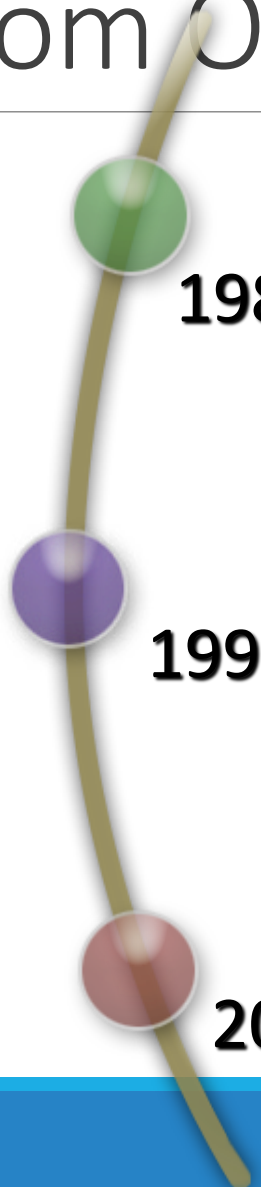
Windows Communication Foundation (WCF)

WEEK 09

MURTAZA MUNAWAR FAZAL

From Objects to Services



1980s

Object-Oriented

- Polymorphism
- Encapsulation
- Subclassing

1990s

Component-Based

- Interface-based
- Dynamic Loading
- Runtime Metadata

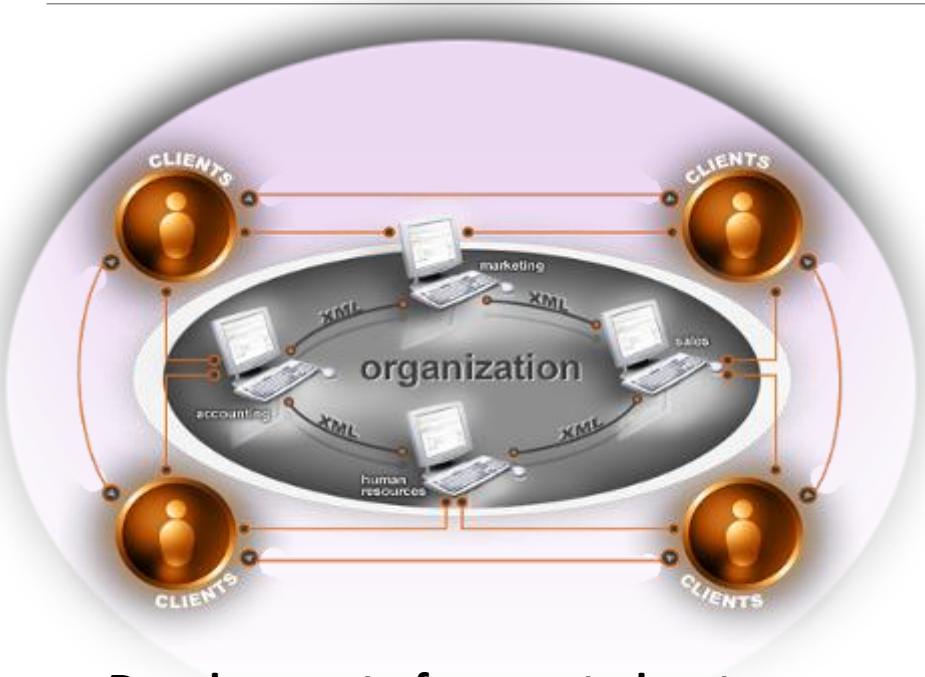
2000s

Service-Oriented

- Message-based
- Schema+Contract
- Binding via Policy

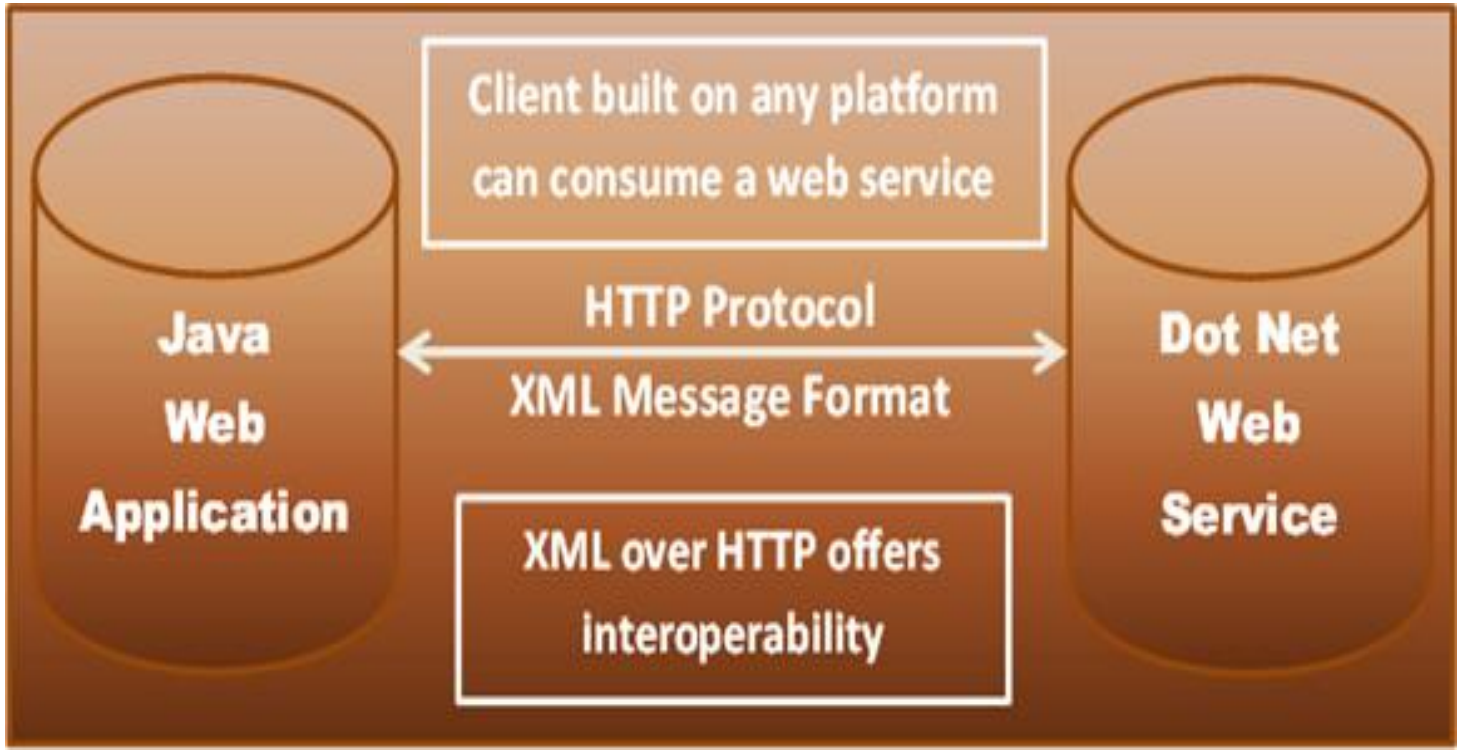
The Challenge

Radically Simplifying Distributed Application Development

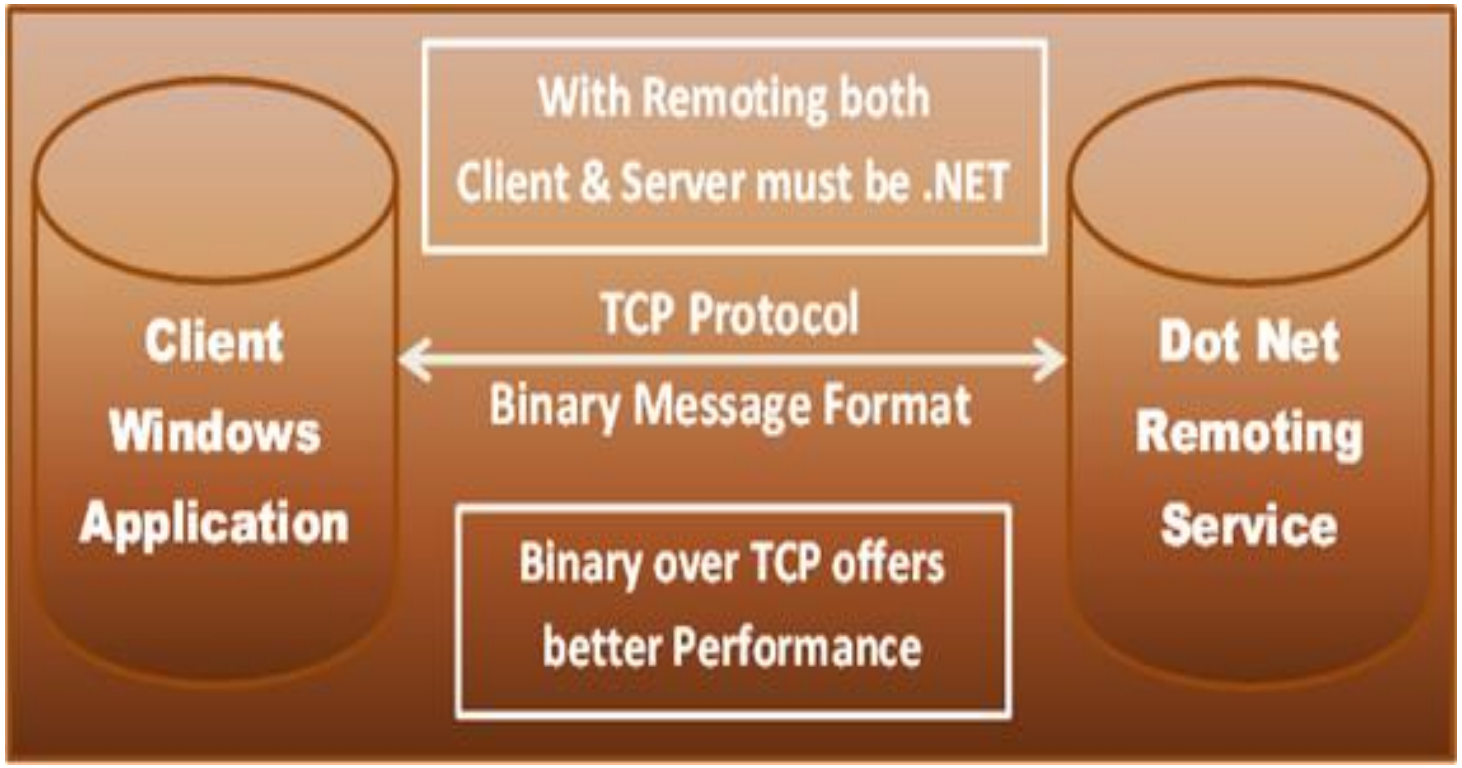


Development of connected systems remains costly and frustrating

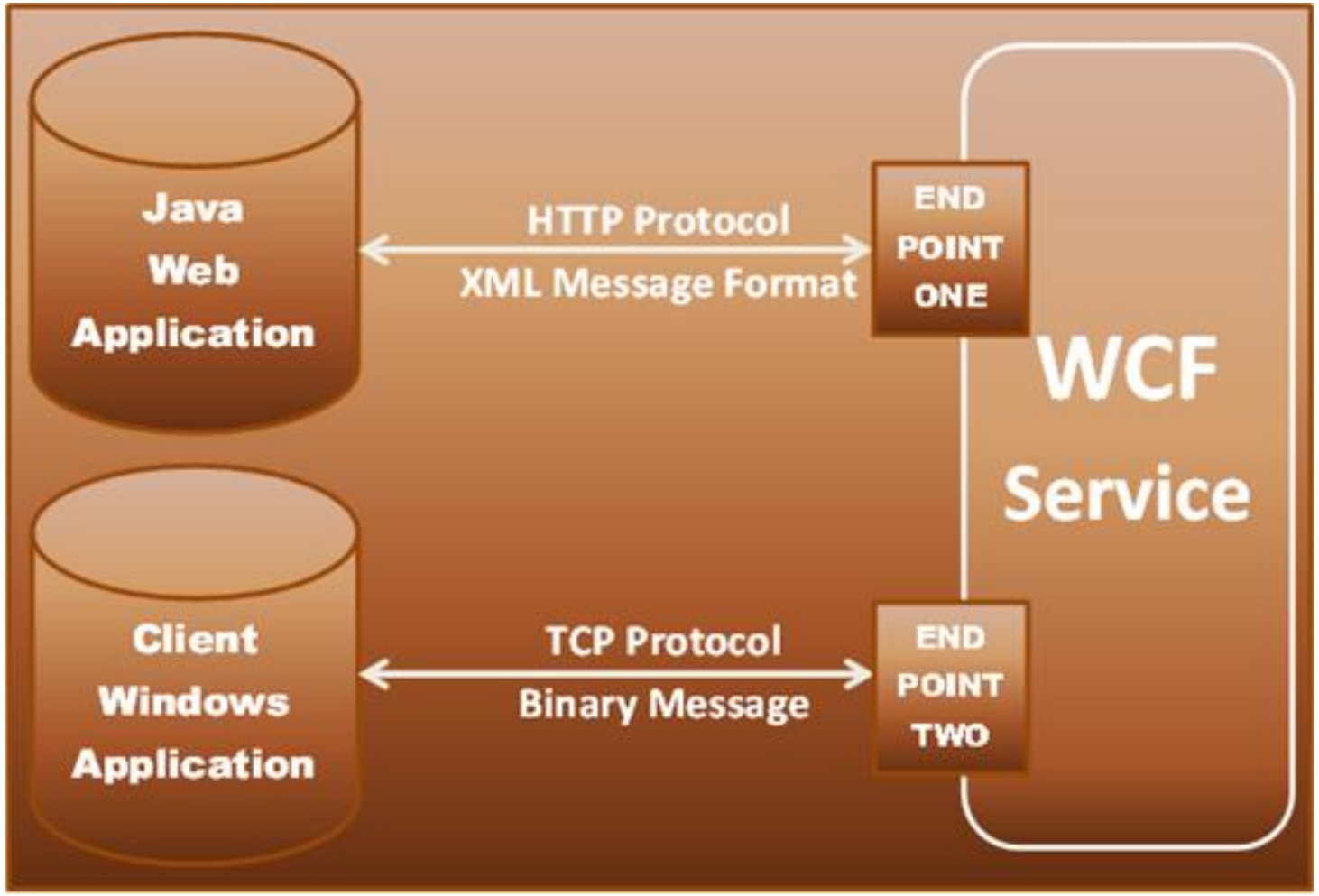
- **Different programming models for different tasks**
- **Need for security and reliable messaging**
- **Interoperability with applications on other platforms**
- **Productive service-oriented programming model needed**


Client built on any platform
can consume a web service
Java
Web
Application
HTTP Protocol
XML Message Format
Dot Net
Web
Service
XML over HTTP offers
interoperability

Example 1

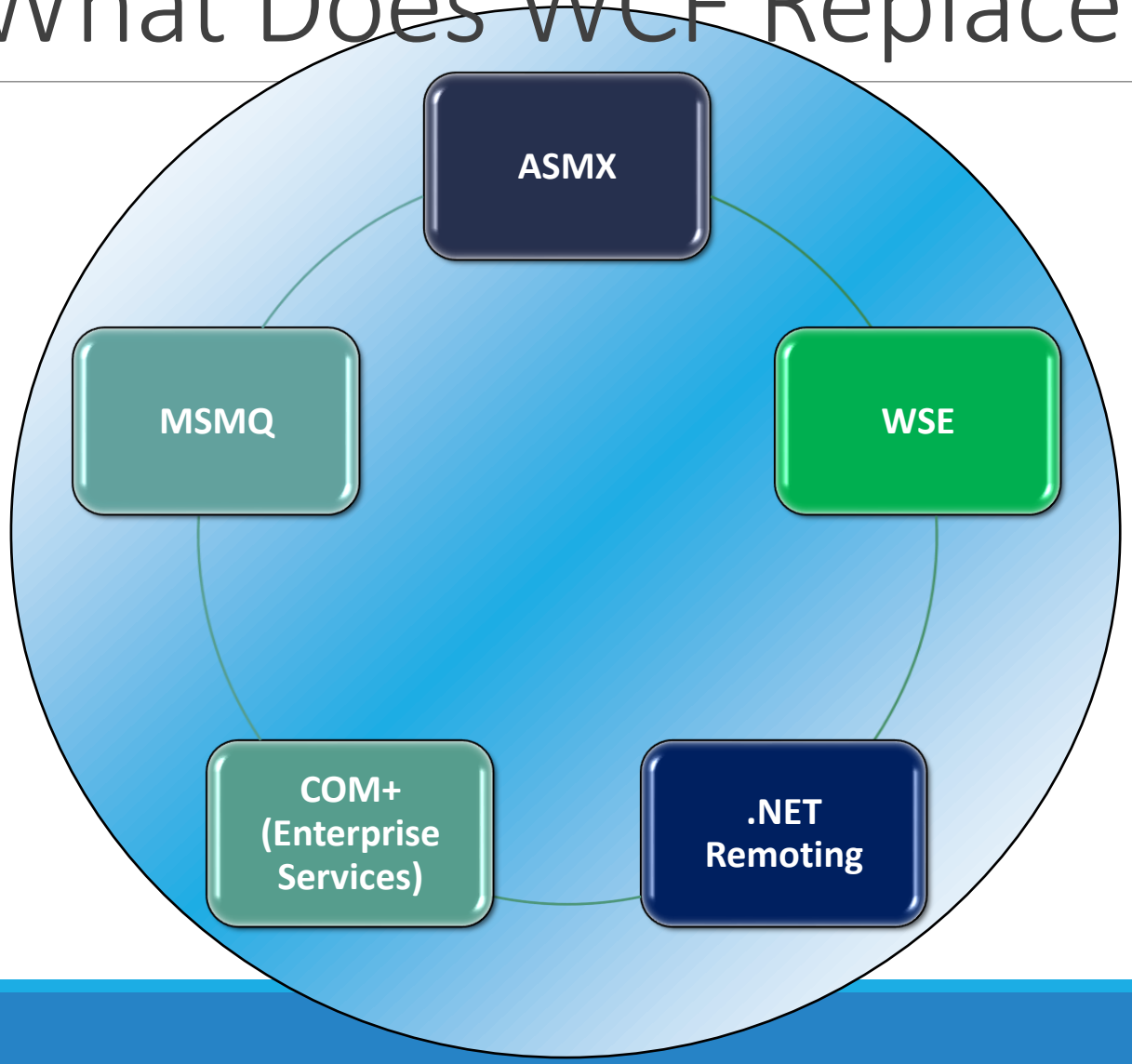

With Remoting both
Client & Server must be .NET
Client
Windows
Application
TCP Protocol
Binary Message Format
Dot Net
Remoting
Service
Binary over TCP offers
better Performance

Example 2



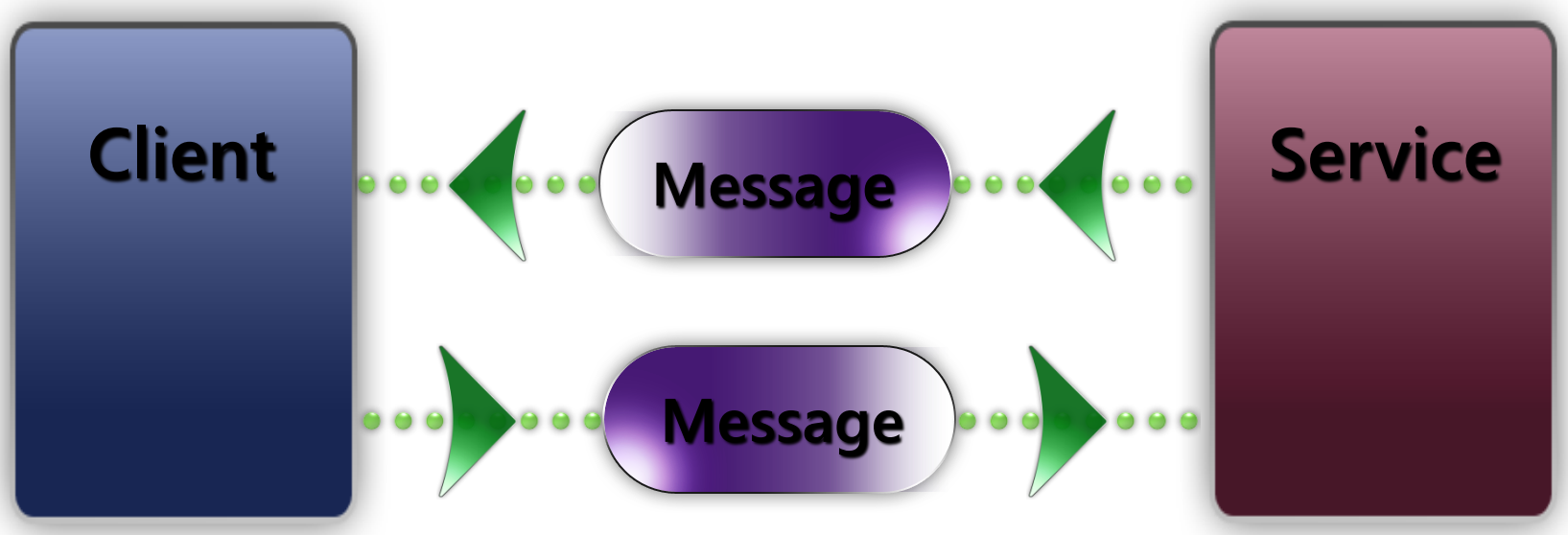
WCF Solution

What Does WCF Replace?

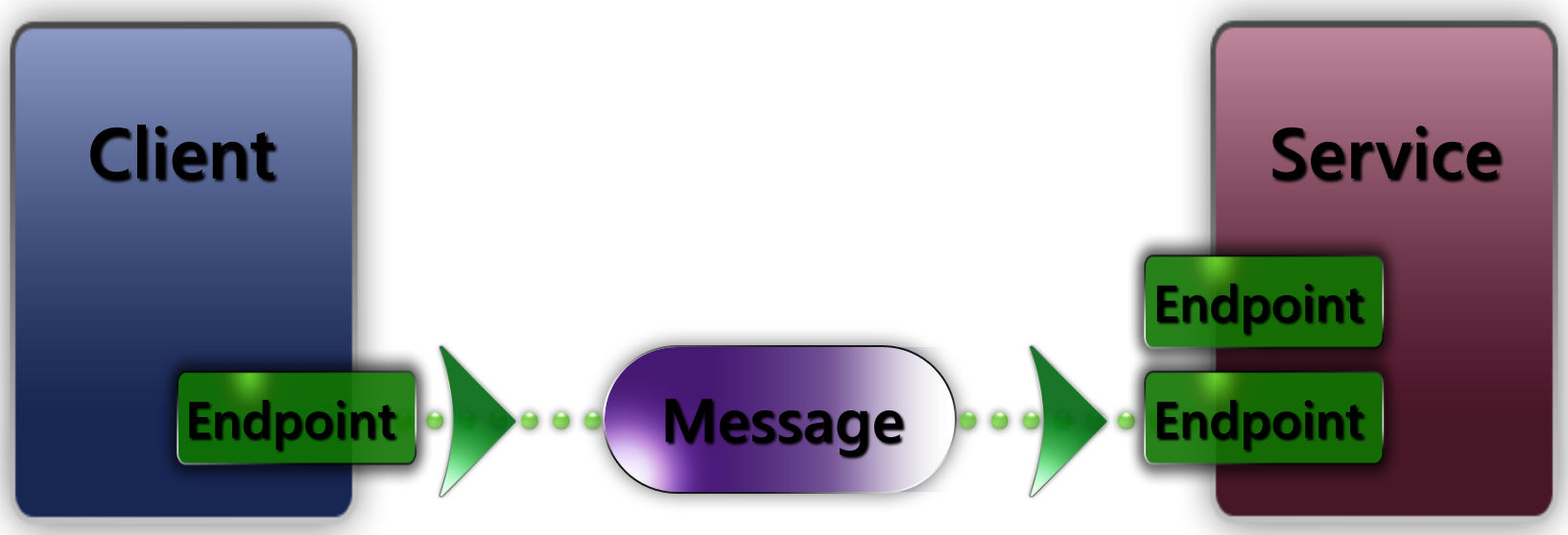


Understanding WCF principles

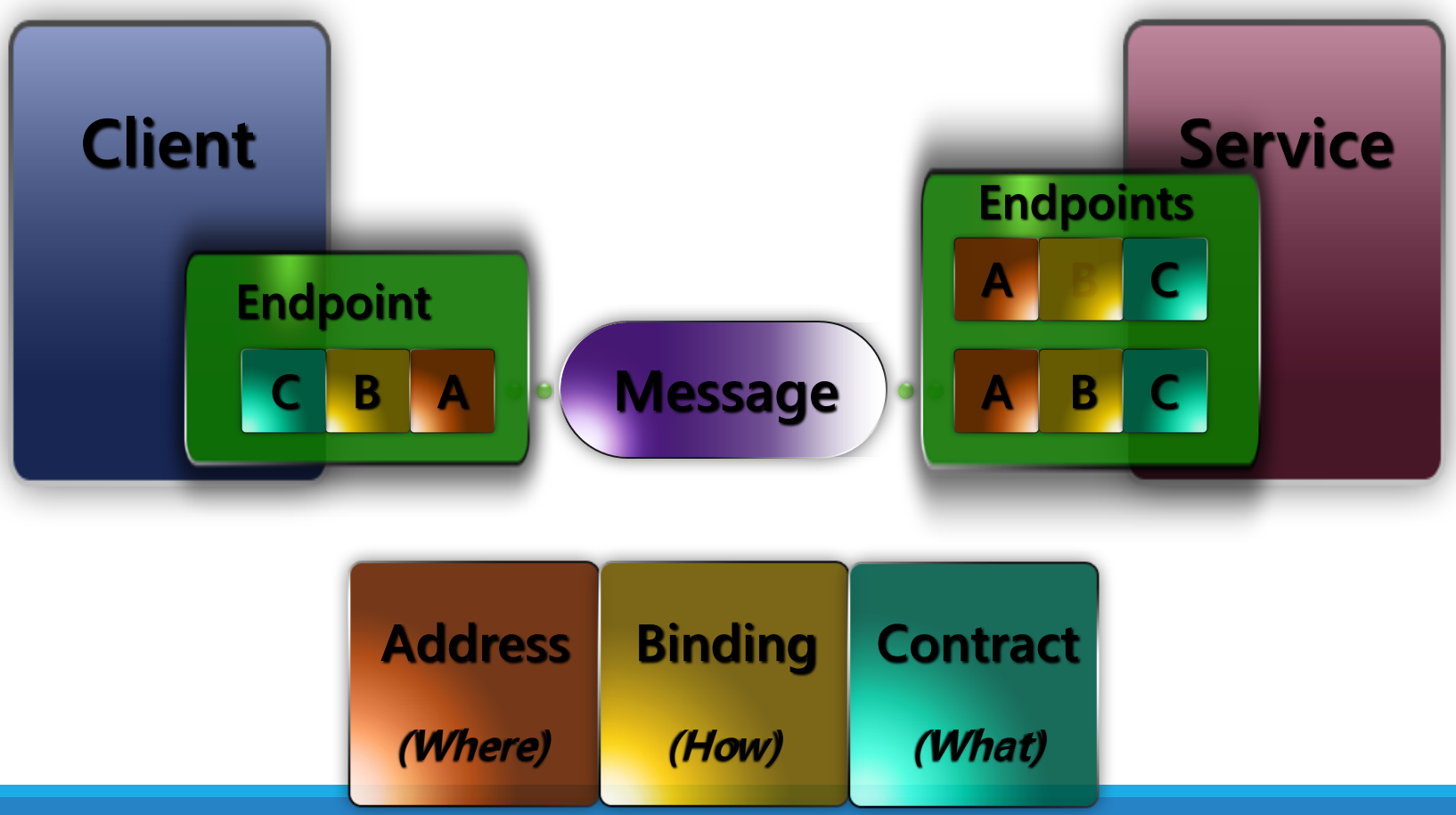
Services and Clients



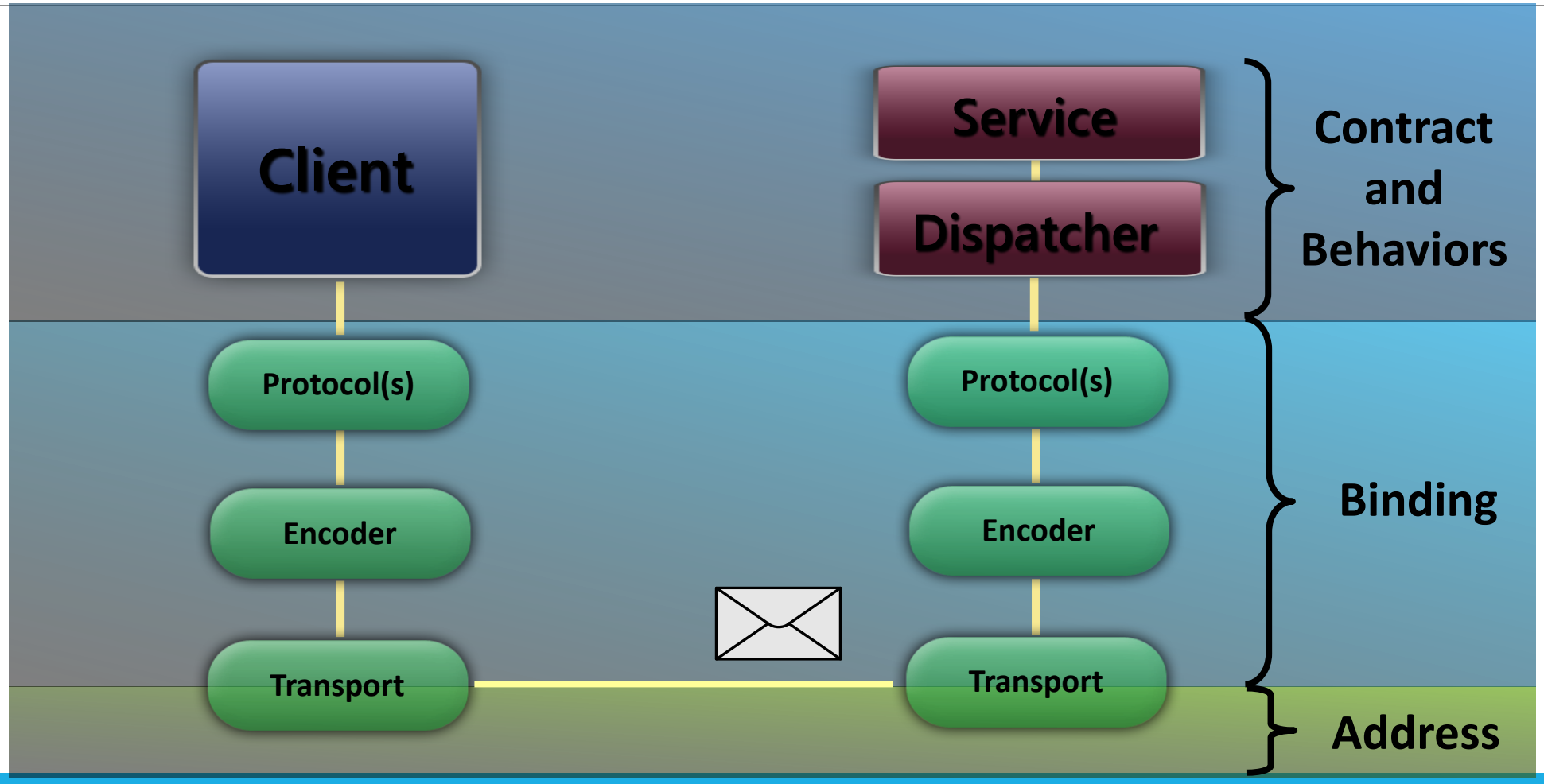
Endpoints



Address, Binding, Contract



WCF Architecture: Messaging Runtime



Address

Basically URL, specifies where this WCF service is hosted. Client will use this URL to connect to the service. e.g.

http://localhost:8090/MyService/SimpleCalculator.svc

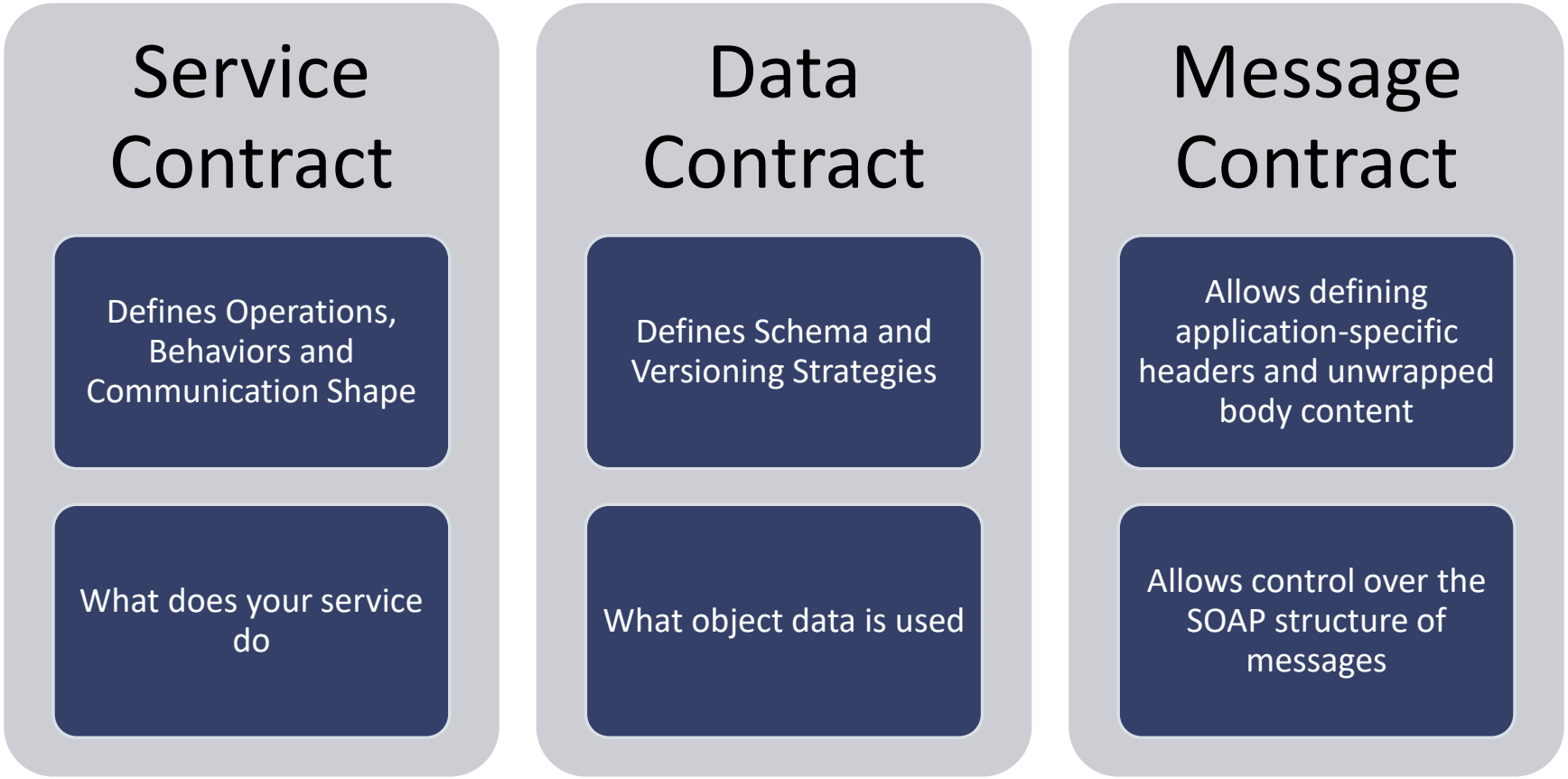
Contracts

THE WHAT

What are Contracts?

Collection of operation that specifies what the endpoint will communicate with outside world. Usually name of the Interface will be mentioned in the Contract, so the client application will be aware of the operations which are exposed to the client. Each operation is a simple exchange pattern such as one-way, duplex and request/reply.

Three Types of Contracts



Service Contract

```
[ServiceContract]
public interface IService1
   {
     [OperationContract]
       string GetData(int value);

       [OperationContract]
       CompositeType GetDataUsingDataContract(CompositeType composite);

       [OperationContract]
       int Sum(int a, int b);
   }
```

Data Contracts

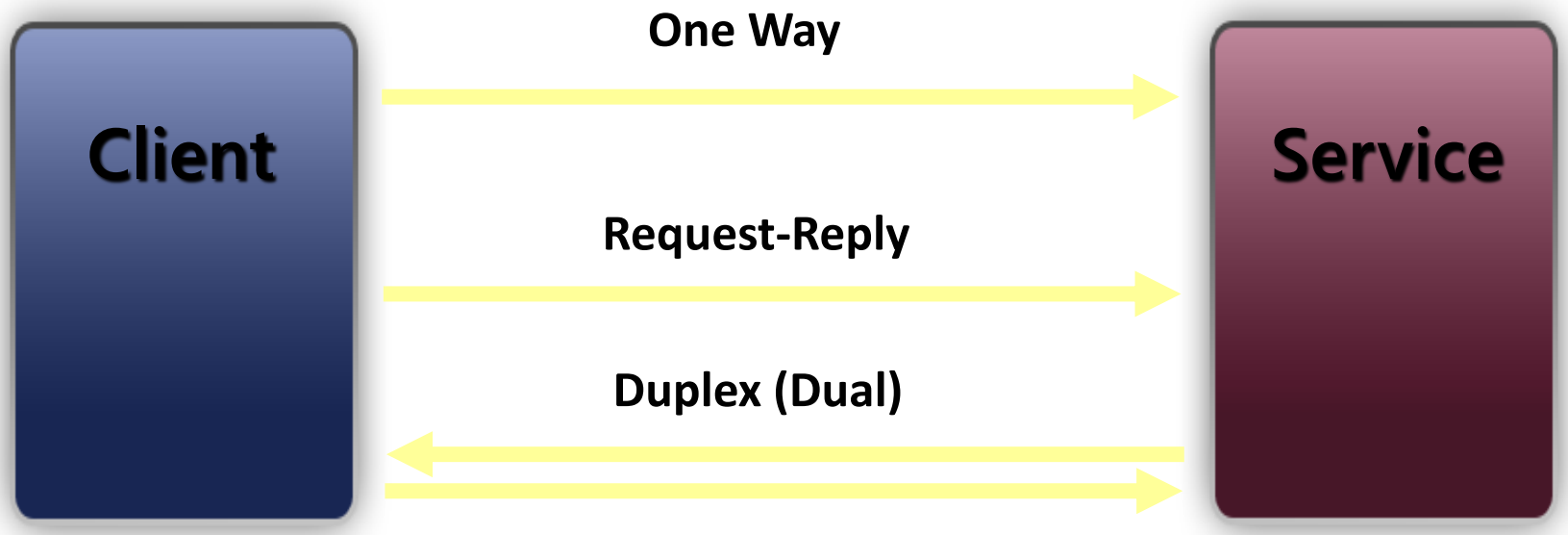
```
[DataContract]

public class CompositeType
{

 bool boolValue = true;


[DataMember]
public bool BoolValue
{

 get { return boolValue; }
 set { boolValue = value; }
}

}
```

Message Contracts

Message is the packet of data which contains important information. WCF uses these messages to transfer information from Source to destination.

WCF uses SOAP(Simple Object Access Protocol) Message format for communication. SOAP message contain Envelope, Header and Body. SOAP envelope contains name, namespace, header and body element. SOAP Header contain important information which are not directly related to message. SOAP body contains information which is used by the target.

Ways to Talk



One Way:
- Datagram-style delivery

Request-Reply
- Immediate Reply on same logical thread

Duplex
- Reply “later” and on backchannel (callback-style)