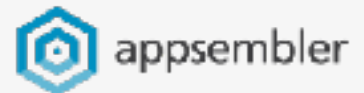


The challenges of Multi-tenant Open edX

By **Maxi Fernandez**,
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About me

From **Montevideo, Uruguay**

Software engineer at **Appsembler**



About Appsembler

20 people in the organisation

13 engineers



About Tahoe

**Appsembler SaaS Cloud based
platform**

appsembler.com/tahoe



Goals

- **To understand what multi-tenancy is.**
- **Learn what we have available for multi-tenancy approaches in edX**
- **To learn what we haven't available for multi-tenancy in edX.**
- **See some Appsembler Tahoe examples on how to push multi-tenancy forward.**
- **To see what are the challenges ahead and start the conversation in the community.**

What is Multi-tenancy?

Multi-tenancy \neq Multi-instance

Multi-tenancy \neq Virtualisation

Benefits of Multi-tenancy

Lowers down infrastructure costs

Same application code is shared by all tenants

Simultaneous upgrades

Simultaneous feature releases

Use cases

Universities with different departments

Companies who wants to serve partners

Companies who wants to resell Open edX Courses

Cloud SaaS Architecture for Open edX

**On which parts / components of Open edX
can we rely today for multi-tenancy?**

Open edX Sites
Site configurations
Site theming
Configuration helpers
edX Organizations

Open edX Sites

Open edX Sites

Django administration Welcome, staff | [View site](#) | [Change password](#) | [Logout](#)

[Home](#) | [Sites](#) | [Sites](#) | [Add site](#)

Add site

Domain name:	<input type="text" value="mooi-academyexample.com"/>
Display name:	<input type="text" value="mooi-academy"/>
Save and add another Save and continue editing <input type="button" value="Save"/>	

Open edX Sites

Django administration Welcome, user | View site / Change password / Log out

Home / Site configuration / Site configurations / Add site configuration

Add site configuration

Site:

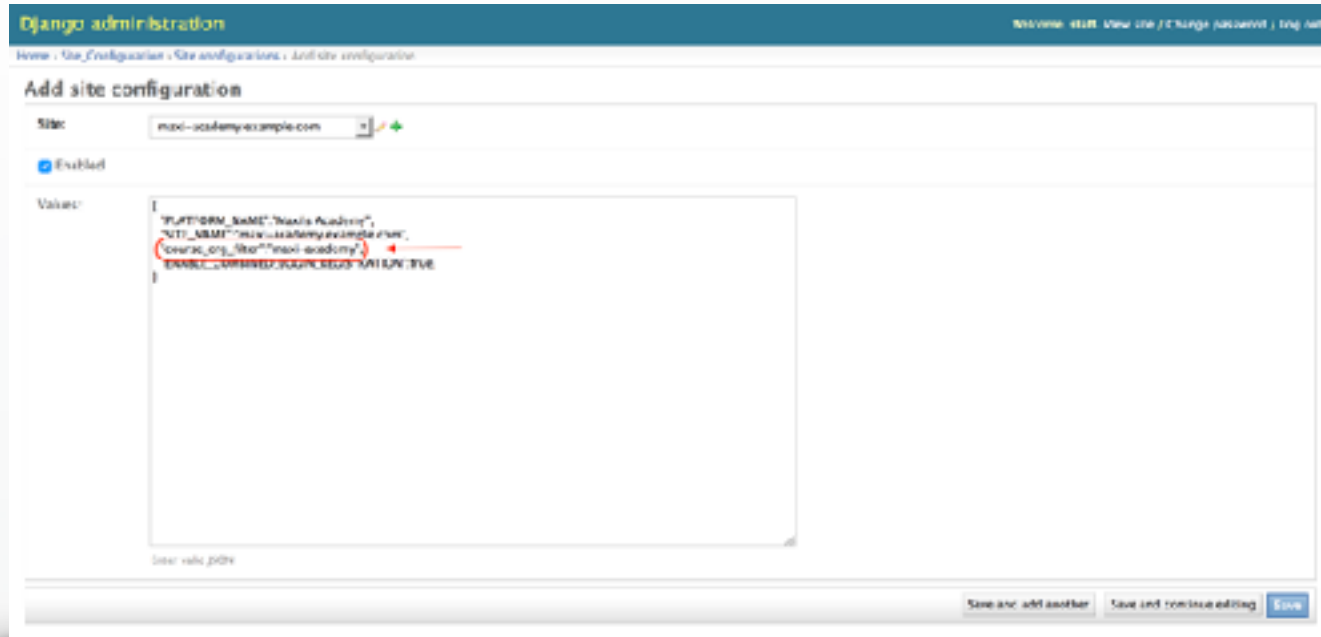
Enabled

Values:

```
{
  "PLATFORM_NAME": "ocsfam Academy",
  "SITE_NAME": "mooc-ocsfamexample.com",
  "default_org_filter": "mooc-ocsfam",
  "ENABLE_DEFAULT_ORG_FILTER": true
}
```

View site profile

Open edX Sites



The screenshot shows the Django administration interface for adding a new site configuration. The page title is "Django administration" and the breadcrumb trail is "Home > Site configuration > Site configurations > Add site configuration".

The form is titled "Add site configuration" and includes the following fields:

- Site:** A text input field containing "mooc-ocsfamyexample.com" with a dropdown arrow and a green plus icon.
- Enabled:** A checkbox that is checked.
- Values:** A large text area containing the following JSON configuration:

```
{
  "PLATFORM_NAME": "Mooc Academy",
  "SITE_NAME": "mooc-ocsfamyexample.com",
  "creation_time": "mooc-ocsfamyexample.com",
  "ENABLED": "ENABLED"
}
```

Red circles and arrows highlight the "creation_time" field and the "ENABLED" field in the JSON configuration.

At the bottom right of the form, there are three buttons: "Save and add another", "Save and continue editing", and "Save".

Open edX Sites

Django administration Welcome, SMF. View site / Change password / Log out

[Home](#) / [Training](#) / [Site theme](#) / [Add site theme](#)

Add site theme

Site:	<input type="text" value="mux-academy.example.com"/>
Theme dir name:	<input type="text" value="edx/edxapp/themes/mux-academy"/>

edx-organizations

<https://github.com/edx/edx-organizations>

Configuration helpers

[edx-platform/openedx/core/djangoapps/site_configuration/helpers.py](https://github.com/edx-platform/openedx-core-djangoapps-site_configuration_helpers.py)

Config - standard way:

```
from django.conf import settings
```

```
settings.ENABLE_COURSE_SORTING_BY_START_DATE
```

Config - site-aware way:

```
from django.conf import settings
```

```
from openedx.core.djangoapps.site_configuration import helpers as configuration_helpers
```

```
configuration_helpers.get_value("ENABLE_COURSE_SORTING_BY_START_DATE",  
                                settings.FEATURES["ENABLE_COURSE_SORTING_BY_START_DATE"])
```

Config - site-aware way:

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from django.conf import settings
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```

How have we extended the platform?

edx-organizations customizations

edx-organizations customizations

user -> organization mapping

edx-organizations customizations

user -> organization mapping

Django Authentication backends

edx-organizations customizations

user -> organization mapping

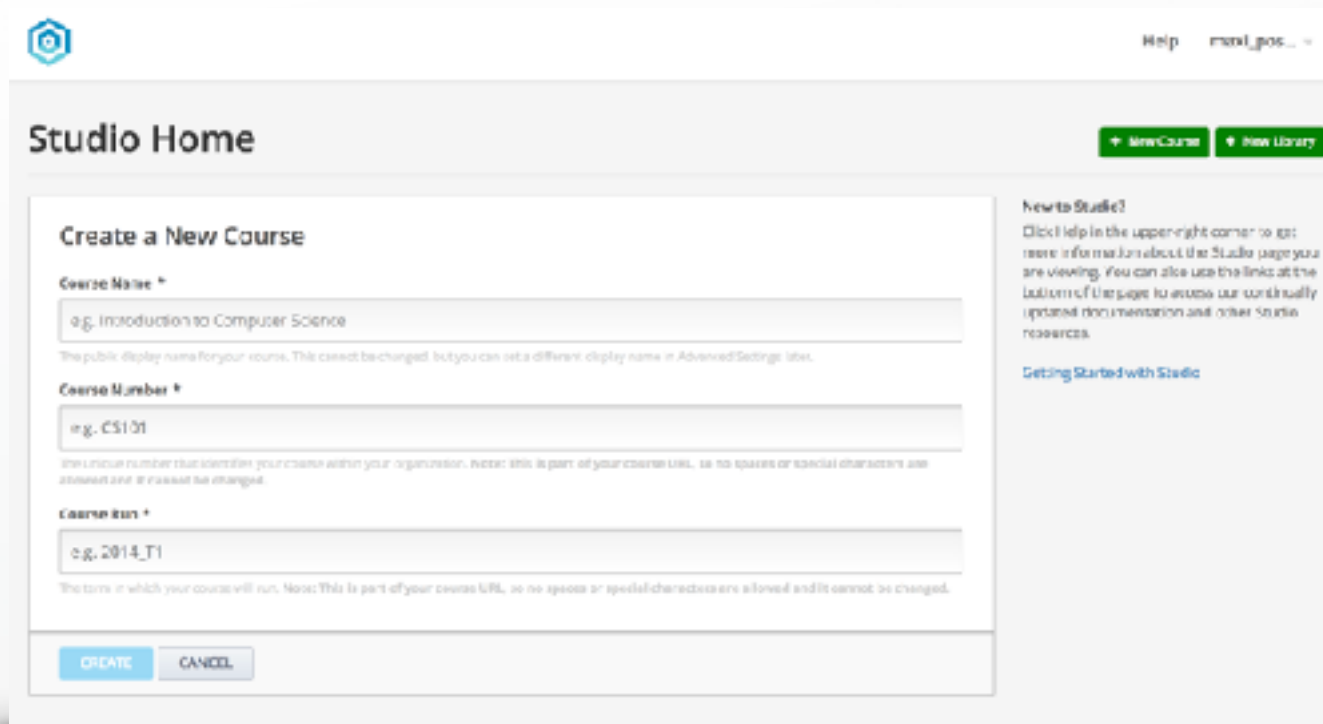
Django Authentication backends

Django middleware

Studio customizations

**By default, no Open edX Sites available in Studio.
Also, if a user has global staff permissions,
will be able to access all courses in studio**

Studio customizations



The screenshot shows the 'Studio Home' interface. At the top left is the Appsembler logo. At the top right are links for 'Help' and 'myorg_pos...'. Below the header, there are two green buttons: '+ New Course' and '+ New Library'. The main content area is titled 'Create a New Course' and contains three input fields:

- Course Name ***: A text input field containing 'e.g. Introduction to Computer Science'. Below it is a note: 'The public display name for your course. This cannot be changed, but you can set a different display name in Advanced Settings later.'
- Course Number ***: A text input field containing 'e.g. CS101'. Below it is a note: 'The course number that identifies your course within your organization. Note: this is part of your course URL, so no spaces or special characters are allowed and it cannot be changed.'
- Course Run ***: A text input field containing 'e.g. 2014_T1'. Below it is a note: 'The term in which your course will run. Note: This is part of your course URL, so no spaces or special characters are allowed and it cannot be changed.'

At the bottom of the form are two buttons: 'CREATE' (in blue) and 'CANCEL' (in grey). To the right of the form is a sidebar with the heading 'New to Studio?' and a paragraph of text: 'Click help in the upper-right corner to get more information about the Studio page you are viewing. You can also use the links at the bottom of the page to access our continually updated documentation and other Studio resources.' Below this is a link: 'Getting Started with Studio'.

Studio customizations

The screenshot displays the 'Studio Home' interface. At the top left is the Appsembler logo, and at the top right are 'Help' and a user profile 'maxi_pos...'. Below the header, there are two green buttons: 'New Course' and 'New Library'. The main content area is divided into two sections: 'Courses' (active) and 'Libraries'. Under 'Courses', three items are listed: 'My Awesome Course' (maxi_pos... / 001 / 2018_2), 'My Awesome Course 2' (maxi_pos... / 002 / 2018_2), and 'My Awesome Course 3' (maxi_pos... / 003 / 2018_1). To the right, a 'New to Studio?' section provides instructions on how to find help, and a 'Getting Started with Studio' link is present. At the bottom, there is a search bar with the text 'Looking for help with Studio?', a copyright notice for Appsembler, Inc., and a logo for 'POWERED BY OPENEDX'.

So, back to the current state of platform.

Challenges ahead:

User registration over multiple sites

Challenges ahead:

Permissions Structure

Challenges ahead:

APIs

Takeaways

What do we have available today:

- **Sites**
- **edx-organizations**

What we cannot achieve yet:

- **Separate user accounts per site/organizations**
- **Partitioning courses per organizations in studio**

Join the conversation

If you're interested, please join us to the discussion in the Open edX
Slack channel **#multi-tenancy**

Thanks!



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Questions?