香港教育城 HKedCity

www.hkedcity.net

Tryout Programme of Standardised Data Format for e-Textbook and e-Learning Platform

EdConnect and EdDATA

5 December 2018

Agenda

- Introduction and background
- Try-out Programme
- Q&A

電子課本統一數據格式 / 平台規格試行計劃

(1) 單一帳戶登入(SSO)：19年1月至4月

試行項目及預期成果	出版社的參與
● 測試出版社系統透過公開技術標準成功接入教城SSO	● 更新出版社服務平台以支援網站 (web) 及流動應用程式 (app) ● 使用教城戶口及測試數據進行測試 ● 參與者：Technical staff

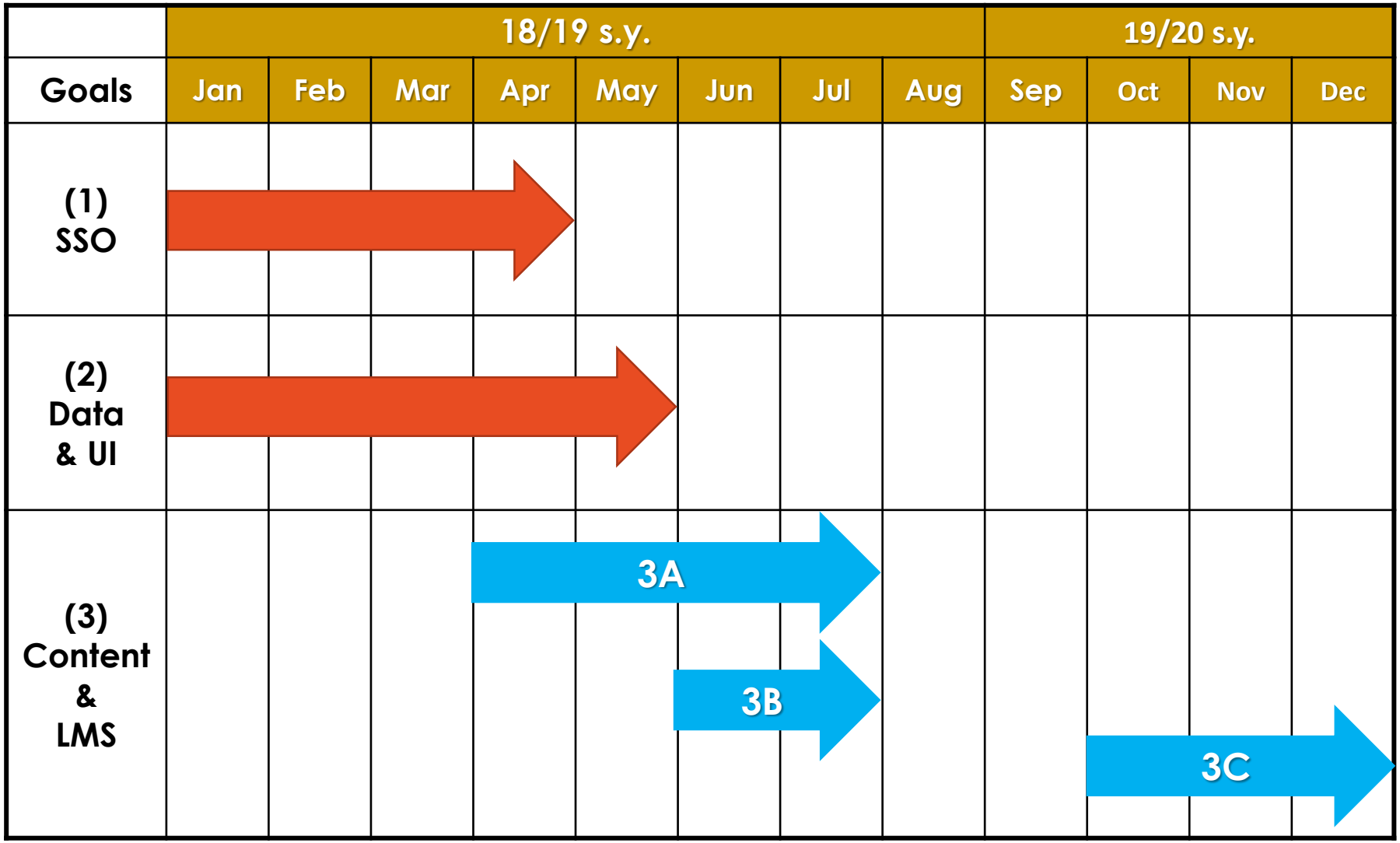
(2) 學生數據(Data)及使用者介面(UI)：19年1月至5月

試行項目及預期成果	出版社的參與
● 測試學生數據標準(EdData)的合適性 ● 測試學校，教城及出版社系統三方的數據存取流程 ● 出版社透過教城標準數據介面成功存取學校數據 ● 收集學校對統一帳戶管理介面(UI)的呈現模式及功能的意見	● 測試學生數據標準能否配合出版社的需要 ● 測試學生數據(EdData)存取介面 ● 對數據存取介面(UI)的呈現模式及功能提供意見，包括學生及學校數據 ● 參與者：Technical Staff

(3) 電子課本內容(Content)及學習管理系統(LMS)：19年4月至7月

試行項目及預期成果	出版社的參與
● 測試及調整電子教科書的設計及技術規格，使其兼容於學校使用的學習管理系統(LMS) ● 評估此方案能否便利教師利用學校的LMS整合電子課本及其他電子學習資源 ● 學校透過LMS的單一登入可以無縫地使用出版社的教學資源	● 提供學校試教用的電子課本材料 ● 測試電子教科書內容及電子功能能否相容於業界標準的學習平台，繼而作出適當的技術調整 ● 調適電子教科書及資源的設計以配合不同教學上的需要，達致個人化的學習環境，發揮及突顯電子教科書的優勢 ● 參與者：Technical staff & Editors

試行計劃時間表 (初定)


18/19 s.y.
19/20 s.y.
Goals
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
(1) SSO
(2) Data & UI
(3) Content & LMS
3A
3B
3C

Background

- Single sign-on
- Publishers - use standard student data to serve all schools
- Schools - prepare one set of data for all publishers
- Consultation of Student Data Standard on 24 Aug 2018
- Proof of Concept and Tryout

Video on Student Data Standard :

https://videoplayer.hkedcity.net/embed/bf0a66cf895f201610a3cdd1da0dc10f

Data Standard
Part 1- Data Fields

1.1 Basic Data (mandatory data)

Field Name	Data Type	Description	Example
DISPLAY_NAME	Varchar(35)	This is the "Name" to be displayed in the system. It can be a code if users do not want to show name.	E.g. 1) David Chan E.g. 2) P4A-10
PROFILE_ID	Varchar(12)	A unique profile ID to identify a student in the system.	TYPNY8NJAOOH

Notes:
(a) Part 1.1 – Basic Data is the minimal data to support user authentication.
(b) PROFILE_ID: Provided by HKEdCity. Third party data users should make sure this field is unique in their system if they have multiple data sources for the student data.

香港教育城 HKedCity

Data Standard
Part 1- Data Fields

1.2 Optional Data

Field Name	Data Type	Description	Example
HKEDCITY_ID	Varchar(44)	The login_id of the user in HKEdCity	hke-stud001
SCHOOL_CODE	Varchar(12)	An unique school identifier from EDB - SCRN **Combination of SCRN**: School Number [6 digits] + Location ID [4 digits]+ School Level [1 digit] + Session [1 digit] **School Level:** Kindergarten - 1 Primary - 2 Secondary - 3 Post-Secondary - 4 Others - 9 **Session:** AM - 1 PM - 2 Whole Day - 3 Evening - 4	SCRN: 190381000133 School Number: 190381 Location ID: 0001 School Level: 3 (Secondary) Session: 3 (Whole Day)

Data Standard
Part 1- Data Fields

1.2 Optional Data

Field Name	Data Type	Description	Example
STUDENT_ENNAME	Varchar(35)	English full name	
STUDENT_CHNAME	Varchar(18)	Chinese full name	
REG_NO	Varchar(9)	Student School Registration Number (Unique in each school)	
SCH_YEAR	Integer	School academic year (YYYY)	
CLASS_LVL	Varchar(2)	Class Level K1 - Kindergarten 1, K2 - Kindergarten 2, K3 - Kindergarten 3, P1 - Primary 1, P2 - Primary 2, P3 - Primary 3, P4 - Primary 4, P5 - Primary 5, P6 - Primary 6, S1 - Secondary 1, S2 - Secondary 2, S3 - Secondary 3, S4 - Secondary 4, S5 - Secondary 5, S6 - Secondary 6	

香港教育城 HKedCity

Data Standard
Part 1- Data Fields

1.2 Optional Data

Field Name	Data Type	Description	Example
CLASS_NAME	Varchar(4)	Class Name Unique identifier of a class in a school	4A
CLASS_NUMBER	Integer	Student Class Number Unique identifier for a student in a class	10
GENDER	Varchar	Gender code Male: M Female: F	F
MOBILE_NO	Varchar(12)	Mobile phone number	91234567
EMAIL	Varchar(60)	Email address	chantaiman@hello.edu.hk

Notes:

(c) School information (School Number, Location ID, School Level and Session) can be retrieved from: https://applications.edb.gov.hk/schoolsearch/schoolinfo.aspx?langno=1&scrn=190381000133

(d) The availability of Part 1.2 - Optional Data for third parties is subject to the authorization of individual schools.

香港教育城 HKedCity

www.hkedcity.net

Feedbacks on Student Data Standard

Overall

- A total of 14 responses have been received.
- Q: Do you agree that student data standardisation is necessary for the industry?

Yes	14
No	0

N:14

Mandatory Data

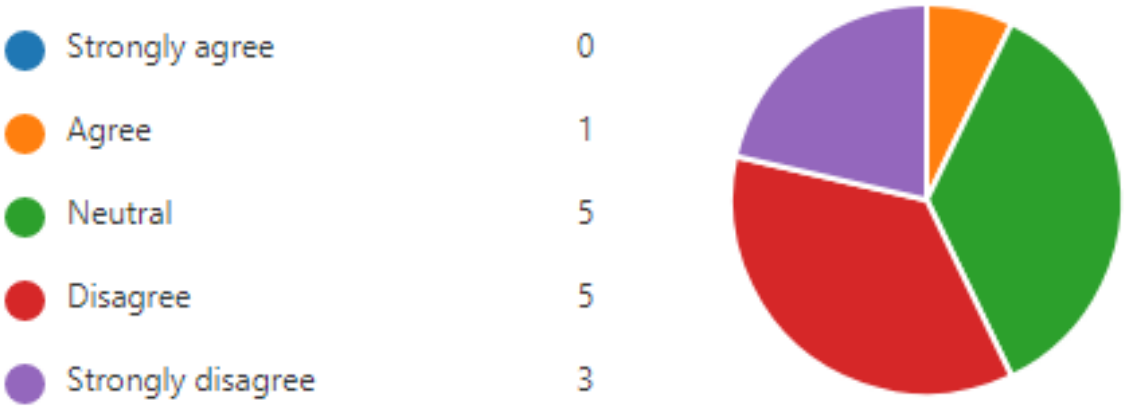
- Q: Do you agree with the suggested data fields and format listed for Basic Data (mandatory data)?

Strongly agree	6
Agree	2
Neutral	3
Disagree	3
Strongly disagree	0

N:14

Optional Data

- Q: Do you agree with the suggested data fields and format listed for Basic Data (optional data)?



N:14

香港教育城 HKedCity

www.hkedcity.net

Three Tryout Options

香港教育城 HKedCity

www.hkedcity.net

1. Single Sign-on

EdConnect – secure based on industry standards

EdConnect 1.0

- Single sign-on solution provided by HKEdCity
- A set of restful API
- 1.0 Launched in 2014
- Support OAuth 2.0

EdConnect 2.0

- Upgrade of EdConnect 1.0
- Based on the Student Data Standard (Mandatory data)

EdConnect 2.0

	EdConnect 1.0	EdConnect 2.0
WEB integration	OAUTH 2.0	OAUTH 2.0 SAML 2.0
APP framework	Webview*	AppAuth Webview*
Student data retrieval	By EdConnect 1.0	By EdDATA

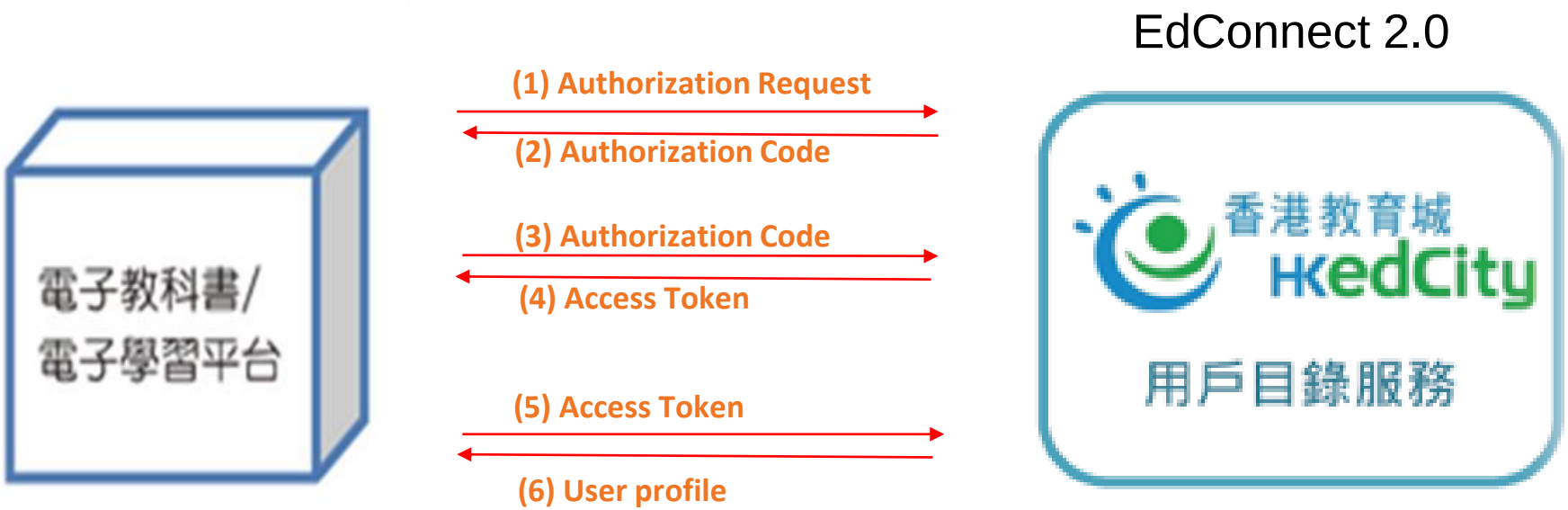
Remark : Webview does not support log in by Google account

香港教育城 HKedCity

OAUTH 2.0

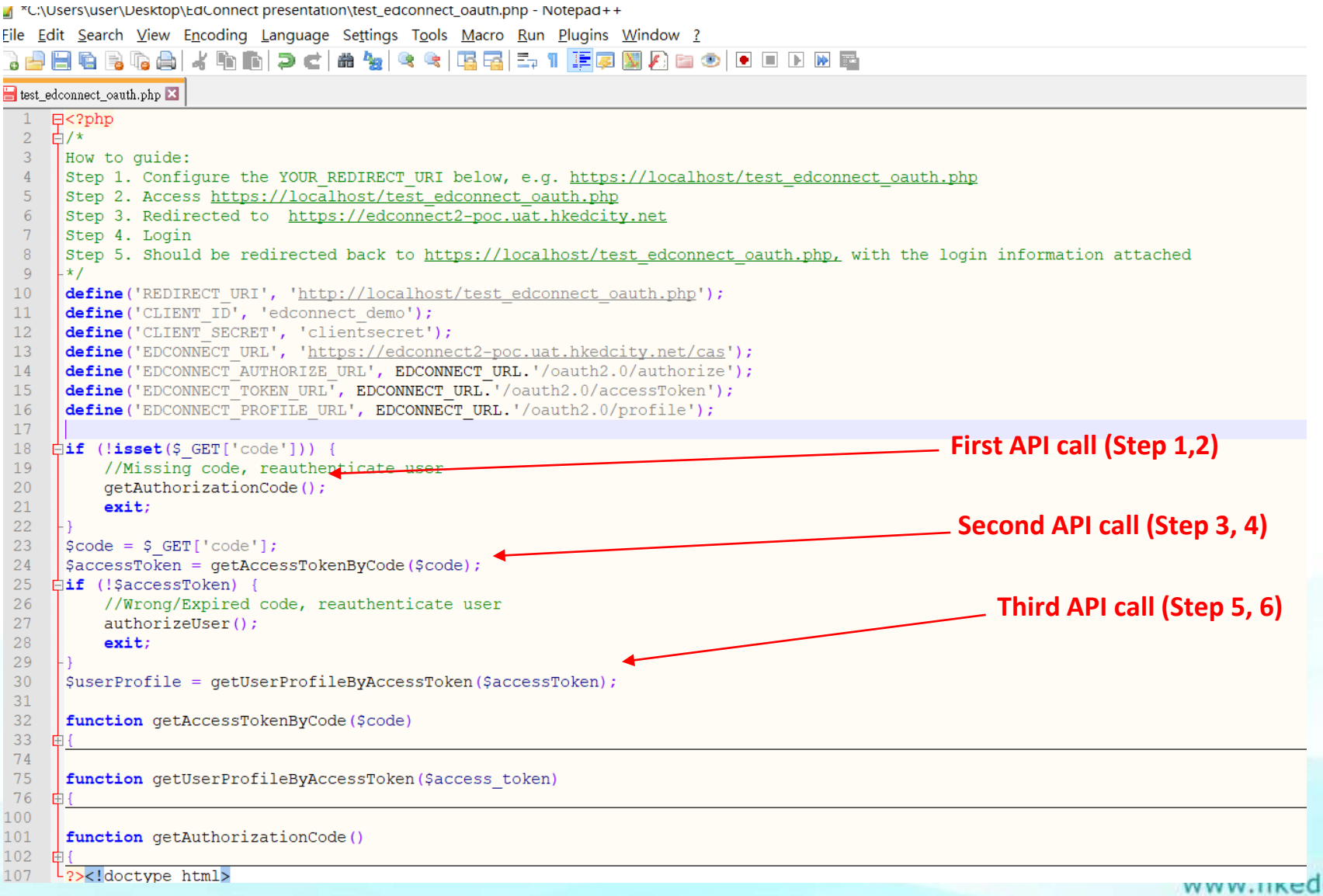
- Oauth 2.0 Web Site
  - https://oauth.net/2/
- Recommended Grant Type
  - Authorization Code
- Information Provided by Publisher
  - Redirect URL
- Information Provided by HKEdCity
  - Client ID
  - Client Secret

OAUTH 2.0



Click here to view demo

OAUTH 2.0


*C:\Users\user\Desktop\EdConnect presentation\test_edconnect_oauth.php - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
test_edconnect_oauth.php
1 <?php
2 /*
3 How to guide:
4 Step 1. Configure the YOUR_REDIRECT_URI below, e.g. https://localhost/test_edconnect_oauth.php
5 Step 2. Access https://localhost/test_edconnect_oauth.php
6 Step 3. Redirected to https://edconnect2-poc.uat.hkedcity.net
7 Step 4. Login
8 Step 5. Should be redirected back to https://localhost/test_edconnect_oauth.php, with the login information attached
9 */
10 define('REDIRECT_URI', 'http://localhost/test_edconnect_oauth.php');
11 define('CLIENT_ID', 'edconnect_demo');
12 define('CLIENT_SECRET', 'clientsecret');
13 define('EDCONNECT_URL', 'https://edconnect2-poc.uat.hkedcity.net/cas');
14 define('EDCONNECT_AUTHORIZE_URL', EDCONNECT_URL.'/oauth2.0/authorize');
15 define('EDCONNECT_TOKEN_URL', EDCONNECT_URL.'/oauth2.0/accessToken');
16 define('EDCONNECT_PROFILE_URL', EDCONNECT_URL.'/oauth2.0/profile');
17
18 if (!isset($_GET['code'])) {
19 //Missing code, reauthenticate user
20 getAuthorizationCode();
21 exit;
22 }
23 $code = $_GET['code'];
24 $accessToken = getAccessTokenByCode($code);
25 if (!$accessToken) {
26 //Wrong/Expired code, reauthenticate user
27 authorizeUser();
28 exit;
29 }
30 $userProfile = getUserProfileByAccessToken($accessToken);
32 function getAccessTokenByCode($code)
33 {
75 function getUserProfileByAccessToken($access_token)
76 {
101 function getAuthorizationCode()
102 {
107 ?><!doctype html>
First API call (Step 1,2)
Second API call (Step 3, 4)
Third API call (Step 5, 6)

SAML 2.0

- SAML 2.0 Website
  - https://www.oasis-open.org/standards#samlv2.0
- Recommended Binding
  - HTTP-Post
- Information Provided by Publisher
  - Publisher SAML meta data
- Information Provided by HKEdCity
  - EdConnect 2.0 SAML meta data
- Implementation method
  - Install authentication application
    (e.g. simplesamlphp)
  - Configure installed application

AppAuth

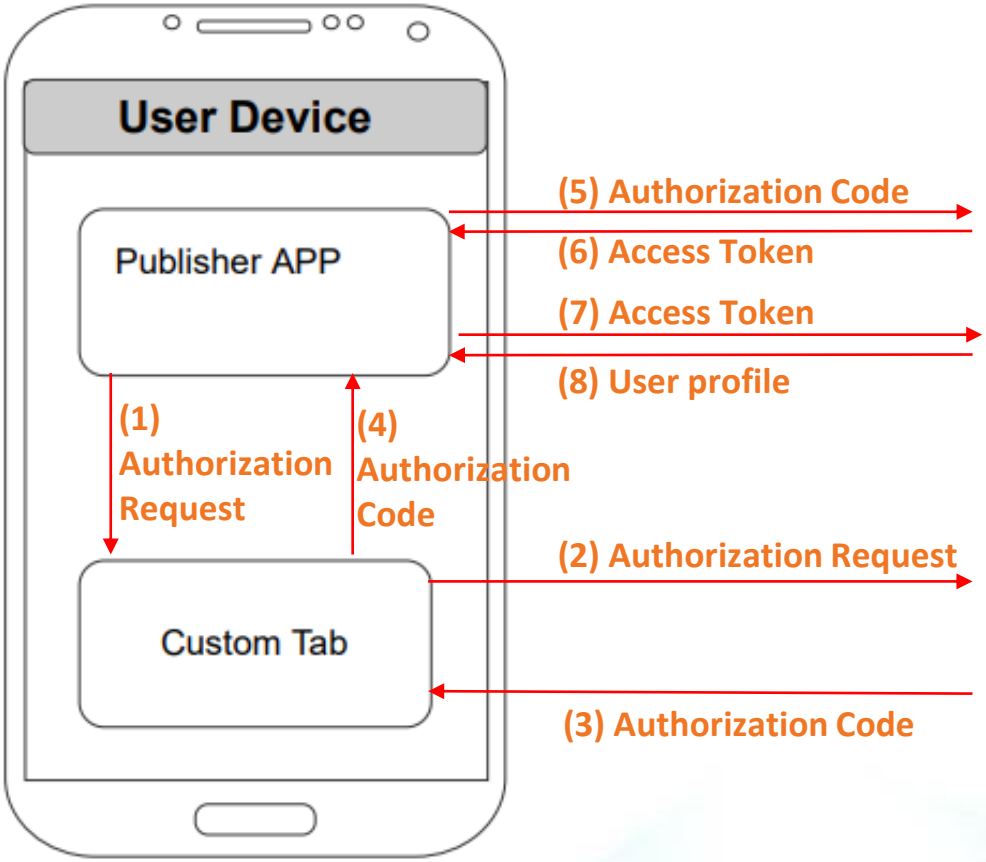
- AppAuth WebSite
  - https://appauth.io/

- AppAuth
  - Open source native client SDK for IOS and Android
  - Based on Oauth 2.0 and Open ID Connect

- Information Provided by Publisher
  - Custom URI

- Information Provided by HKEdCity
  - Client ID

AppAuth



EdConnect 2.0

香港教育城 HKedCity 用戶目錄服務

Click here to view demo

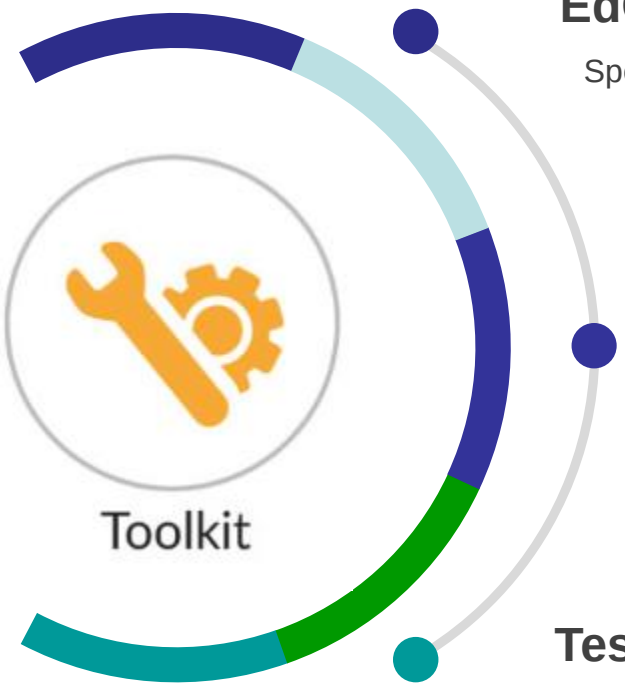
EdConnect vs Publisher System

- Need both Authentication and Authorisation in order to access a book

- EdConnect - Authentication
  - Confirm student identity
  - All students with HKEdCity account
  - Return display_name, profile_id only

- Publisher System - Authorization
  - Control access of publisher resources
  - Only authorised students

Test Toolkit (EdConnect 2.0) for Publishers



EdConnect 2.0 Specification

Specification on integration with EdConnect 2.0

Sample Code

Web integration using Oauth 2.0
APP integration using AppAuth at Android using Java
APP integration using AppAuth at IOS using Objective C
APP integration using AppAuth at IOS using Swift

Testing Account information

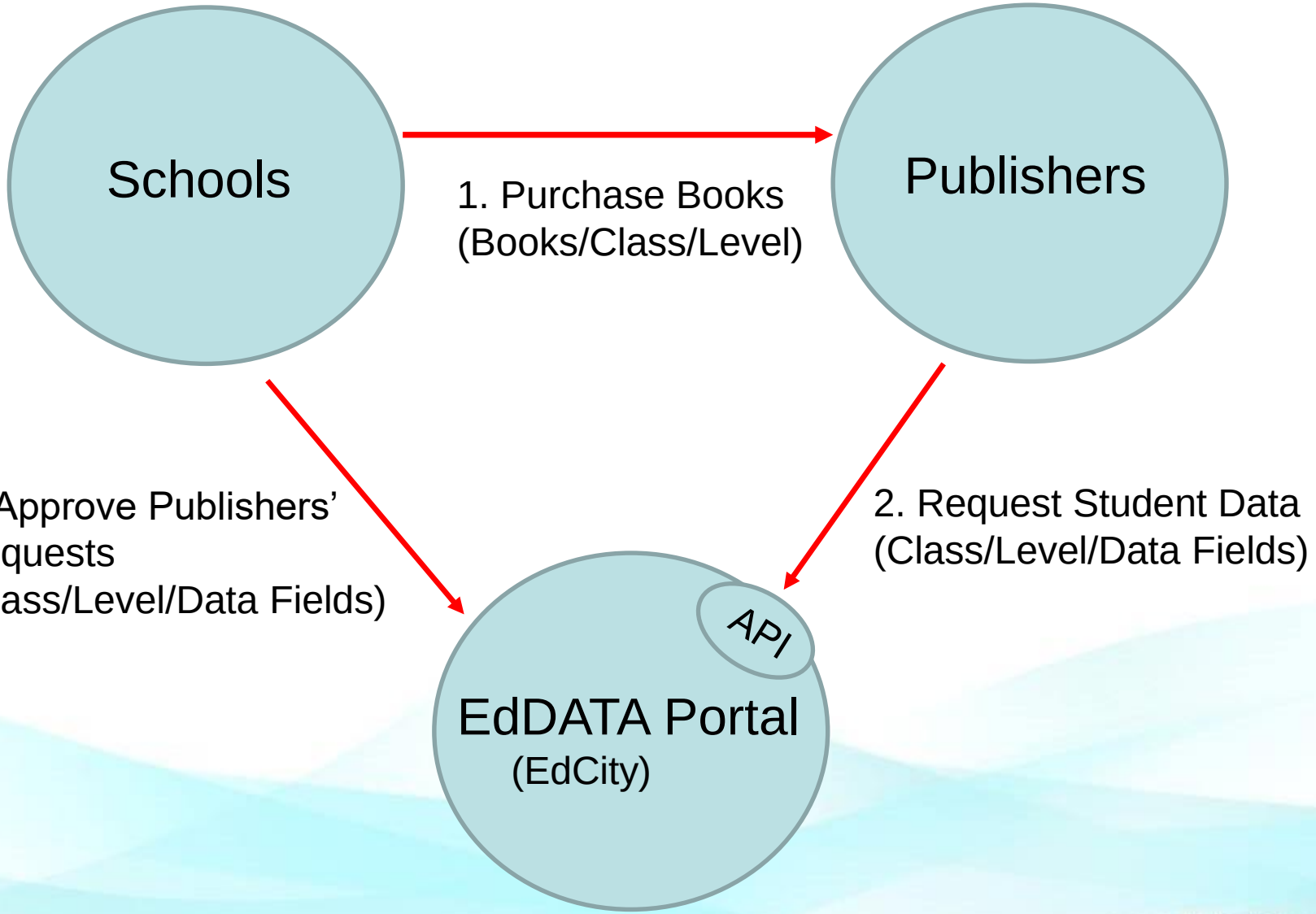
Testing client information for Oauth 2.0 connection
Testing student account

香港教育城 HKedCity

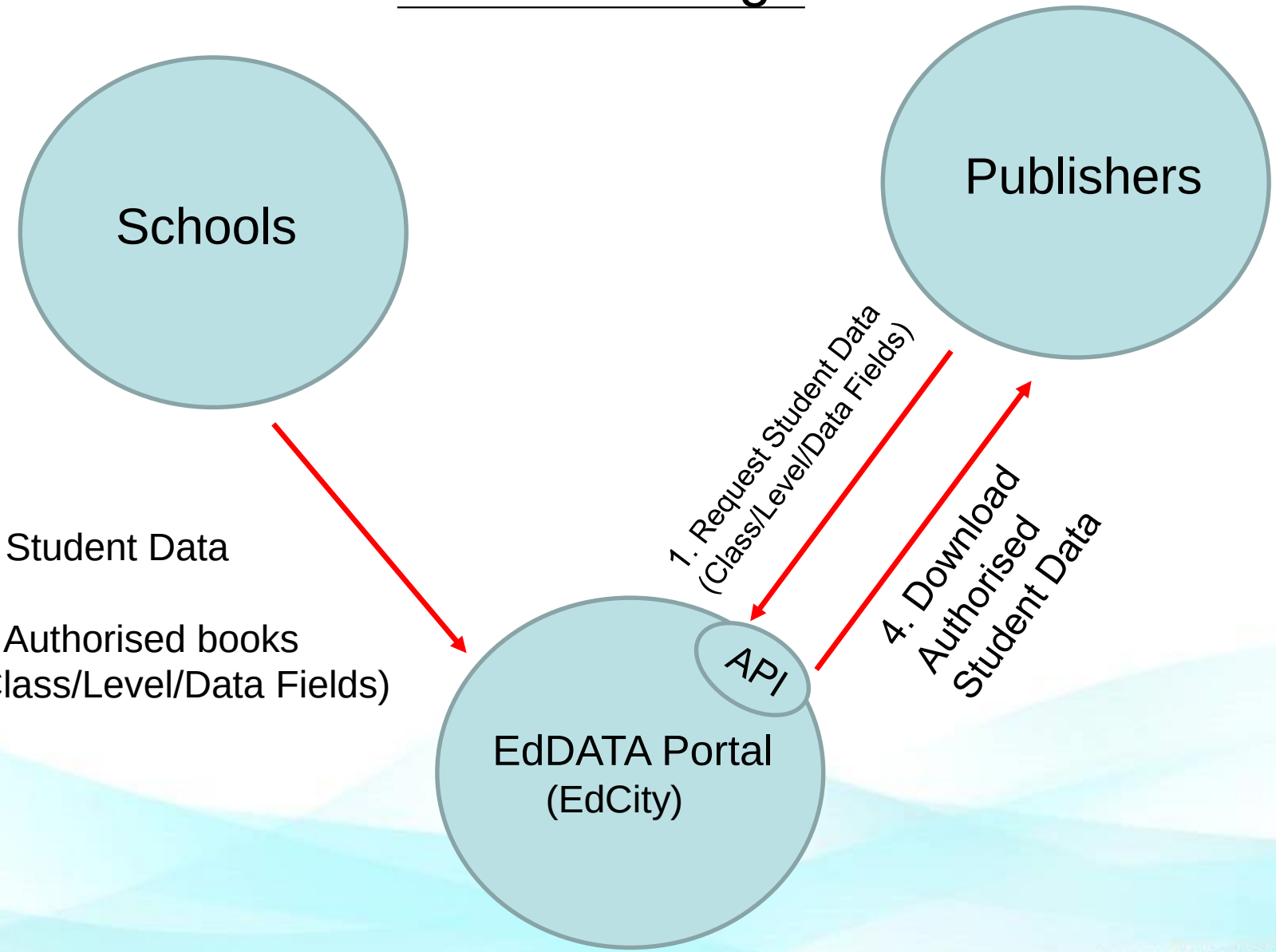
www.hkedcity.net

2. Access Standard Student Data (EdDATA)

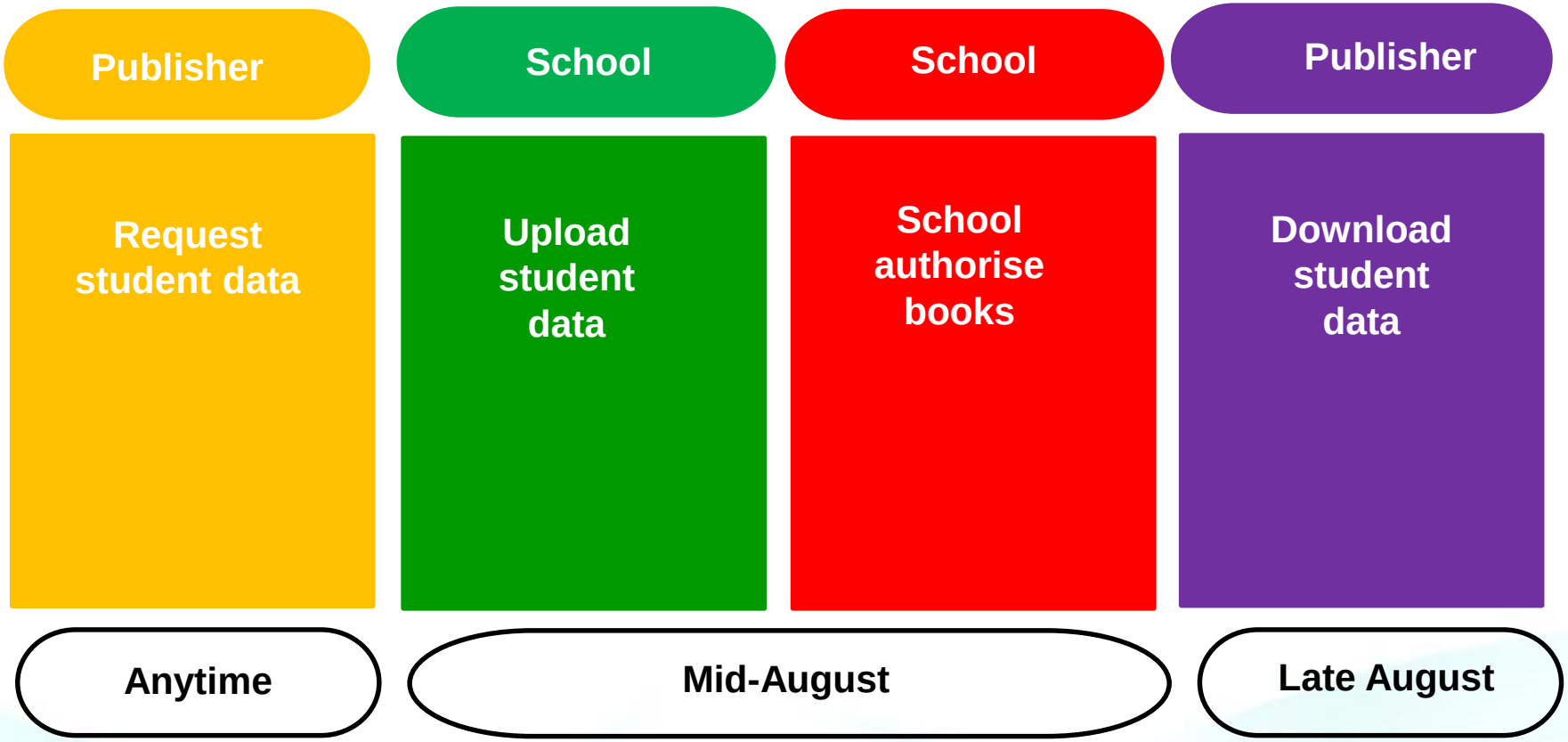
Data Access Authorisation



Data Exchange



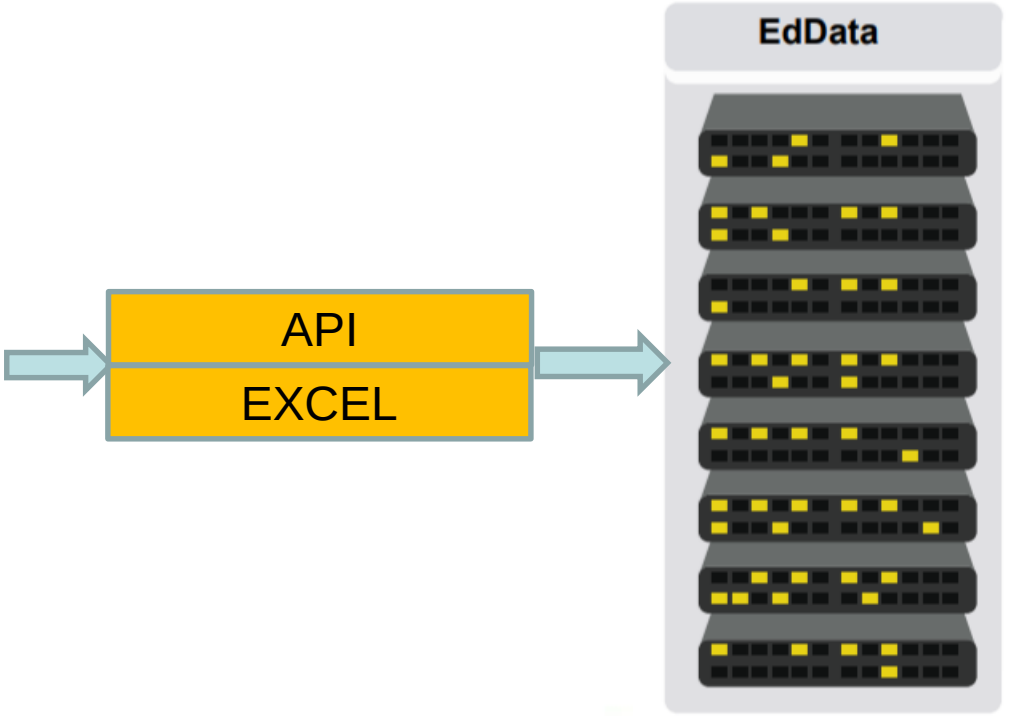
Data Ready Timeline



Request Student Data

- By Publisher

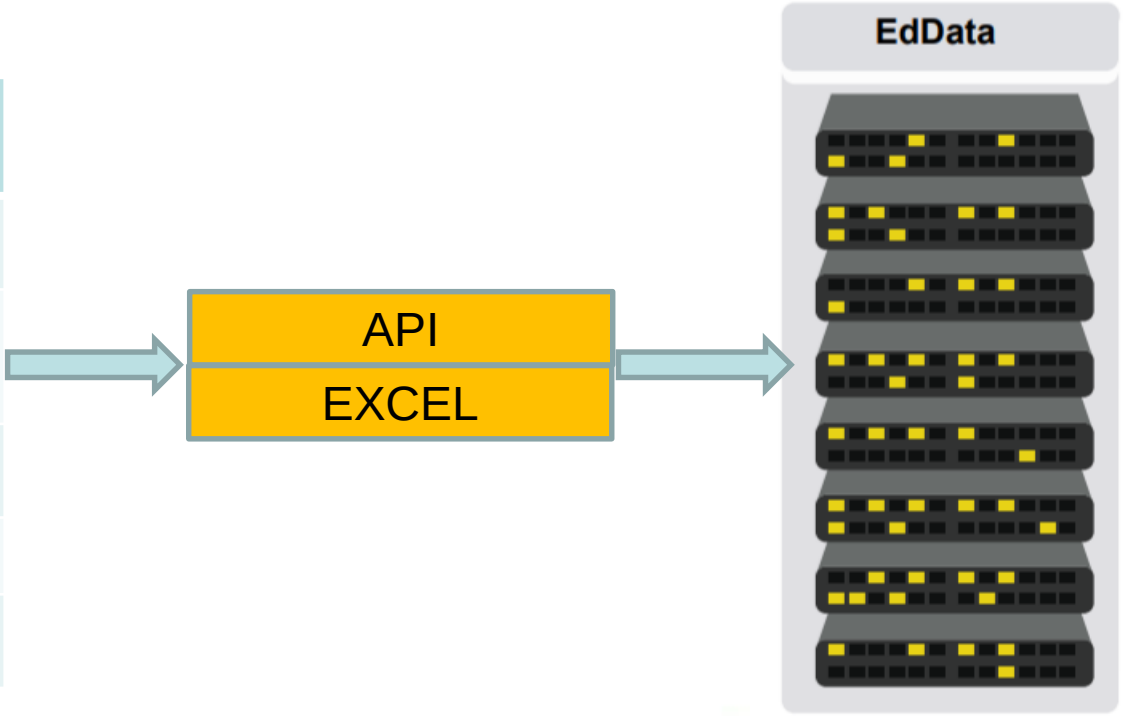
Product Name	Name	Class	Class No
Book 1	✓		
Book 2	✓	✓	✓
Book 3		✓	✓



Schools Authorise Book

- By School

Name	Class	Product
Student 1	6A	Book 1
Student 2	6A	Book 1, Book 3
Student 3	6B	Book 3
:	:	
Student N	3C	Book 9



Remark : School has to approve the retrieval of student data field when authorising book(s)

Download Student Data

- By Publisher

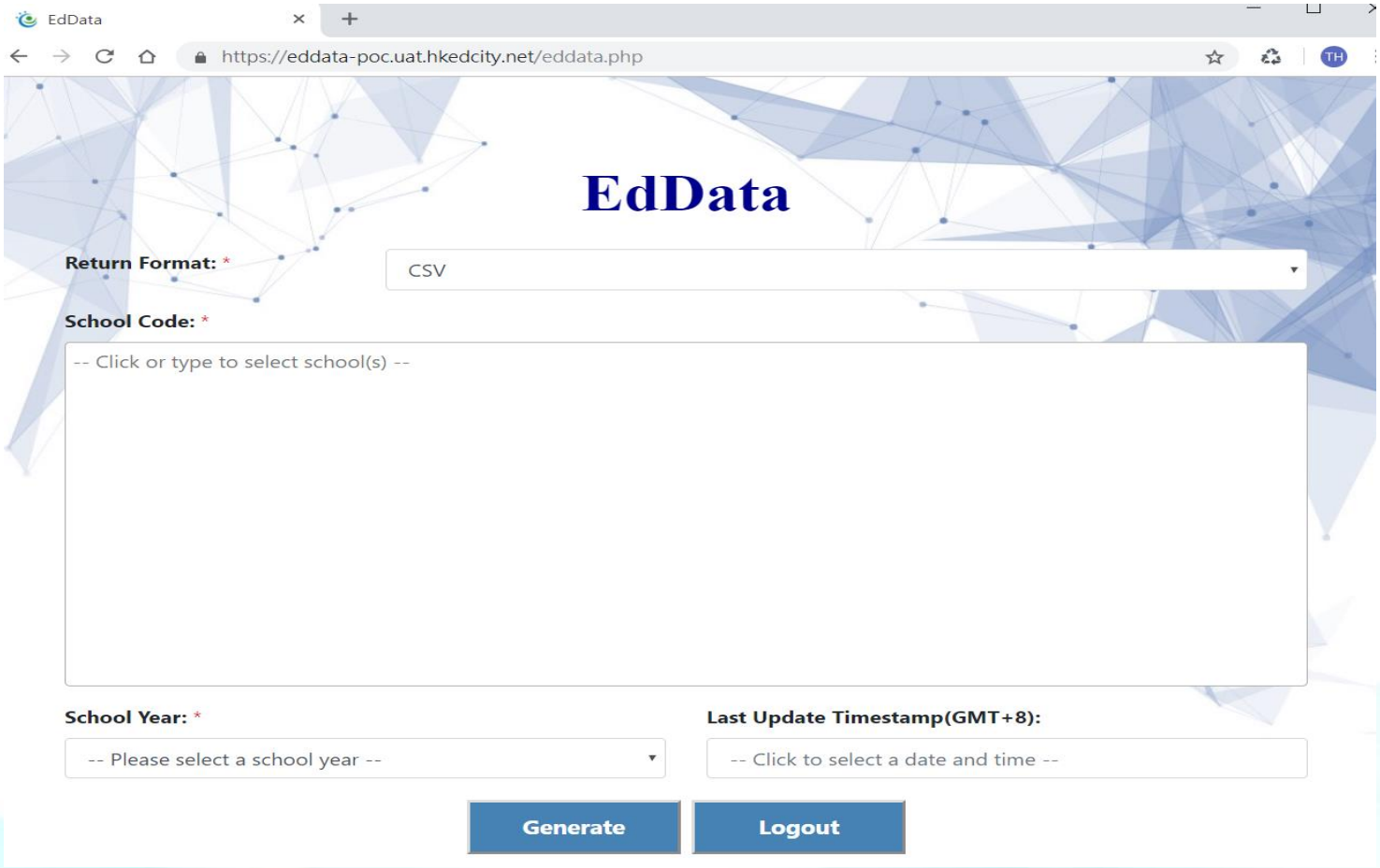
Publisher A

Name	Student Data	Product
Student 1	Required field of Book 1	Book 1
Student 2	Required field of Book 1, Book 3	Book 1, Book 3
Student 3	Required field of Book 3	Book 3

Publisher B

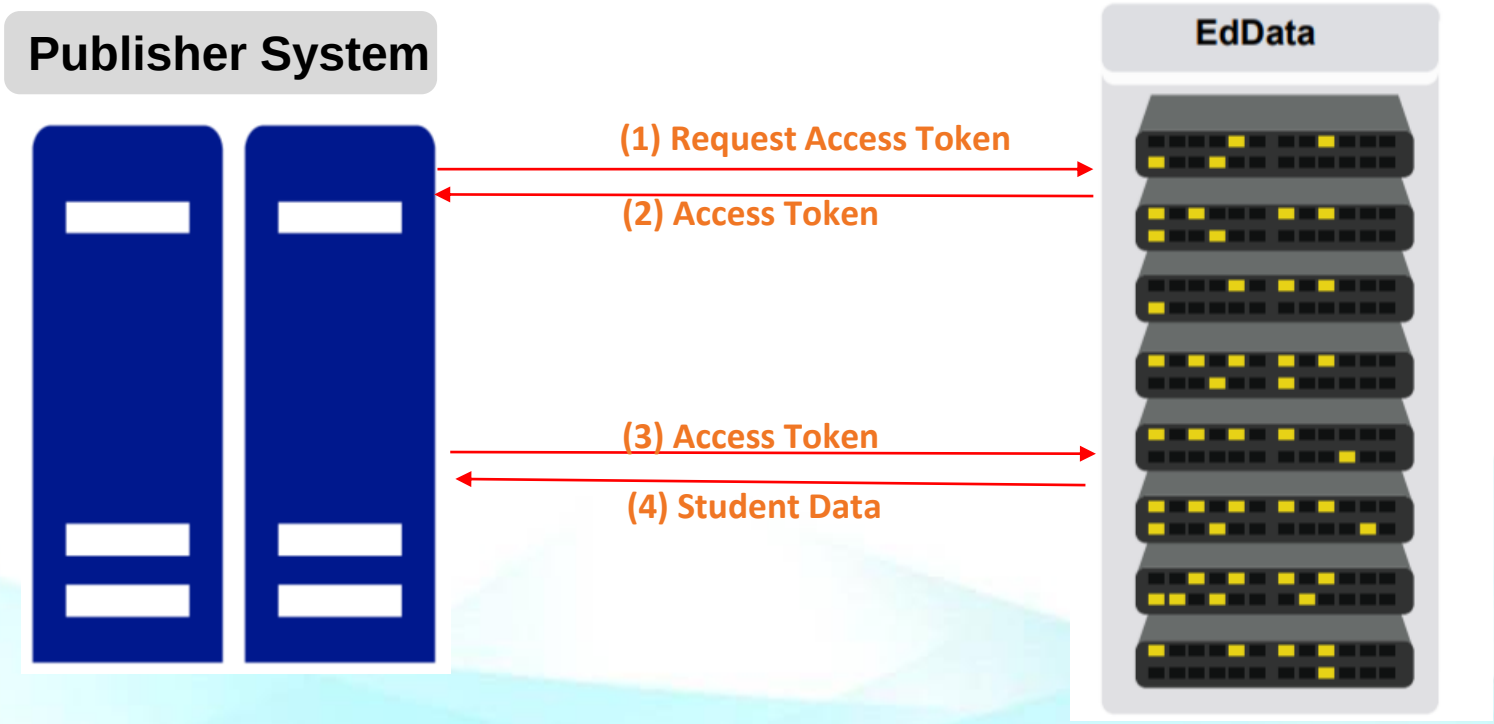
Name	Student Data	Product
Student N	Required field of Book 9	Book 9

EdDATA Portal



EdDATA API

- Restful API
  - Get access token
  - Retrieve Student Data



EdDATA API

C:\Users\user\Desktop\EdConnect presentation\test_eddata_api.php - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

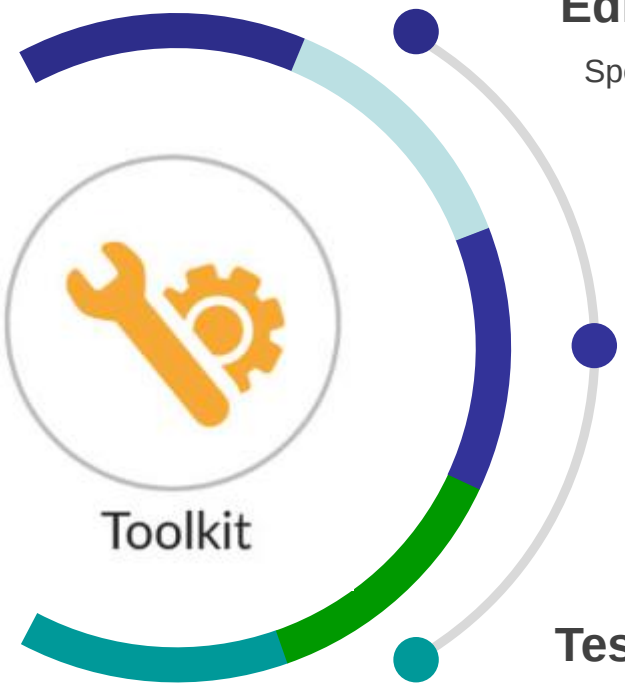
test_edconnect_oauth.php | test_eddata_api.php

```php
    return $response;
}

function run() {
    // Retrieving Access Token
    $data = array();
    $data['client_id'] = CLIENT_ID;
    $data['client_secret'] = CLIENT_SECRET;
    $result = callAPI(AUTHENTICATE_URL, $data);
    if (empty($result)) { // Handle error
        echo "Error\n";
        exit;
    }
    $result = json_decode($result, true);
    if(isset($result['error'])) { // Handle error
        print_r($result);
        exit;
    }

    // Retrieving Students Information
    $data = array();
    $data['access_token'] = $result['access_token'];
    $data['return_format'] = RETURN_FORMAT;
    $data['school_code'] = SCHOOL_CODE;
    $data['sch_year'] = SCHOOL_YEAR;
    if (defined('LAST_UPDATE_TS')) {
        $data['last_update_ts'] = LAST_UPDATE_TS;
    }
    $result = callAPI(STUDENT_URL, $data);
    if (empty($result)) { // Handle error
        echo "Error\n";
        exit;
    }
    $result = $data['return_format'] == 'JSON' ? json_decode($result, true) : str_getcsv($result);
    if(isset($result['error'])) { // Handle error
        print_r($result);
        exit;
    }
    print_r($result);
}

run();
```

First API call (Step 1,2)

Second API call (Step 3, 4)

Test Toolkit (EdDATA) for Publishers



EdDATA Specification

Specification on integration with Edata

Sample Code

Sample code to call EdDATA API

Testing Account information

Testing client information for EdDATA
EdDATA portal account

香港教育城 HKedCity

www.hkedcity.net

3. Integrating LMS (VLE) with LTI and Common Cartridge

LTI

- LTI - **Learning Tools Interoperability** is a standard protocol developed by the IMS Global Learning Consortium

- To deliver a single framework for integrating any LMS product with any learning application.

References

- Basic Overview of how LTI ® Works

  https://www.imsglobal.org/basic-overview-how-lti-works

- LTI Specifications

  https://www.imsglobal.org/activity/learning-tools-interoperability

- Tutorials & examples

  Hundreds of LTI apps - https://www.eduappcenter.com/

  LTI Tutorials - http://www.edu-apps.org/tutorials.html

Common Cartridge

- Common Cartridge is a standard developed by the IMS Global Learning Consortium to address content packaging, assessment, and integration with learning application.

References

- Common Cartridge

  https://www.imsglobal.org/activity/common-cartridge

- Examples

  Sample course - https://topkit.org/wp-content/uploads/2017/01/topkit-sample-course-lite-export_26-JAN-2017.imscc

  Canvas Commons - https://lor.instructure.com/search

How to get started

- HKEdCity VLE platform is using Canvas https://www.canvaslms.com/
- Try Canvas Free-for-Teacher accounts

  https://learn.canvas.net/courses/1233/pages/canvas-free-for-teachers-account-registration-and-login
- Canvas LTI development course

  https://canvas.instructure.com/courses/785215
- Common Cartridge Import/Export

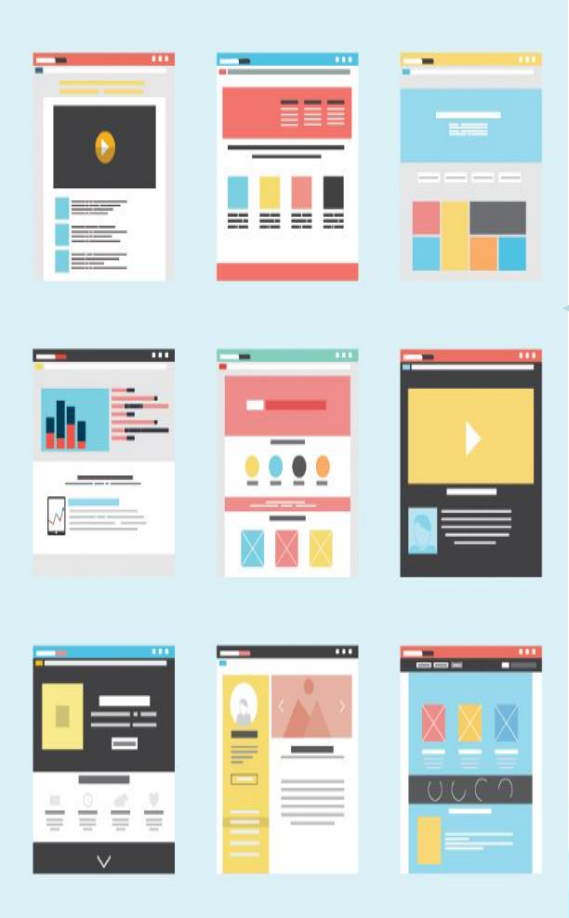
  Import: https://community.canvaslms.com/docs/DOC-15586-4152982593

  Export: https://community.canvaslms.com/docs/DOC-12785-415241323

LTI Integration

Multiple Publishers

Learning contents

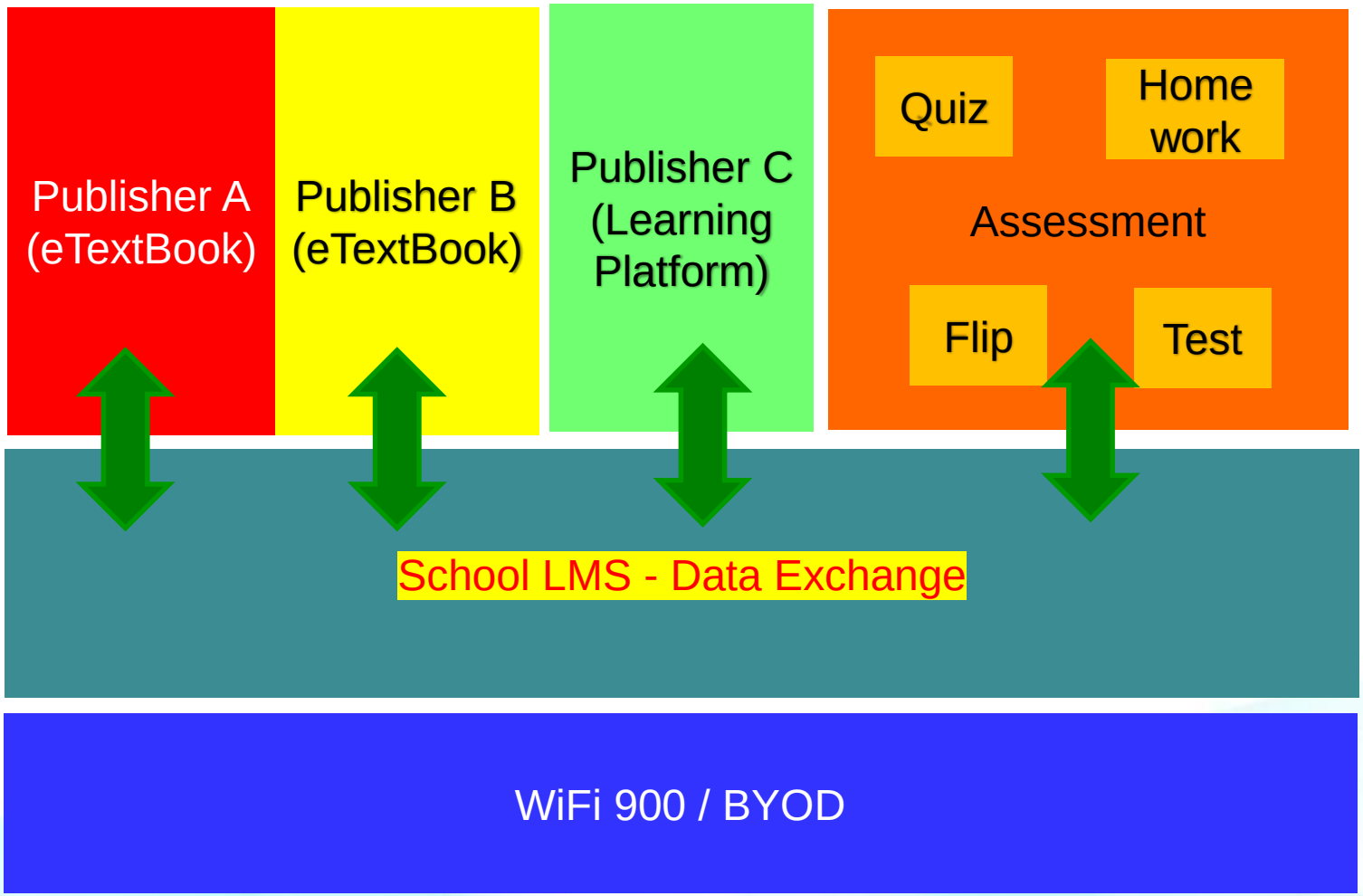


LTI

Learning data

School LMS

Mode B – data exchange



香港教育城
HKedCity

LTI Integration

Video Demonstration

Common Cartridge

One Publisher with many course contents

Learning contents, learning data

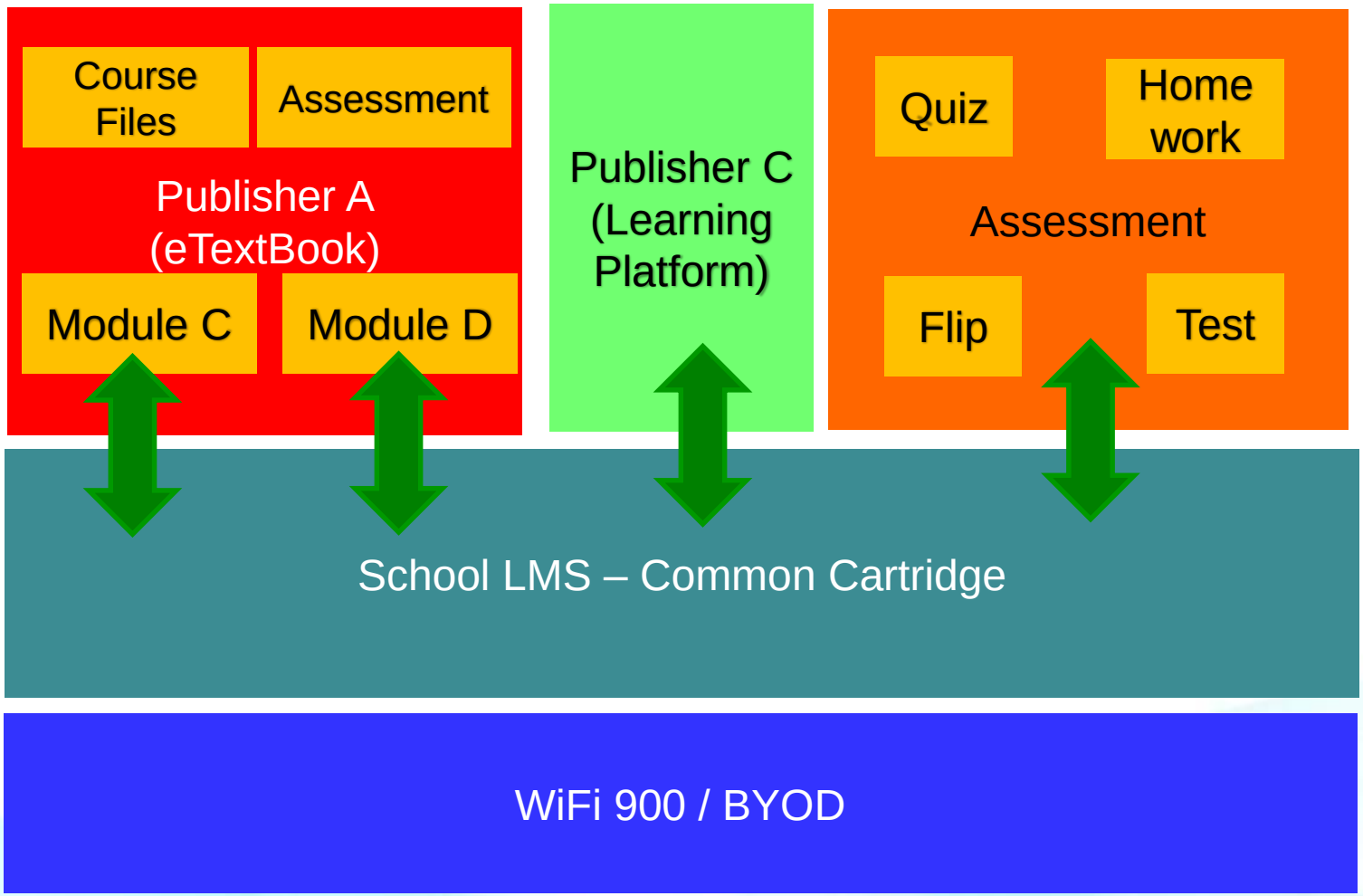
Publisher A

Publisher B

Content (Common Cartridge)

School LMS

Common Cartridge



Common Cartridge

Video Demonstration

香港教育城 HKedCity

www.hkedcity.net

Actions to be taken...

Next Actions

- Equiry
  - Hotline : 2624 1000
  - Email: support@hkedcity.net
- Indication of Interest to EDB
  - Reply to EDB's survey form before 7 Dec 2018
  - Indicate interest in tryout option(s)
- Enrolment for tryout starts in Jan 2019, open for all interested parties