



From Code to Distribution: Building a Complete Testing Pipeline



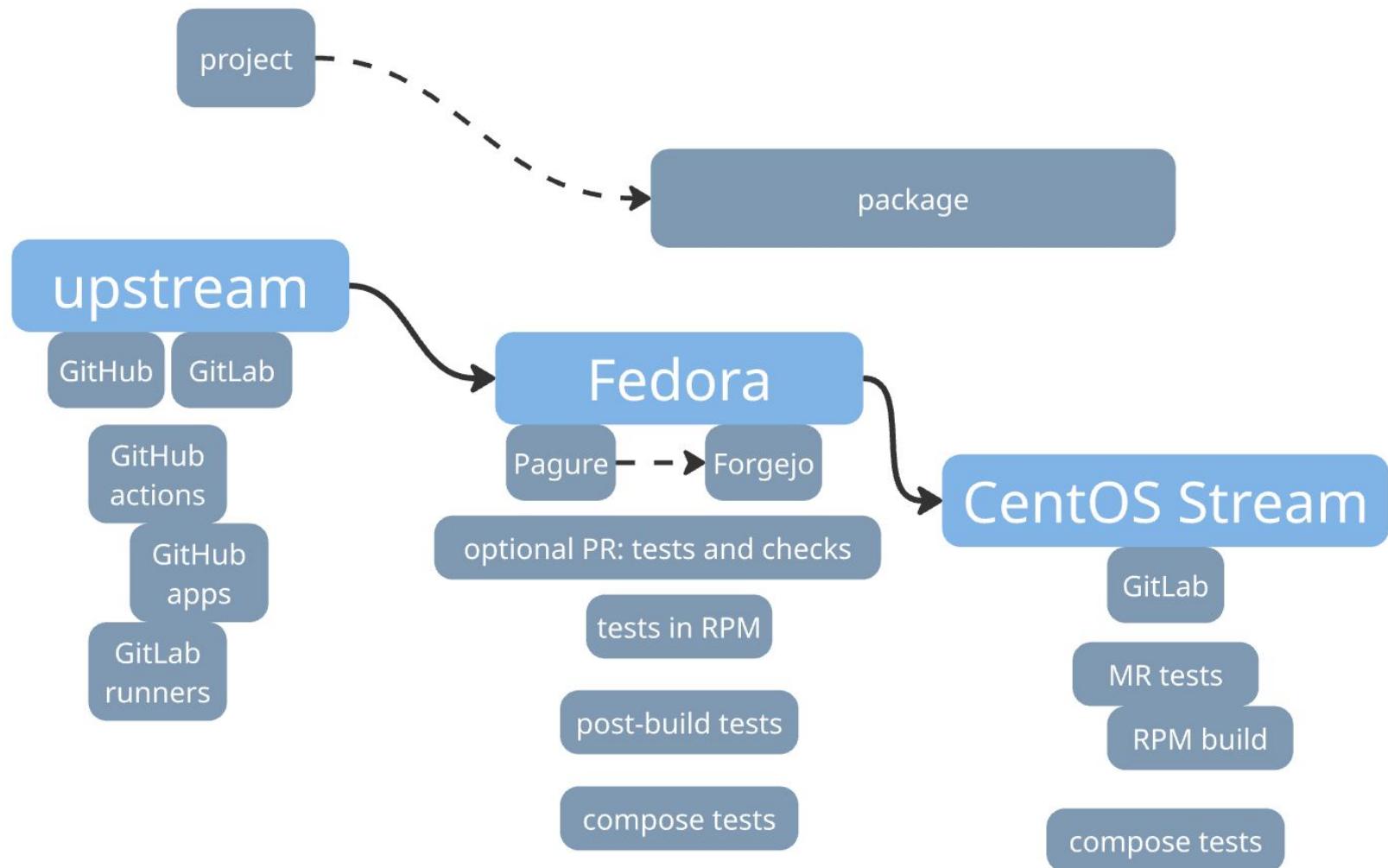
A decorative graphic in the bottom left corner consists of several dotted lines forming a stylized, winding path or staircase pattern against a dark blue background.

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(Principal Software Engineer)
PTE PO @ RH

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(Senior Software Engineer)
tmt team @ RH

Agenda

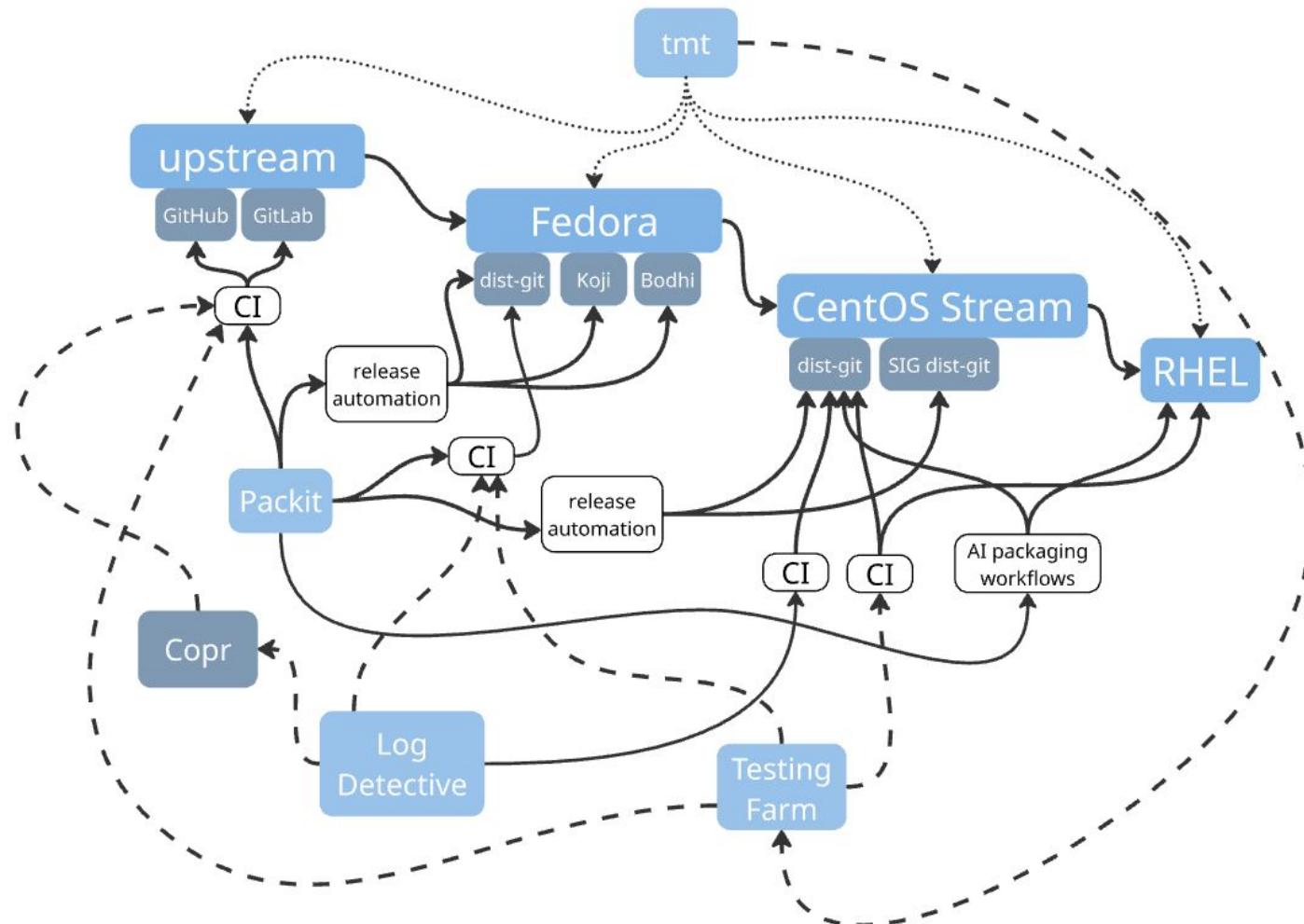
- Flow of code
- Packaging and Testing Experience projects
- Shifting left
- Test sharing
- Collaboration



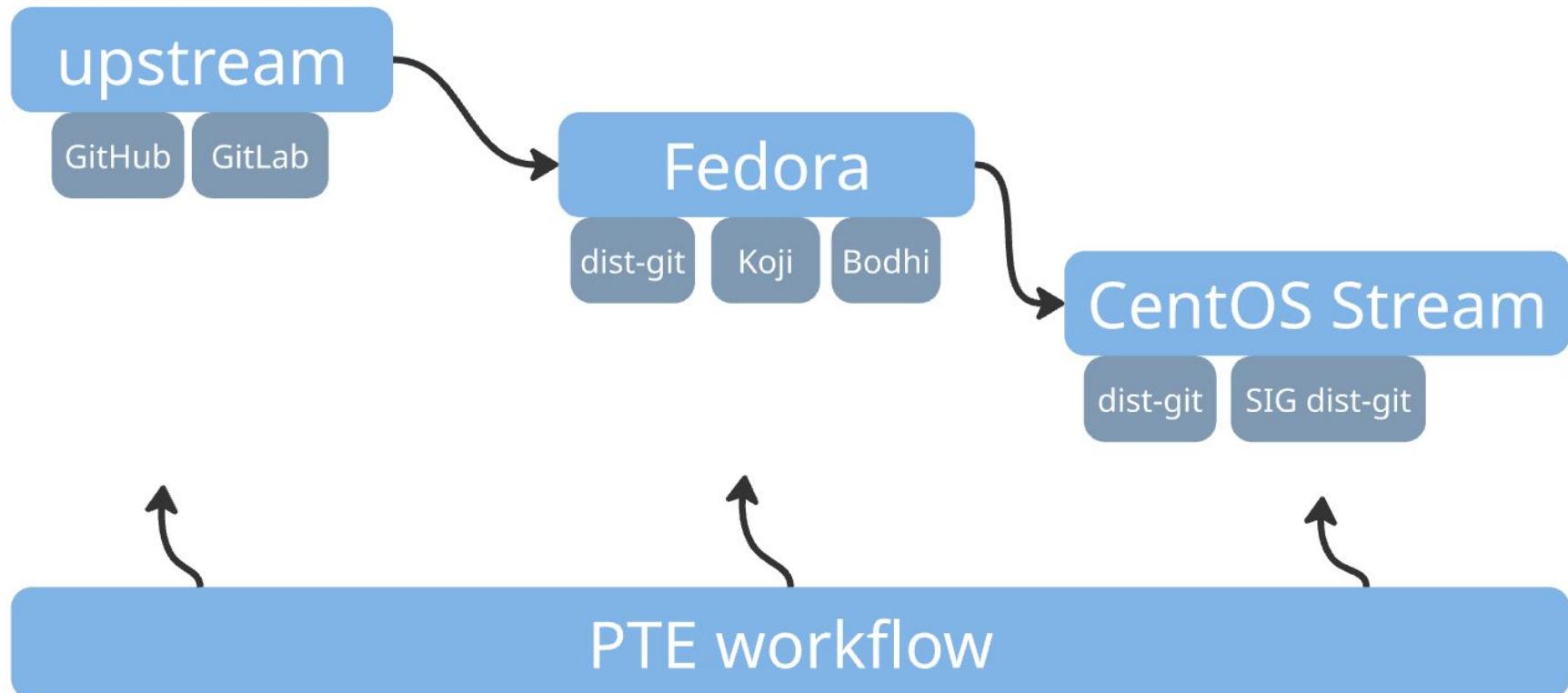
Packaging and Testing projects

+ *Experience*





unification





Copr

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

Name ^	Last Build Version	Last Build Submitted	Last Build Status	Automatic Build	Actions
atuin	18.6.1-1	26 days ago	✖ failed	Disabled	-
rust-axum-server	0.7.2-1	5 months ago	✔ succeeded	Disabled	-
rust-interim	0.2.1-1	5 months ago	✔ succeeded	Disabled	-

Show entries

« < of 1 > »

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

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/
Development/
20/21 Test #20: test_ruby_libdnf5_utils/test_patterns.rb .....***Not Run 0.00 s
    Start Z1: 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_set_operators.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 CTTest
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-raw
INFO: Results and/or logs in: /var/lib/copr-rpmbuild/results
INFO: Cleaning up build root ('cleanup_on_failure=True')
INFO: clean_chroot
INFO: unmounting tmpfs.
Finish: clean chroot
ERROR: Command failed:
# /usr/bin/systemd-spawn -q -M ec9af141fd814a06a7662034669d845e -D /var/lib/mock/fedora-rawhid
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.

Like Dislike Delete

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

Like Dislike

How to fix the issue?

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

Like Dislike

Ready to submit the results?

Submit

Log Detective

<https://logdetective.com/>

 **Log Detective** @group_8794173_bot_029d2e92d461920a3695e55137a87774 2 days ago

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

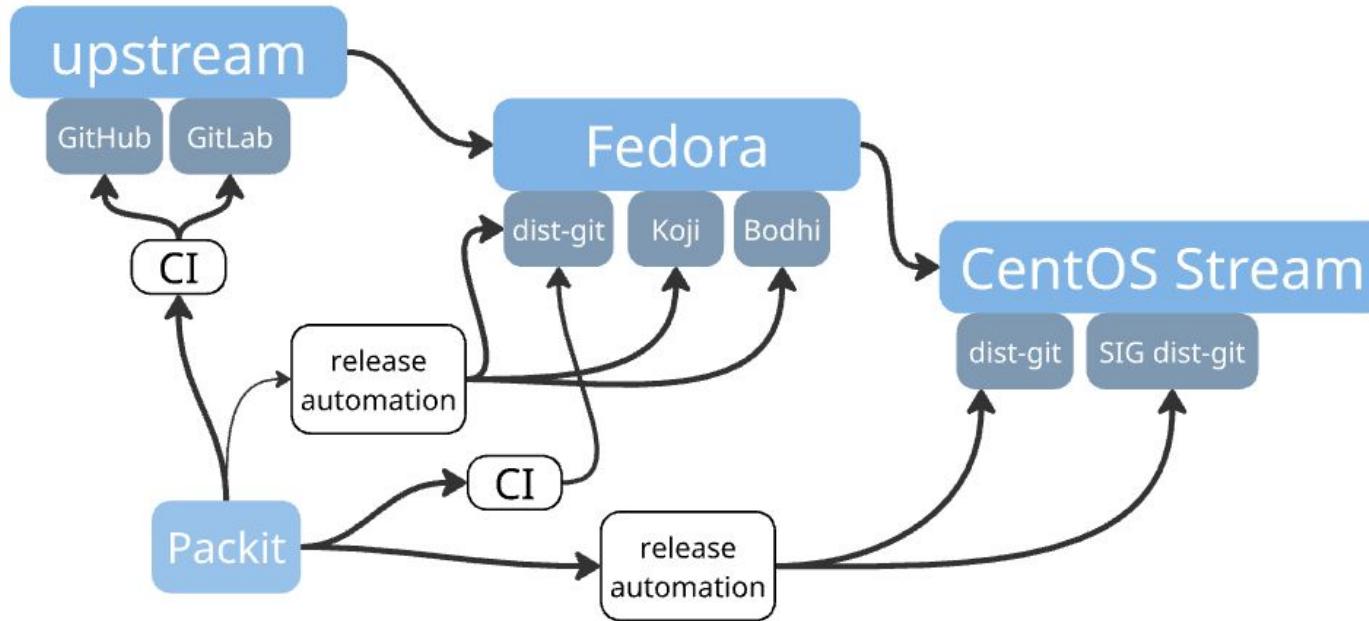
updated.

Reply... Reopen thread



Packit

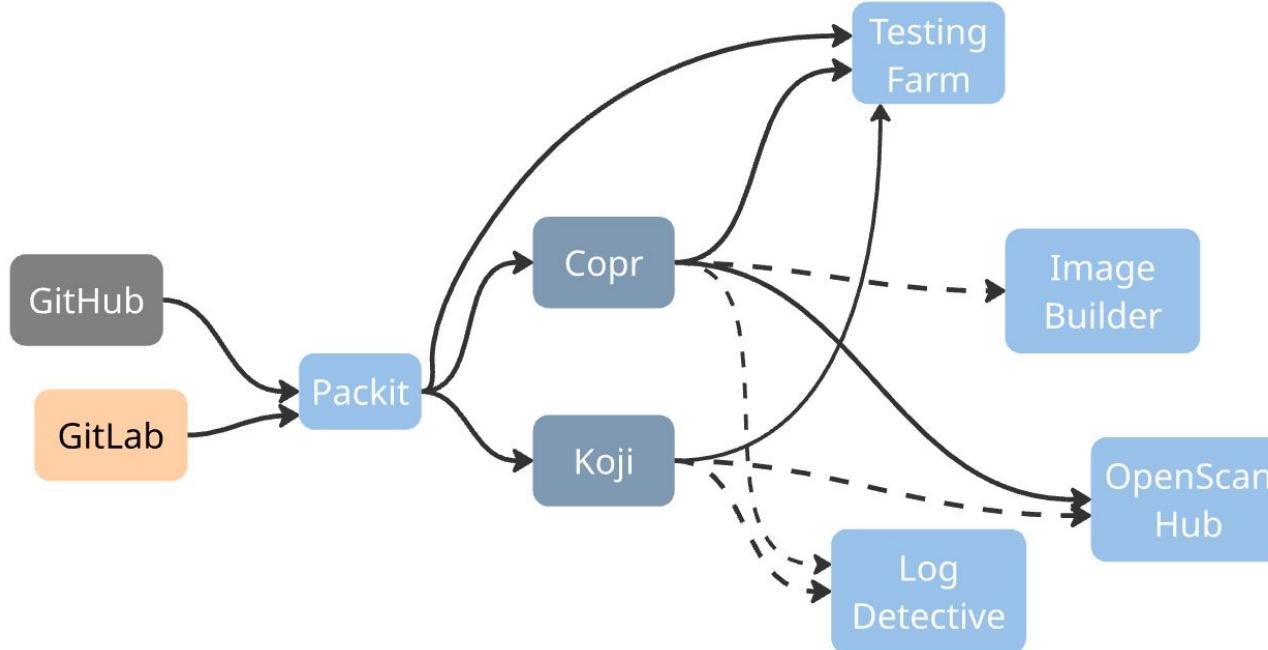
<https://packit.dev/>





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](#)

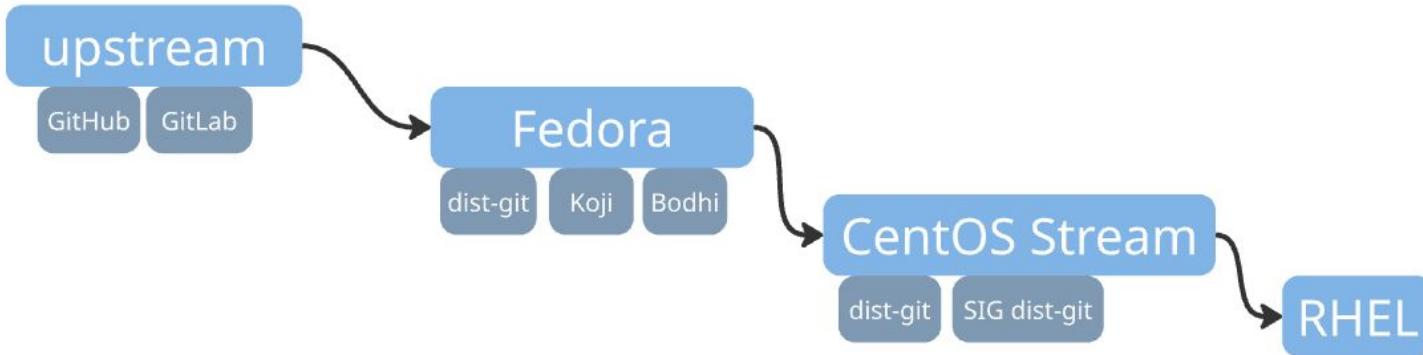
Installability Legend: SKIP OK INFO VERIFY BAD

update downgrade remove download build

install

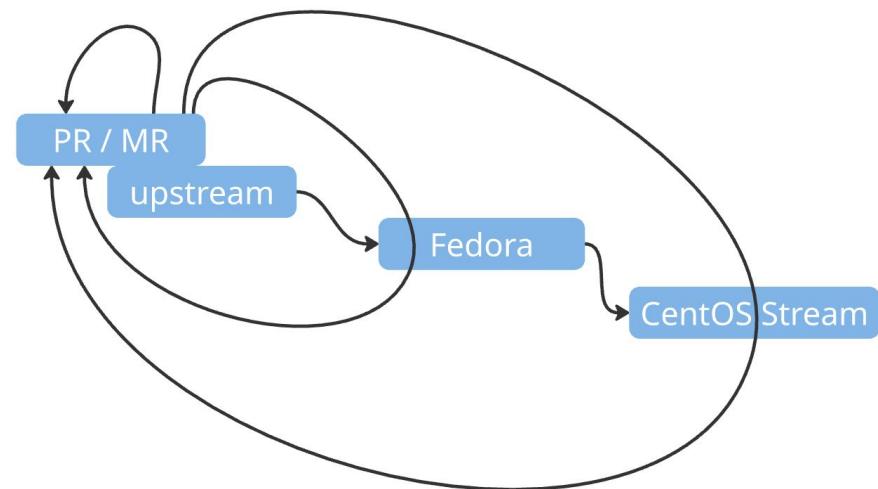
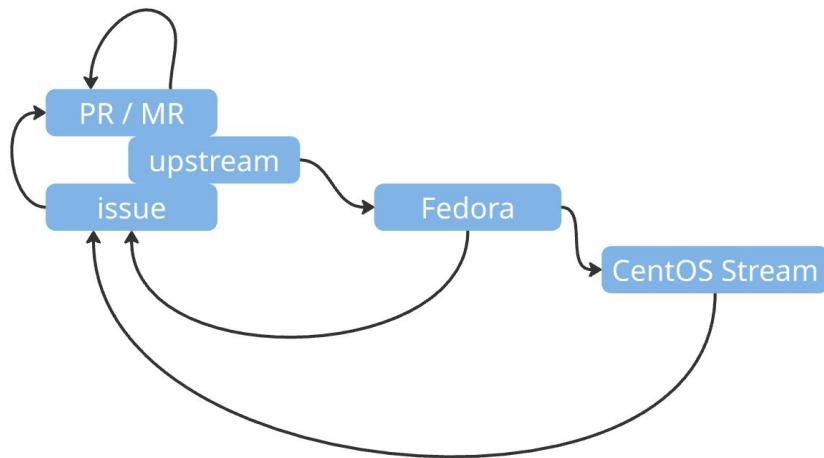
Shifting left





<<< shift-left

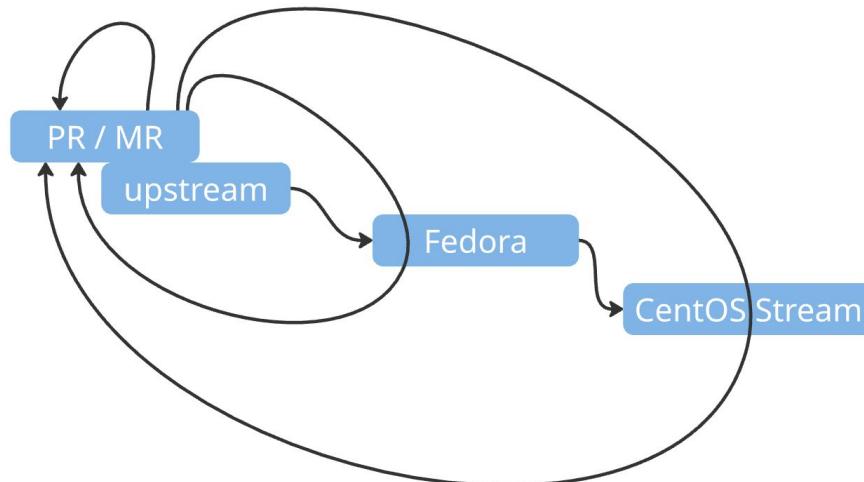
Shifting left



Shifting left

TEST

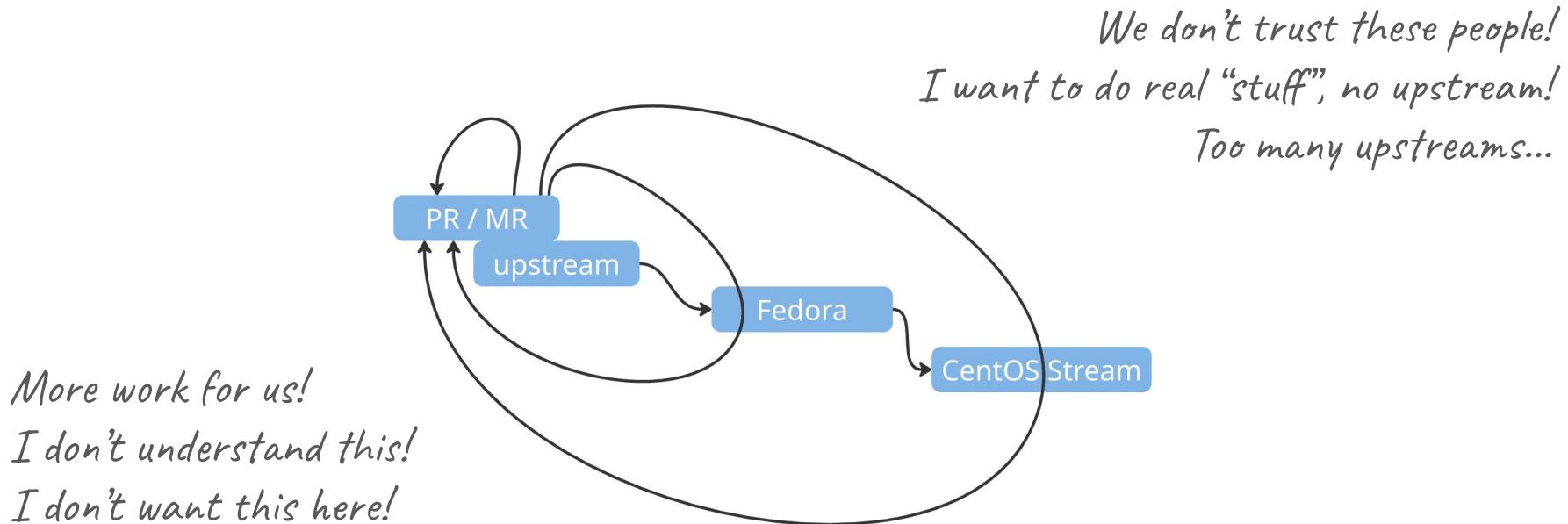
→ provide tests and testing infrastructure



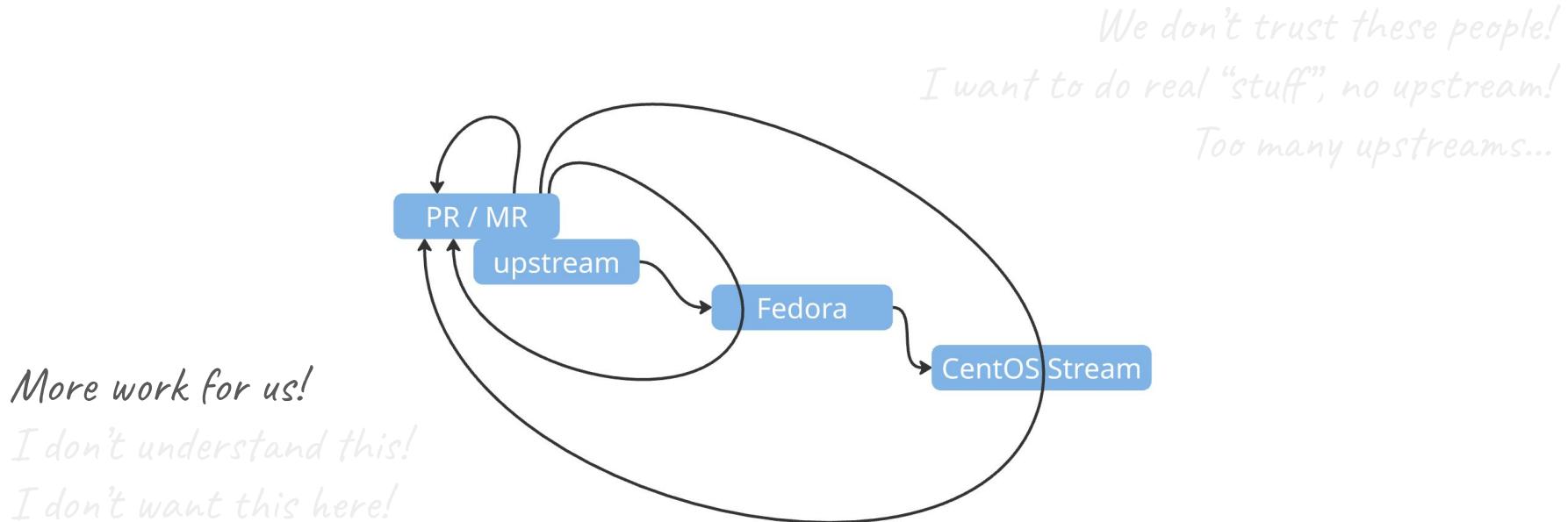
VERIFY

→ provide environment

Shifting left



Shifting left

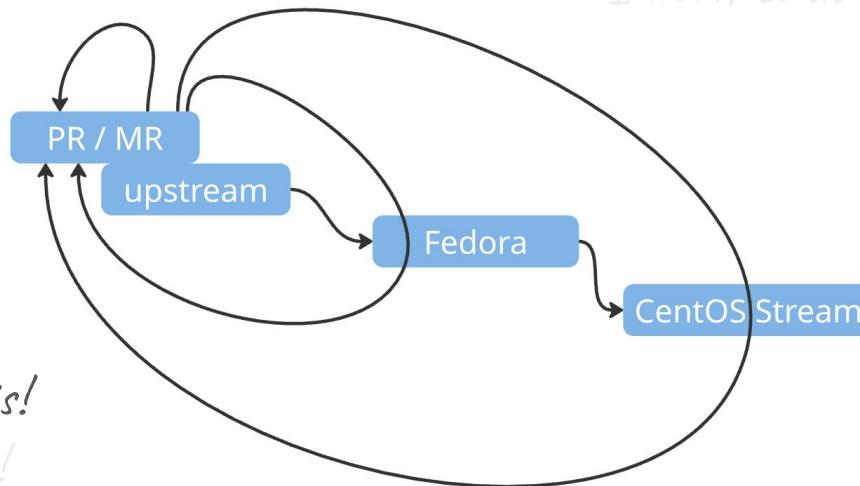


Shifting left

More work for us!

I don't understand this!

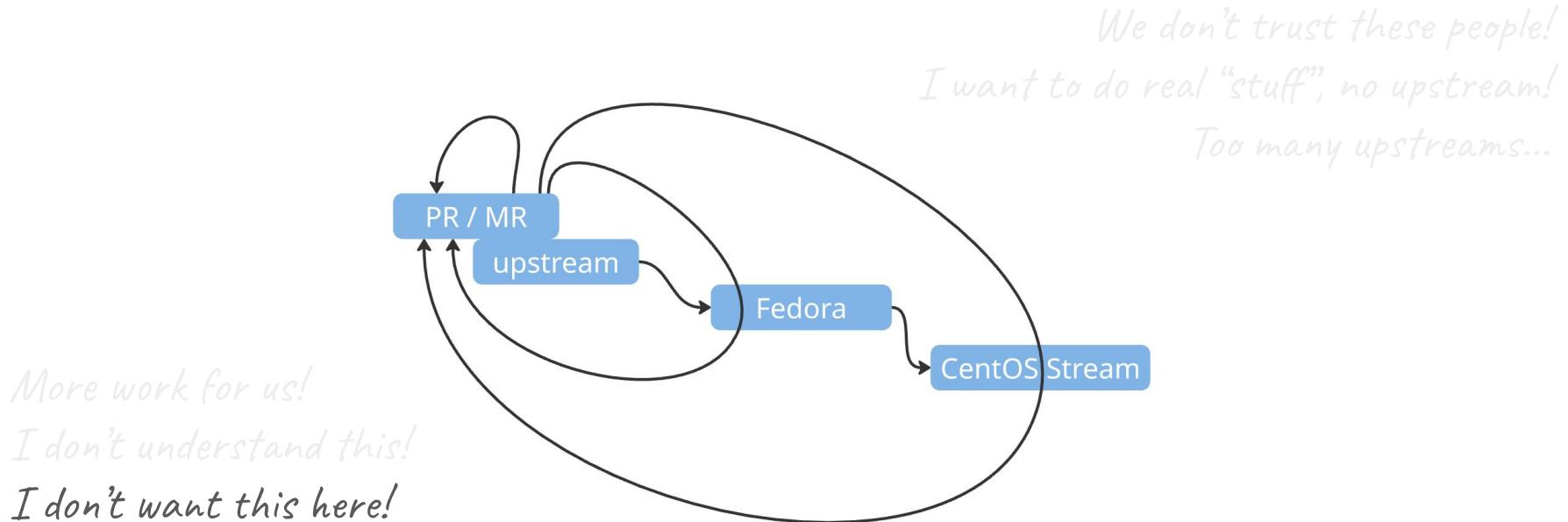
I don't want this here!



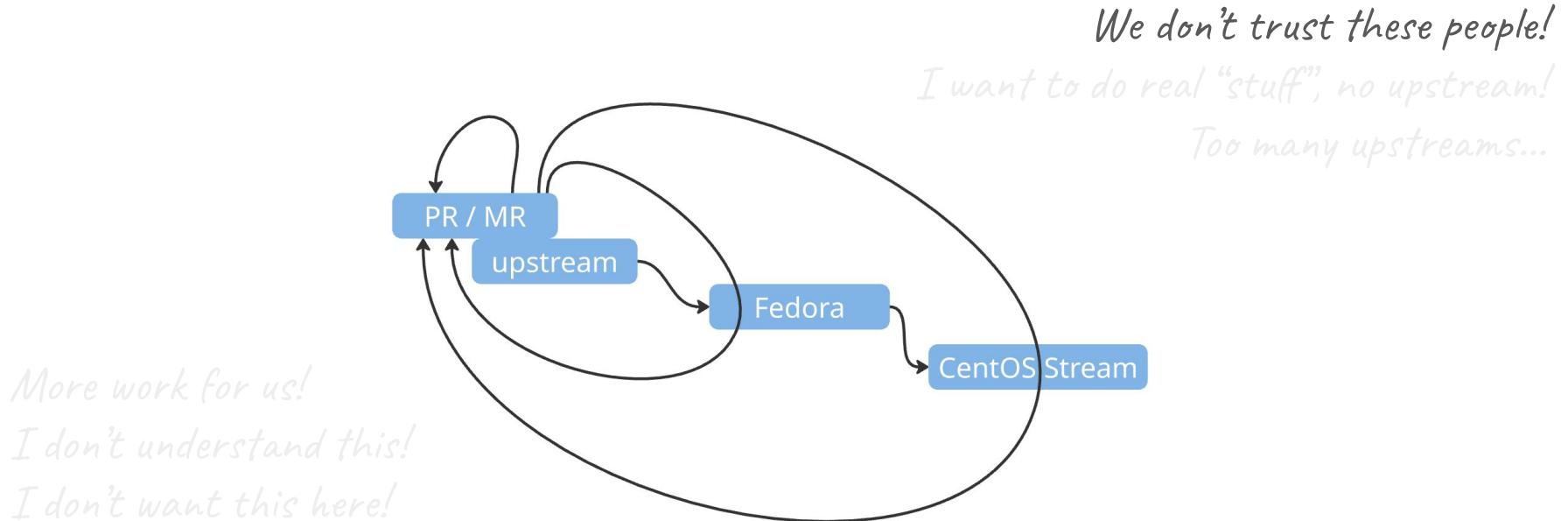
*We don't trust these people!
I want to do real "stuff", no upstream!
Too many upstreams...*



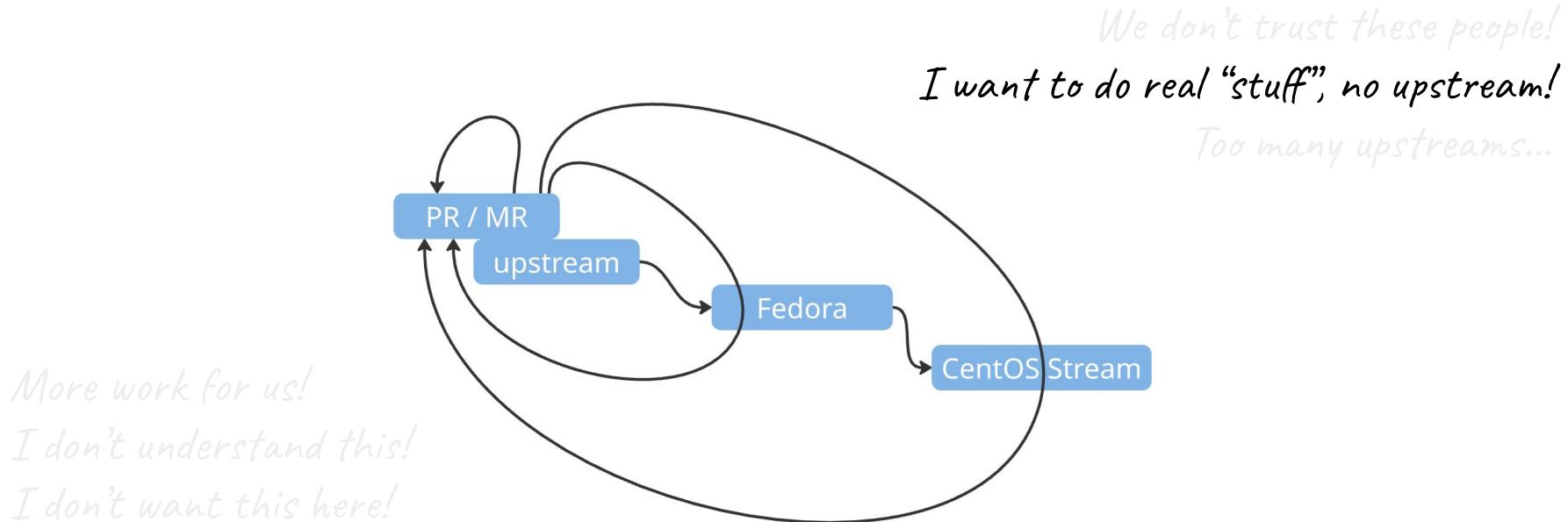
Shifting left



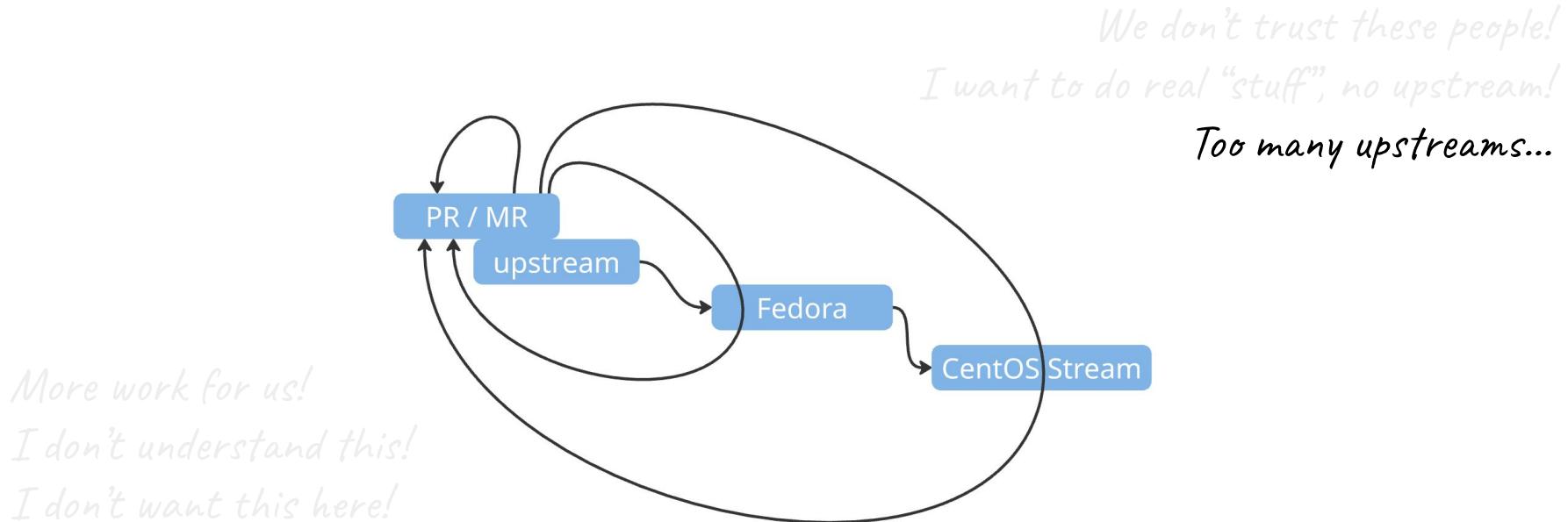
Shifting left



Shifting left



Shifting left



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)

The screenshot shows a code editor interface with a sidebar and a main content area.

Sidebar (Files):

- main
- Go to file
- .distro
- .fmf
- plans
- tests
 - smoke.fmf
- python-scikit-build-core.spec
- .fmf

Main Content Area:

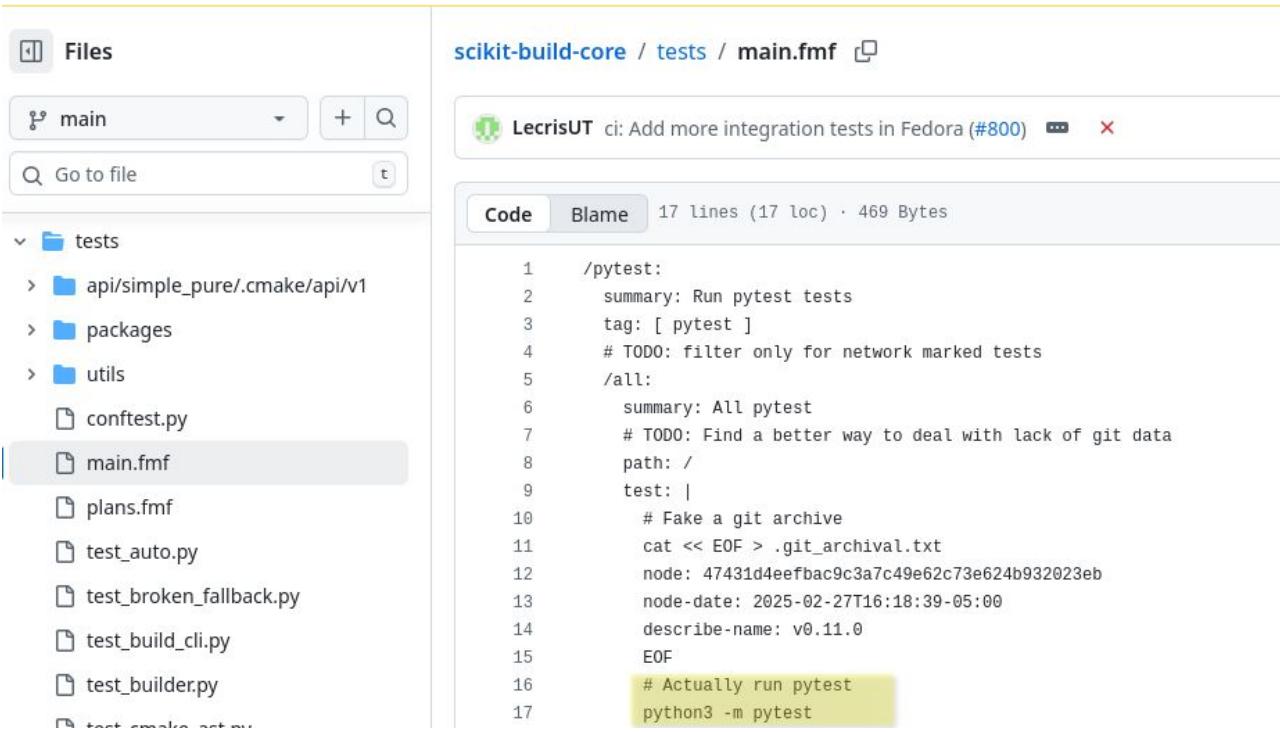
scikit-build-core / .distro / tests / smoke.fmf

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)



The screenshot shows a code editor interface with two panes. The left pane is a file browser titled "Files" with a search bar. It lists several files and folders under a "main" directory, including "tests", "api/simple_pure/.cmake/api/v1", "packages", "utils", "conftest.py", "main.fmf" (which is selected and highlighted with a blue border), "plans.fmf", "test_auto.py", "test_broken_fallback.py", "test_build_cli.py", "test_builder.py", and "test_cmake_list.py". The right pane displays the contents of the "main.fmf" file. The file starts with a shebang line and contains configuration for pytest tests, including paths, test selection, and git archival details. The last line of the file, which runs pytest, is highlighted with a yellow background.

```
#!/usr/bin/python  
#  
# pytest:  
# summary: Run pytest tests  
# tag: [ pytest ]  
# TODO: filter only for network marked tests  
# all:  
# summary: All pytest  
# TODO: Find a better way to deal with lack of git data  
# path: /  
# test: |  
#     # Fake a git archive  
#     cat << EOF > .git_archival.txt  
#     node: 47431d4eefbac9c3a7c49e62c73e624b932023eb  
#     node-date: 2025-02-27T16:18:39-05:00  
#     describe-name: v0.11.0  
#     EOF  
#     # Actually run pytest  
#     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 ...	Details
✓	testing-farm:main:centos-stream-10-x86_64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-42-aarch64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-42-x86_64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-43-aarch64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-43-x86_64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-rawhide-aarch64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-rawhide-x86_64:downstream - Tests passed ...	Details
✓	testing-farm:main:fedora-rawhide-x86_64:upstream - Tests passed ...	Details

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

Example: scikit-build-core (downstream)



passed

► /plans/examples 🔎
■ x86_64 🌐 Fedora-Rawhide

▼ /plans/smoke 🔎
■ x86_64 🌐 Fedora-Rawhide

[Go to Logs and Artifacts](#)

▼ /tests/smoke/version 🔎

[testout.log](#)

0.11.5

Example: scikit-build-core (downstream)



▼ /installability ↗
 ■ x86_64 ● Fedora-Rawhide

[Go to Logs and Artifacts](#)

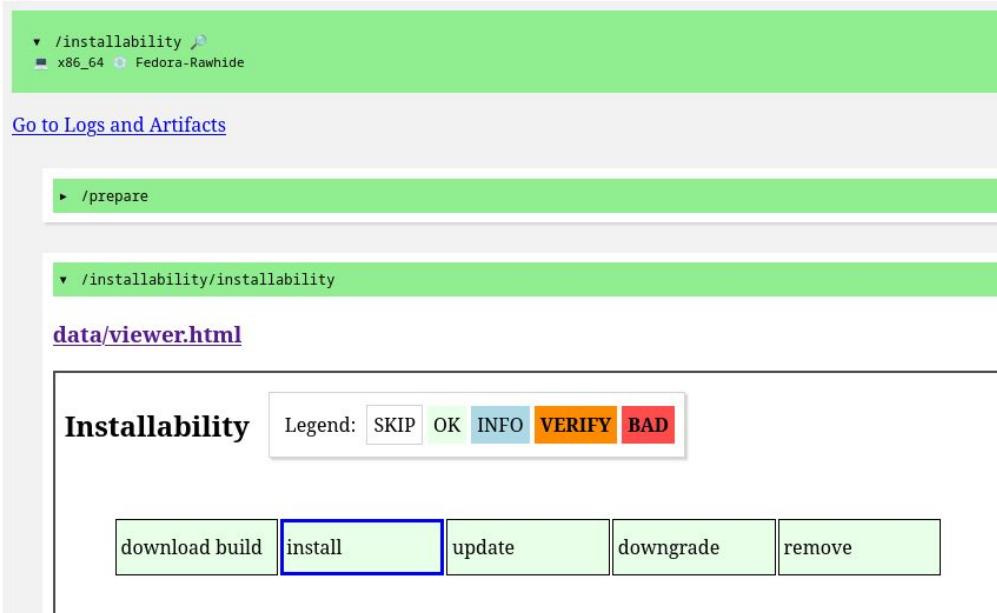
► /prepare

▼ /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:fedoraim
@packit@fosstodon.org
<https://packit.dev>



Questions?