Git-based Courses

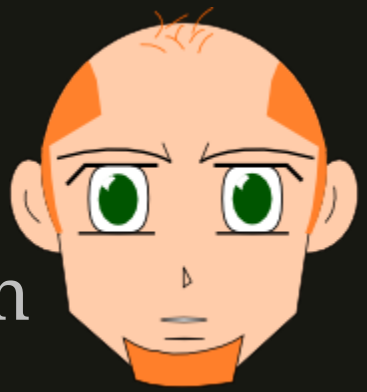
Carson Gee and Peter Pinch

@carsongee & @pdpinch

Peter Pinch

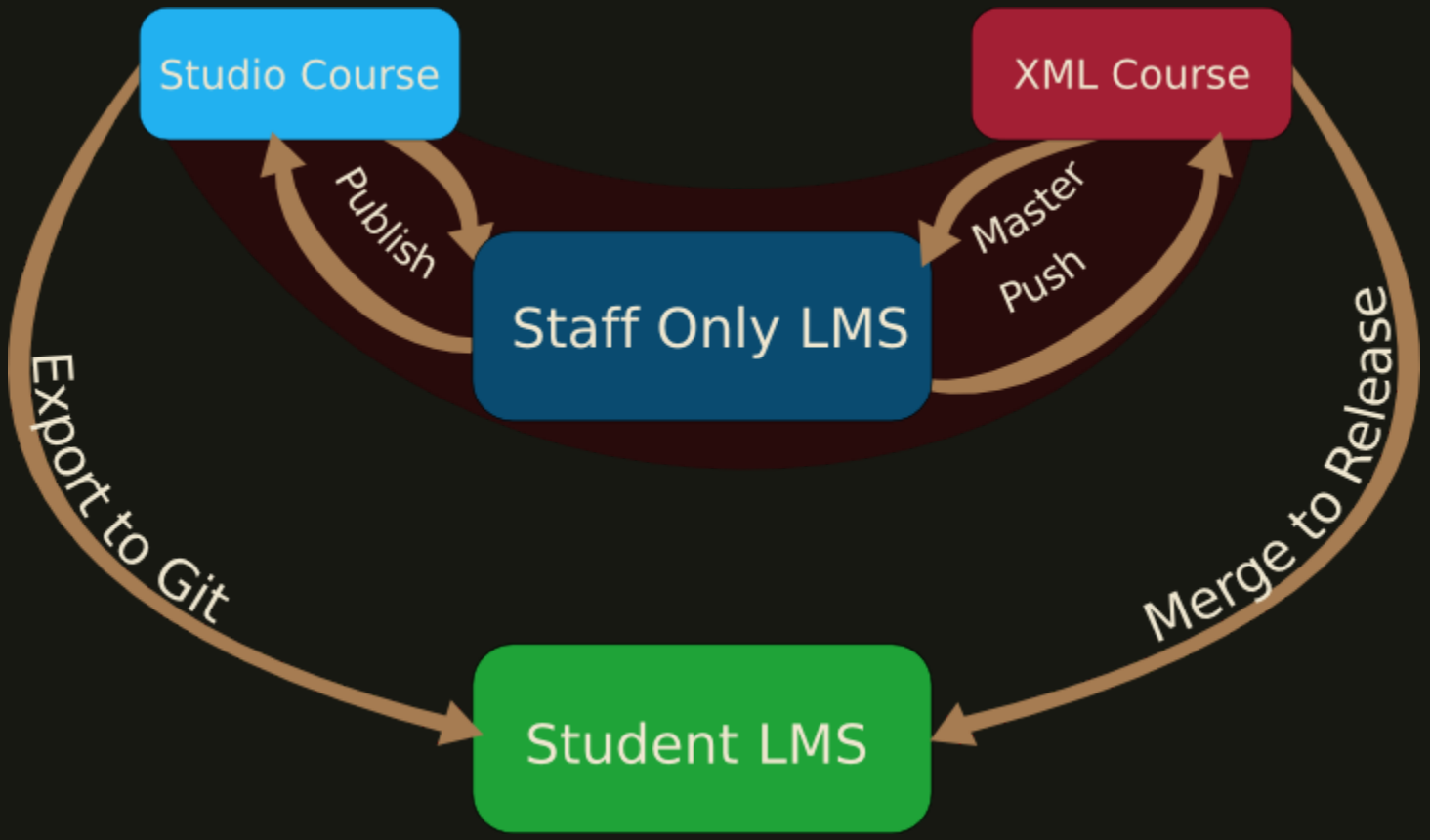
- education at scale
- pbs.org, pbslearningmedia.org
  - Ask me about animatronic aardvarks
- MIT OpenCourseWare
  - 2,240 courses and counting
- man of many hats at MITx

Carson Gee



- Seriously into process automation
- Over a year with Open edX
- Over 100 PRs between platform and configuration
- Not serious about much else

Git Course Flow Overview



What We'll Cover

- Course Production Workflow

- How to make it go (tech details)

Why do we do it this way?

Course teams want to:

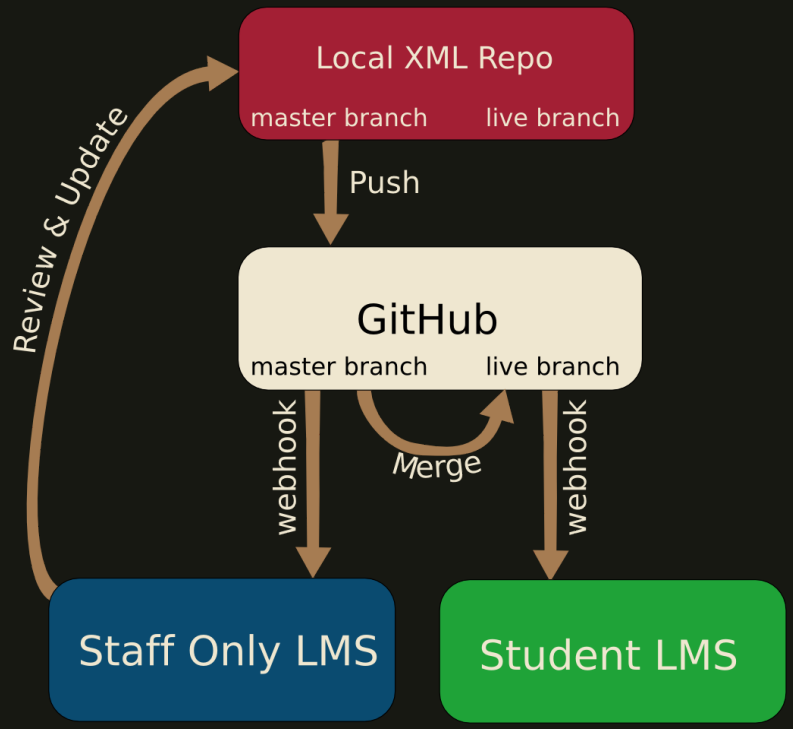
- use familiar tools
- migrate content
- manage versions
- manage multiple contributors
- preview and release

Why do we do it this way?

Admins need to:

- help course teams, safely
- bulk updates
- move courses from staging to production
- archive (and restore) courses

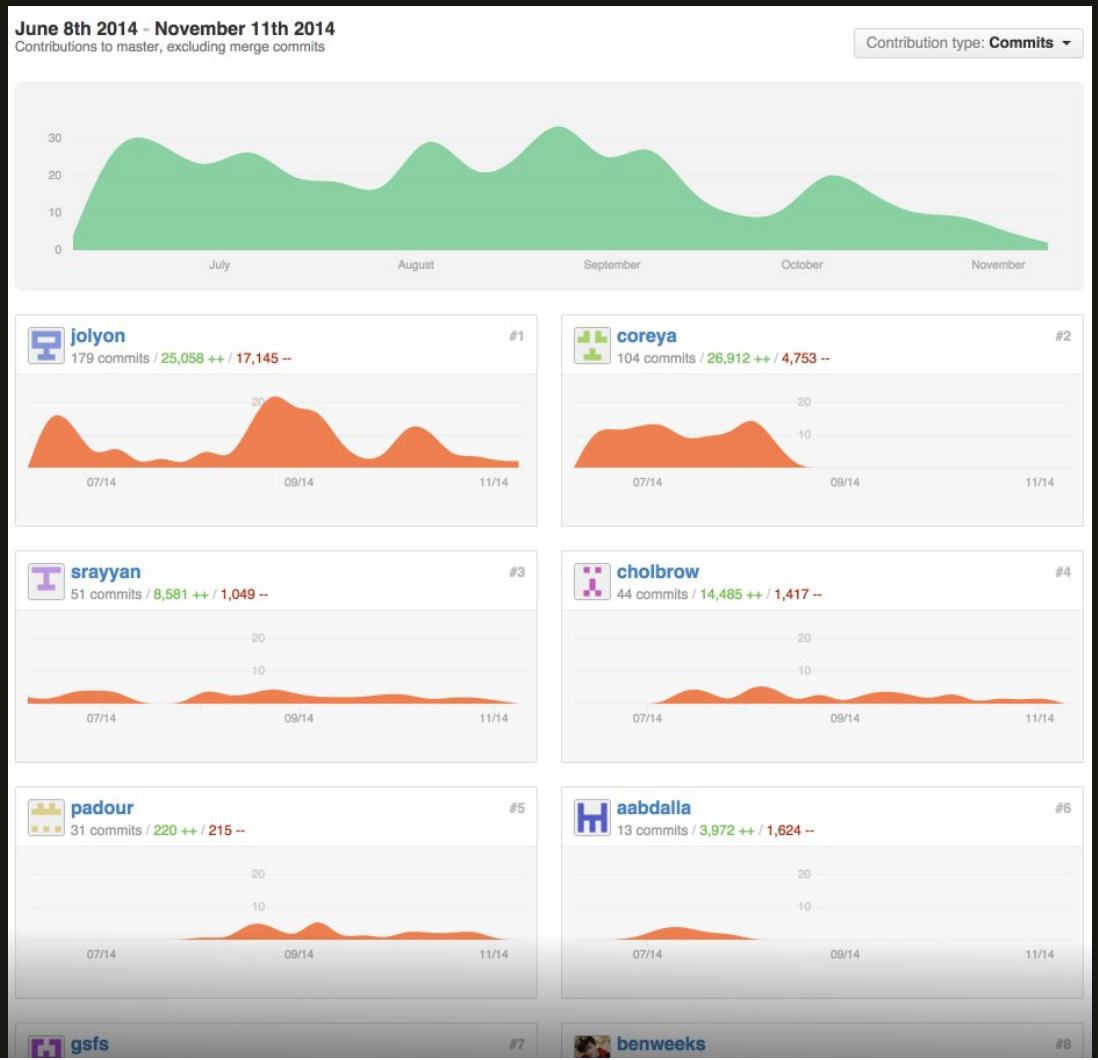
XML Course Development



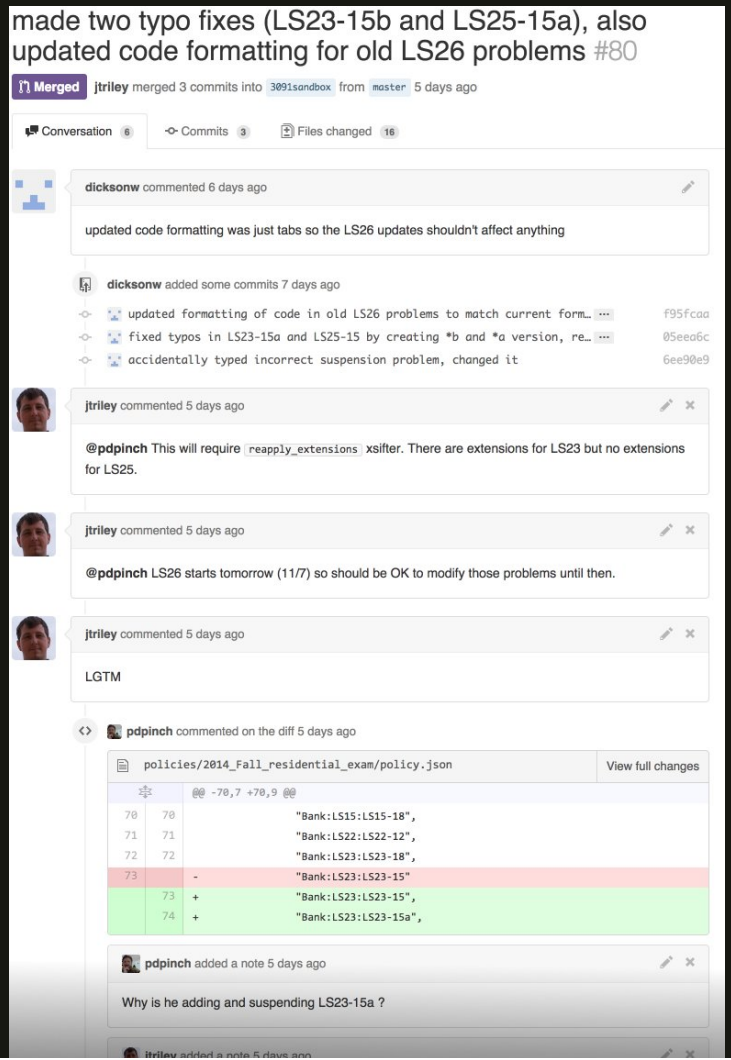
XML Course Development

1. edit XML
2. commit and push to master branch
3. trigger → updates course on staging server
4. review on staging, repeat as necessary
5. merge to live branch
6. trigger → updates course on production server

example commit graph



example PR with comments



made two typo fixes (LS23-15b and LS25-15a), also updated code formatting for old LS26 problems #80

Merged jtriley merged 3 commits into 3091sandbox from master 5 days ago

Conversation 6 · Commits 3 · Files changed 16

dicksonw commented 6 days ago

updated code formatting was just tabs so the LS26 updates shouldn't affect anything

dicksonw added some commits 7 days ago

- updated formatting of code in old LS26 problems to match current form… f95fcaa
- fixed typos in LS23-15a and LS25-15 by creating *b and *a version, re… 05eea6c
- accidentally typed incorrect suspension problem, changed it 6ee90e9

jtriley commented 5 days ago

@pdpinch This will require `reapply_extensions` xsifter. There are extensions for LS23 but no extensions for LS25.

jtriley commented 5 days ago

@pdpinch LS26 starts tomorrow (11/7) so should be OK to modify those problems until then.

jtriley commented 5 days ago

LGTM

pdpinch commented on the diff 5 days ago

policies/2014_Fall_residential_exam/policy.json — View full changes

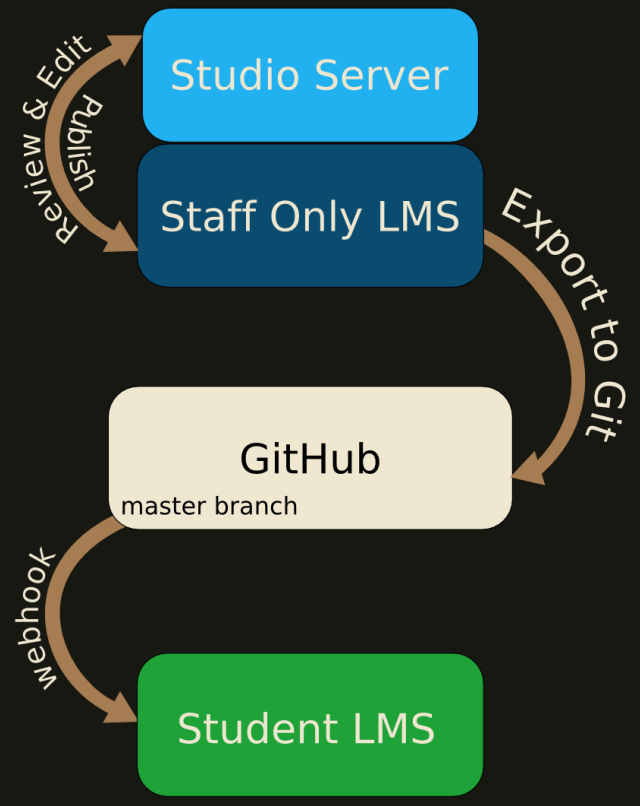
```
@@ -70,7 +70,9 @@
70 70          "Bank:LS15:LS15-18",
71 71          "Bank:LS22:LS22-12",
72 72          "Bank:LS23:LS23-18",
73    -        "Bank:LS23:LS23-15"
   73 +        "Bank:LS23:LS23-15",
   74 +        "Bank:LS23:LS23-15a",
```

pdpinch added a note 5 days ago

Why is he adding and suspending LS23-15a ?

jtriley added a note 5 days ago

Studio Course Development



Studio Course Development

1. author course on studio server
2. review on staging server, repeat
3. export to Git
4. trigger → updates course on production server

Technical Implementation

- Course Import and Export via Git
- Workflow Automation

Git Course Import via Command

```
sudo su - edxapp -s /bin/bash
. edxapp_env
mkdir /edx/var/edxapp/course_repos
python edx-platform/manage.py lms --settings=aws \
   git_add_course http://github.com/edx/edx-demo-course
```

Options

- Directory to check out into
- Branch to use

Sysadmin Dashboard Import

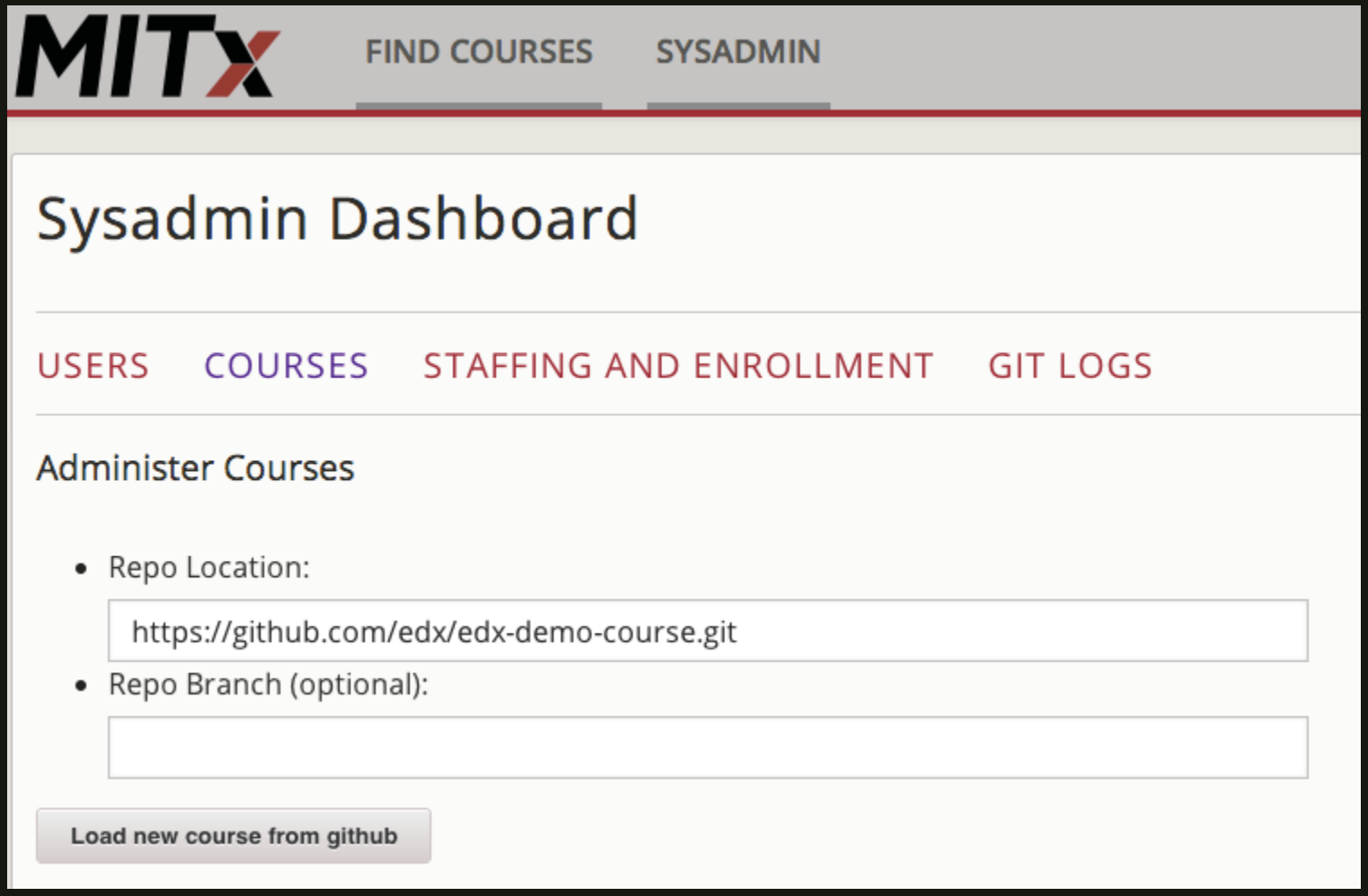
Enable with:

```
ENABLE_SYSADMIN_DASHBOARD=True
```

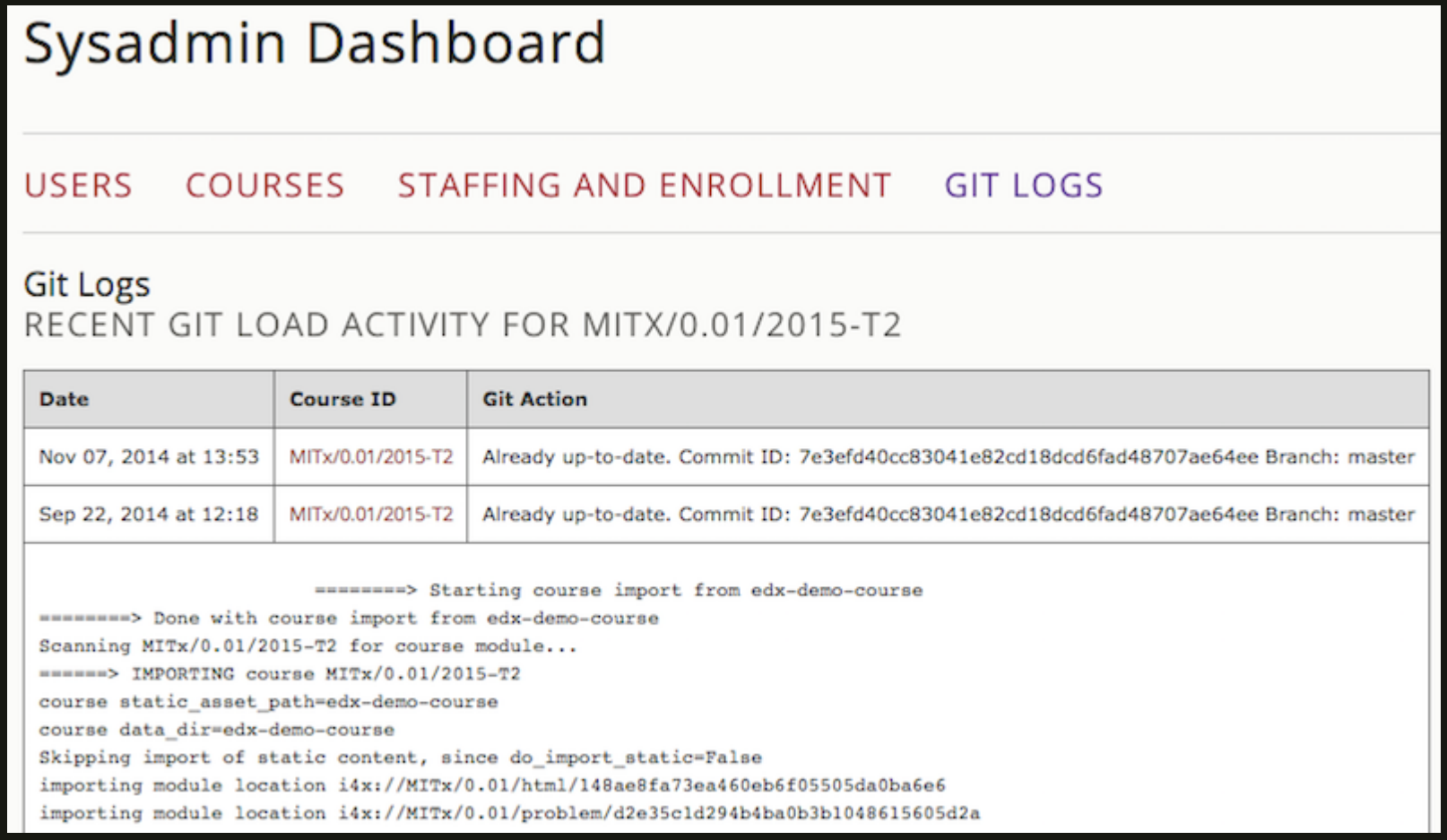
flag in `FEATURES` dict

- Head to: `https://<your_instance>/sysadmin` with global staff privs

Sysadmin Dashboard Import



Sysadmin Dashboard Import



Git Course Export via Command

```
sudo su - edxapp -s /bin/bash
. edxapp_env
mkdir /edx/var/edxapp/export_course_repos
cd edx-platform
python manage.py cms --settings=aws \
   git_export edX/DemoX/Demo_Course \
   git@github.com:carsongee/edx-demo-course.git
```

Options

- username (for commit authorship)
- repo_dir (specify location of local repo location)

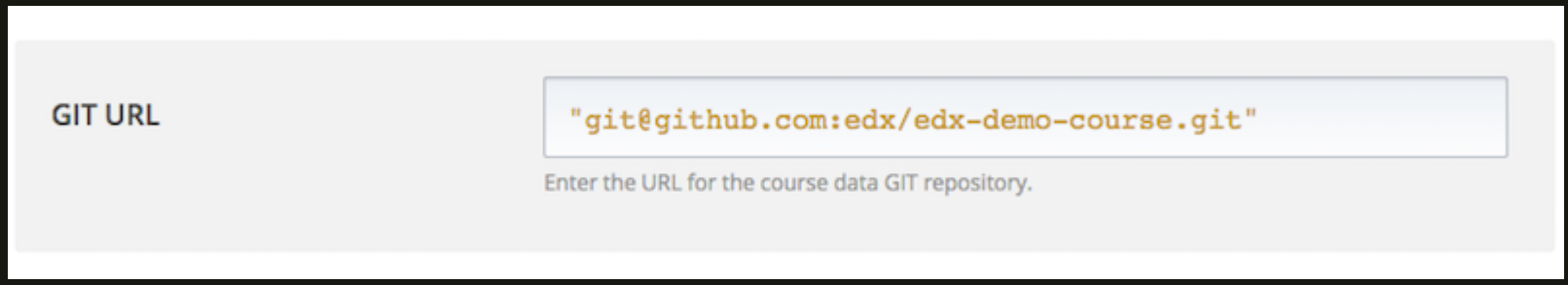
Export to Git in Studio

Enable with:

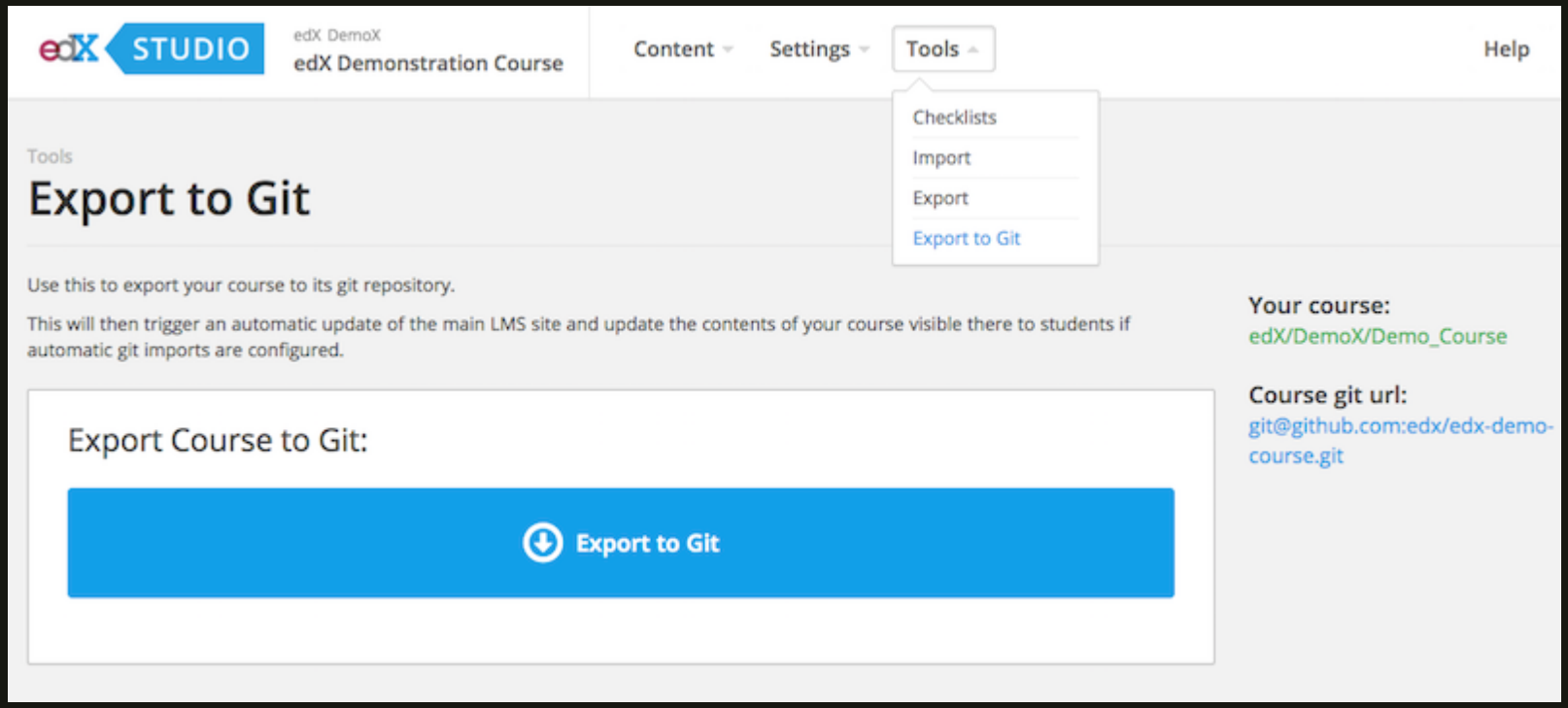
```
ENABLE_EXPORT_GIT=True
```

flag in `FEATURES` dict

- Set `giturl` in course's advanced settings



Export to Git in Studio



Workflow Automation

Enter gitreload:
https://github.com/mitodl/gitreload

- Responds to hooks from github/gitlab
- Runs `git_add_course` from hookshot
- Only operates on courses already checked out

Installing gitreload

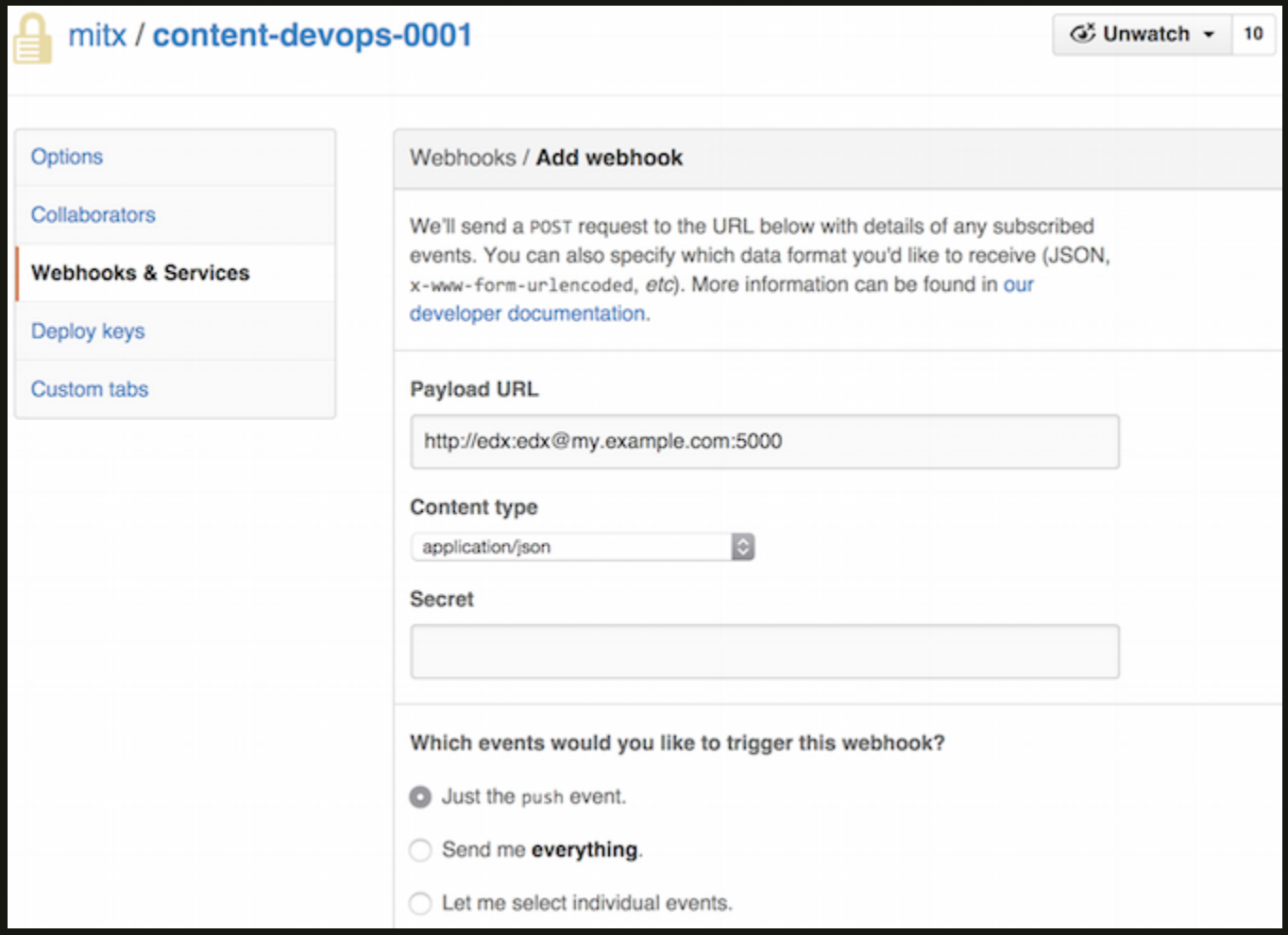
Try before you buy:

```
sudo su - edxapp -s /bin/bash
. edxapp_env
pip install gitreload
gitreload
```

Install for realsies with Ansible:

```
- hosts: all
  sudo: True
  vars:
    COMMON_ENABLE_BASIC_AUTH: True
  roles:
    - gitreload
    - role: nginx
      nginx_sites:
        - gitreload
```

Add the Hook


mitx / content-devops-0001
Unwatch
10
Options
Collaborators
Webhooks & Services
Deploy keys
Custom tabs
Webhooks / Add webhook
We'll send a POST request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, x-www-form-urlencoded, etc). More information can be found in our developer documentation.
Payload URL
http://edx:edx@my.example.com:5000
Content type
application/json
Secret
Which events would you like to trigger this webhook?
Just the push event.
Send me everything.
Let me select individual events.

Who needs ContentStore?

- Setup shared filesystem for course storage
- Symlink to:

```
{{ edxapp_data_dir }}/course_static
```

- Set `GIT_IMPORT_STATIC=False`

Who needs ContentStore?

Add to static nginx server rule:

```
  location ~ ^/static/(?P<file>.*) {
      root {{ edxapp_data_dir }};
      try_files /staticfiles/$file
        /course_static/$file =404;
```

Changes to:

```
location ~ /static/((?P<dir>[^/]+)/(?P<file>.*)|(?P<rfile>[\w\d\-.]+)) {
        root {{ edxapp_app_dir }};
        try_files /staticfiles/$dir/$file
          /course_static/$dir/static/$file
          /staticfiles/$rfile =404;
```

Conclusions

The Good

- Simple and safe to publish to students
- Social course development w/ github
- Versioned per course backups gratis
- Support of multiple student LMS targets
- Better courseware debugging

Conclusions

The Bad

- More complex setup
  - git hooks
  - repository creation
  - manual first checkout
- Extra step for Studio courses
- Did the hook work?
- Easier to break courses when editing raw XML

Future Work

- Create RESTful token auth Course Import/Export API
  - Studio and LMS
- "Create a Course" Application
  - Automatic course/repo creation
  - Initial LMS import
  - Hook setup
  - "giturl" setting

Questions?

mitodl/git-based-courses-slides