WCF Interview Questions and Answers (172) - Page 1

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172 records found.

What is WCF?

Windows Communication Foundation (WCF) is an SDK for developing and deploying services on Windows. WCF provides a runtime environment for services, enabling you to expose CLR types as services, and to consume other services as CLR types.

WCF is part of .NET 3.0 and requires .NET 2.0, so it can only run on systems that support it.

What is service and client in perspective of data communication?

A service is a unit of functionality exposed to the world.

The client of a service is merely the party consuming the service.

What is address in WCF and how many types of transport schemas are there in WCF?

Address is a way of letting client know that where a service is located. In WCF, every service is associated with a unique address. This contains the location of the service and transport schemas.

WCF supports following transport schemas

HTTP
TCP
Peer network
IPC (Inter-Process Communication over named pipes)
MSMQ

The sample address for above transport schema may look like

http://localhost:81
http://localhost:81/MyService
net.tcp://localhost:82/MyService
net.pipe://localhost/MyPipeService
net.msmq://localhost/private/MyMsMqService
net.msmq://localhost/MyMsMqService

net.msmq://localhost/MyMsmqService

What are contracts in WCF?

In WCF, all services expose contracts. The contract is a platform-neutral and standard way of describing what the service does.

WCF defines four types of contracts.

Service contracts

Describe which operations the client can perform on the service.
There are two types of Service Contracts.
ServiceContract - This attribute is used to define the Interface.
OperationContract - This attribute is used to define the method inside Interface.

```
[ServiceContract]

interface IMyContract

{

   [OperationContract]

   string MyMethod( );

}

class MyService : IMyContract

{

   public string MyMethod( )

   {

      return "Hello World";

   }

}
```

Data contracts

Define which data types are passed to and from the service. WCF defines implicit contracts for built-in types such as int and string, but we can easily define explicit opt-in data contracts for custom types.

There are two types of Data Contracts.
DataContract - attribute used to define the class
DataMember - attribute used to define the properties.

```
[DataContract]

class Contact

{

   [DataMember]

   public string FirstName;


   [DataMember]

   public string LastName;

}
```

If DataMember attributes are not specified for a properties in the class, that property can't be passed to-from web service.

Fault contracts

Define which errors are raised by the service, and how the service handles and propagates errors to its clients.

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Message contracts

Allow the service to interact directly with messages. Message contracts can be typed or untyped, and are useful in

interoperability cases and when there is an existing message format we have to comply with.

Where we can host WCF services?

Every WCF services must be hosted somewhere. There are three ways of hosting WCF services.

They are

1. IIS
2. Self Hosting
3. WAS (Windows Activation Service)

For more details see http://msdn.microsoft.com/en-us/library/bb332338.aspx

What is binding and how many types of bindings are there in WCF?

A binding defines how an endpoint communicates to the world. A binding defines the transport (such as HTTP or TCP) and the encoding being used (such as text or binary). A binding can contain binding elements that specify details like the security mechanisms used to secure messages, or the message pattern used by an endpoint.

WCF supports nine types of bindings.

Basic binding

Offered by the BasicHttpBinding class, this is designed to expose a WCF service as a legacy ASMX web service, so that old clients can work with new services. When used by the client, this binding enables new WCF clients to work with old ASMX services.

TCP binding

Offered by the NetTcpBinding class, this uses TCP for cross-machine communication on the intranet. It supports a variety of features, including reliability, transactions, and security, and is optimized for WCF-to-WCF communication. As a result, it requires both the client and the service to use WCF.

Peer network binding

Offered by the NetPeerTcpBinding class, this uses peer networking as a transport. The peer network-enabled client and services all subscribe to the same grid and broadcast messages to it.

IPC binding

Offered by the NetNamedPipeBinding class, this uses named pipes as a transport for same-machine communication. It is the most secure binding since it cannot accept calls from outside the machine and it supports a variety of features similar to the TCP binding.

Web Service (WS) binding

Offered by the WSHttpBinding class, this uses HTTP or HTTPS for transport, and is designed to offer a variety of features such as reliability, transactions, and security over the Internet.

Federated WS binding

Offered by the WSFederationHttpBinding class, this is a specialization of the WS binding, offering support for federated security.

Duplex WS binding

Offered by the WSDualHttpBinding class, this is similar to the WS binding except it also supports bidirectional communication from the service to the client.

MSMQ binding

Offered by the NetMsmqBinding class, this uses MSMQ for transport and is designed to offer support for disconnected queued calls.

MSMQ integration binding

Offered by the MsmqIntegrationBinding class, this converts WCF messages to and from MSMQ messages, and is designed to interoperate with legacy MSMQ clients.

For WCF binding comparison, see
http://www.pluralsight.com/community/blogs/aaron/archive/2007/03/22/46560.aspx

What is endpoint in WCF?

Every service must have Address that defines where the service resides, Contract that defines what the service does and a Binding that defines how to communicate with the service. In WCF the relationship between Address, Contract and Binding is called Endpoint.

The Endpoint is the fusion of Address, Contract and Binding.

How to define a service as REST based service in WCF?

WCF 3.5 provides explicit support for RESTful communication using a new binding named WebHttpBinding.
The below code shows how to expose a RESTful service

```
[ServiceContract]

interface IStock

{

[OperationContract]

[WebGet]

int GetStock(string StockId);

}
```

By adding the WebGetAttribute, we can define a service as REST based service that can be accessible using HTTP GET operation.

What is the address formats of the WCF transport schemas?

Address format of WCF transport schema always follow

[transport]://[machine or domain][:optional port] format.

for example:

HTTP Address Format

http://localhost:8888
the way to read the above url is

"Using HTTP, go to the machine called localhost, where on port 8888 someone is waiting"
When the port number is not specified, the default port is 80.

TCP Address Format

net.tcp://localhost:8888/MyService

When a port number is not specified, the default port is 808:

net.tcp://localhost/MyService

NOTE: Two HTTP and TCP addresses from the same host can share a port, even on the same machine.

IPC Address Format
net.pipe://localhost/MyPipe

We can only open a named pipe once per machine, and therefore it is not possible for two named pipe addresses to share a pipe name on the same machine.

MSMQ Address Format
net.msmq://localhost/private/MyService
net.msmq://localhost/MyService

What is Proxy and how to generate proxy for WCF Services?

The proxy is a CLR class that exposes a single CLR interface representing the service contract. The proxy provides the same operations as service's contract, but also has additional methods for managing the proxy life cycle and

the connection to the service. The proxy completely encapsulates every aspect of the service: its location, its implementation technology and runtime platform, and the communication transport.

The proxy can be generated using Visual Studio by right clicking Reference and clicking on Add Service Reference. This brings up the Add Service Reference dialog box, where you need to supply the base address of the service (or a base address and a MEX URI) and the namespace to contain the proxy.

Proxy can also be generated by using SvcUtil.exe command-line utility. We need to provide SvcUtil with the HTTP-GET address or the metadata exchange endpoint address and, optionally, with a proxy filename. The default proxy filename is output.cs but you can also use the /out switch to indicate a different name.

SvcUtil http://localhost/MyService/MyService.svc /out:Proxy.cs

When we are hosting in IIS and selecting a port other than port 80 (such as port 88), we must provide that port number as part of the base address:

SvcUtil http://localhost:88/MyService/MyService.svc /out:Proxy.cs

What are different elements of WCF Srevices Client configuration file?

WCF Services client configuration file contains endpoint, address, binding and contract. A sample client config file looks like

```
<system.serviceModel>

   <client>

      <endpoint name = "MyEndpoint"

         address  = "http://localhost:8000/MyService/"

         binding  = "wsHttpBinding"

         contract = "IMyContract"

      />

   </client>

</system.serviceModel>
```

What is Transport and Message Reliability?

Transport reliability (such as the one offered by TCP) offers point-to-point guaranteed delivery at the network packet level, as well as guarantees the order of the packets. Transport reliability is not resilient to dropping network connections and a variety of other communication problems.

Message reliability deals with reliability at the message level independent of how many packets are required to deliver the message. Message reliability provides for end-to-end guaranteed delivery and order of messages, regardless of how many intermediaries are involved, and how many network hops are required to deliver the message from the client to the service.

How to configure Reliability while communicating with WCF Services?

Reliability can be configured in the client config file by adding reliableSession under binding tag.

```
<system.serviceModel>

   <services>

      <service name = "MyService">
```

```
        <endpoint
           address  = "net.tcp://localhost:8888/MyService"
           binding  = "netTcpBinding"
           bindingConfiguration = "ReliableCommunication"
           contract = "IMyContract"
        />
      </service>
   </services>
   <bindings>
      <netTcpBinding>
         <binding name = "ReliableCommunication">
            <reliableSession enabled = "true"/>
         </binding>
      </netTcpBinding>
   </bindings>
</system.serviceModel>
```

Reliability is supported by following bindings only

NetTcpBinding
WSHttpBinding
WSFederationHttpBinding
WSDualHttpBinding

How to set the timeout property for the WCF Service client call?

The timeout property can be set for the WCF Service client call using binding tag.

```
<client>
   <endpoint
      ...
      binding = "wsHttpBinding"
      bindingConfiguration = "LongTimeout"
      ...
   />
</client>
<bindings>
   <wsHttpBinding>
      <binding name = "LongTimeout" sendTimeout = "00:04:00"/>
   </wsHttpBinding>
</bindings>
```

If no timeout has been specified, the default is considered as 1 minute.

How to deal with operation overloading while exposing the WCF services?

By default overload operations (methods) are not supported in WSDL based operation. However by using **Name** property of **OperationContract** attribute, we can deal with operation overloading scenario.

```
[ServiceContract]

interface ICalculator

{

   [OperationContract(Name = "AddInt")]

   int Add(int arg1,int arg2);



   [OperationContract(Name = "AddDouble")]

   double Add(double arg1,double arg2);

}
```

Notice that both method name in the above interface is same (Add), however the Name property of the OperationContract is different. In this case client proxy will have two methods with different name AddInt and AddDouble.

What was the code name for WCF?

The code name of WCF was **Indigo** .

WCF is a unification of .NET framework communication technologies which unites the following technologies:-

NET remoting
MSMQ
Web services
COM+

What are the main components of WCF?

The main components of WCF are

1. Service class
2. Hosting environment
3. End point

For more details read http://www.dotnetfunda.com/articles/article221.aspx#WhatarethemaincomponentsofWCF

What are various ways of hosting WCF Services?

There are three major ways of hosting a WCF services

• Self-hosting the service in his own application domain. This we have already covered in the first section. The service comes in to existence when you create the object of Service Host class and the service closes when you call the Close of the Service Host class.

• Host in application domain or process provided by IIS Server.

• Host in Application domain and process provided by WAS (Windows Activation Service) Server.

More details http://www.dotnetfunda.com/articles/article221.aspx#whatarethevariouswaysofhostingaWCFservice

What is the difference WCF and Web services?

Web services can only be invoked by HTTP (traditional webservice with .asmx). While WCF Service or a WCF component can be invoked by any protocol (like http, tcp etc.) and any transport type.

Second web services are not flexible. However, WCF Services are flexible. If you make a new version of the service then you need to just expose a new end. Therefore, services are agile and which is a very practical approach looking at the current business trends.

We develop WCF as contracts, interface, operations, and data contracts. As the developer we are more focused on the business logic services and need not worry about channel stack. WCF is a unified programming API for any kind of services so we create the service and use configuration information to set up the communication mechanism like HTTP/TCP/MSMQ etc

For more details, read http://msdn.microsoft.com/en-us/library/aa738737.aspx

What is three major points in WCF?

We Should remember ABC.

Address --- Specifies the location of the service which will be like http://Myserver/MyService.Clients will use this location to communicate with our service.

Binding --- Specifies how the two paries will communicate in term of transport and encoding and protocols

Contract --- Specifies the interface between client and the server.It's a simple interface with some attribute.

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