

Git-based Courses

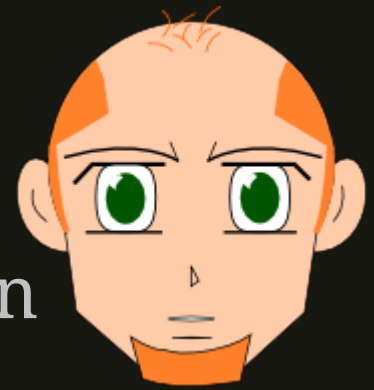


Carson Gee and Peter Pinch

Peter Pinch

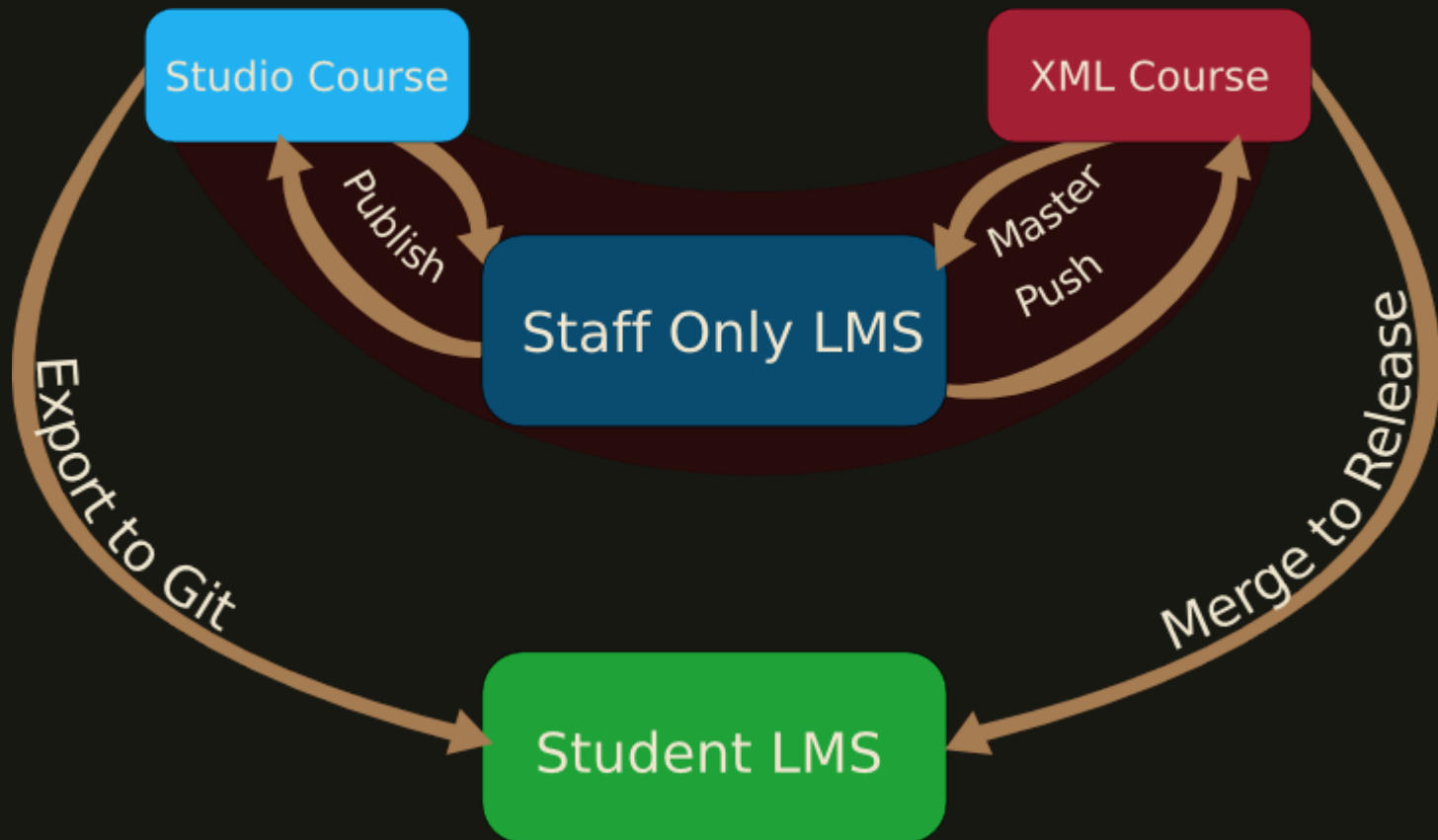
- education at scale
- pbs.org, pbslearningmedia.org
- MIT OpenCourseWare
- MITx multitool
- Ask me about talking aardvarks

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)

Course Production Workflow

Course teams want to:

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

Course Production Workflow

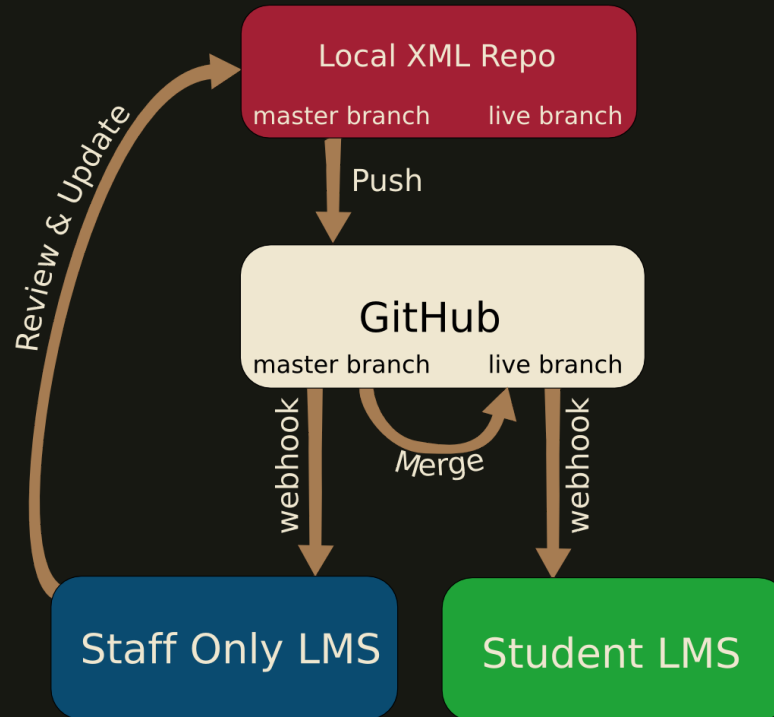
Admins need to:

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

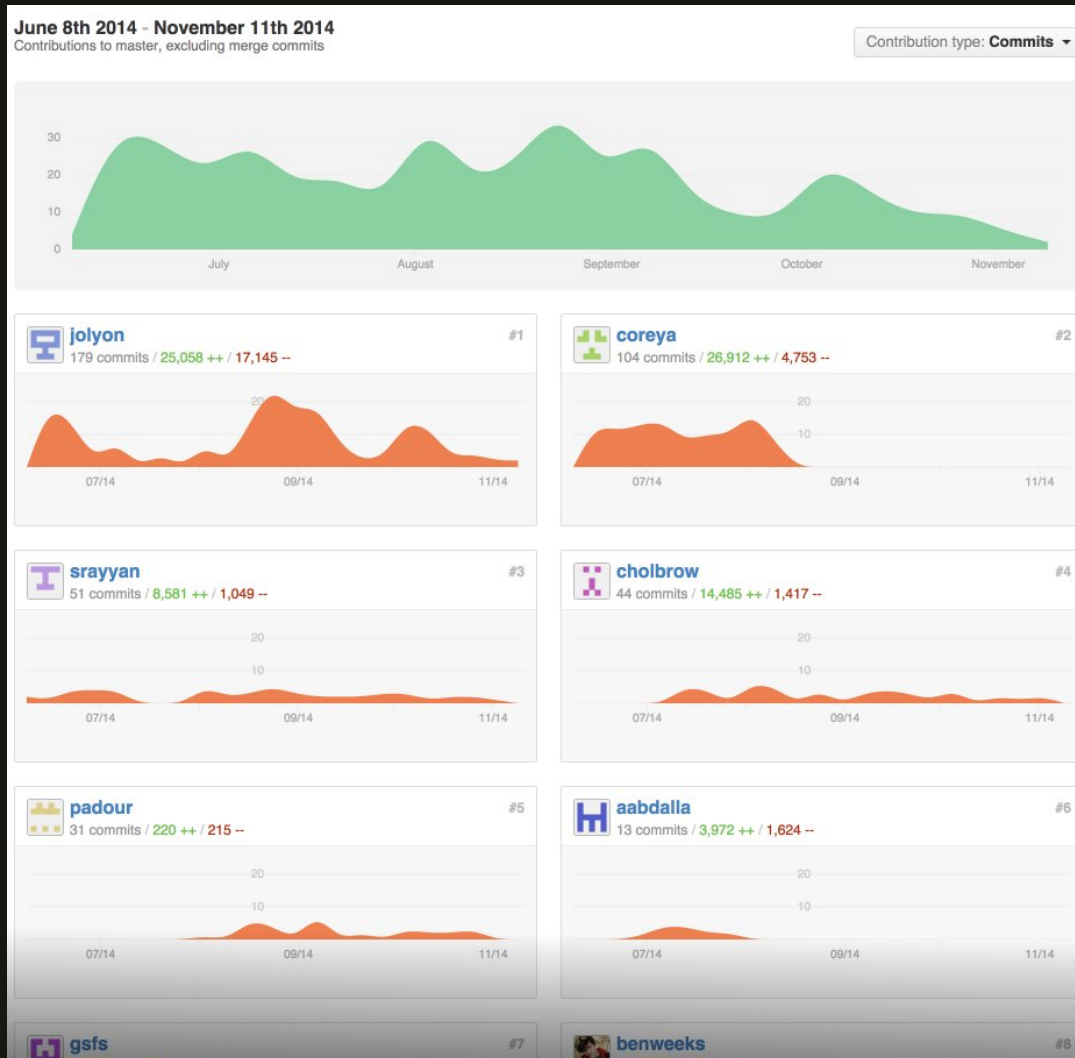
XML Course Development

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

XML Course Development



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... 05ee06c
- accidentally typed incorrect suspension problem, changed it 6ee90e9

jtriley commented 5 days ago

@pdpinch This will require `reapply_extensions` xsifier. 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	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

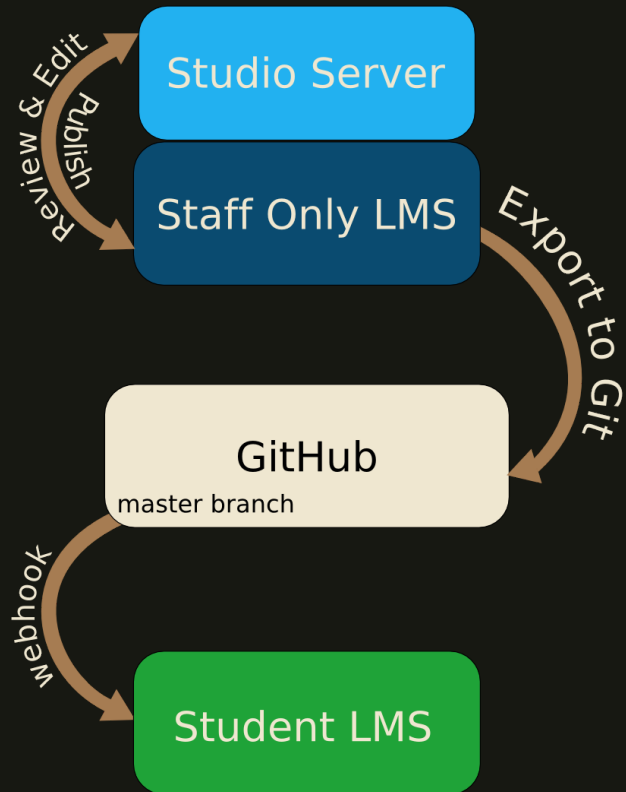
Why is he adding and suspending LS23-15a ?

jtriley added a note 5 days ago

Studio Course Development

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

Studio Course Development



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

Course Import/Export

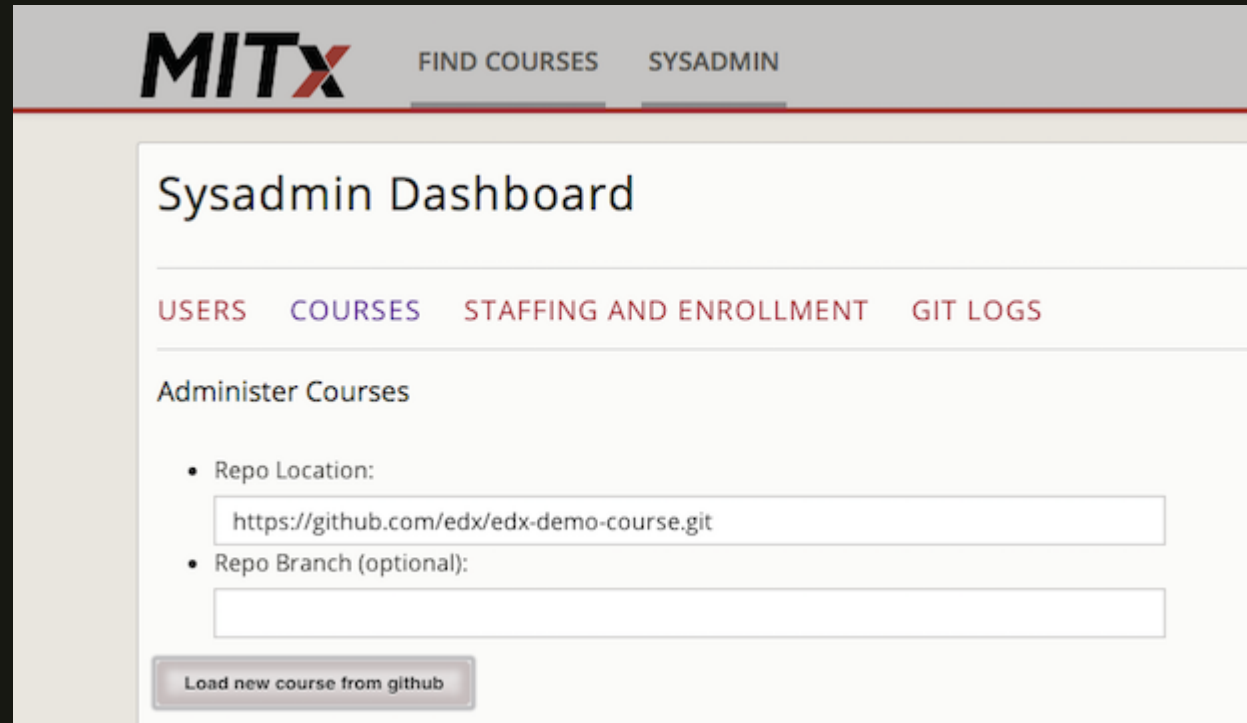
- Course Import

- Course Export

Automations

- gitreload

- ContentStore



The screenshot shows the MITx Sysadmin Dashboard. The top navigation bar includes the MITx logo, a 'FIND COURSES' button, and a 'SYSADMIN' button. Below the navigation bar, the main heading is 'Sysadmin Dashboard'. Underneath this heading is a horizontal menu with four items: 'USERS', 'COURSES', 'STAFFING AND ENROLLMENT', and 'GIT LOGS'. The 'COURSES' item is highlighted. Below the menu is the section 'Administer Courses'. This section contains two bullet points: 'Repo Location:' and 'Repo Branch (optional):'. The 'Repo Location' bullet point has a text input field containing the URL 'https://github.com/edx/edx-demo-course.git'. The 'Repo Branch (optional)' bullet point has an empty text input field. At the bottom of the form is a button labeled 'Load new course from github'.

MITx

FIND COURSES SYSADMIN

Sysadmin Dashboard

USERS COURSES STAFFING AND ENROLLMENT GIT LOGS

Administer Courses

- Repo Location:
- Repo Branch (optional):

Load new course from github

Sysadmin Dashboard Import

Course Import/Export

- Course Import

- Course Export

Automations

- gitreload

- ContentStore

MITx [FIND COURSES](#) [SYSADMIN](#)

Sysadmin Dashboard

[USERS](#) [COURSES](#) [STAFFING AND ENROLLMENT](#) [GIT LOGS](#)

Git Logs

RECENT GIT LOAD ACTIVITY FOR EDX/DEMOX/DEMO_COURSE

Date	Course ID	Git Action
Nov 07, 2014 at 13:49	edx/DemoX/Demo_Course	Already up-to-date. Commit ID: 9aad9f2d084171aec9cc5090dcc95ed70eb9eedf Branch: master
Nov 03, 2014 at 11:18	edx/DemoX/Demo_Course	Already up-to-date. Commit ID: 9aad9f2d084171aec9cc5090dcc95ed70eb9eedf Branch: master

```
=====> Starting course import from edx-demo-course
=====> Done with course import from edx-demo-course
Scanning edx/DemoX/Demo_Course for course module...
=====> IMPORTING course edx/DemoX/Demo_Course
course_data_dir=edx-demo-course
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/subs_LkVZhEtaQCA.art.sjson...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/Screen Shot 2013-04-16 at 1.43.36 PM.png...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/ethglycol.jpg...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/practice:games_expectimax.js...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/subs_AEvvgtBf44.art.sjson...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/jaxgraph.css...
importing static content /edx/var/edxapp/course_repos/edx-demo-course/static/instatathematics_0_1_0_0...
```

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)

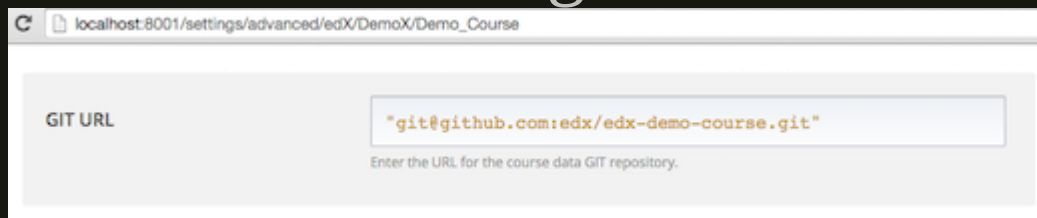
Export to Git in Studio

Enable with:

```
ENABLE_EXPORT_GIT=True
```

flag in `FEATURES` dict

- Set `giturl` in course's advanced settings



The screenshot shows a web browser window with the address bar displaying 'localhost:8001/settings/advanced/edx/DemoX/Demo_Course'. The main content area is titled 'GIT URL' and contains a text input field with the value 'git@github.com:edx/edx-demo-course.git'. Below the input field, there is a small text label that reads 'Enter the URL for the course data GIT repository.'

Export to Git in Studio

Course Import/Export

- Course Import

- Course Export

Automations

- gitreload

- ContentStore

The screenshot shows the edX Studio interface for the 'edX DemoX edX Demonstration Course'. The top navigation bar includes 'Content', 'Settings', and 'Tools'. The 'Tools' dropdown menu is open, showing options: 'Checklists', 'Import', 'Export', and 'Export to Git'. The main heading is 'Export to Git'. Below it, a text block explains: 'Use this to export your course to its git repository. This will then trigger an automatic update of the main LMS site and update the contents of your course visible there to students if automatic git imports are configured.' A large blue button with a download icon and the text 'Export to Git' is centered. On the right, the 'Your course:' section shows 'edX/DemoX/Demo_Course' and the 'Course git url:' is 'git@github.com:edx/edx-demo-course.git'.


edX STUDIO edX DemoX edX Demonstration Course Content Settings Tools Help

Tools

Export to Git

Use this to export your course to its git repository.
This will then trigger an automatic update of the main LMS site and update the contents of your course visible there to students if automatic git imports are configured.

Export Course to Git:

 **Export to Git**

Your course:
edX/DemoX/Demo_Course

Course git url:
git@github.com:edx/edx-demo-course.git

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 realies with Ansible

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

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;
```

Course Import/Export

- Course Import

- Course Export

Automations

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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?

