

# Moodle Moot Global 2022

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Third-party systems integration,  
user accounts and enrolments:  
What are some of the challenges,  
options, and opportunities with  
Moodle?





# Introduction

## Who am I?

I'm James.

## Why am I here?

I'm going to talk about Moodle user creation, enrolment and integrations.

**If an enrolment integration process fails and nobody is around to debug the error messages, is it a really big problem?**

**YES, PROBABLY!**

# Overview



# Overview

## What do we already “know”?

Learner enrolment processing is/was painful.

Third-party systems integration is difficult or time-consuming to build, or both.

Applications differ due to different types of:

- Users (i.e. auth types)
- Courses (e.g. re-use or rollover)
- Enrolments
- Integrations



# A Simple Beginning



# A Simple Beginning

## The Student Journey – (Sorry, not again!)

1. Enrolment and payment
2. Access to the course
3. Learn / study to build and develop knowledge and skills
4. Demonstrate learning outcomes through assessment
5. Obtain confirmation / proof of completion, e.g. credit or certificate



# A Simple Beginning

## A Teacher's Story – (Don't forget about them!)

1. Course design
2. Course approval
3. Content creation
4. Teaching, more teaching...
5. Marking, more marking, marking, yet more marking...
6. Admin, admin, admin, admin, admin, admin, admin...



# A Simple Beginning

## Life of an Admin – (Careful!)

1. Publish the course list, website, and/or contact information
2. Receive calls, emails, web contact form submissions and payment
3. Create courses
4. Enrol students into courses
5. Extract/publish/communicate student grades
6. Ratify student progression, completion, graduation



# A Dash of Complexity



## A Dash of Complexity

### **Manual User / Enrolment Management: It's not scalable.**

Success comes with growth, and growth comes with greater likelihood of errors, edge cases and additional manual intervention. These add up quickly, and outstrip human resource constraints.

Receiving new enrolments from phone calls, emails, web forms and walk-ins will mean creating and enrolling new users, or enrolling existing users, requiring checking (identity details, e.g. for typos) with visual inspection.

“Just uploading a CSV file” of users manually is not a manageable solution. Additions, removals, and corrections (even with “deadlines”, including census date) happen, and create high risk of human error and impact on students.



## A Dash of Complexity

### **Automatic User / Enrolment Management: It's still tricky.**

Larger organisations with more infrastructure might manage user accounts in a database or with LDAP, or use SAML or Open ID Connect (OIDC) for Single-Sign-On.

However, user accounts might be created on-the-fly when users log in using Just-In-Time (JIT) provisioning, or in advance in bulk batch synchronisation jobs. There may be multiple jobs that need to run, before accounts are loaded into Moodle in batch, and they might be be “push” or “pull”.

Batch jobs may co-exist with JIT, or webservice/API account creation.



## A Dash of Complexity

### Timing can be a thing...

Making sure that user account creation and user enrolment happens as expected can rely on a number of timing factors.

Batch jobs take time to run. JIT/APIs can be instant.

Can a user login and be created with JIT before their account comes through in a batch sync? Does it matter?

What about if the Moodle accounts/enrolments (e.g. for OIDC) need to be in sync with other services integrated with Moodle?

# Components and Options



# Components and Options

## How Does it Work?

**Authentication:** User accounts exist with an associated authentication type (an authentication method as part of core or third-party authentication plugin.)

Having a valid user account allows login to Moodle – but not a course.

**Enrolment:** Enrolling an existing user account into a course allows the user to interact with other course participants and content (according to the role/roles assigned to that enrolment, and the associated permissions/capabilities).

Similarly, enrolment types/plugins exist to extend how users get enrolled.



# Components and Options

## Just a Few (core) Authentication Methods / Plugins:

Name	Users	Enable	Up/Down	Settings	Test settings
Manual accounts	2			<a href="#">Settings</a>	
No login	0				
Email-based self-registration	0		↓	<a href="#">Settings</a>	
CAS server (SSO)	0		↑ ↓	<a href="#">Settings</a>	<a href="#">Test settings</a>
External database	0		↑ ↓	<a href="#">Settings</a>	<a href="#">Test settings</a>
LDAP server	0		↑ ↓	<a href="#">Settings</a>	<a href="#">Test settings</a>
LTI	0		↑ ↓		
MNet authentication	0		↑ ↓	<a href="#">Settings</a>	<a href="#">Test settings</a>
OAuth 2	0		↑ ↓	<a href="#">Settings</a>	
Shibboleth	0		↑ ↓	<a href="#">Settings</a>	<a href="#">Test settings</a>
Web services authentication	0		↑		



## Components and Options

### Just a Few (core) Authentication Methods / Plugins:

**auth\_manual:** Users and passwords inside the Moodle database

**auth\_email:** Users and passwords inside Moodle, self-register with email

**auth\_db:** Users in external database (passwords optionally in Moodle)

**auth\_ldap:** Users/and passwords in an LDAP server, Moodle copies user data

**auth\_lti:** Allows Moodle to act as an LTI Tool Provider (and have users created from other LTI Tool Consumers)

And so many settings...





# Components and Options

## Just a Few (core) Enrolment Methods / Plugins:

Name	Instances / enrolments	Version	Enable
Manual enrolments	0 / 0	2020061500	

Name	Instances / enrolments	Version	Enable		
Guest access	0 / 0				
Self enrolment	0 / 0	IMS Enterprise file	0 / 0	2020061500	
Cohort sync	0 / 0	LDAP enrolments	0 / 0	2020061500	
Category enrolments	0 / 0	Publish as LTI tool	0 / 0	2020061500	
External database	0 / 0	Course meta link	0 / 0	2020061500	
Flat file (CSV)	0 / 0	MNet remote enrolments	0 / 0	2020061500	
		PayPal	0 / 0	2020061500	



# Components and Options

## Third-Party Plugins for SSO:

SSO is ubiquitous now, but comes with its own complexity.

## SAML2 and Open ID Connect:

auth\_saml2: [https://moodle.org/plugins/auth\\_saml2](https://moodle.org/plugins/auth_saml2)

auth\_oidc: [https://moodle.org/plugins/auth\\_oidc](https://moodle.org/plugins/auth_oidc)



# Components and Options

## Webservice APIs:

Relevant core user Web Service APIs:

core\_user\_\* (e.g. “create\_user”, “delete\_user”, “get\_users”)

```
core_user_add_user_device ▶  
core_user_add_user_private_files ▶  
core_user_agree_site_policy ▶  
core_user_create_users ▶  
core_user_delete_users ▶  
core_user_get_course_user_profiles ▶  
core_user_get_private_files_info ▶  
core_user_get_user_preferences ▶  
core_user_get_users ▶  
core_user_get_users_by_field ▶  
core_user_remove_user_device ▶  
core_user_set_user_preferences ▶  
core_user_update_picture ▶  
core_user_update_user_preferences ▶  
core_user_update_users ▶  
core_user_view_user_list ▶  
core_user_view_user_profile ▶
```



# Components and Options

## Webservice APIs:

Relevant enrolment Web Service APIs:

### core\_enrol\_\*

- [core\\_enrol\\_edit\\_user\\_enrolment](#) ▶
- [core\\_enrol\\_get\\_course\\_enrolment\\_methods](#) ▶
- [core\\_enrol\\_get\\_enrolled\\_users](#) ▶
- [core\\_enrol\\_get\\_enrolled\\_users\\_with\\_capability](#) ▶
- [core\\_enrol\\_get\\_potential\\_users](#) ▶
- [core\\_enrol\\_get\\_users\\_courses](#) ▶
- [core\\_enrol\\_search\\_users](#) ▶
- [core\\_enrol\\_submit\\_user\\_enrolment\\_form](#) ▶
- [core\\_enrol\\_unenrol\\_user\\_enrolment](#) ▶

### enrol\_\*

- [enrol\\_guest\\_get\\_instance\\_info](#) ▶
- [enrol\\_manual\\_enrol\\_users](#) ▶
- [enrol\\_manual\\_unenrol\\_users](#) ▶
- [enrol\\_self\\_enrol\\_user](#) ▶
- [enrol\\_self\\_get\\_instance\\_info](#) ▶

### core\_course\_get\_enrol\*

- [core\\_course\\_get\\_enrolled\\_courses\\_by\\_timeline\\_classification](#) ▶
- [core\\_course\\_get\\_enrolled\\_users\\_by\\_cm\\_id](#) ▶



## Components and Options

### **Being Able to Authenticate Doesn't Guarantee Login!**

For various reasons, you may wish to prevent JIT provisioning, and you may need to rely on batch user synchronisation for account creation.

A Moodle integrated with LDAP or SSO might authenticate a user, but knock them back because they don't have an account.

Usually not a problem, due to timing in your favour – distance in the journey.

Good reasons, bad reasons – they're all reasons.

**...BUT! And what about downstream integrations?**

**Don't Be Intimidated!**

**YOU GOT THIS!**



Don't Be Intimidated! YOU GOT THIS!

**Greenfields or Existing: It's all still possible...**

Coming to Moodle auth/enrolment for the first time, rebuilding an existing platform, or migrating from an established structure is all achievable.



# Don't Be Intimidated! YOU GOT THIS!

## Where can I read more?

- Moodle Docs: <https://docs.moodle.org/> e.g. Managing a Moodle Site: [https://docs.moodle.org/en/Managing\\_a\\_Moodle\\_site](https://docs.moodle.org/en/Managing_a_Moodle_site)
- Moodle Plugin Directory, for:
  - Authentication: <https://moodle.org/plugins/?q=type:auth>
  - Enrolment: <https://moodle.org/plugins/?q=type:enrol>
- Your own Moodle site: (Webservice API Documentation) <https://your.moodle/admin/webservice/documentation.php>





# Don't Be Intimidated! YOU GOT THIS!

## Strategies for Success

- **Don't Panic!**
- **Read the Docs!** (<https://docs.moodle.org/>)
- Think carefully about your environment.
- Break down your requirements.
- Explore and review any existing configuration settings.
- Remember your toolset: Auth plugins, Enrolment plugins, Web Service APIs.
- Community Engagement: Ask in the forums, build it yourself, find a partner!

**Thank you!**

**Any Questions?**

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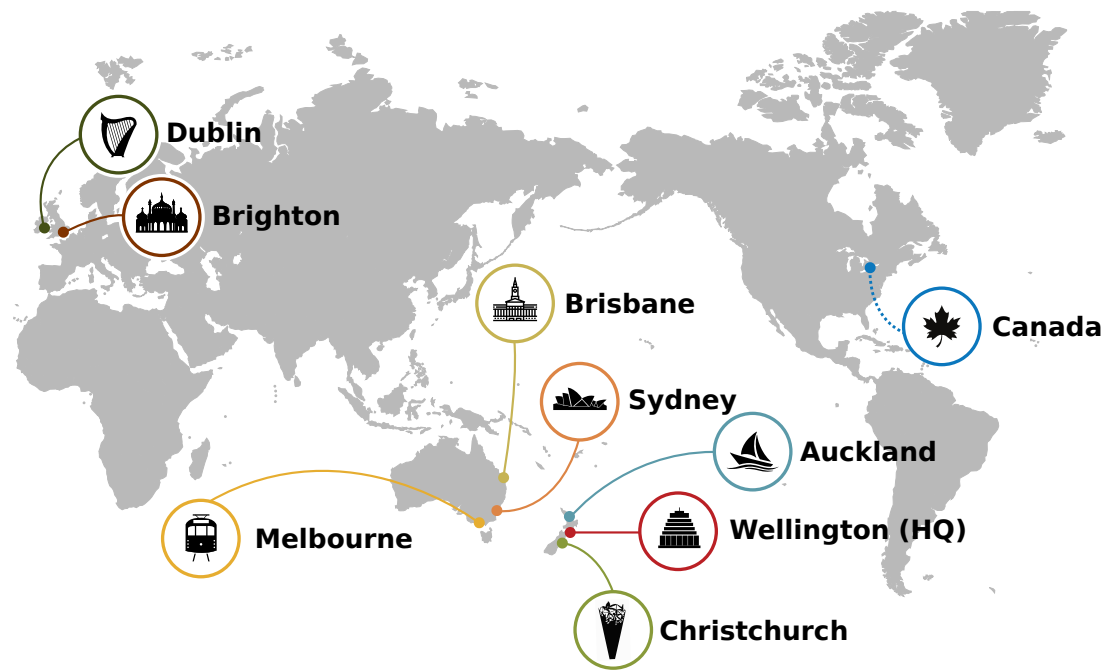
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