



# From Code to Distribution: Building a Complete Testing Pipeline

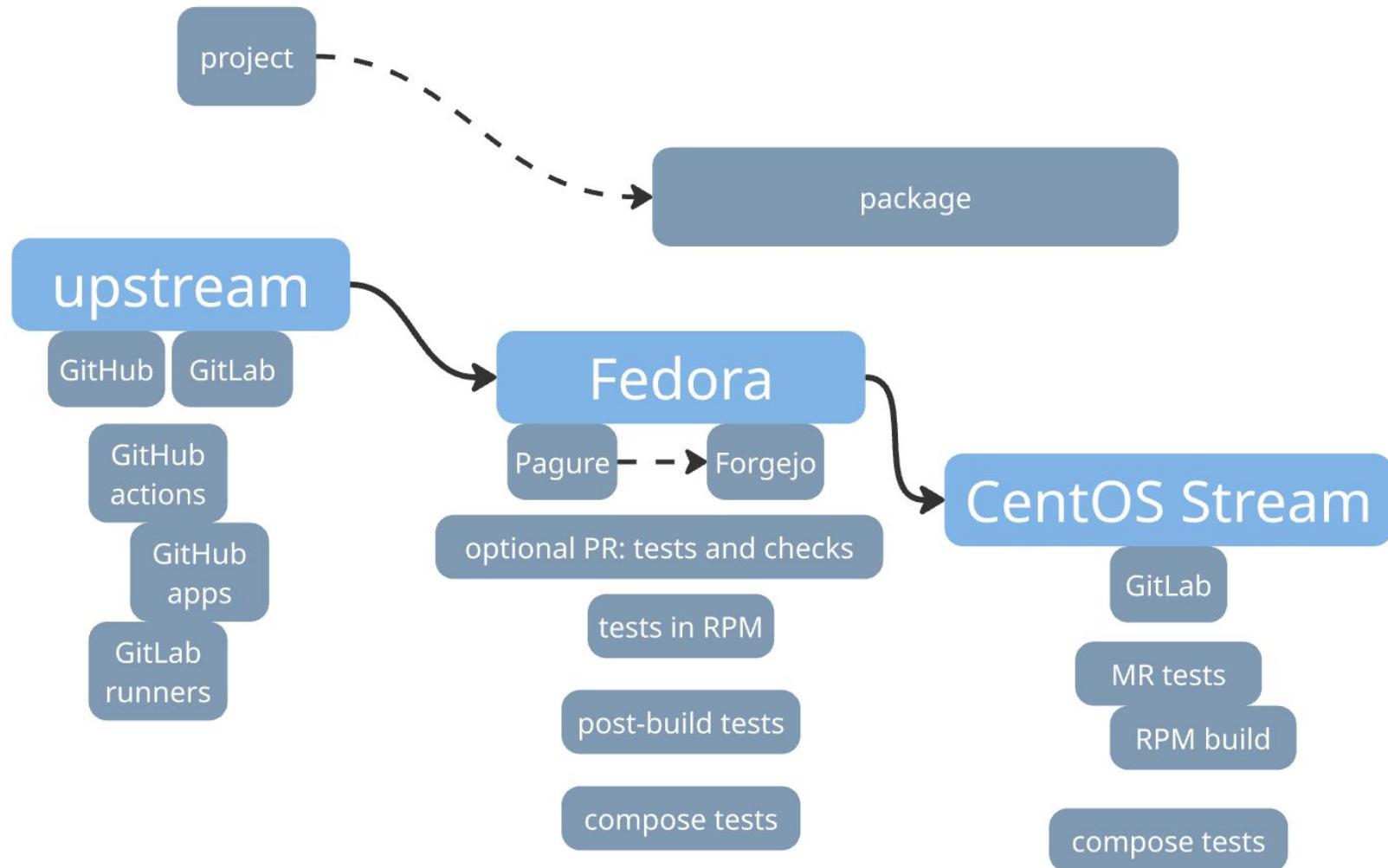
A decorative graphic in the background consists of several thin, light-gray dotted lines of varying lengths, some ending in small circles. These lines are arranged in a way that suggests a flow or a network, with a larger, more prominent cluster on the left side containing the speakers' names and titles.

František Lachman  
(Principal Software Engineer)  
PTE PO @ RH

Cristian Le  
(Senior Software Engineer)  
tmt team @ RH

# Agenda

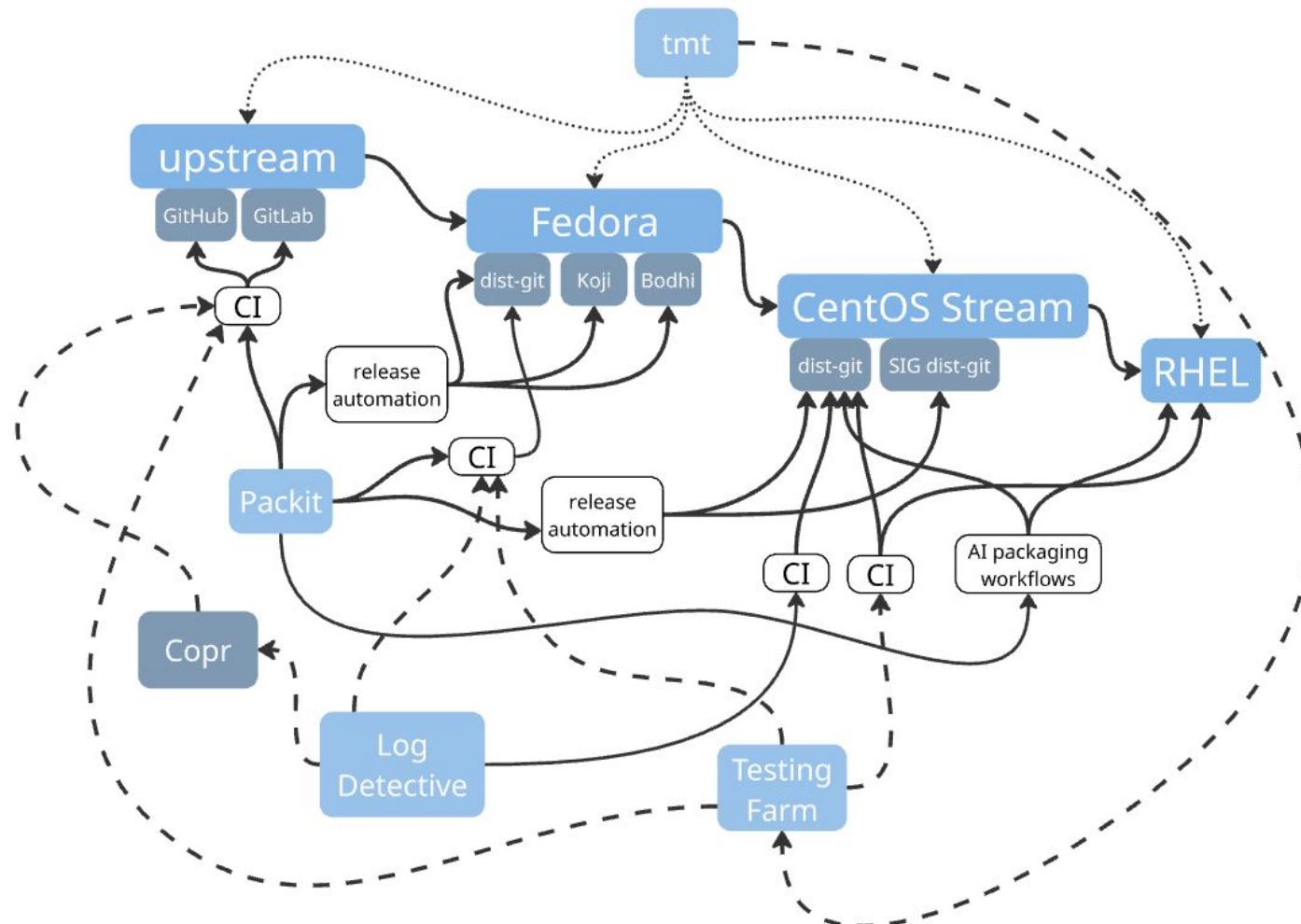
- Flow of code
- Packaging and Testing Experience projects
- Shifting left
- Test sharing
- Collaboration



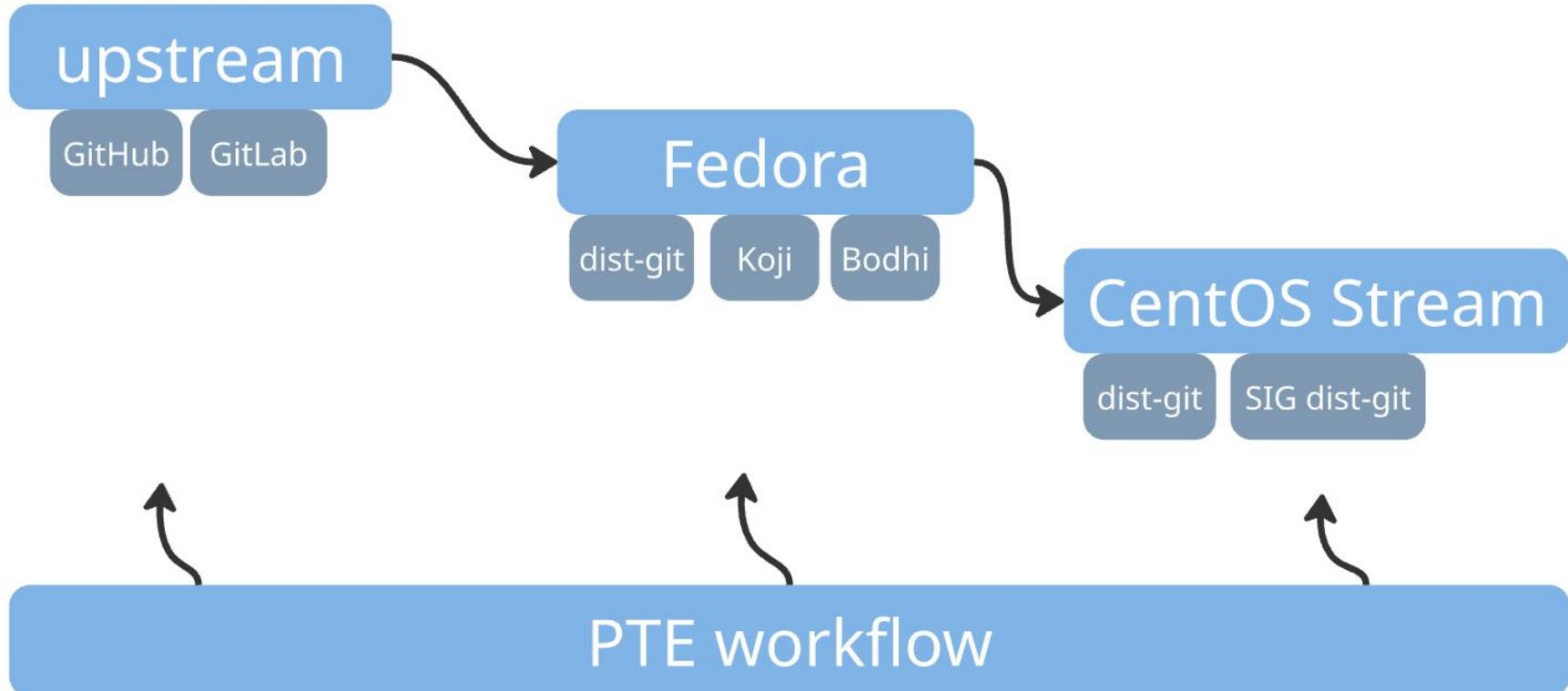
# Packaging and Testing projects

*+ Experience*





# unification





# Copr

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

Showing 1 to 3 of 3 Items

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 25 entries

« < 1 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 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 CTTest
error: Bad exit status from /var/tmp/rpm-tmp.uhFRDQ (%check)

RPM build errors:
    Bad exit status from /var/tmp/rpm-tmp.uhFRDQ (%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')
Start: clean chroot
INFO: unmounting tmpfs.
Finish: clean chroot
ERROR: Command failed:
# /usr/bin/systemd-nspawn -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.

**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 ⌚ ⋮

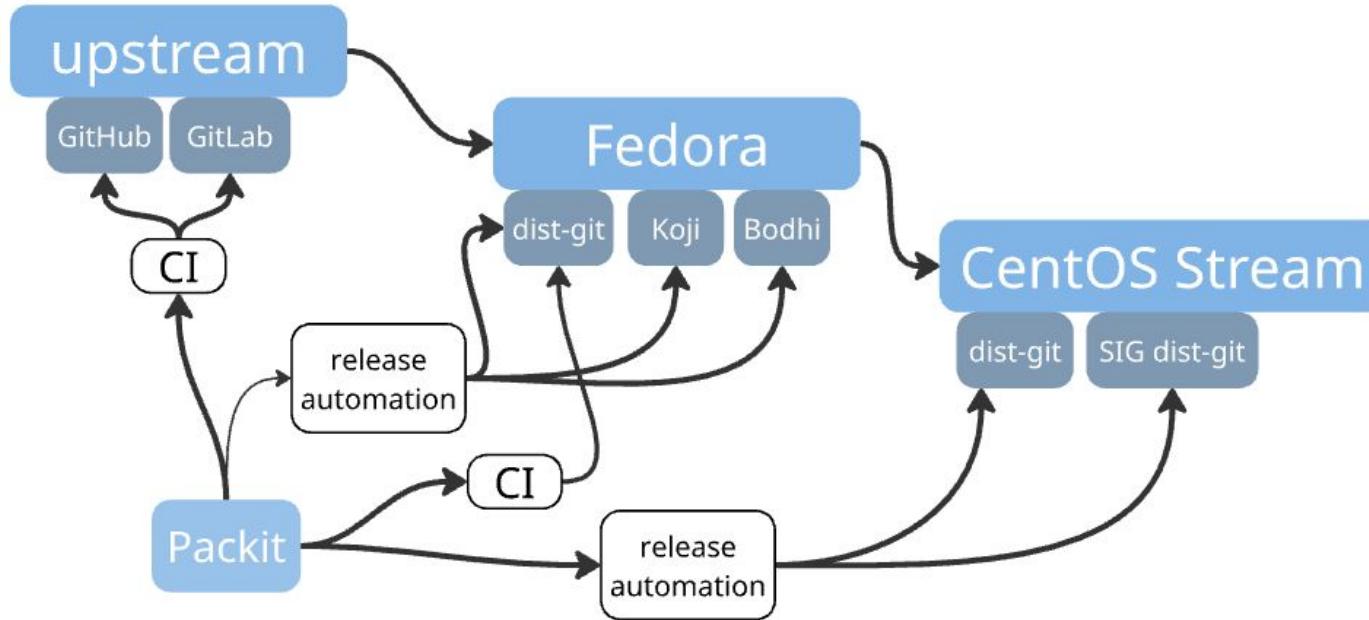
updated.

Reply... Reopen thread



# Packit

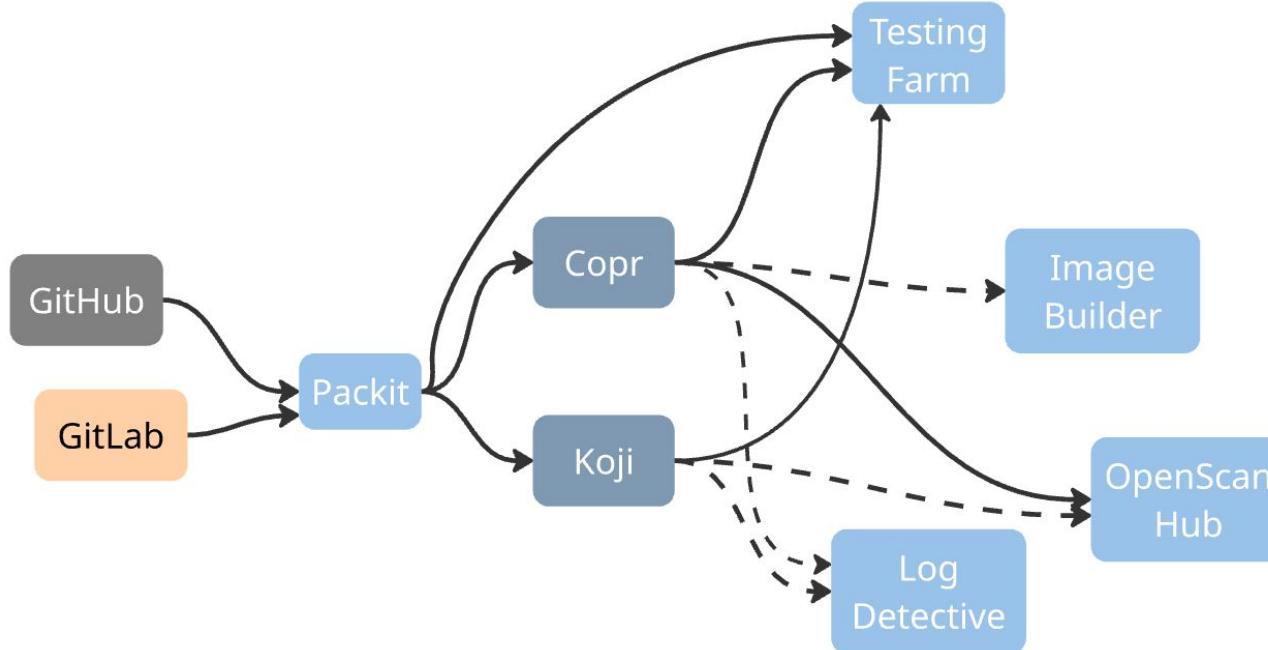
<https://packit.dev/>





# 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](#)

---

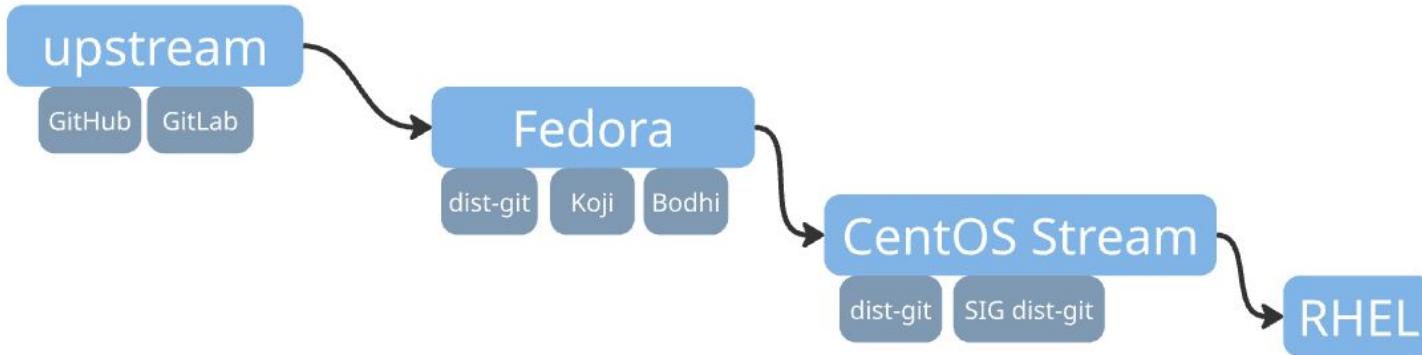
**Installability** Legend: SKIP OK INFO VERIFY BAD

update downgrade remove download build

**install**

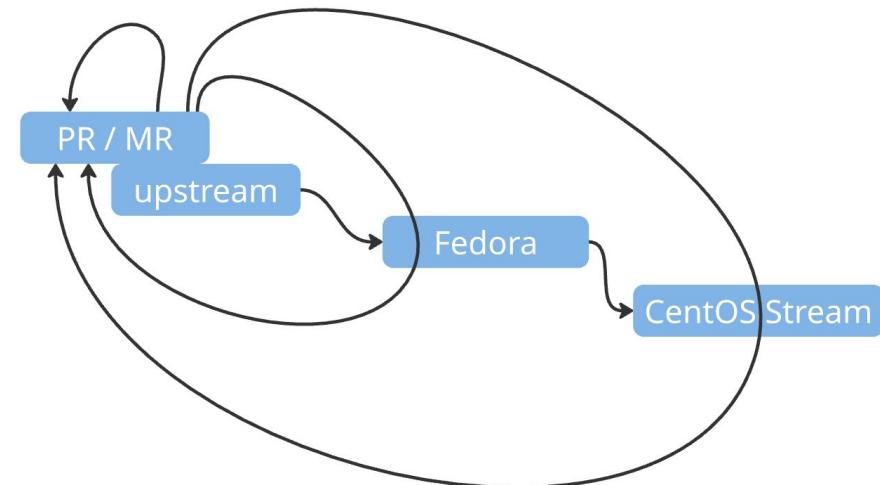
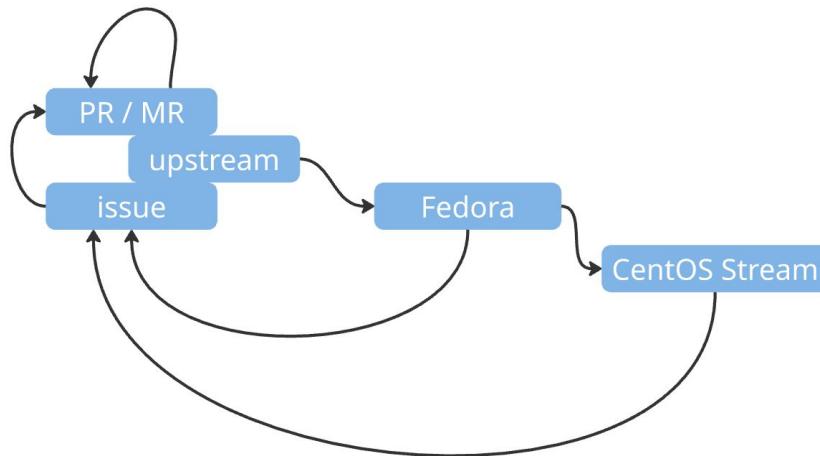
# Shifting left





<<< shift-left

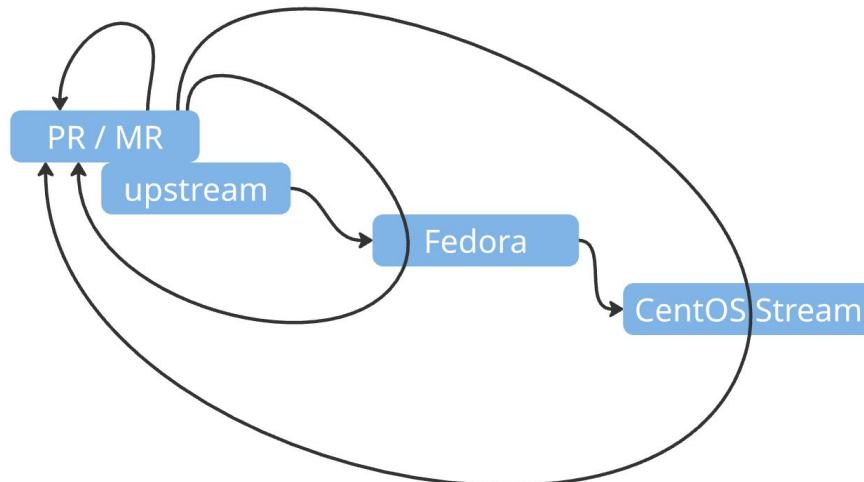
# Shifting left



# Shifting left

TEST

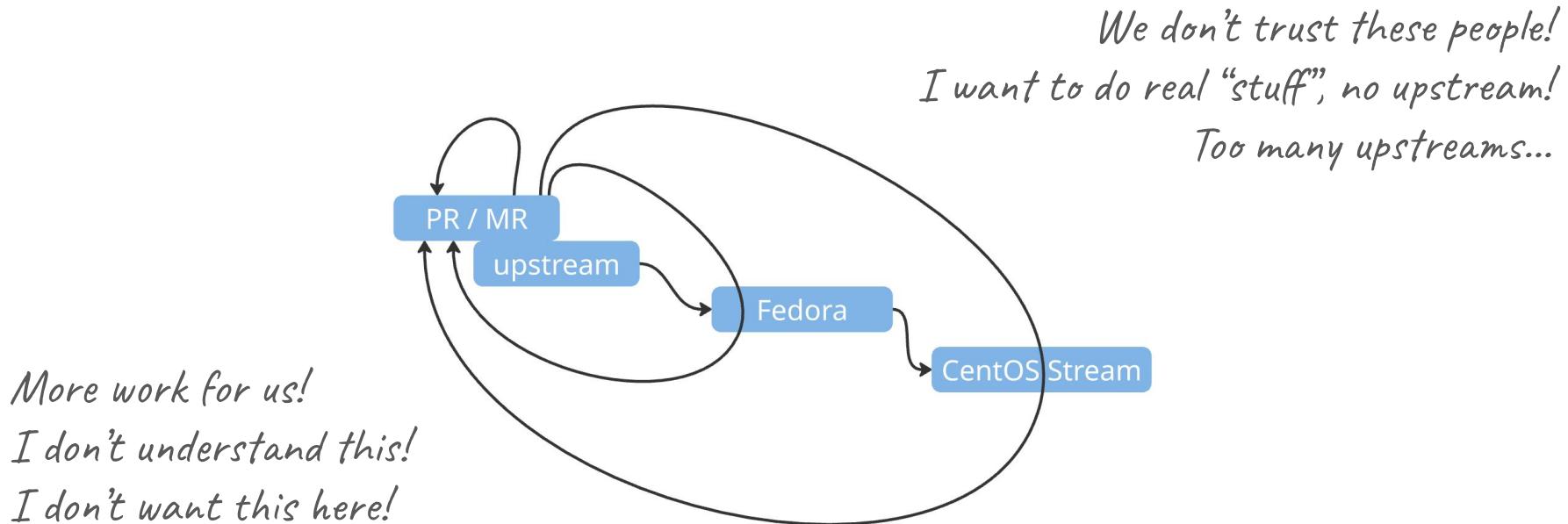
→ provide tests and testing infrastructure



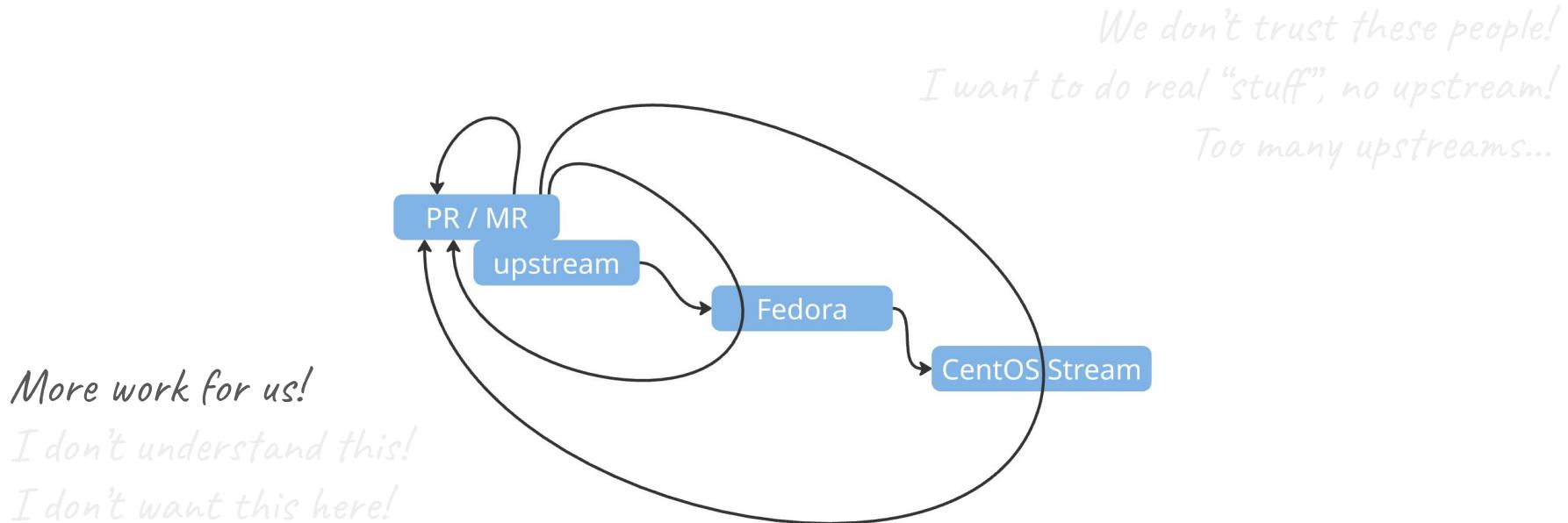
VERIFY

→ provide environment

# Shifting left



# Shifting left

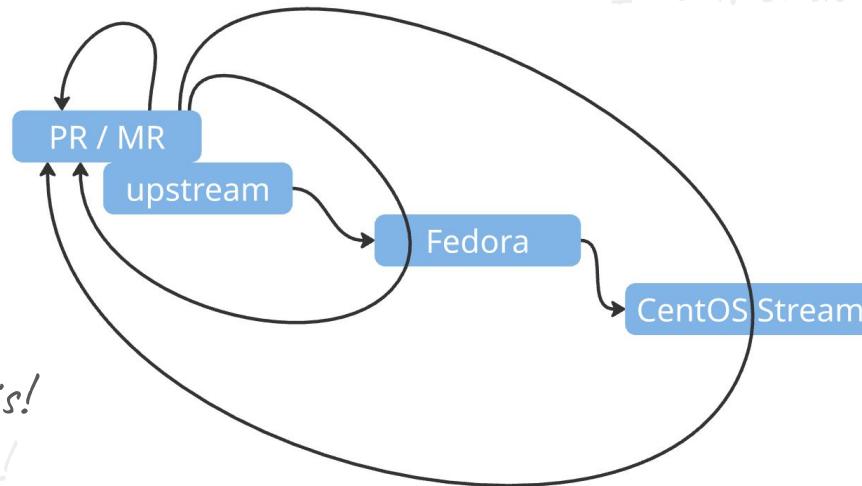


# Shifting left

*More work for us!*

*I don't understand this!*

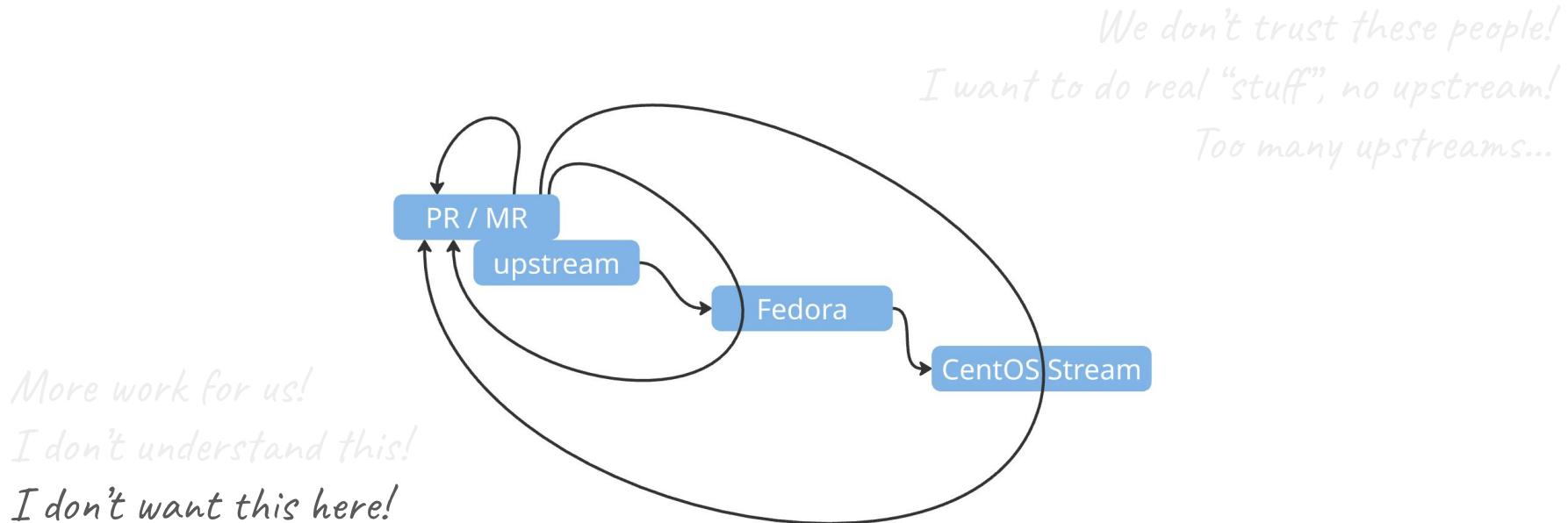
*I don't want this here!*



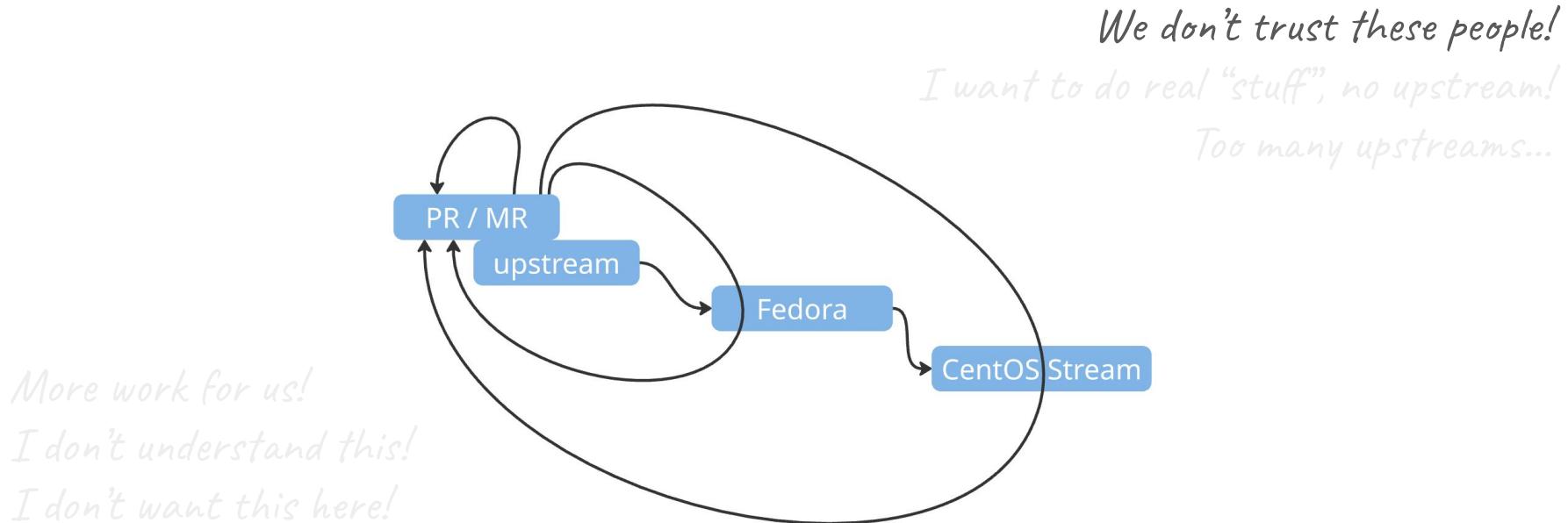
*We don't trust these people!  
I want to do real "stuff", no upstream!  
Too many upstreams...*



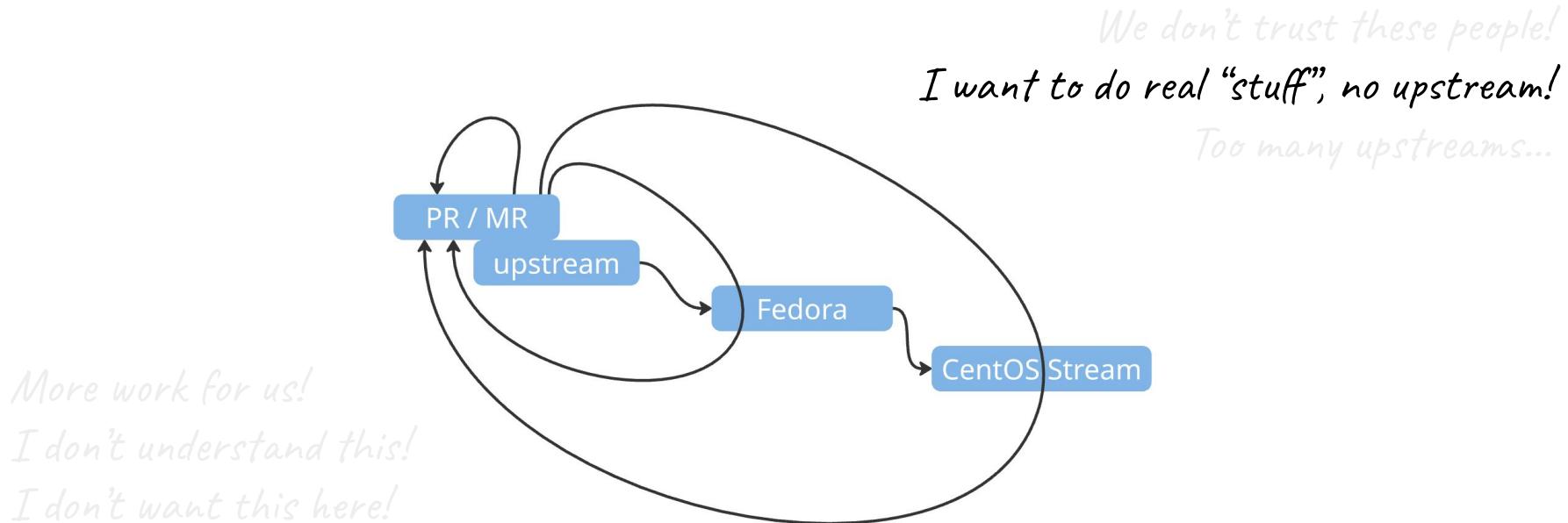
# Shifting left



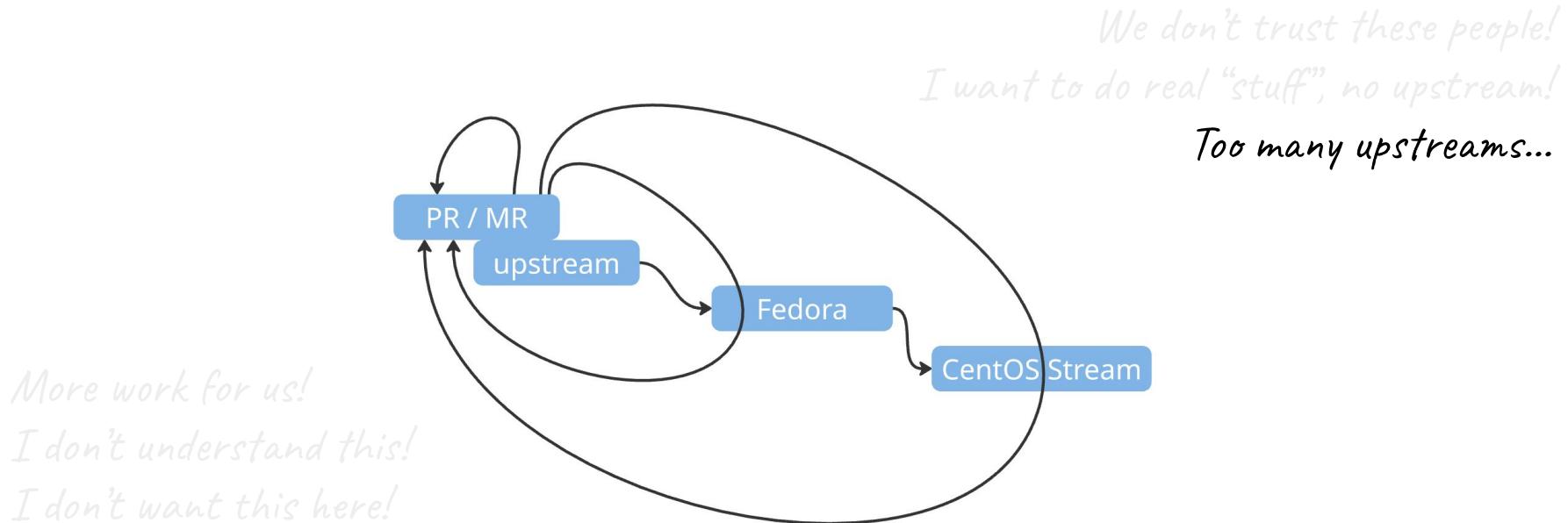
# Shifting left



# 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
```

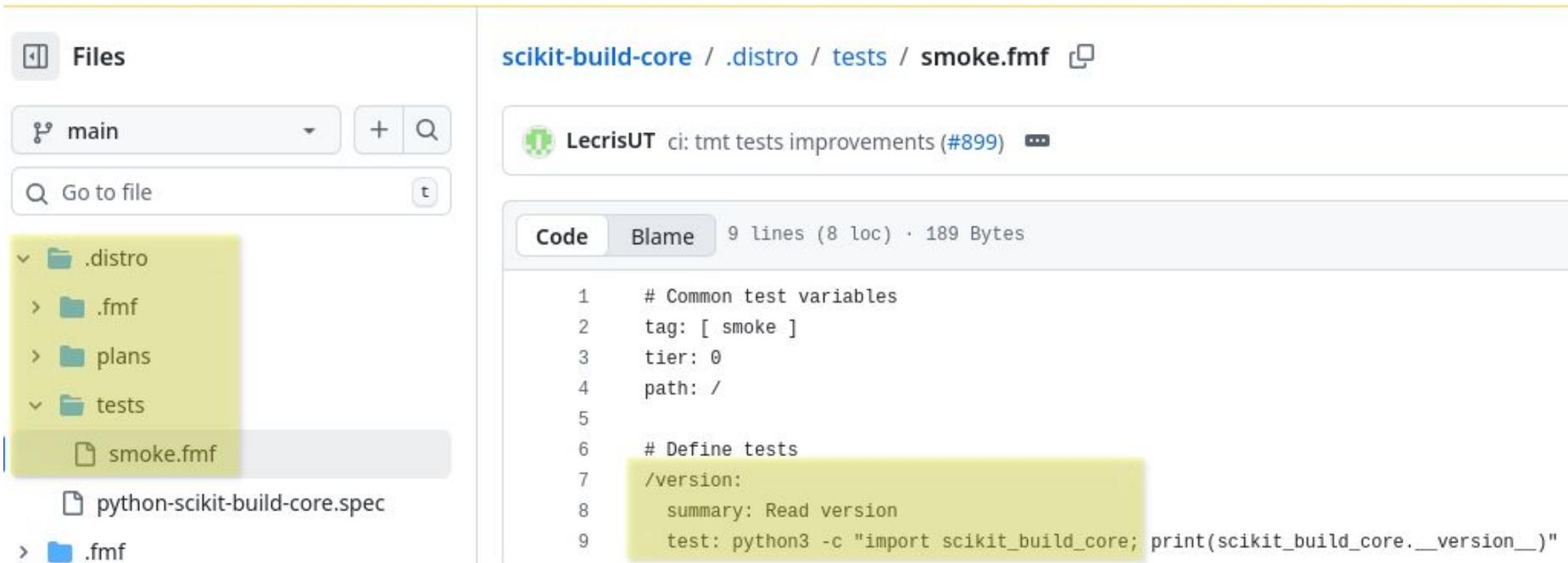
# Sharing tests with tmt

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)

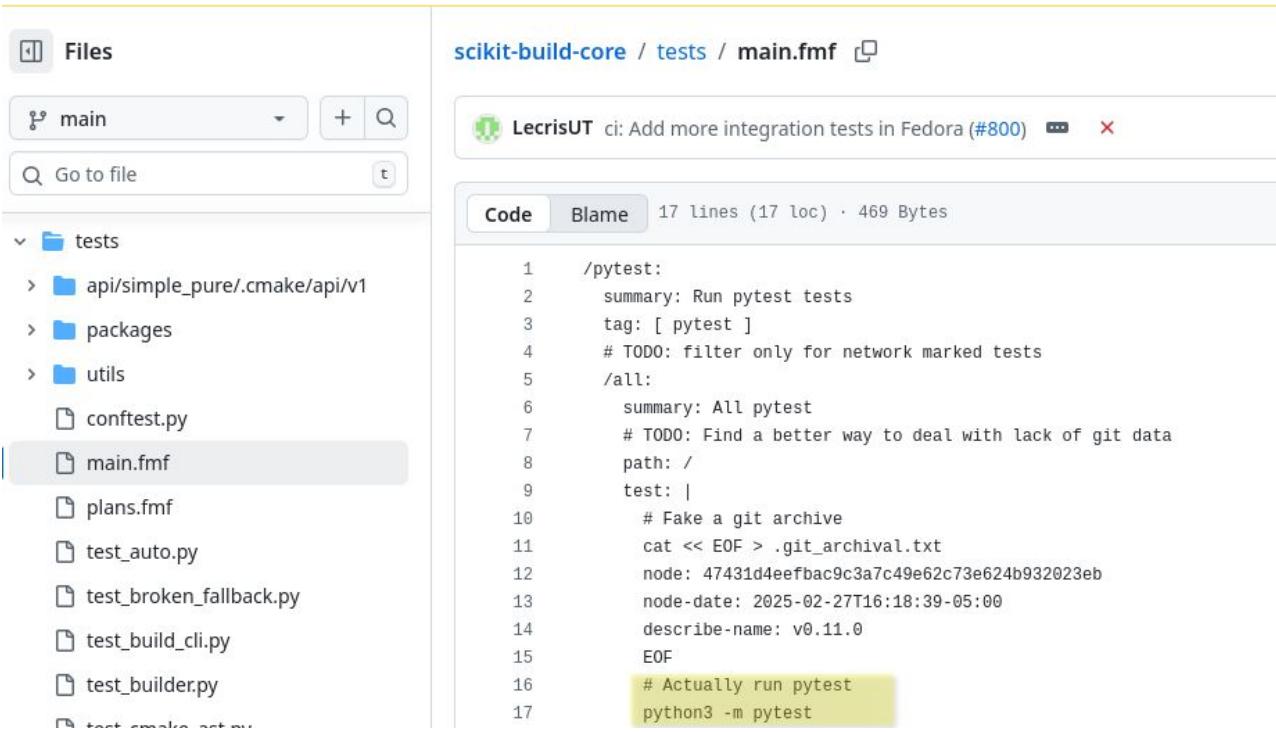


The screenshot shows a code editor interface with a sidebar and a main content area. The sidebar on the left is titled 'Files' and shows a tree view of the repository structure. The 'tests' folder is expanded, and the 'smoke.fmf' file is selected, highlighted with a yellow background. Other files visible in the sidebar include 'main', '.fmf', 'plans', 'tests', 'python-scikit-build-core.spec', and another '.fmf' file. The main content area shows the 'smoke.fmf' file with the following content:

```
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__)"
```

The code editor has tabs for 'Code' and 'Blame', and displays '9 lines (8 loc) · 189 Bytes'.

# Example: scikit-build-core (definition)



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

# 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

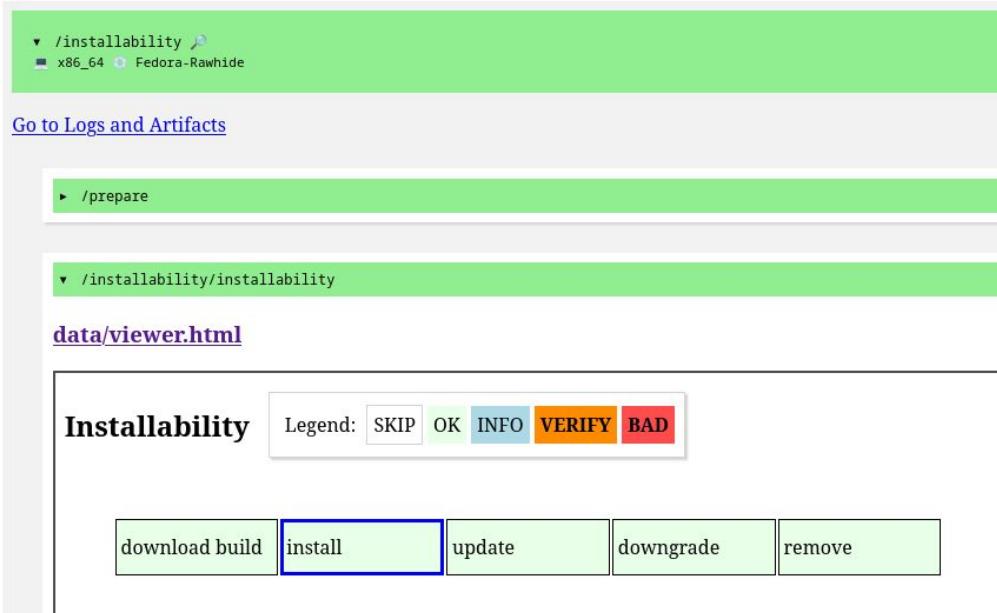
▼ /installability/installability

[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?