

The Implementation of Information Service Based on Social Network Systems Using Advanced Web Service Technologies (WCF)

E. Kalai Kavitha

Assistant Professor, Department of Information Technology, Rathinam Arts and Science College,
Coimbatore - 641 021, Tamil Nadu, India

E-mail : priyakalaikavitha@gmail.com, ekalaikavitha@gmail.com

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Abstract - Social network systems are one of the most popular of Internet applications in recent years. However, most people only using social network to manage their relationship. In this paper, we proposed an online information service model based on social networking systems. The result shows that embed the online information of social systems by Windows Communication Foundation (WCF) could make the application simpler, faster and more reliable than web services.

Keywords - Social Network, Information Service (WCF), Applications, Online Information

I. INTRODUCTION

Social network is first used by J.A. Barnes in the Class and Committees in a Norwegian Island Parish in 1954 to explain human relations. Social network appear as a social structure consists with many different network nodes and each 'node' stands for a particular individual or an organization. Since each node is a unique existent, there are many connections amount them like we have our family our colleague etc.

In comparison to the old-time Social Network, nowadays the difference is people are usually having initiation relationships rather than family or friends which means they are often between strangers. However in this virtual networking people are reunion mutually depending on one or more particular type for example different value, concept, foreseeing, pros and cons upon a particular instance etc. General speaking, a social network is a map with all the nodes and connections marked up; from this map we can usually figure out more complicate connections in our real world.

Base on the potential users behind this network as well as the development of the web-based technology more and more social network systems appears currently for example Facebook, Twitter, QQ, Renren, LinkedIn and so on. There is no denying that SNS is in a time of high prosperity. In short, a social network is a social structure made of nodes

(which are generally individuals or organizations), that are tied by one or more specific types of interdependency, just like a map of all of the relevant ties between the nodes being studied (Figure 1).

In Existing system of information service based on social network uses the information service method called web service. But we proposed an online information service model based on social networking systems is Windows Communication Foundation (WCF). It makes the application simpler, faster and more reliable than web services.

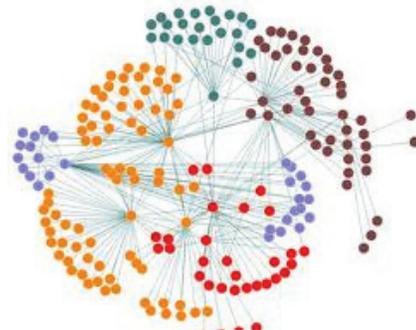


Fig. 1 A social network Schematic

II. THE IMPLEMENTATION MODEL

Besides providing people a convenient platform for social communication and activities, social network system can also provide us extraordinary even a little overwhelming information service because massive information from individual or organization is being uploaded or creating every minute right now. Anyway most social network services currently are providing services through a particular application of social network system itself like Facebook. The information can be only used within the websites and its applications (Games) however information stored in SNS may be very generous and complicated[6]. In a case,

building a particular system like an information service system for a school, there are many staff both academic and administration if we have to set up another database and putting all their information will causing more burden for the system. We have an idea that if we can access the information using a real-time technique that can extract exactly the piece of the information we want to embedded into the particular system which can make the system more light and concise as well as more accurate and reliable.

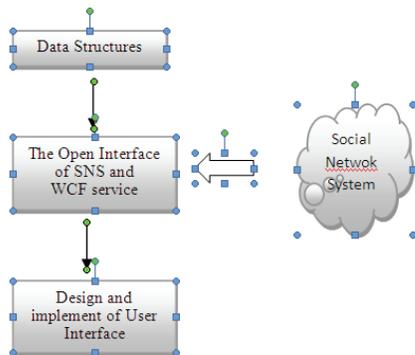


Fig. 2 The Implementation model of Service based on SNS.

A. Data Structure for Information Services

Data Structure is crucial for retrieving of the information later on. So the first step is designing the data structure to meet the requirement of the service applications as well as specifically listing the information needed from the Social network system, which we called online information.

B. The Online Information Extracting from SNS

The key point to achieve all the idea is how to achieve the goal that we can actually obtain the online information from SNS which can well match the data structure of the information service we provide.

A technical problem here lies on two points. One is we need an opened-portal from the SNS. The other is application Windows Communication Foundation techniques. On the other hand, we need two kinds of data: one is the data from the application itself another is the online information from the Social network systems.

C. Service Implementation

1. Windows Communication Foundation

Windows Communication Foundation (Code named Indigo) is a programming platform and runtime system for

building, configuring and deploying network-distributed services. It is the latest service oriented technology; Interoperability is the fundamental characteristics of WCF. It is unified programming model provided in .Net Framework 3.0. WCF is a combined features of Web Service, Remoting, MSMQ and COM+. WCF provides a common platform for all .NET communication.

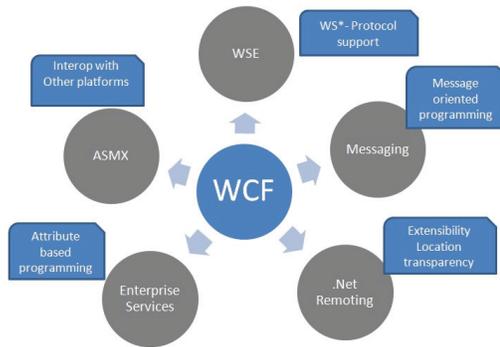


Fig. 3 Windows Communication Foundation

2. Building A Basic WCF Service

WCF is based around the idea of Services. A Service is essentially a class that you can access from outside of the application where the class lives, even across the Internet. Let's have a look at a simple WCF service:

```
Imports System.ServiceModel
<ServiceContract(> _
Public Class Test
    <OperationContract(> _
        Public Function GetLocalTime(ByVal includeDate As Boolean) As String
            If includeDate Then
                Return Now.ToString
            Else
                Return Now.TimeOfDay.ToString
            End If
        End Function
    End Class
```

As you can see, it's really just an ordinary class. <ServiceContract(> marks the class as a WCF service, and <OperationContract(> marks the function as an operation of the service, so that you can access it outside of

its application. In many samples, you'll see this class split between an interface (the contract) and a class (the service). This is probably a good idea, but it's not required.

If that code won't compile, you probably need to add a reference to System Service Model.

3. *Hosting A Basic WCF Service in IIS*

It tells the time and everything! But how do we use it? Well, that's where things get a bit complicated.

There are many ways we can host this service, and many ways clients can access it. We can host the service in a stand-alone application, or in a Windows Service we've written. We can use something called Windows Process Activation Service. Or, we can use good old IIS. Using IIS has a few nice advantages: we get to use all the power and configuration of IIS, it's easy for people to understand what's happening, even if they don't know WCF, and it's easy for other applications to use the service – even if they're not built with .NET.

We also have to choose a binding. A binding is essentially a means of communication, and there are many to choose from. We can choose HTTP (in many flavours), TCP, named pipes, MSMQ, and so on. We're going to look at `basicHttpBinding`, which is nice and simple to work with and highly compatible.

So, if we're hosting in IIS, we clearly need a virtual application folder in which to run our service. Let's call this web `WCFTTest`. Then, use IIS Manager to allow anonymous authentication so we don't have to worry about security concerns for the time being.

We'll need to add three files to our web. First, we need the assembly containing the service you wrote. We'll assume we created the service and we put it in a class library (DLL project) called `WCFTTest`. When we compiled that project, we made a file called `WCFTTest.dll`. Create a folder called 'bin' in our web, and copy this file there.

Second, we need to add a `*.svc` file to the web. This file represents the address that clients will use to access the service, and it tells IIS where to find the service to use. Let's call this file `Test.svc`. It needs to contain the following:

```
<%@ ServiceHost Service="WCFTTest.Test" %>
```

`ServiceHost` tells the server that this URL represents a WCF Service. `Service="WCFTTest.Test"` tells the server what class to use to run the service. Because we put our `*.dll` file in the `/bin` folder, the server will automatically find the class and be able to use it. There are other ways of organizing this, but this is perhaps the simplest to understand.

Finally, we need a `web.config` file placed in the web's root to tell the server how to configure the service. Here's what we need::

```
<?xml version="1.0"?>
<configuration>
  <system.serviceModel>
    <services>
      <service name="WCFTTest.Test">
        <endpoint address="" binding="basicHttpBinding"
contract="WCFTTest.Test" />
      </service>
    </services>
  </system.serviceModel>
</configuration>
```

We can see that we've configured one service, called `WCFTTest.Test`, and we've created one endpoint using `basicHttpBinding`. We can see that for the contract we're using the same class as the actual service itself, but if we want, we could define the service contract (as an Interface) in one assembly and then implement the service itself (as a class that implements our interface) in another class or assembly.

Now, when we browse to `http://localhost/WCFTTest/Test.svc`, We'll see a web page that states we've accessed a WCF service. The rest of the page talks about metadata. Right now, our service is up and running. If we had any clients using the service, they'd be working.

But, we don't have any clients using this service. And without metadata, we're going to find it tough to build one. Metadata tells other programs how our service works and how to use it. Once they know this, they don't need the metadata anymore, but to get there, we're going to expose the metadata through IIS. To do this, we'll change our `web.config` file to add another endpoint. This endpoint will use `mexHttpBinding`, which is a metadata exchange format. We'll set the address to `/mex`, and we'll also define and set a

serviceBehavior, which allows you to specify more detailed options about how your service works. Here's how your new web.config file should look:

```
<?xml version="1.0"?>
<configuration>
<system.serviceModel>
<services>

<servicebehaviorConfiguration="basicBehavior"
name="WCFTest.Test">

<endpoint address="" binding="basicHttpBinding"
contract="WCFTest.Test" />

<endpoint address="mex" binding="mexHttpBinding"
contract="IMetadataExchange" />
</service>
</services>
<behaviors>
<serviceBehaviors>
<behavior name="basicBehavior">
<serviceMetadata httpGetEnabled="true" />
</behavior>
</serviceBehaviors>
</behaviors>
</system.serviceModel>
</configuration>
```

Now, metadata about our WCF service is available at http://localhost/WCFTest/Test.svc/mex. We won't be able to browse it with Internet Explorer, though; it's not meant to be used by a web browser. You can, however, browse to http://localhost/WCFTest/Test.svc?wsdl to see an XML version of our metadata.

At this point, our service is up and running in IIS, and metadata about our service is available so other programs will know how to access and use it.

4. WCF: Calling a Basic WCF Service

So, we've built a WCF service and we've hosted it in IIS. Now you want to access this service. How? We'll, we're back to things being easy!

Using Visual Studio 2008, just go to Project, Add Service Reference. Type URL of the service we built and choose a name for our new reference. Once we click OK, we'll be able to use our service just as though it was a class in our project:

```
Dim wcfTest As New svcTest.TestClient
Dim sTime As String = wcfTest.GetLocalTime(True).
```

5. Difference between WCF and Web Service

Web service is a part of WCF. WCF offers much more flexibility and portability to develop a service when comparing to web service. Still we are having more advantages over Web service, following table provides detailed difference between them.

TABLE I WCF AND WEB SERVICE

Features	Web Service	WCF
Hosting	It can be hosted in IIS	It can be hosted in IIS, windows activation service, Self-hosting, Windows service
Programming	[WebService] attribute has to be added to the class	[ServiceContract] attribute has to be added to the class
Model	[WebMethod] attribute represents the method exposed to client	[OperationContract] attribute represents the method exposed to client
Operation	One-way, Request- Response are the different operations supported in web service	One-Way, Request-Response, Duplex are different type of operations supported in WCF
XML	System.Xml.serialization name space is used for serialization	System.Runtime.Serialization namespace is used for serialization
Encoding	XML 1.0, MTOM(Message Transmission Optimization Mechanism), DIME, Custom	XML 1.0, MTOM, Binary, Custom
Transports	Can be accessed through HTTP, TCP, Custom	Can be accessed through HTTP, TCP, Named pipes, MSMQ,P2P, Custom
Protocols	Security	Security, Reliable messaging, Transactions

III. CONCLUSION

Now-a-days more people using SNS are simply use it as a social communication tool. In this article we propose a new idea which based on SNS but provide more service using our own project as background to implement the thesis into real world. Research base on this model and application example shows that people can use SNS more than just communication but also use SNS as a resource of information to embedding into a particular application system which will make the target system more light and concise as well as more accurate and reliable. Digging more SNS there are more potential valuable research, such as data mining, community discovery, information and knowledge management, services modes, role relationship management, collaboration tools, Human-Computer Interaction Interface based on Social Network Systems. Windows communication Foundation model has more advantages than other web service techniques. So it makes the application simpler, faster and more reliable than web services.

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