New code management model #3417

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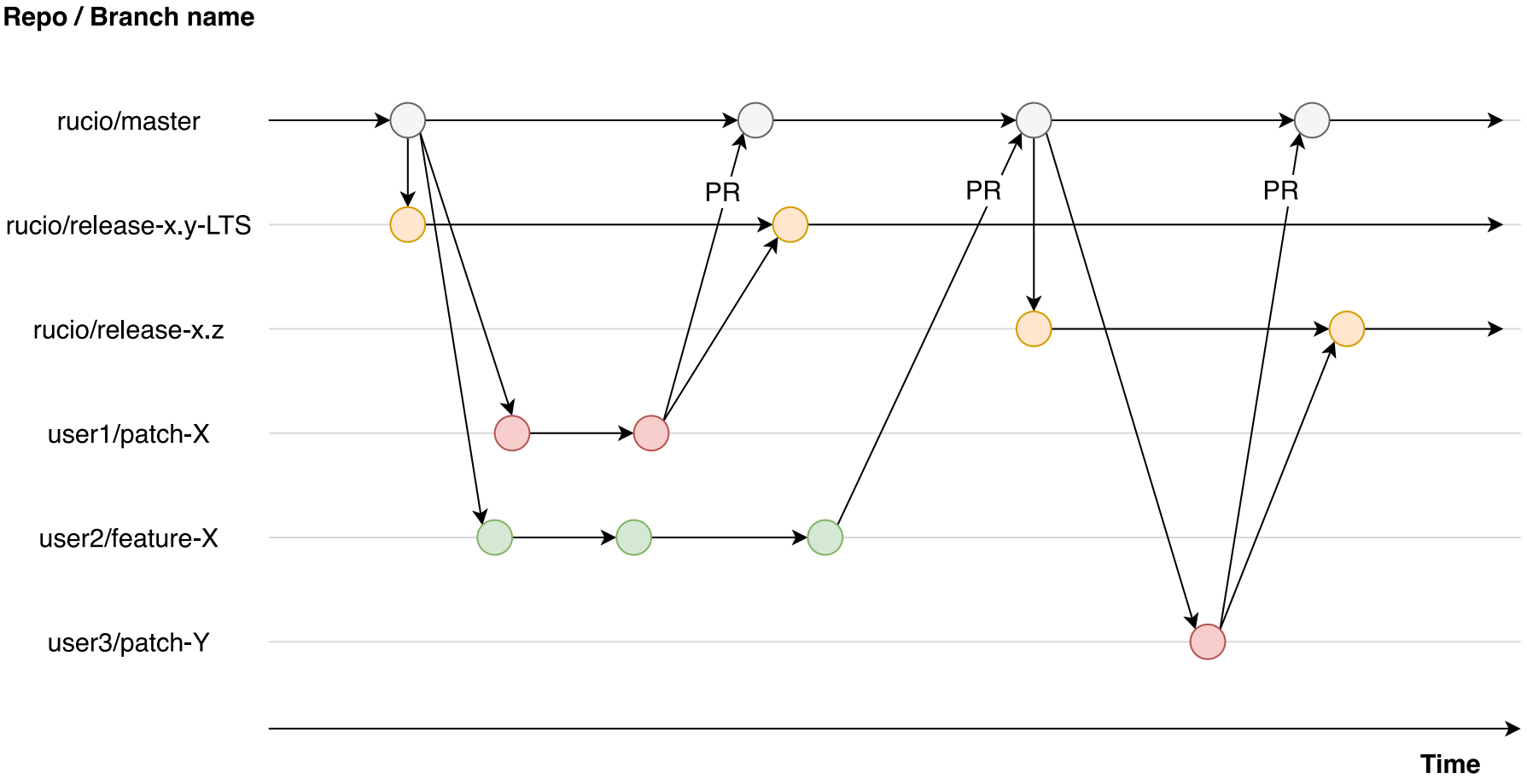
Motivation

The current code management model with two PRs against `next` and `master` is very cumbersome. This should be changed to a model with only one PR necessary.

The Idea

- Getting rid of the next branch
- Using master as the main development branch
  - All pull requests should be created against master
- Not moving away from using feature and patch branches
- Release branches for the currently supported releases
  - Necessary patches will be cherry-picked to the release
- Automated testing of PRs against the latest release branch

Git Branching Strategy for Rucio



GitHub Actions

- Concurrency: 20 jobs vs. 5 jobs on Travis
- Flexibility: events like labeling an issue or a timer can trigger a workflow
- Shell, Python, Docker are ready-to-use
- Bigger steps can be outsourced to custom actions
- Contrary to Travis, its infrastructure is not Open Source
- A workflow step may trigger some other CI via webhook

Proof of Concept

Test PR into release / **test**
succeeded 2 days ago in 14m 39s

▸ ✓	**Set up job**	2s
▸ ✓	**Grab latest release branch**	1s
⊘	**Fail if no release branch was found**	0s
▸ ✓	**Run actions/checkout@v2**	3s
▸ ✓	**Fetch pull request commit range**	0s
▸ ✓	**Run /./.github/actions/mergetest-docker-action**	21s
▸ ✓	**Fetch containers repository and fetch or build images**	5m 14s
▸ ✓	**Run docker-compose-storage-build composition**	1m 11s
▸ ✓	**Run tests with docker**	7m 33s
▸ ✓	**Stop and remove containers**	14s
▸ ✓	**Post actions/checkout@v2**	0s
▸ ✓	**Complete job**	0s

Proof of Concept (cont‘d)

- For testing non-feature PRs against the latest release branch

```
8  jobs:
9    test:
10     if: '!startsWith(github.event.pull_request.head.ref, ''feature'')'
```

branch name

Proof of Concept (cont‘d)

- Accessing the event workload
- Setting an output variable

```
13        - name: Grab latest release branch
14          id: grabrelease
15          run: |
16            curl $(echo "${{ github.event.repository.branches_url }}" | sed 's/{\/branch}//') | \
17            python3 -c 'import sys; import json; print("::set-output name=release_branch::", \
18            max(filter(lambda b: b.startswith("release"), (b["name"] for b in json.loads(sys.stdin.read())))), \
19                default="no release branch found"), sep="")'
```

```
64  Source commits (5c0cf8cab556e88673d2456172ea0ee3c1a4a93a^..1824d6edf4bf2d9a21c1b1cea1a3e914abd72712) were successfully cherry-picked onto
    bziemons/rucio:release-1.22
```

Prospect

- Porting the current Travis testing matrix to GitHub Actions
- Not being too GitHub dependent by being able to port the workflows fast (e. g. to Buildbot)
- Having a simple way to run the same tests locally
- Documenting everything in CONTRIBUTING.rst

Links

- GitHub Actions Documentation https://help.github.com/en/actions
- Proof of concept PR https://github.com/bziemons/rucio/pull/4
- Proof of concept workflow https://github.com/bziemons/rucio/blob/test/.github/workflows/pr-mergetest.yml
- Test action for cherry-picking into release branch https://github.com/bziemons/rucio/blob/test/.github/actions/mergetest-docker-action/mergetest.py

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