WCF Bindings

1) Describes how a service communicates with the client.
2) Specifies which protocol to use.
3) Specifies encoding method to format the message.
4) Specifies the security requirements.
5) Specifies the message exchange format.
6) Specifies the session mode.
7) Developer can create custom bindings too.

Bindings of an Endpoint

The bindings are the key element of the WCF architecture. There are variety types of bindings available to use when defining endpoints.

Built-In Bindings

Within the Windows Communication Foundation programming model, bindings are represented by the "System.ServiceModel.Channels.Binding" class. All binding classes must derive from this base class. Following image shows all the binding classes which are available with WCF.

Binding Class Name	Transport	Message Encoding	Message Version	Security Mode	Reliable Messaging	Transaction Flow (disabled by default)
BasicHttpBinding	HTTP	Text	SOAP 1.1	None	Not Supported	Not Supported
WSHttpBinding	HTTP	Text	SOAP 1.2 WS-Addressing 1.0	Message	Disabled	WS-AtomicTransactions
WSDualHttpBinding	HTTP	Text	SOAP 1.2 WS-Addressing 1.0	Message	Enabled	WS-AtomicTransactions
WSFederationHttpBinding	HTTP	Text	SOAP 1.2 WS-Addressing 1.0	Message	Disabled	WS-AtomicTransactions
NetTcpBinding	TCP	Binary	SOAP 1.2	Transport	Disabled	OleTransactions
NetPeerTcpBinding	P2P	Binary	SOAP 1.2	Transport	Not Supported	Not Supported
NetNamedPipesBinding	Named Pipes	Binary	SOAP 1.2	Transport	Not Supported	OleTransactions
NetMsmqBinding	MSMQ	Binary	SOAP 1.2	Message	Not Supported	Not Supported
MsmqIntegrationBinding	MSMQ	Not Supported (uses a pre-WCF serialization format)	Not Supported	Transport	Not Supported	Not Supported
CustomBinding	You Decide	You Decide	You Decide	You Decide	You Decide	You Decide

Binding Name	Transport-Level Security	Message-Level Security	WS-* Interoperability	WS-*Transactions	Durable Reliable Messaging	Reliable Sessions	Performance	Communication		
								Request/ Reply	One-way	Duplex
basicHttpBinding	X	X	X				Good	X	X	
wsHttpBinding	X	X	X	X		RS*	Good	X	X	
wsDualHttpBinding	X	X	X	X		RS*	Good	X	X	X
netTcpBinding	X	X		X		RS*	Better	X	X	X
netNamedPipeBinding	X			X			Best	X	X	X
netMsmqBinding	X	X			X		Better		X	
netPeerTcpBinding	X						Good		X	X
msmqIntegrationBinding	X				X		Better		X	
wsFederationHttpBinding	X	X	X			RS*	Good	X	X	
ws2007HttpBinding	X	X	X	X		RS*	Good	X	X	
ws2007FederationHttpBinding	X	X	X			RS*	Good	X	X	

Some of the widely used features are:

- **basicHttpBinding**
  - Designed for scenarios where interoperability is of utmost importance.
  - HTTP for the transport and text for the message encoding.
  - Message version is SOAP 1.1.
  - Capable of using transport or message security, but both are disabled by default.
- **wsHttpBinding**
  - Designed for interoperability while incorporating with richer Web services protocols for security, reliable messaging, and transaction.
  - Message version is SOAP 1.2.
  - This is default binding in WCF.
- **wsDualHttpBinding**
  - Supports all the feature of wsHttpBinding.
  - Used for Duplex service contracts.
  - Supports bidirectional communication.
- **netTCPBinding**
  - Unlike the ws* specific bindings, the various "Net" bindings were not designed for interoperability. This explains why the binding names are prefixed with "Net".
  - Assumes you have the Microsoft .NET Framework 3.0 installed on both sides.
  - NetTcpBinding uses TCP for the transport, binary for the message encoding, and SOAP 1.2 for the message version.
  - Enables transport security by default and can support transactions if enabled.
- **netPeerTCPBinding**
  - Provides a secure binding for peer-to-peer network applications.
- **netNamedPipeBinding**

    - Provides a secure and reliable binding that is optimized for on-machine communication.
    - Can be only used over a single WCF computer.
- **netMSMQBinding**
    - Represents a queued binding that is suitable for cross-machine communication.
- **CustomBinding**
    - Define a custom binding by deriving a class from System.ServiceModel.Channels.Binding
    - Used to enable the use of new transports or encoders at a service endpoint.

Transport Protocols

Not like XML web services, WCF supports any protocol to communicate with the clients.

• **HTTP**: This is the chosen protocol for communicating over the web and gives the ability to integrate the service with open standards exposing services to clients on many platforms.

• **TCP**: Fast binary format protocol. A great performance in WCF-WCF communication.

• **Named pipes**: Fast communication between the client and the server which runs on the same machine. Works only in WCF-WCF.

• **MSMQ**: Microsoft Message Queue allows queuing of messages and very useful in disconnected communications between the client the server. Used when a client wants to enqueue a message that a service can consume later.

• **Custom Protocols**: Can define own protocols.