability

[data/viewer.html](#)

**Installability**

Legend: SKIP OK INFO **VERIFY** **BAD**

download build

install

update

downgrade

remove

# How to get involved



# How can I get involved?

Try doing tests in upstream and downstream

- Try shifting left in your distribution
- Tmt in principle can support other distributions
- Try making a simple plan+test locally. Packit will handle the rest.
  - Just run: `tmt run`
- What is the basic functionality of the project and can you make a simple test for it?
- What limitations of the CI can you overcome with these?

```
/plan:
  prepare:
    how: install
    package:
      - hello
  execute:
    how: tmt

/tests:
  /smoke:
    test: hello --version
  /pytest:
    test: pytest
```

# How can I get involved?

Contribute to shared tests

- Use and report issues.
- <https://github.com/fedora-ci/installability-pipeline/>
- <https://github.com/fedora-ci/rpminspect-pipeline/>
- <https://github.com/packit/tmt-plans/>
- Soon a single repo indexing
- #fedora-ci:fedoraproject.org

```
/rpminspect:
  plan:
    import:
      name: /rpminspect
      url: https://github.com/fedora-ci/rpminspect-pipeline/
/rpmlint:
  plan:
    import:
      name: /plans/rpmlint
      url: https://github.com/packit/tmt-plans/
```

#packit:fedora.im  
@packit@fosstodon.org  
<https://packit.dev>



Questions?