

# Windows Communication Foundation

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# What's WinFX?

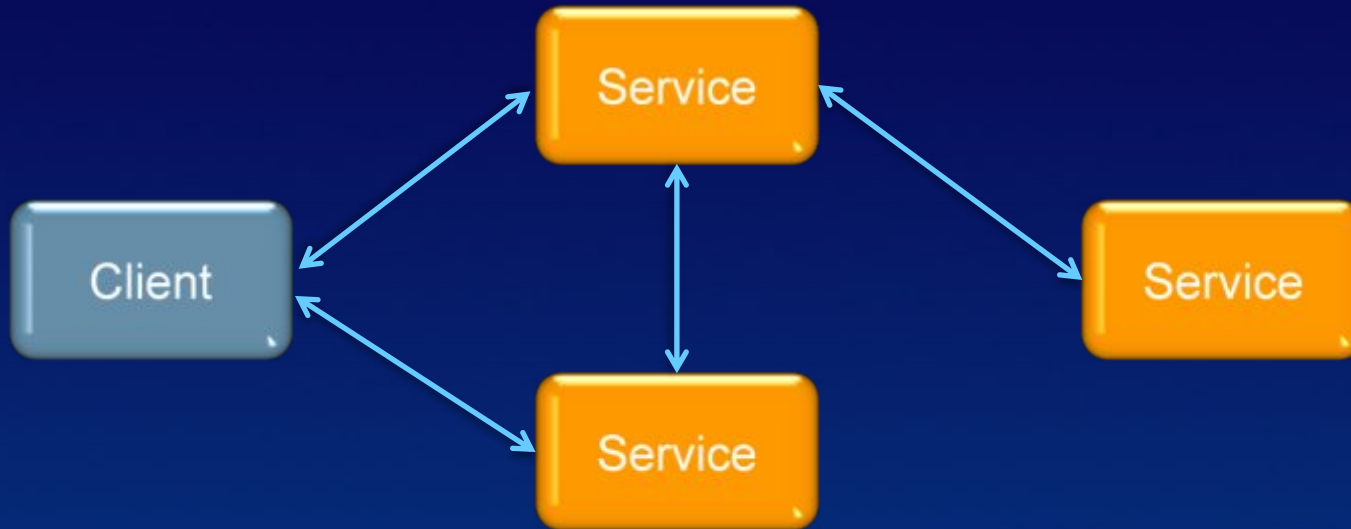


- Managed API for the Windows platform
  - Extends the .NET Framework V2.0
- First ships at the time of Windows Vista (2006)
  - Included in Windows Vista
  - Available on Windows XP Sp 2 and Server 2003
  - Following a Community Technology Preview Cycle
  - Latest is January 2006 CTP

# What's WinFX?

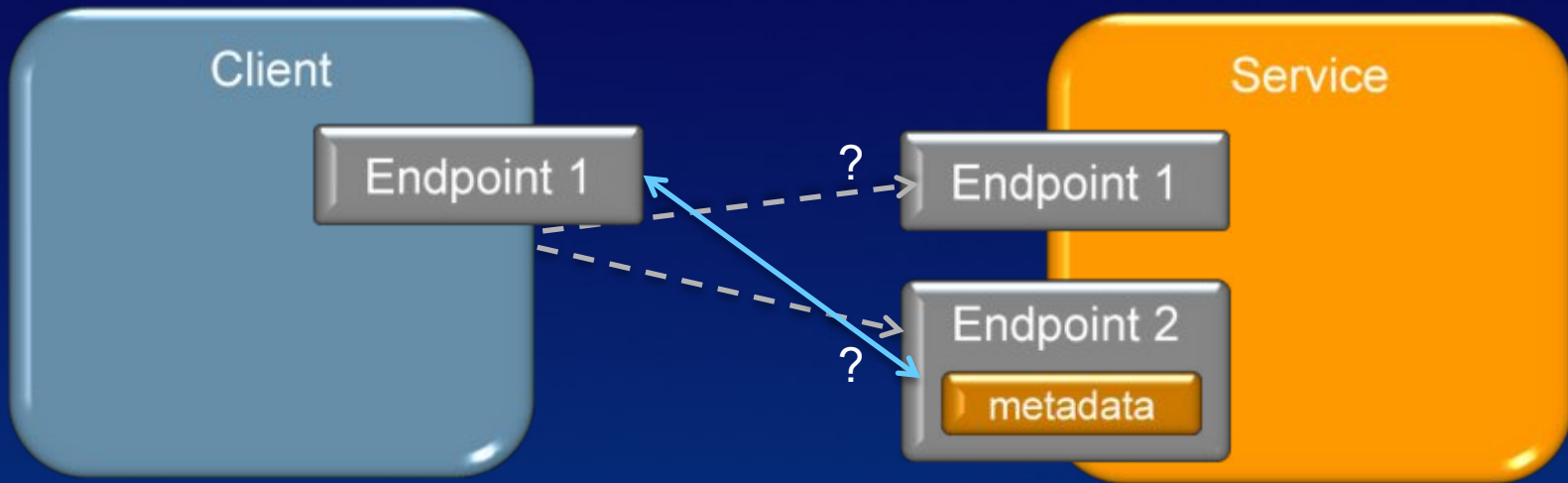


# Windows Communication Foundation



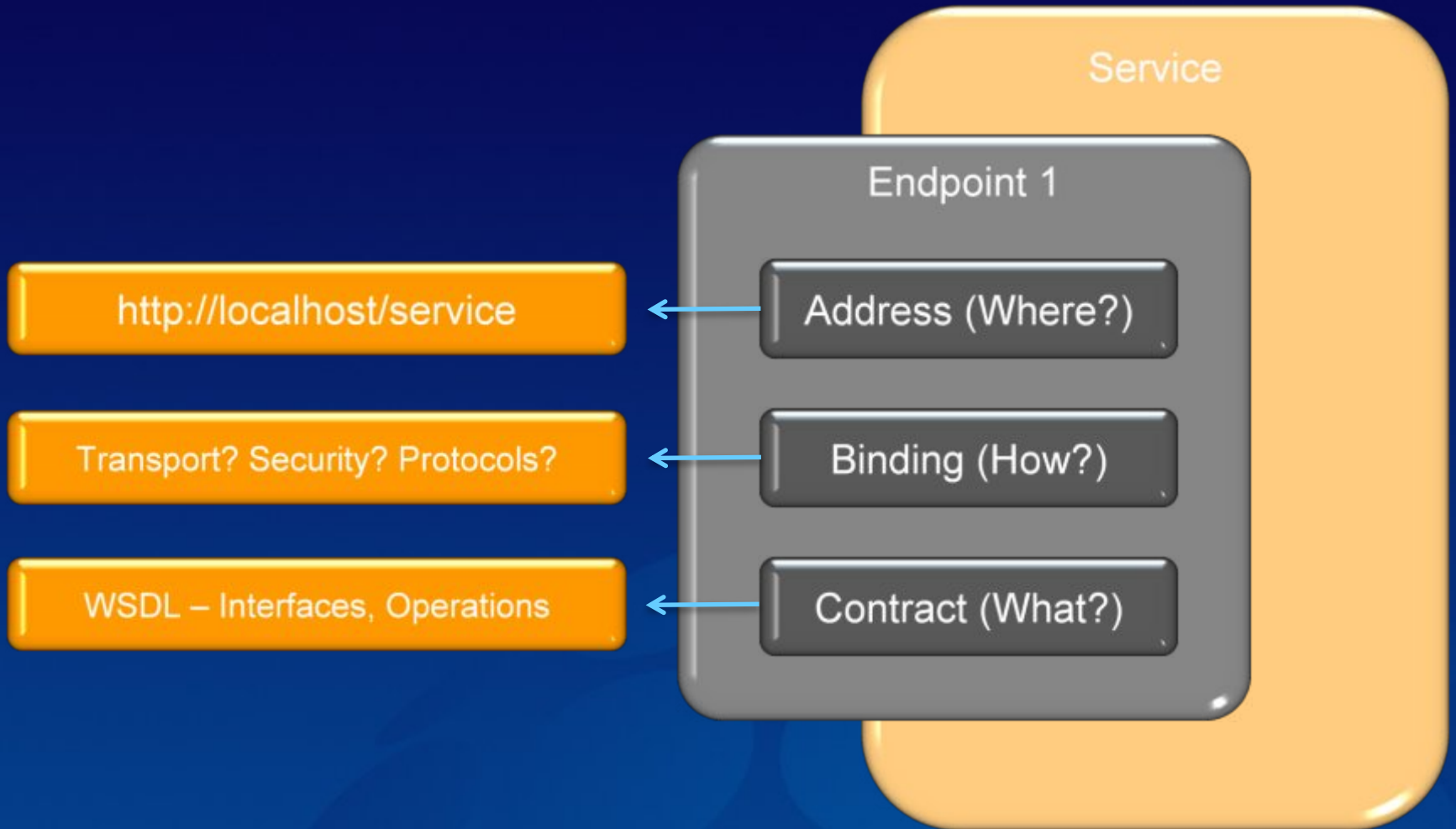
- Unifying capabilities of previous technologies
  - Web Services, Remoting, DCOM, MSMQ, etc.
- Simplifying and reducing code
- Using declarative means when possible

# Communication via Endpoints



- Service offers one or more endpoints
  - Endpoints may advertise metadata
- Client consumes one or more endpoints
  - Either a design time or runtime decision

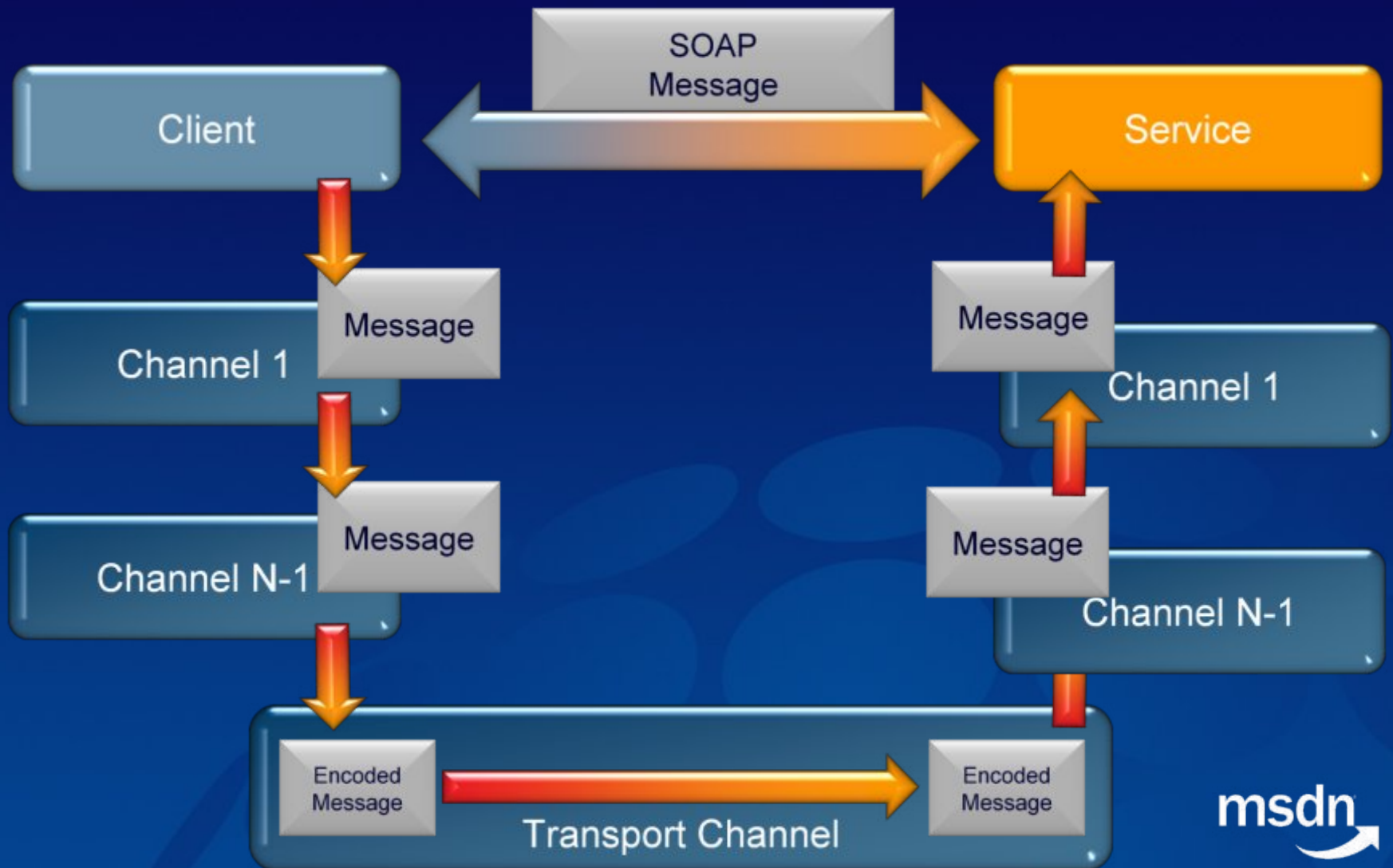
# Endpoints



# Demo

"Hello World"

# Channels Move Messages

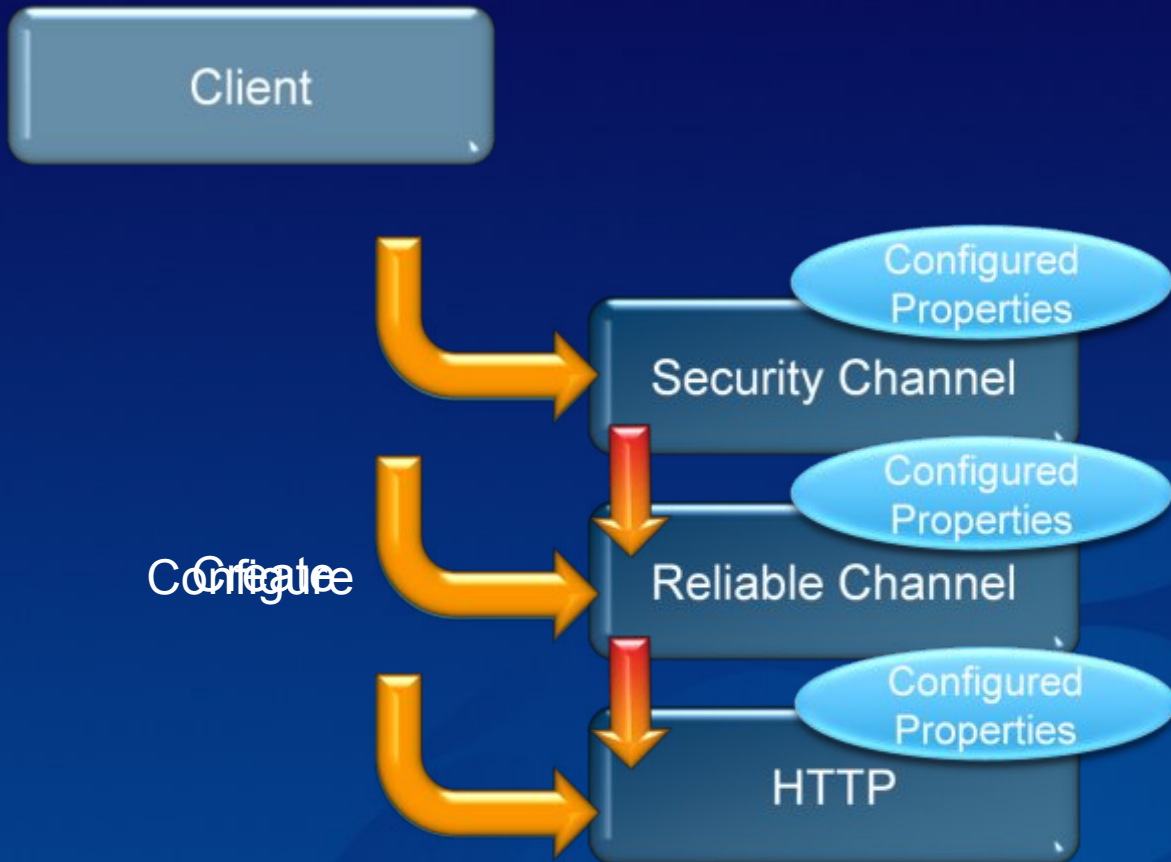




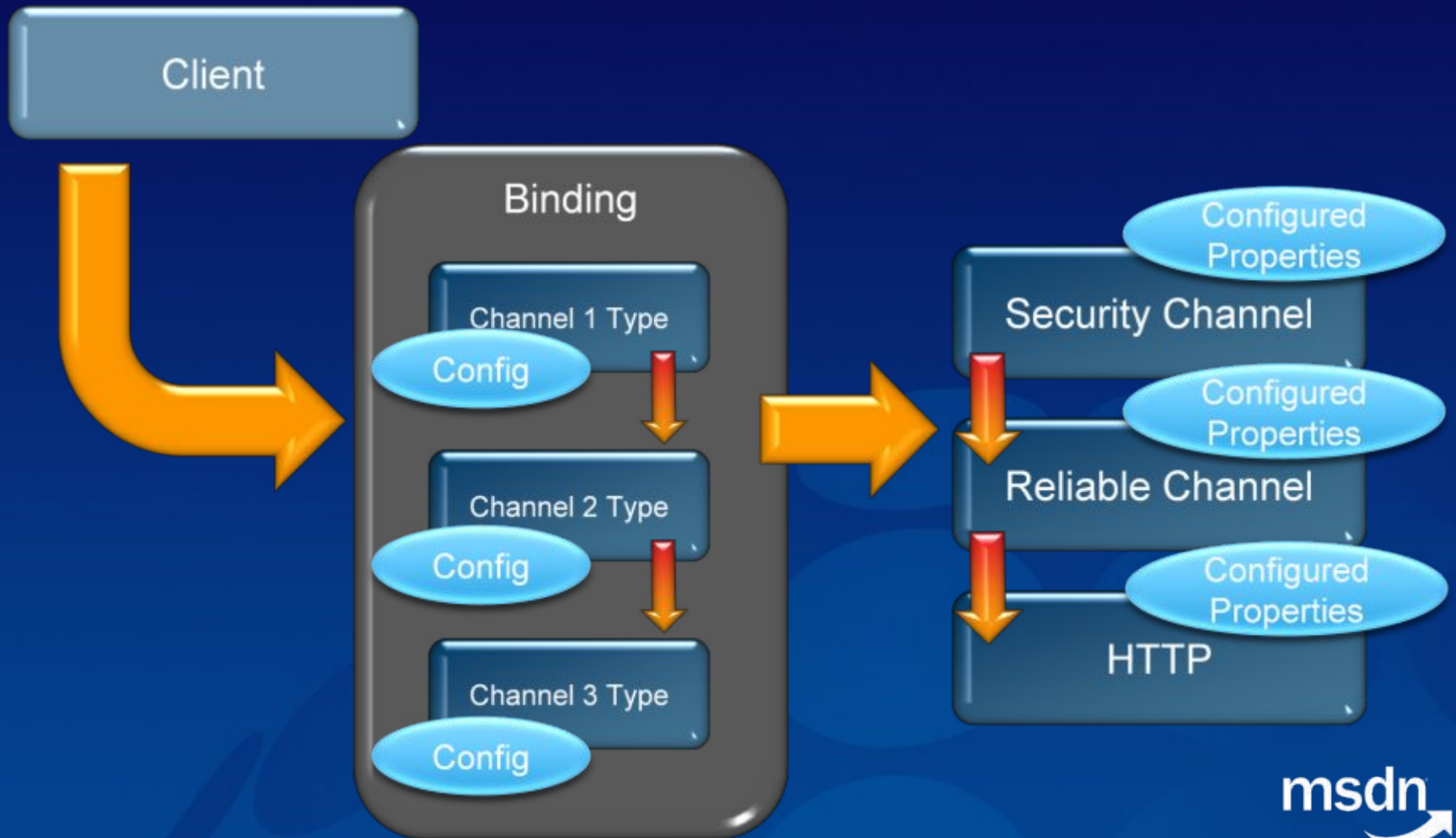
# Demo

## Encoding for transport

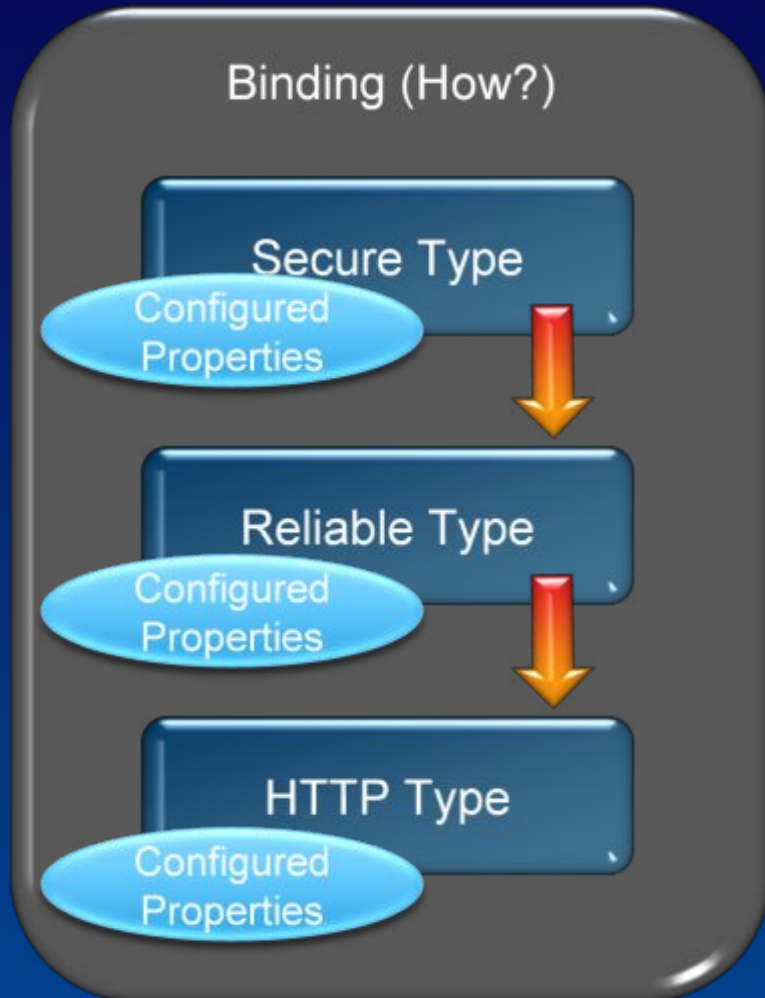
# Bindings Create A "Stack" of Channels



# Bindings Create A "Stack" of Channels



# Bindings – Factory for a Channel Stack

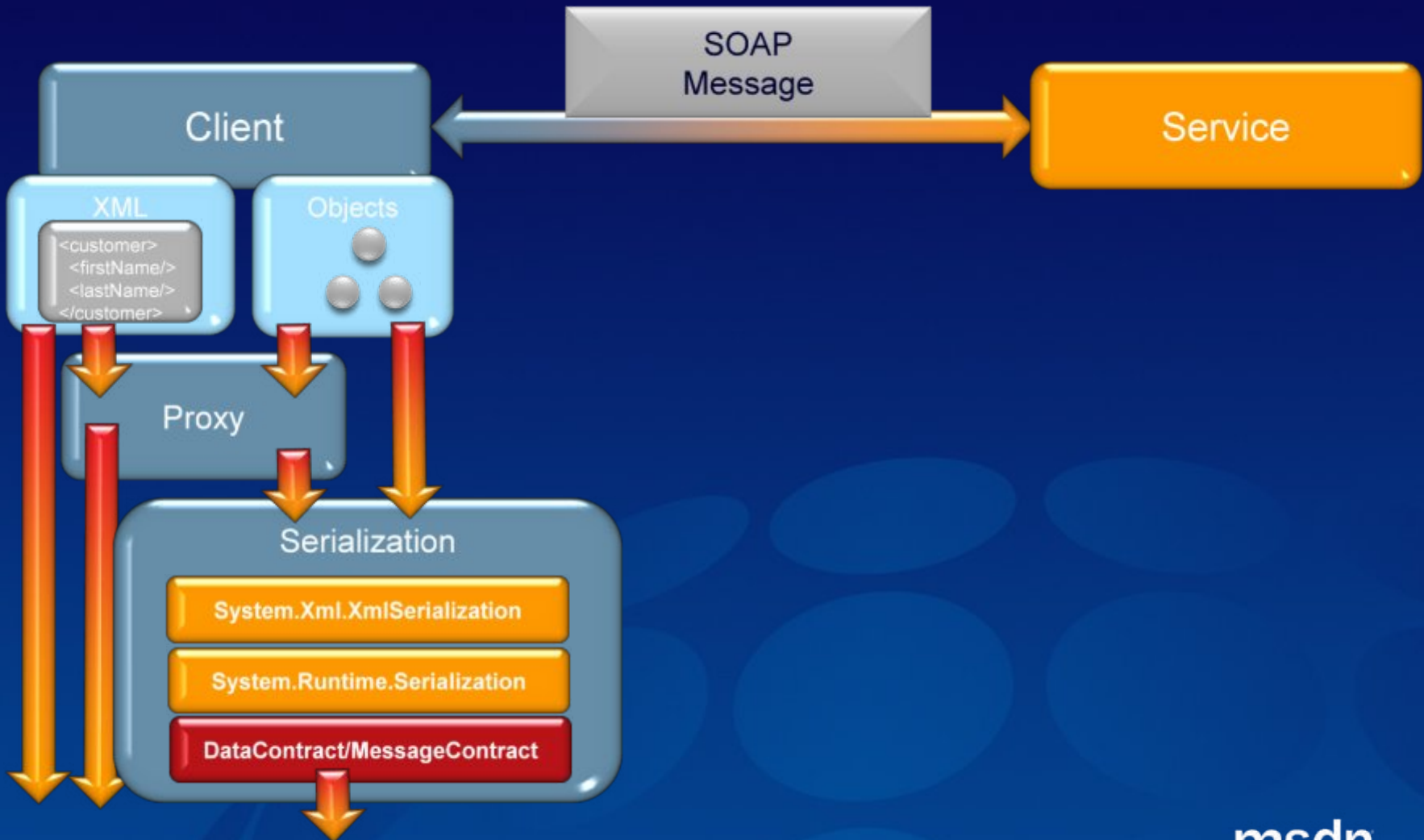


- Means to instantiate a channel collection
  - Named
  - Ordered
  - Configured
- Pre-built set "in the box"
  - WS-I Basic Profile
  - WS-\* on HTTP
  - TCP
  - Named Pipes
  - MSMQ
- Configure/code your own as a "custom" binding

# Demo

From code to standard bindings in configuration

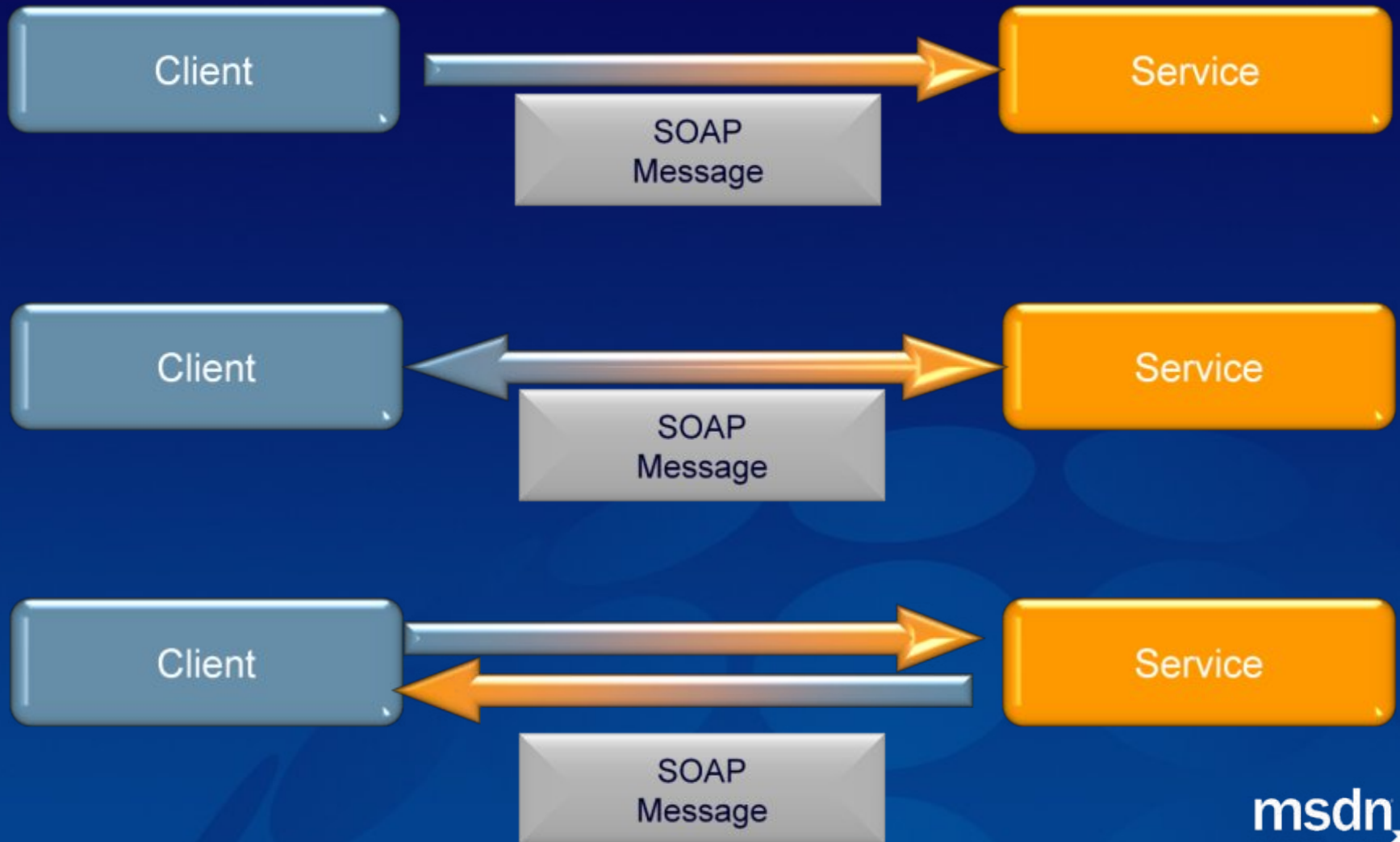
# Applications Exchange Messages



# Demo

## Controlling serialization

# Message Exchange Patterns

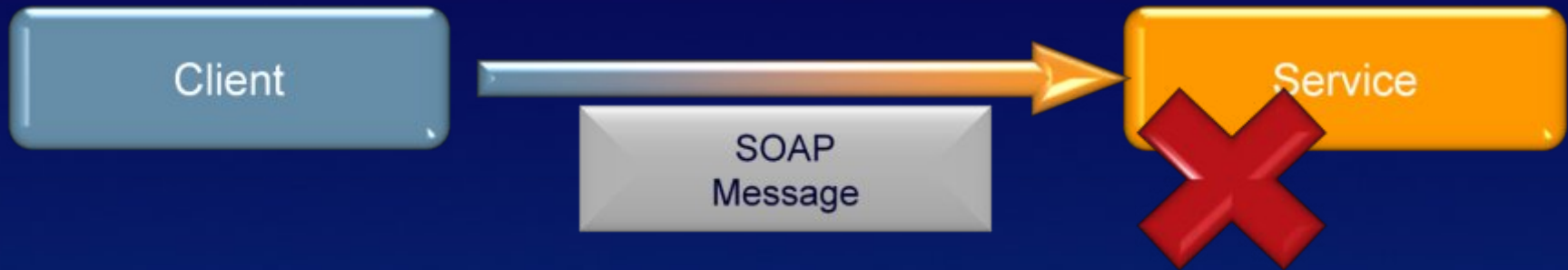




# Demo

## Message Exchange Patterns

# Dealing With Errors

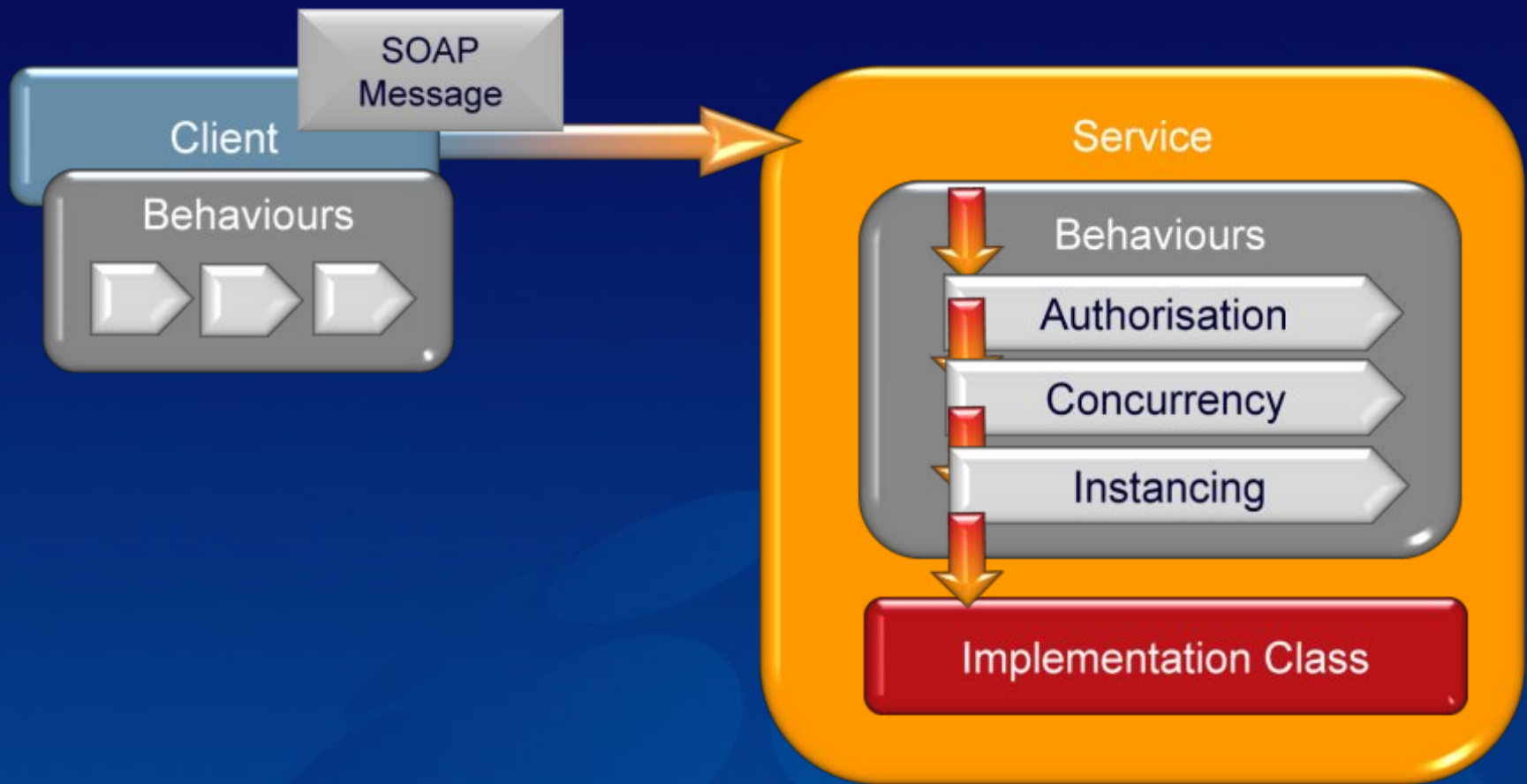


- SOAP models errors with Faults, described in WSDL
- Undescribed errors are not returned to client
  - `ReturnUnknownExceptionsAsFaults` property
- Use `FaultContract` to describe Faults
- Use `FaultException` to throw/catch Faults
- Use `IErrorHandler` for more control

# Demo

## Dealing with Errors

# Behaviours Affect Implementation



# Instantiating, Concurrency, Sessions

- Service implementations can be instantiated;
  - Singleton, Per-Call, Per-Session, Shareable
- Service code can be either;
  - Single threaded, Re-entrant or Multi-threaded
- Service objects can support **sessions**



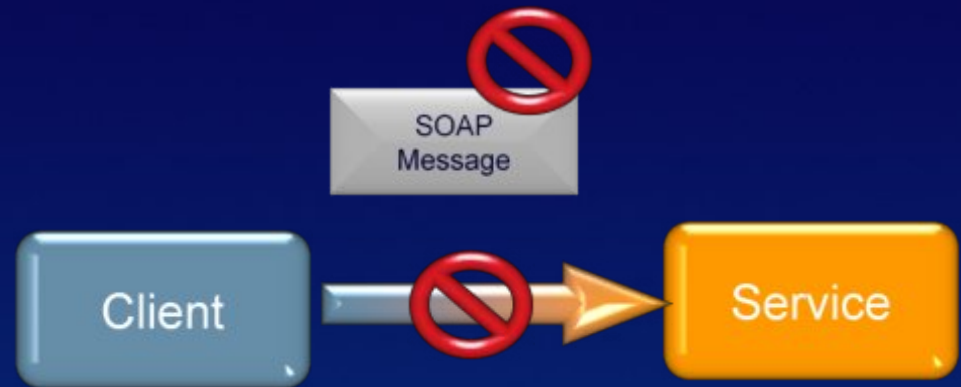
# Demo

Instanting, Concurrency,  
Sessions

# Securing Message Exchanges

- Transfer Security

- Authentication
- Privacy
- Integrity
- Secure the transport or secure the message



- Authorisation

- **PrincipalPermission** attribute
- More flexible **OperationRequirement**
- Complete custom claims processing via XSI

- Auditing

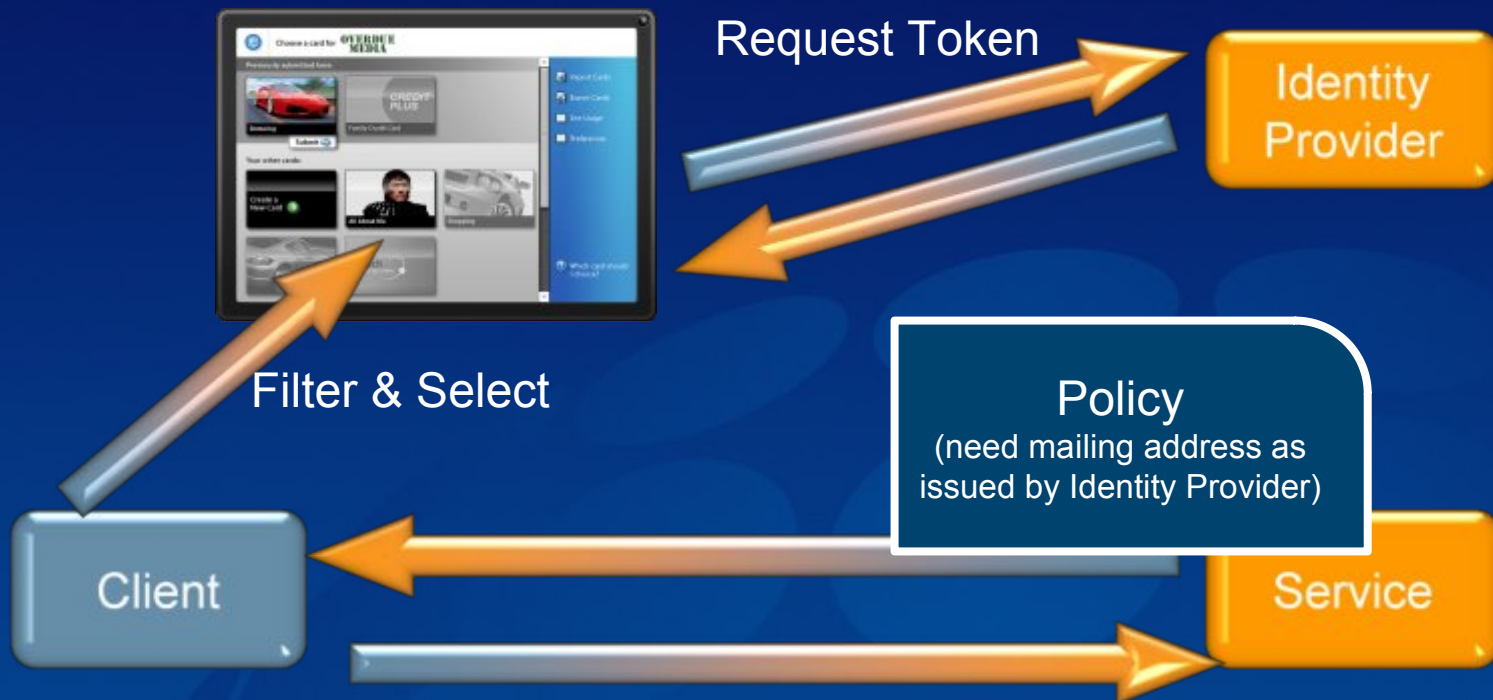
# Demo

## Securing Message Exchanges



# Authenticating with InfoCard

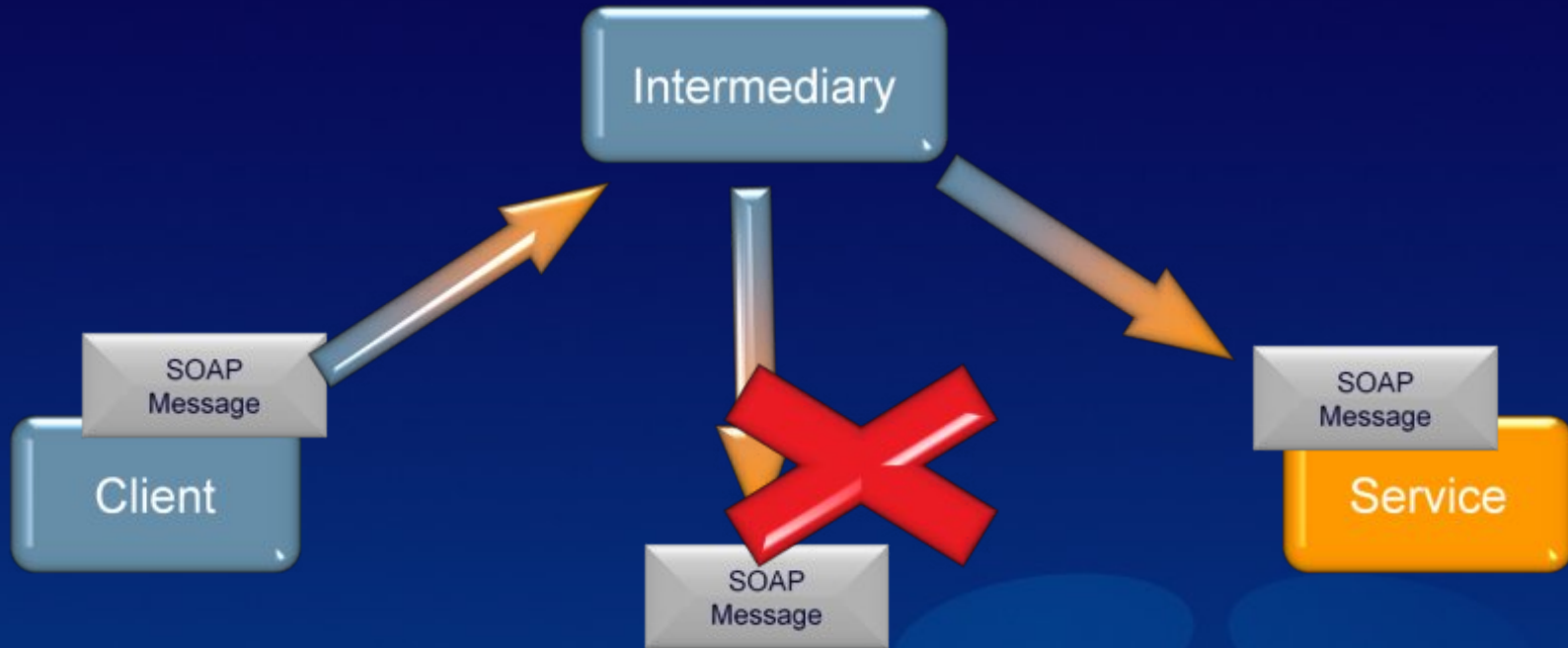
- InfoCard is a WinFX identity "metasystem"
- Built on open standards



# Demo

## Authentication with InfoCard

# Reliable Messaging (!= Queues)

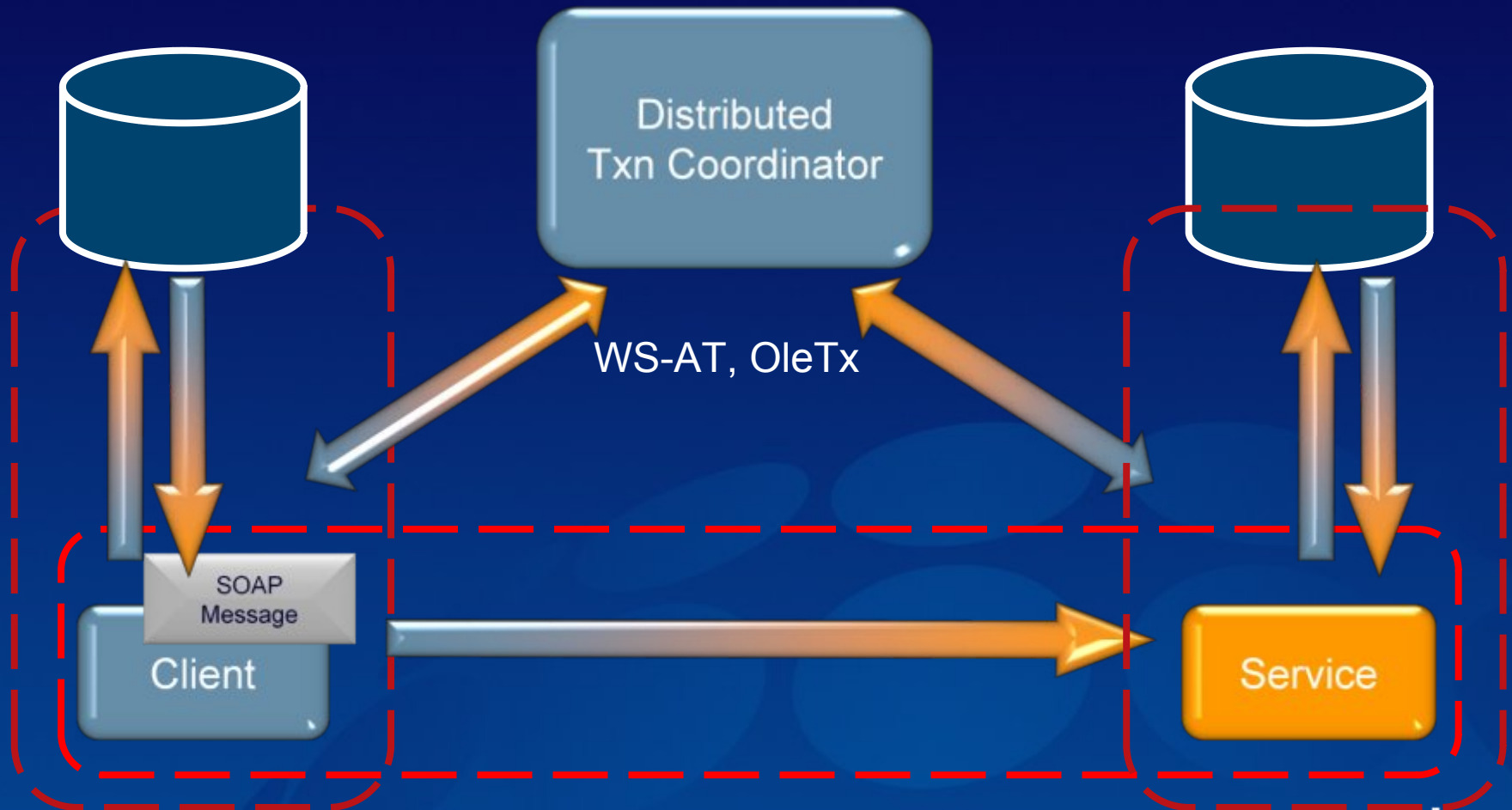


- Client and Service running at the same time
  - Can do exactly once
  - Can do in order
  - Can control the amount of "buffering"

# Demo

## Reliable Messaging

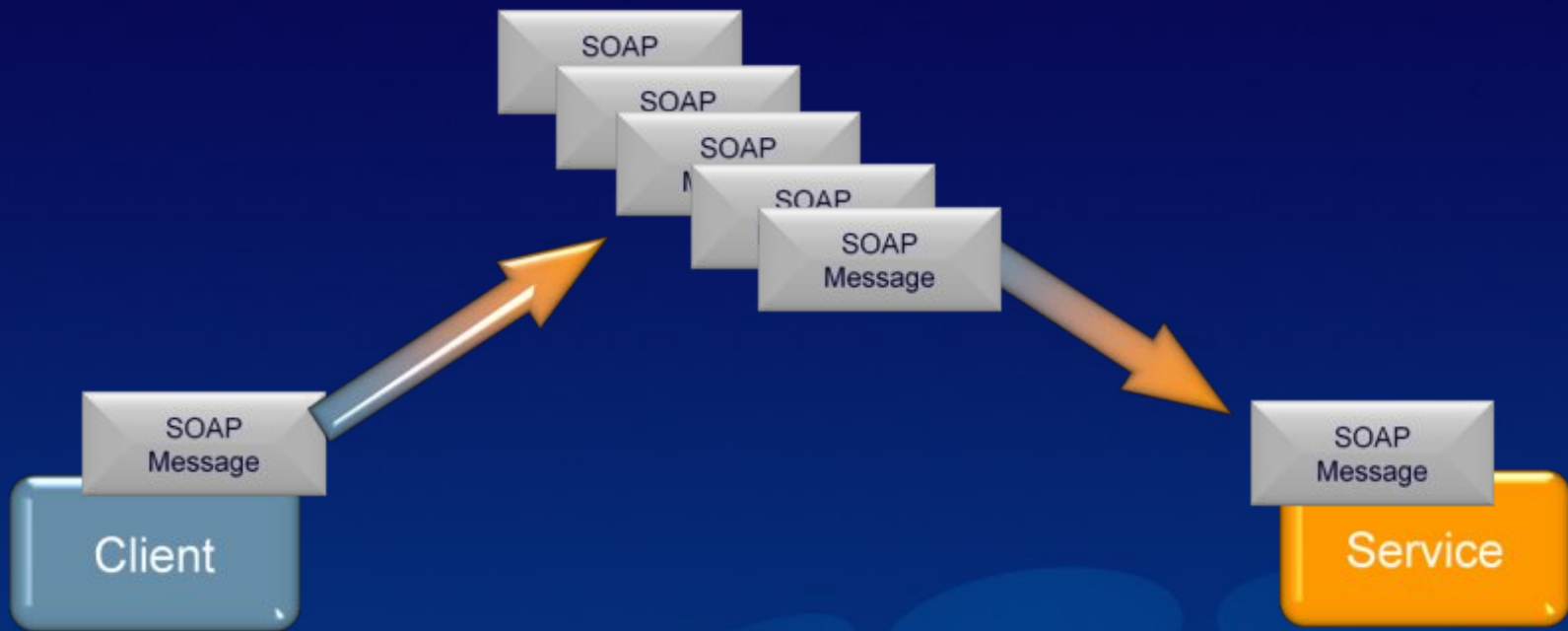
# Transactional Messaging



# Demo

## Transactional Messaging

# Queued Messaging (== Queues)



- Client and Service can have different lifetimes
- Relies on the MSMQ transport
  - Transactional, Secure, In-Order, etc.

# Demo

## Queued Messaging



# Hosting

- **ServiceHost** allows for hosting anywhere
  - Console applications
  - Windows applications
  - Windows services
- IIS provides an enterprise class hosting environment
  - Edit a **.svc** file and point at your service
  - HTTP transport in IIS 6.0
  - All transports in IIS 7.0 (Windows Activation Service)

# Migration/Compatibility

- "basicHttpBinding"
  - WS-I Basic Profile Compliant
  - ASMX V2.0 Web Services
- "wsHttpBinding"
  - WSE 3.0 message compatibility
  - \*WSE 3.0 implements security but not reliable, transactional features

# Diagnostics and Tracing

- Rich diagnostics framework within the WCF
- Two levels of information
  - Message Logging
  - Activity Logging
- Display with the **svctraceviewer** tool

# Demo

## Tracing, Logging and the TraceViewer

# Where Next?

- WinFX

- <http://msdn.microsoft.com/winfx>

- <http://www.roadtowinfx.com>

- WCF

- <http://www.windowscommunication.net>

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