Research on RIA Application Based on Flex Technology

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Abstract: RIA(Rich Internet Application) technology allows web applications to provide more interactive and more responsive user experience. Adobe Flex is a complete set of solutions for RIA technology. This paper describes the conception, architecture and development technology of RIA, and then takes Student Management System as an example, presents the design and implementation details of Student Management System based on Flex.

Keywords: RIA; Flex; JavaEE;Development Framework

1. Introduction

With the rapid development of computer network technology, internet has increasingly become the default platform for the development of application program, and has been widely used in various fields of society.

Desktop applications are not limited by network, so desktop applications have strengths with fast response, strong interaction of user interface and so on. Desktop applications can't support the widespread of information,
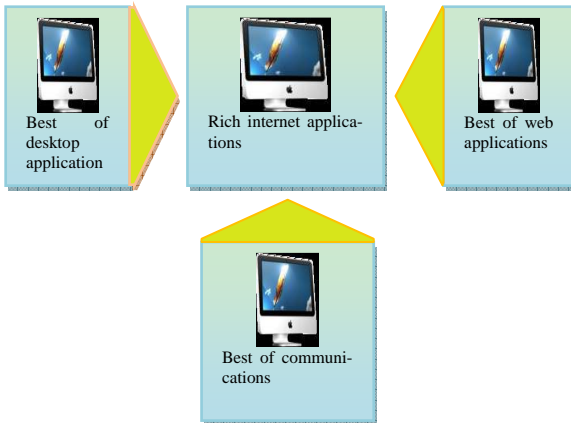

Figure 1. Relations of RIA and Web applications, desktop applications

and program deployment depends on operating system. Web applications based on HTML support the widespread of information, and has the features of common and simple deployment. Now, the front development technology of presentation layer that web support is not perfect, which has made users aren't satisfied with the experience. So RIA has emerged to solve these problems. RIA not only has the features of fast response and rich interface which desktop application has, but also has the strengths of web application with widely used online. So

RIA can provide more interactive and responsive user experience.

2. RIA Technology

RIA is the next generation of web applications which combine the interactive user experience of desktop application with the flexible deployment of traditional web applications. Rich Internet applications (RIAs) are engaging, dynamic applications that can be deployed across desktops, browsers and devices.

2.1. RIA Architecture

The following figure shows the typical architecture of RIA . XML is often used as a form of data transmission, and is used to describe the layout of the form. Access to data is completed by calling the web service.
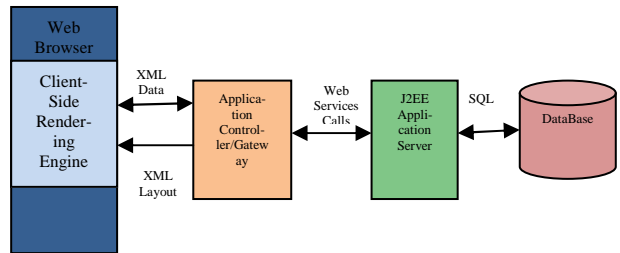

Figure 2. RIA architecture

2.2. RIA's Development Technology

The appearance of RIA allows us deploy client in a simple way on internet. Now, there are Flex, CUL, Ajax, Laszlo and other technologies. And Flex is the most popular. So, in this paper, Adobe Flex development technology is introduced chiefly.

3. Adobe Flex development technology

3.1. Flex Framework

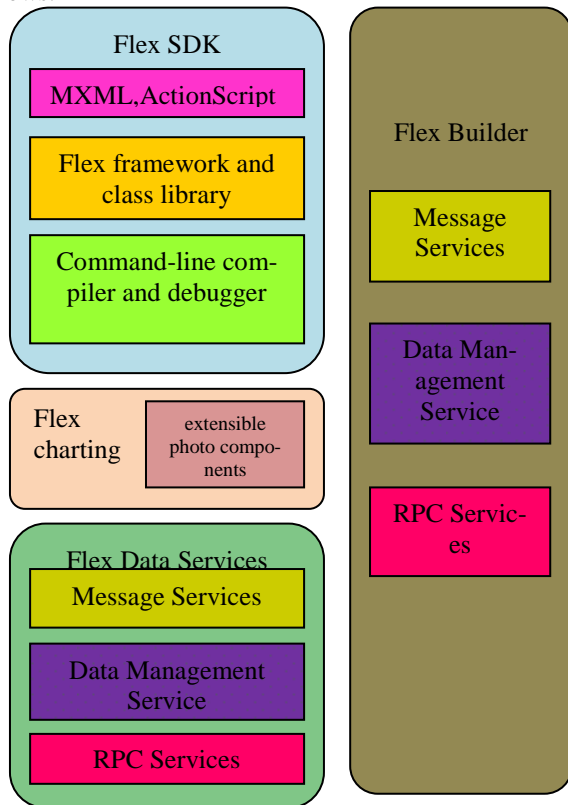Flex basic framework consists of four parts as figure 3 shows.

Figure 3. The Basic Structure of Flex

Adobe Flex SDK is the standard development kit of Flex, which contains Flex framework, Flex class library, MXML and ActionScript compiler. And Flex framework is a component-based development framework. Adobe Flex Charting is a set of extensible components, which provide a rich library of interactive charts and graphs, and support rich data display and interactive data analysis. LiveCycle Data Service provides a set of methods for data interacting with server. Flex Builder is an integrated development environment based on Eclipse, through which RIA applications based on Flash platform can be quickly developed.

3.2. Development Language

MXML is an XML-based user interface markup language first introduced by Macromedia in March 2004. MXML is used mainly to declaratively lay out the interface of applications and can also be used to implement business logic and internet application behaviors. It can contain chunks of ActionScript code, either when creating the body of an event handler function, or with data binding where the curly braces syntax is used.

ActionScript is an object-oriented language, which is used primarily for the development of websites and software targeting the Adobe Flash Player platform, used on Web pages in the form of embedded SWF files. Ac-

tionScript is more suited to development of Flash applications, and it is often possible to save time by scripting something rather than animating it, which usually enables a higher level of flexibility when editing.

The development of Flex application is completed by using MXML and ActionScript.

3.2. Combination between Flex and JavaEE

Because many flex technologies are built on java, Flex has better support for Java technology. At the same time, JavaEE has a large proportion in web applications, so the combination between Flex and JavaEE is essential.

LCDS is provided in the form of war package, which contains a set of jar package and a set of configuration files. Communicating with server throuh LCDS will not only improve the communication efficiency, but also bring function beyond traditional B/S structure.

BlazeDS is a kind of technology that implements web communication by using java in the server side. And the functions of BlazeDS include RCP Service and Message Service, which allow developers connect to distributed data in back-end easily and push data to Flex or AIR application to provide better user experience for RIA.

4. Student Management System based on Flex

Student management system is a kind of modern management information system to manage students' basic information. The system contains student management and student forum management, and each part includes data entry, modify, delete, add, query and other functions. Student management system can complete these functions efficiently and accurately, and the interface is beautiful and friendly. The development includes front-end application development and establishment and maintenance of back-end database. In addition to friendly interface, the system needs a database with data consistency and integrity.

4.1. Function Description

The following is student management system function design figure, and the main function modules include user login, student management and student forum.

(1) User login module: the module has the function of access control. It mainly processes user's request and operations, and implements user authentication and certification authority.

(2) Student management module: the module provides a function of maintenance and license management of user information, and provides definition and maintenance for users. And it includes query student, add student, delete student, modify student and other sub-function modules.

(3) Student forum module: the module is used to display notice informations which registered students can publish and modify.
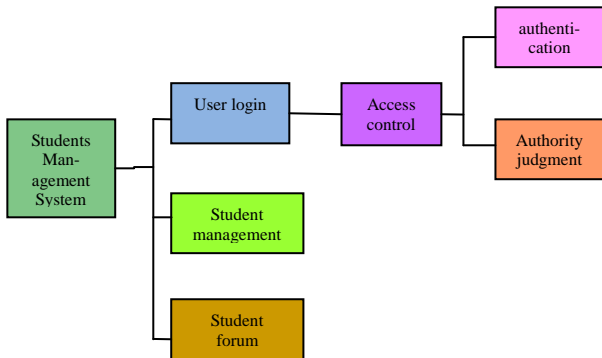

Figure 4. The Function Modules of Student Management System

4.2. Function Implement and Advantages

Traditional B/S applications need to refresh the pages, and each request, including only changing a field on the page, need to refresh the whole page. During refreshing pages, user can't do anything only waiting. Flex rich client is as a whole not consisted of many pages, and don't need to refresh naturally. When page loading starts, the whole is downloaded to the client.

We implement student management system by using Flex. So the system has better user experience, which is reflected in faster user response time, and has operating ability of online and offline.

Implementing communication between Flex and server is the key technology. The communication between Flex and server is like communicating on Flash Player platform, and is implemented by using HTTPService, WebService and Flash Remoting.
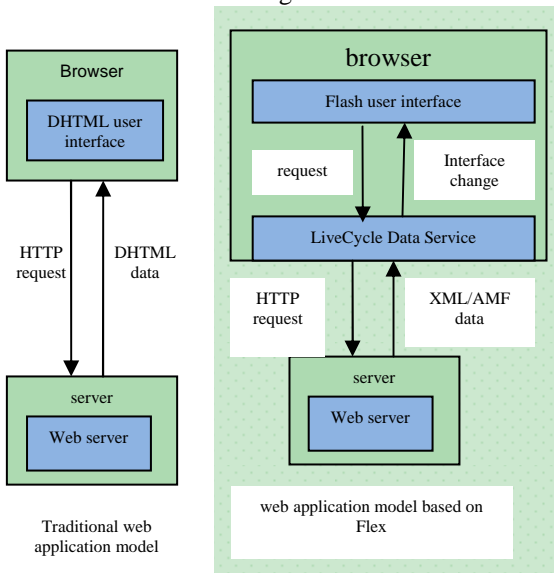

Figure 5. Traditional Web Applications and Web Applications Based on Flex
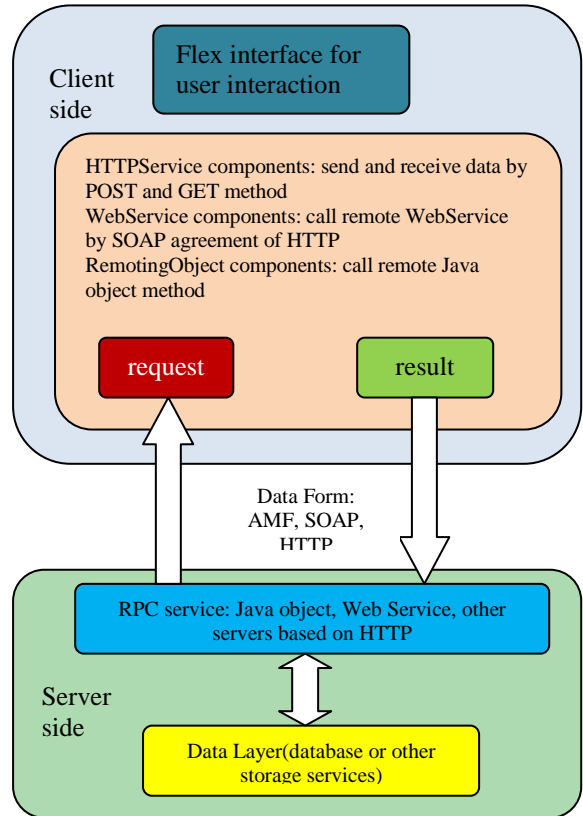

Figure 6. The Communication Architecture between Flex and Service

We use Flash Remoting to achieve communication between Flex and servers. In order to achieve components' versatility and improve its scalability, and reduce labor of system maintenance user, the information for play of the components is not only on the static XML file, but also connect to database through JSP files, and read information restored in database to generate XML data in stated form dynamically.

Figure 7. System Interface

The connection between Flex and SQL Server is implemented as follows:

First, configure the remotr-config.xml file, and we insert
<destination id="remoteLogin ">

```
<properties>
  <source>com.test.Login</source>
    </properties>
  </destination>
```

The corresponding in .mxml file is as following:
<mx:RemoteObject   id="firstRO"   destination="remoteLogin" result="getROResult(event)"/>
Then, we can call java method in button trigger event (FirstRO) through id of RemoteObject components (FirstRO).

```
Private function FirstRO (str1:String,str2:String): void{
firstRO.checkLogin(str1,str2);//send two parameter
}
```

4. Conclusions

Because of effective and efficient switch response and compelling visual characteristics, RIA brings about new experience to web application users. RIA has not been universal currently. With the development and improvement of Flex and other technologies, and customer's "humanization" needs, RIA will be the mainstream of Internet.

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