**Patching Moodle 4.0 to allow integration with SLS**

**Current Situation**

Moodle 4.0 supports LTI 1.3 and LTI Advantage

SLS partially supports LTI 1.3 and does not support LTI Advantage

References:

* Publish as LTI tool in Moodle, available at <https://docs.moodle.org/400/en/Publish_as_LTI_tool#Custom_launch_parameters>
* List of LTI Advantage certified products, available at <https://www.imsglobal.org/ltiadvantage>
* Integration with SLS, available at <https://docs.learning.moe.edu.sg/sls/partners/integration/integrationsls.html>

**Patch for resource identification**

Moodle 4.0 supports two targets link uris:

* [MOODLE\_40]/enrol/lti/launch.php endpoint (for regular resource link launches)
* [MOODLE\_40]/enrol/lti/launch\_deeplink.php endpoint (for deep linking launches)

Moreover, Moodle 4.0 requires that the resource identification by the custom claim field 'id'.

For example, a valid launch request for Moodle could be the following one:

{"sub":"f25afda7-b05b-4b70-82b5-2f285f1807fe",

 "name":"Loo Kang, Wee",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/roles":[

 "http:\/\/purl.imsglobal.org\/vocab\/lis\/v2\/institution\/person#Instructor"

 ],

 "iss":"https:\/\/vle.dev.sls.ufinity.com",

 "aud":["76b5f118-d6b0-4a6b-9cfa-00fa3387e3d9"],

 "nonce":"nonce-7964af86f762fdac04fdaa4286650308f2c63cb92dba8f2a21e226049a65c8c5",

 "iat":1660698910,

 "exp":1660699210,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/message\_type":"**LtiResourceLinkRequest**",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/version":"1.3.0",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/deployment\_id":

 "9ebbd42f-0f45-41f8-b25b-8cf5aef68d02",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/**target\_link\_uri**":

 "**https:\/\/iwant2study.org\/moodle402\/enrol\/lti\/launch.php** ",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/resource\_link":{

 "id":"13d6485e-2482-49d4-bbc5-f9dec785d5cf\_890743021\_1660698910",

 "title":null,

 "description":null

 },

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/context":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/role\_scope\_mentor":[],

 "https:\/\/purl.imsglobal.org\/spec\/lti-nrps\/claim\/namesroleservice":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/**custom**": **{**

 **"id":** "**68b09cbe-85fc-4777-be2d-d6d8c219f775**"

 **}**

}

Moodle implements the resource identification consistently with the LTI 1.3 specification. See <https://www.imsglobal.org/spec/lti/v1p3/impl#do-not-use-resource_link-id>

However, SLS does not allow to include the resource identification by the custom claim field 'id'.

We decided to patch Moodle to allow SLS to include the resource identification in the target link uri.

For example, a valid SLS launch request for Moodle could be the following one:

{"sub":"f25afda7-b05b-4b70-82b5-2f285f1807fe",

 "name":"Loo Kang, Wee",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/roles":[

 "http:\/\/purl.imsglobal.org\/vocab\/lis\/v2\/institution\/person#Instructor"

 ],

 "iss":"https:\/\/vle.dev.sls.ufinity.com",

 "aud":["76b5f118-d6b0-4a6b-9cfa-00fa3387e3d9"],

 "nonce":"nonce-7964af86f762fdac04fdaa4286650308f2c63cb92dba8f2a21e226049a65c8c5",

 "iat":1660698910,

 "exp":1660699210,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/message\_type":"**LtiResourceLinkRequest**",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/version":"1.3.0",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/deployment\_id":

 "9ebbd42f-0f45-41f8-b25b-8cf5aef68d02",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/**target\_link\_uri**":

 "**https:\/\/iwant2study.org\/moodle402\/enrol\/lti\/launch.php?id=68b09cbe-85fc-4777-be2d-d6d8c219f775**",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/resource\_link":{

 "id":"13d6485e-2482-49d4-bbc5-f9dec785d5cf\_890743021\_1660698910",

 "title":null,

 "description":null

 },

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/context":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/role\_scope\_mentor":[],

 "https:\/\/purl.imsglobal.org\/spec\/lti-nrps\/claim\/namesroleservice":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/**custom**":**null**

}

File: [MOODLE\_40]/enrol/lti/login.php

// This code verifies the target\_link\_uri. Only two values are permitted (see endpoints listed above).

>> if (!in\_array($targetlinkuri, $validuris)) {

<< if (!in\_array(strtok($targetlinkuri,'?'), $validuris)) {

 $msg = 'The target\_link\_uri param must match one of the redirect URIs set during tool registration.';

 throw new coding\_exception($msg);

}

File: [MOODLE\_40]/lib/lti1p3/src/LtiMessageLaunch.php

/\*\*

\* Fetches the decoded body of the JWT used in the current launch.

\*

\* @return array|object returns the decoded json body of the launch as an array

\*/

public function getLaunchData()

{

>> return $this->jwt['body'];

<< $launchdata = $this->jwt['body'];

<< if(strpos($launchdata['iss'], ".sls.") !== false) {

<< if (empty($launchdata['https://purl.imsglobal.org/spec/lti/claim/custom']['id'])) {

<< $query = parse\_url($launchdata['https://purl.imsglobal.org/spec/lti/claim/target\_link\_uri'], PHP\_URL\_QUERY);

<< if (!empty($query)) {

<< parse\_str($query, $query\_array);

<< if (!empty($query\_array['id'])) {

<< $launchdata['https://purl.imsglobal.org/spec/lti/claim/custom'] = $query\_array;

<< }

<< }

<< }

<< }

<< return $launchdata;

}

References:

* Learning Tools Interoperability Core Specification Version 1.3, available at <https://docs.moodle.org/400/en/Publish_as_LTI_tool#Custom_launch_parameters>

**Patch for keeping SLS username and role in Moodle**

New Moodle accounts will be automatically created for SLS users launching a resource from SLS platform. Because of the SLS launch request does include the fields 'given\_name' and 'family\_name', Moodle generates a new account with a name that is difficult to be associated with SLS users.

We decided to patch Moodle to include the missing fields (based on the field 'name') in the SLS launch request.

Moreover, the role identifier used by the SLS platform is not identified adequately by Moodle. Specifically, Moodle requires role identifier with the prefix http://purl.imsglobal.org/vocab/lis/v2/membership, wheres SLS uses the prefix http://purl.imsglobal.org/vocab/lis/v2/institution/person.

We decided to patch Moodle to include the identification of the role used by SLS in Moodle.

Considering these patches, a valid SLS launch request for Moodle could be the following one:

{"sub":"f25afda7-b05b-4b70-82b5-2f285f1807fe",

 "name":"Loo Kang, Wee",

 **"given\_name": "Wee",**

 **"family\_name": "Loo Kang",**

 **"https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/roles":[**

 **"http:\/\/purl.imsglobal.org\/vocab\/lis\/v2\/membership#Instructor"**

 **],**

 "iss":"https:\/\/vle.dev.sls.ufinity.com",

 "aud":["76b5f118-d6b0-4a6b-9cfa-00fa3387e3d9"],

 "nonce":"nonce-7964af86f762fdac04fdaa4286650308f2c63cb92dba8f2a21e226049a65c8c5",

 "iat":1660698910,

 "exp":1660699210,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/message\_type":"LtiResourceLinkRequest",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/version":"1.3.0",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/deployment\_id":

 "9ebbd42f-0f45-41f8-b25b-8cf5aef68d02",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/target\_link\_uri":

 "https:\/\/iwant2study.org\/moodle402\/enrol\/lti\/launch.php?id=68b09cbe-85fc-4777-be2d-d6d8c219f775",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/resource\_link":{

 "id":"13d6485e-2482-49d4-bbc5-f9dec785d5cf\_890743021\_1660698910",

 "title":null,

 "description":null

 },

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/context":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/role\_scope\_mentor":[],

 "https:\/\/purl.imsglobal.org\/spec\/lti-nrps\/claim\/namesroleservice":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/custom":null

}

File: [MOODLE\_40]/lib/lti1p3/src/LtiMessageLaunch.php

/\*\*

\* Fetches the decoded body of the JWT used in the current launch.

\*

\* @return array|object returns the decoded json body of the launch as an array

\*/

public function getLaunchData()

{

 $launchdata = $this->jwt['body'];

 if(strpos($launchdata['iss'], ".sls.") !== false) {

 if (empty($launchdata['https://purl.imsglobal.org/spec/lti/claim/custom']['id'])) {

 $query = parse\_url($launchdata['https://purl.imsglobal.org/spec/lti/claim/target\_link\_uri'], PHP\_URL\_QUERY);

 if (!empty($query)) {

 parse\_str($query, $query\_array);

 if (!empty($query\_array['id'])) {

 $launchdata['https://purl.imsglobal.org/spec/lti/claim/custom'] = $query\_array;

 }

 }

 }

>> if (!empty($launchdata['name']) and

>> empty($launchdata['given\_name']) and

>> empty($launchdata['family\_name'])) {

>> $parts = explode(",", $launchdata['name']);

>> $launchdata['given\_name'] = trim($parts[0]);

>> if (!empty($parts[1])) {

>> $launchdata['family\_name'] = trim($parts[1]);

>> } else {

>> // if not family name, set initials

>> $launchdata['family\_name'] = implode( '', array\_map( function ( $word ) {

>> return strtoupper( $word['0'] );

>> }, explode( ' ', $parts[0] ) ) );

>> }

>> }

>> $launchroles = $launchdata['https://purl.imsglobal.org/spec/lti/claim/roles'] ?? null;

>> if ($launchroles) {

>> foreach ($launchroles as $key => $role) {

>> if ($role == 'http://purl.imsglobal.org/vocab/lis/v2/institution/person#Instructor') {

>> $launchroles[$key] = 'http://purl.imsglobal.org/vocab/lis/v2/membership#Instructor';

>> } elseif ($role == 'http://purl.imsglobal.org/vocab/lis/v2/institution/person#Leaner') {

>> $launchroles[$key] = 'http://purl.imsglobal.org/vocab/lis/v2/membership#Leaner';

>> }

>> }

>> $launchdata['https://purl.imsglobal.org/spec/lti/claim/roles'] = $launchroles;

>> }

 }

 return $launchdata;

}

Reference:

* Role vocabularies, available at <https://www.imsglobal.org/spec/lti/v1p3/#role-vocabularies>

**Patch for forcing embed simulation**

Moodle uses the custom field 'force\_embed' of the launch request to force embed view. This field is not sent by the SLS platform.

We decided to patch Moodle to include the custom field 'force\_embed' in the SLS launch request.

Considering this patch, a valid SLS launch request for Moodle could be the following one:

{"sub":"f25afda7-b05b-4b70-82b5-2f285f1807fe",

 "name":"Loo Kang, Wee",

"given\_name": "Wee",

 "family\_name": "Loo Kang",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/roles":[

 "http:\/\/purl.imsglobal.org\/vocab\/lis\/v2\/membership#Instructor"

 ],

 "iss":"https:\/\/vle.dev.sls.ufinity.com",

 "aud":["76b5f118-d6b0-4a6b-9cfa-00fa3387e3d9"],

 "nonce":"nonce-7964af86f762fdac04fdaa4286650308f2c63cb92dba8f2a21e226049a65c8c5",

 "iat":1660698910,

 "exp":1660699210,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/message\_type":"LtiResourceLinkRequest",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/version":"1.3.0",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/deployment\_id":

 "9ebbd42f-0f45-41f8-b25b-8cf5aef68d02",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/target\_link\_uri":

 "https:\/\/iwant2study.org\/moodle402\/enrol\/lti\/launch.php?id=68b09cbe-85fc-4777-be2d-d6d8c219f775",

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/resource\_link":{

 "id":"13d6485e-2482-49d4-bbc5-f9dec785d5cf\_890743021\_1660698910",

 "title":null,

 "description":null

 },

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/context":null,

 "https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/role\_scope\_mentor":[],

 "https:\/\/purl.imsglobal.org\/spec\/lti-nrps\/claim\/namesroleservice":null,

 **"https:\/\/purl.imsglobal.org\/spec\/lti\/claim\/custom": {**

 **"force\_embed": 1**

 **}**

}

File: [MOODLE\_40]/lib/lti1p3/src/LtiMessageLaunch.php

/\*\*

\* Fetches the decoded body of the JWT used in the current launch.

\*

\* @return array|object returns the decoded json body of the launch as an array

\*/

public function getLaunchData()

{

 $launchdata = $this->jwt['body'];

 if(strpos($launchdata['iss'], ".sls.") !== false) {

 if (empty($launchdata['https://purl.imsglobal.org/spec/lti/claim/custom']['id'])) {

 $query = parse\_url($launchdata['https://purl.imsglobal.org/spec/lti/claim/target\_link\_uri'], PHP\_URL\_QUERY);

 if (!empty($query)) {

 parse\_str($query, $query\_array);

 if (!empty($query\_array['id'])) {

 $launchdata['https://purl.imsglobal.org/spec/lti/claim/custom'] = $query\_array;

 }

 }

 }

 if (!empty($launchdata['name']) and

 empty($launchdata['given\_name']) and

 empty($launchdata['family\_name'])) {

 $parts = explode(",", $launchdata['name']);

 $launchdata['given\_name'] = trim($parts[0]);

 if (!empty($parts[1])) {

 $launchdata['family\_name'] = trim($parts[1]);

 } else {

 // if not family name, set initials

 $launchdata['family\_name'] = implode( '', array\_map( function ( $word ) {

 return strtoupper( $word['0'] );

 }, explode( ' ', $parts[0] ) ) );

 }

 }

 $launchroles = $launchdata['https://purl.imsglobal.org/spec/lti/claim/roles'] ?? null;

 if ($launchroles) {

 foreach ($launchroles as $key => $role) {

 if ($role == 'http://purl.imsglobal.org/vocab/lis/v2/institution/person#Instructor') {

 $launchroles[$key] = 'http://purl.imsglobal.org/vocab/lis/v2/membership#Instructor';

 } elseif ($role == 'http://purl.imsglobal.org/vocab/lis/v2/institution/person#Leaner') {

 $launchroles[$key] = 'http://purl.imsglobal.org/vocab/lis/v2/membership#Leaner';

 }

 }

 $launchdata['https://purl.imsglobal.org/spec/lti/claim/roles'] = $launchroles;

 }

>> $launchdata['https://purl.imsglobal.org/spec/lti/claim/custom']['force\_embed'] = 1;

 }

 return $launchdata;

}