

# Data Exchange based on Web Services

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## Summary

This paper introduces Web service, then gives a method to exchange data based on Web service, and gives the implementation prototype using .net. It guarantees the data consistency using web service, thus in one hand decreases system cost, on the other hand increases system security.

## Key words:

Web Service; Data Exchange; ASP.NET

## 1. Introduction

Along with developments of government information system, every department begin to establish own information system, but because the system architecture, operating system and database of each system is different, so each system is independent with each other, and can not share information and can not communicate with each other. At the mean time ,because the development time of each system is different, the reserved interface is not perfect, the problem of data exchange and data sharing is becoming serious.

Along with the development of network technique, Web Service, XML and SOAP are mature. They quickly become core techniques to realize data exchange between different systems. They not only provide the possibility of data exchange, but also provide the technique supporting data integration, data collection and data sharing between different systems. This paper introduces the basic concept of web service, gives a scheme of data exchange with web service and provides the example.

## 2 .Web Service

The Web service defines an applied logic which can be used through Internet, after published, it can be used outside in public and united way. Simply, Web service is an application function; it provides an outer API which

can be called safely through Web. That is to say, in your program, you can call the method of Web service through web. Web service is the method of class which can be called by HTTP protocol. It is a new platform to establish operable distributed applications.

The Web service allows Web site is distributed, and allows user interview them through Internet. Automatic discovery mechanism makes the service turn more quickly and more transparent. So if more than one web site provides similar function, then when one server has fault or halt, user can turn to another backup server, system robustness is increased.

Web service defines clear interface, it describes its offering service. Application program of client understands the service and uses method provided by web service according to this appointment. Developer can combine remote web service, local service and coding by themselves to realize Web application. Web service provides technique supporting distributed web application. Fig 1 is the applied model of web service.

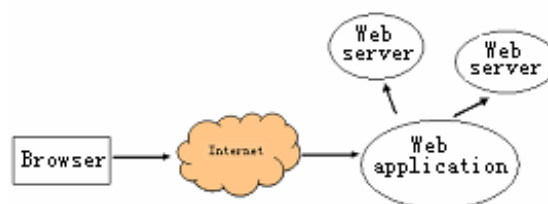


Fig.1 Web services application model

All protocols of Web service are based on the standard web protocol, such as HTTP, Extended Markup Language XML, Simple Object Access Protocol SOAP, Web Service Description Language WSDL, Unified Description Discovery Integrated UDDI and so on.

The messages of Web Service can cross the different programming language, operating system, fire wall, hardware terrace together and communicate with other application; these are attributed to standard technique adopted by Web Service.

- (1) Using standard form of XML for system intercommunication;
- (2) Using HTTP protocol as application layer communication protocol;
- (3) Using SOAP as message exchange protocol;
- (4) Using WSDL to describe input/output argument;
- (5) Using UDDI to publish all registered Web Service.

### 3. Data exchange based on Web service

#### (1) System model

Data exchange is a system that needs some data from another system, at the same time; also offers some data to another system. Information system is built gradually, but is deployed at the same time between different departments, the demand of data consistency and data sharing makes data exchange more necessary. Direct data access between systems is impossible because of safety, so a kind of safe data interface between systems is needed. Web Service makes this possible. And systems which demand data exchanges are on the Internet; this also provides possible condition to realize data exchange by Web service. Each system can build own Web service according to its data exchange demand, and then publishes it through Internet. Thus we can obtain data needed by calling Web Service provided, then operate database in own Web application. Fig.2 is our system model.

From the above model, we can know that web Service has wide application area. It provides a kind of very safe and valid technique support for system integration. It can go across gateway, firewall, and provide a safe “Remote Procedure Call” based on common HTTP to user. It provides powerful technique means to develop distributed system.

#### (2) Example Implementation

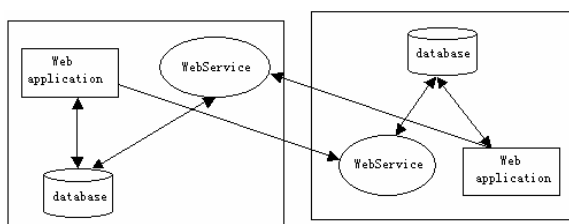


Fig.2 System model

Implementation below is based on one example. In 2005, we develop “construction project invited bidding and bidding management system(system A)”. This system is mainly for whole procedure management of construct project invited bidding and bidding from project registration, calling for bidding registration, announcement of public bidding, project sign up, bid opening, bid evaluation to announcement of bid-winning enterprise. This system has province scope. At the mean time, in some city there is another construction project supervision system (System B), this system is mainly for management from project declaration, calling for bidding, contract, quality supervision, safety supervision to final acceptance. In System B, calling for bidding is a simple procedure, and only input result information. Now there are some regulations from government that all calling for bidding must use system A. In order to guarantee data consistency and data accuracy, data must be exchanged between two systems. For example system A must obtain construction project ID from system B, and system B must obtain bid-winning enterprise ID from system A. For this, we offer a data exchange scheme using Web service, and implement it. The following is our part implementation which gets bid-winning enterprise ID according construction project ID.

#### ① establishes the Web service

First we establish a Web service project using C#, and then add some methods which Web service demands. The means to build Web service method is same as the means to build common application method, just add Web Method attribute in front of Web service. In our example, we define a Web service method called `getzbqy()` which can return bid-winning enterprise ID according project ID.

```

[WebMethod( Description="data exchanges")]
Public string getzbqy( string xmbm1)
// get bid-winning enterprise ID according to project //ID
{
    string strconn;
    strconn="server=RLJD;database=tgws;uid=sa;pwd=sa"
;
    SqlConnection myConnection = new
    
```

```

SqlConnection(strconn);
myConnection.Open();
string sql="select zbqybm from ztb_gc_zbgs where
xmbm="+xmbm1.ToString().Trim()+" and sffb=1";
SqlCommand myCommand = new SqlCommand(sql,
myConnection);
SqlDataReader result;
string bp=new string[20];
result =
myCommand.ExecuteReader(CommandBehavior.CloseC
onnection);
if (result.Read())
bp=result[0].ToString().Trim();
else
bp="";
return bp;
}

```

## ② Use the Web service

After Web service is published, other application can use it. In MicroSoft.net, application can add Web service inside by adding Web reference. The following is the function model which use Web service after a user login in Web application.

```

private void Button1_Click(object sender,
System.EventArgs e)
{
String xmbm1= Session[" xmbm"].ToString();
www.myService.f ms=new www.myService.f());
string enterpID=new string[20];
enterpID =ms.getzbqy(xmbm1);
if (enterpID.Trim()!="")
Label3.Text= enterpID;
}

```

## 4. Conclusion

Today science technique develops very fast, the urgent mission is not to establish the application system, it is how to exterminate the information isolated island as much as possible, integrate internal system with other related system using the Internet technique, and realize data exchange and data sharing. Web service based on XML which use standard Web protocol is a safe way to realize data exchange. It can integrate data with the lowest cost, quickest efficiency,

utmost realize the data exchange and data share among many systems. It will provide convenience for information interchange.

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