**Hope Android 系统设计文档 1.0**

Ａｎｄｒｏｉｄ　系统设计

1. Ｈｏｐｅ 系统结构图

Android Tablet

Rest

HopeLocalService

Login Activity

Hope

Rest

Service

Event

Bus

MainPage

Rest

Topic

Homework

UserSessionContext

**2) 主要组成部件**

1. HopeLocalServices

这是一个Android Service部件，一旦程序打开后，LocalService 会一直运行在后台，由于Android系统Lifecycle管理机制， 任何程序都可能定期被系统重新启动。使用Service可以用来保证保存程序的相关信息能够保存在UserSessionContext 并且被Activities（mainpage，topic，homework） 所共享。

ＬｏｃａｌＳｅｒｖｉｃｅ的另一个重要功能是帮助Ａｃｔｉｖｉｔｉｅｓ执行与Ｓｅｒｖｅｒ相关的后台程序。当后台操作完成后通过ＥｖｅｎｔＢｕｓ　通知前台Ａｃｔｉｖｉｔｉｅｓ。

ＬｏｃａｌＳｅｒｉｖｅ　还有定时器功能。　本系统Ｔｉｍｅｒ会每隔一分钟触发MinuteElapseEvent。Ｈｏｍｅｗｏｒｋ　Ａｃｔｉｖｉｔｙ　可以通过该Ｅｖｅｎｔ计算学生做作业花费时间。　该Ｅｖｅｎｔ也可以用于触发定期Ｂａｃｋｅｎｄ　Ｐｏｌｌｉｎｇ功能。

LocalService还利用Android Notification 机制， 可以通过Android系统Notification bar 去通知Hope系统后台到来信息（待完成）

Hope系统使用特制ＬＡＴＥＸ　输入键盘。　该界面用Ｏｖｅｒｌａｙ实现并通过ＬｏｃａｌＳｅｒｖｉｃｅ加载到显示界面上。

**b) UserSessionContext**

This is an object that used to keep track status once the user logged in It holds following info which are critical for the application

PersonalInfo : basic user profile , it is populated after user successfully loggin .

cousreList: the course list that associated with the login user. For student there might be course for differnet subject . For teacher it could be course for different classes

todoItemList : all todoitem on the main page

planList : plan is always associated to the course .From backend side topic is tied to plan In our code for consistency I tie all the backend info to course since for student it doesn't make sense to expose plan concept to them

assignmentQuestion , this is a map to hold all the question associated with current assignment in memory . The reason of using this is once we retrieved questions from backend . we would like to save the round trip to backend again for the same question. But we are based on assumption that there's only one active backend web session . otherwise . if two clients access the same session could cause everythign out of sync.

**c) Restfull services**

We are using Square Retrofit to deal with all restful call to backend server .

* **Service Endpoint**

Service End point is just regular url , we support both http and https

* **Session Management**

We need to maintain session cross different rest call and download request

CookieManager public void put(URI uri, Map<String, List<String>> stringListMap)

is used to capture session

RequestInterceptor public void intercept(RequestFacade request) is overridden to inject session .

* **SSL Enable**

Tablet client is Two-way SSL authentication. But not enabled right now .

* **Sync vs Async call**

Retrofi support both Async and sync call . We used both . For async we need to provide a callback object . And thread is managed by Retrofit thread pool

* API

@GET("/rest/grade")

List<Grade> listGrades ();

/\*

@GET("/users/{user}/repos")

List<Repo> listRepos(@Path("user") String user);

\*/

@POST("/rest/logon/{user}/{password}")

LogonStatus logon(@Path("user") String user,@Path("password") String password);

@GET("/rest/account")

AccountStatus getMyAccount();

@GET("/rest/course")

List<RestCourseItem> getMyCourse();

@GET("/rest/to\_do")

List<RestTodoItem> getTodoList();

@GET("/rest/to\_do")

void getTodoList(TodoRequestCallback<List<RestTodoItem>> callback);

@POST("/rest/to\_do")

void addTodoItem(@Body String message,TodoRequestCallback<String> callback);

@DELETE("/rest/to\_do/{id}")

void deleteTodoItem(@Path("id") String id,TodoRequestCallback<String> callback);

@PUT("/rest/to\_do/{id}/close")

void closeTodoItem(@Path("id") String id,TodoRequestCallback<String> callback);

@PUT("/rest/to\_do/{id}/reopen")

void reopenTodoItem(@Path("id") String id,TodoRequestCallback<String> callback);

@PUT ("/rest/to\_do/{id}")

void updateTodoItem(@Path("id") String id,@Body String message,TodoRequestCallback<String> callback);

@GET("/rest/assignment\_alert")

List<RestAssignmentItem> getAssignmentAlert();

// http://72.93.93.62/rest/global/plan

@GET("/rest/global/plan")

List<RestMyPlan> getPublisedPlan();

@GET("/rest/plan")

List<RestMyPlan> getMyPlan();

// /rest/global/topic/1

@GET("/rest/global/topic/{topicId}")

RestTopic getTopic(@Path("topicId") String topicId);

// http://72.93.93.62/rest/student\_question/4524

@GET("/rest/student\_question/{id}")

void getStudentQuestion(@Path("id") String qId, GetQuestionCallback<RestStudentQuestionAndAnswer> callback);

// @Headers({

//

// "Content-Type: charset=UTF-8; application/json"

// })

@PUT("/rest/student\_question/{asnId}")

void submitStudentQuestion(@Path("asnId") int asnId, @Body String[] answers, SubmitQuestionCallback<String> callback);

@GET ("/rest/student\_question\_with\_official\_answers/{sqId}")

void getQuestinWithOfficalAnswer(@Path("sqId")String sqId, GetQuestionCallback<RestStudentQuestionAndAnswer> callback);

@PUT ("/rest/student\_assignment/{asnId}")

void submitStudentAssignment(@Path("asnId") String asnId,SubmitAssignmentCallback<String> callback);

@GET("/rest/global/q\_set/{qSetId}")

void getQSet(@Path("qSetId") String qSetId, GetQSetCallback<RestQset> callback);

@GET("/rest/question/{id}")

void getQSetQuestion(@Path("id") String id,GetQuestionCallback<RestStudentQuestionAndAnswer> callback );

@GET ("/rest/global/document/topic/{topicId}")

void getDocumentByTopicId(@Path("topicId") String topicId ,GetDocumentCallback<List<RestDocument>> callback);

**d)** **HopeLeftPanelActivity**

HopeLeftPanelActivity extend FragmentActivity . It is used to display common navigation panel cross all the activities.

It also contains a expand menu which is used to display all the course that associated with a new user . All the Activities ( Main page , topic and HomeWork) extends from HopeLeftPanelActivity.

e) **package com.lanking.mainpage**

This package contains all the source code for the UI component on main page

Calendar Widget , Time table . Todo List and , Latest update



**f) home.android.topic**

Source code for following topic page .

1. Topic content
2. horizontal list view for homework
3. right side sliding menu

You can swipe to display different topic .

Also you can switch topic by clicking menu item on right menu

By click homework icon it will open homework page



**1 Project structure**

**a) HorizontalListView**

This is the library code that used to display Assignment icons on 教案界面

**b) CalendarLibrary**

Calendar Widget display on 首页. I have customized the source to adjust the size and color to fix in our table UI

Source: calendarlibrary

Jar: com.android.support:support-v4:19.+

Android support library

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Jar: com.android.support:support-v13:19.+

Android support library

Jar: com.squareup:otto:1.3.4

Square Event bus, wildely used in the project

Jar: com.squareup.okhttp:okhttp:2.0.0

Square httpClient

Jar: com.squareup.okhttp:okhttp-urlconnection:2.0.0

Square httpClient

Jar: com.squareup.retrofit:retrofit:1.6.1

Square Restful library , used to rest client library and communicate with backed server .

Jar: com.google.code.gson:gson:2.2.4

Google json parser

Jar: com.j256.ormlite:ormlite-android:4.48

lightweighted orm for db access

Jar: org.slf4j:slf4j-api:1.7.6

logging

Jar: com.github.tony19:logback-android-classic:1.1.1-2

logging library

Jar: org.java-websocket:Java-WebSocket:1.3.0

websocket , will be using

Jar : com.squareup.dagger:dagger-compiler:1.2.1

Code Injection library

Jar: com.squareup.dagger:dagger:1.2.1

Jar: com.squareup.picasso:picasso:2.2.0

