Knowledge SYNC
Where Business and Technology Converge

Windows Communication Foundation

Craig Butler
Senior Consultant
Application Integration CoE Lead

Introduction

- **Who am I…**
  - Craig Butler, Senior Consultant
  - Application Integration CoE Leader
  - Areas of Focus
    - Application Integration
    - SOA / ESB Architecture
    - Human Centric Workflow / Business Process Management
  - Member of the Microsoft BizTalk Server Virtual Technology Specialist Team
  - K2 Insider

- **What is WCF?**

- **Common Deployment Scenarios**

- **Clients and Services**

- **SOAP and WS-***

- **Is WCF right for my project?**

Session Prerequisites

- **Experience building Microsoft .NET Framework Applications**

- **Basic Understanding of distributed application scenarios and Web Services**

Agenda

- **What is WCF?**
- Common Deployment Scenarios
- Clients and Services
- SOAP and WS-*
- Is WCF right for my project?

What is WCF?

- **Windows Communication Foundation**
- **Part of the Microsoft .NET Framework 3.0**
  - **Part of the Windows Vista and Windows Server 2008 operating systems**
  - **Supported by Windows XP SP2 and Windows Server 2003**
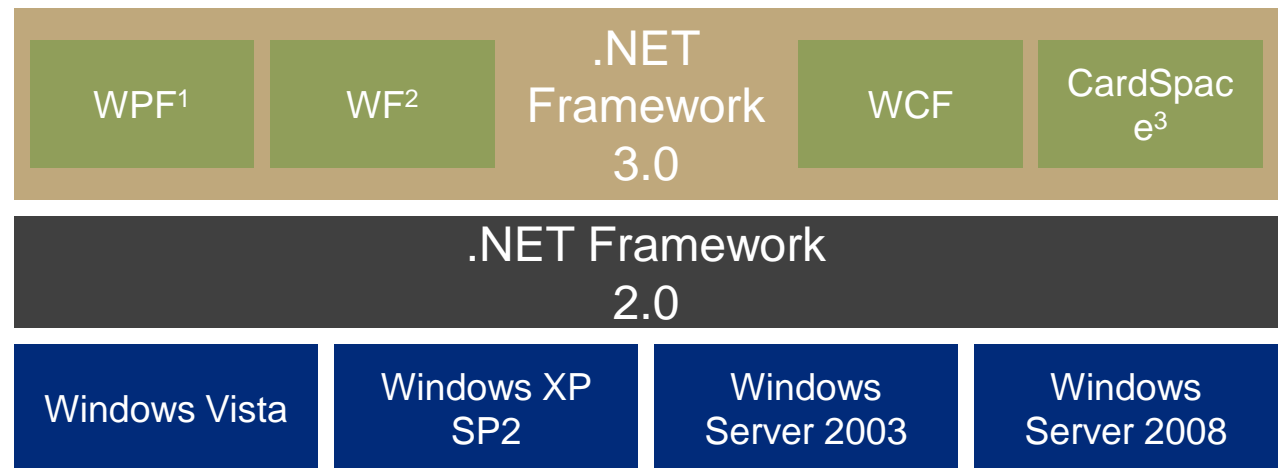
1. Windows Presentation Foundation (WPF)
2. Windows Workflow Foundation (WF)
3. Windows CardSpace

WPF[1]	WF[2]	.NET Framework 3.0	WCF	CardSpace[3]

.NET Framework 2.0

Windows Vista	Windows XP SP2	Windows Server 2003	Windows Server 2008

Communication Platform Evolution

ASMX

Interop with other platforms

.NET Remoting

Extensibility

Location transparency

Enterprise Services

Attribute – Based Programming

MSMQ

Message – Oriented Programming

WSE

WS-* Protocol Support

Agenda

- What is WCF?
- **Common Deployment Scenarios**
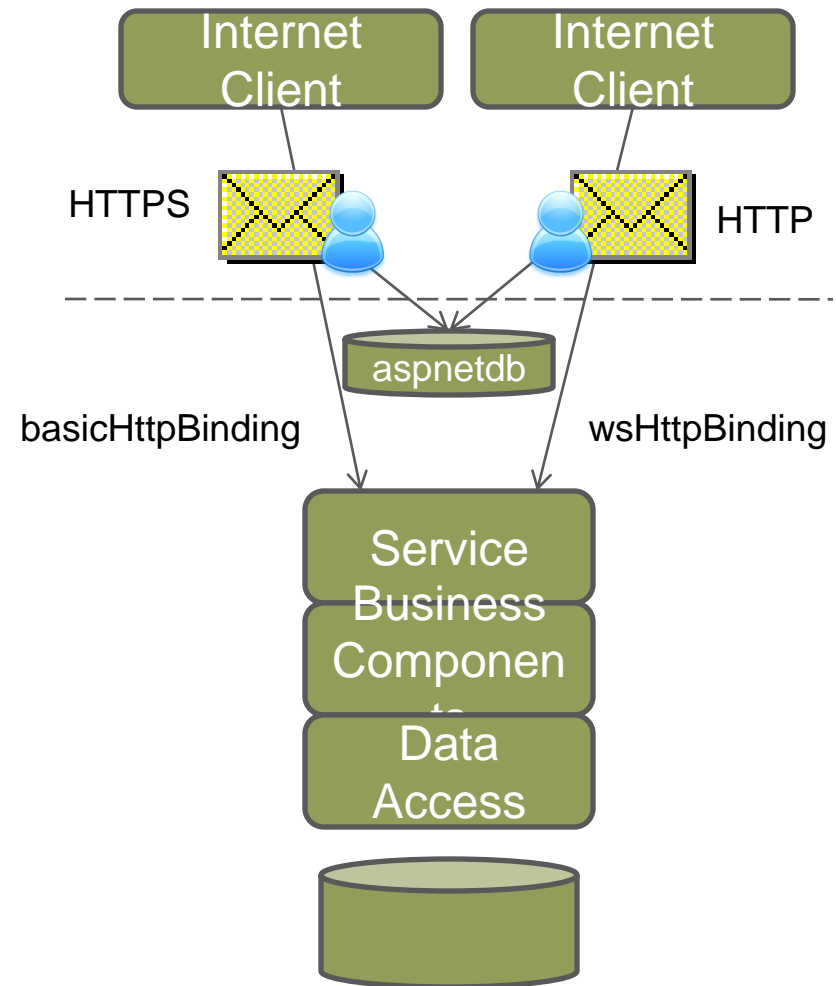- Clients and Services
- SOAP and WS-*
- Is WCF right for my project?

Intranet Applications

- **WCF supports classic client-server deployments**
  - **Mutual Windows authentication (NTLM or Kerberos)**
  - **TCP/binary messaging**
  - **Windows credentials for message protection**
- **Services distributed across process or machine boundaries**

Intranet Client

Windows

Active Directory
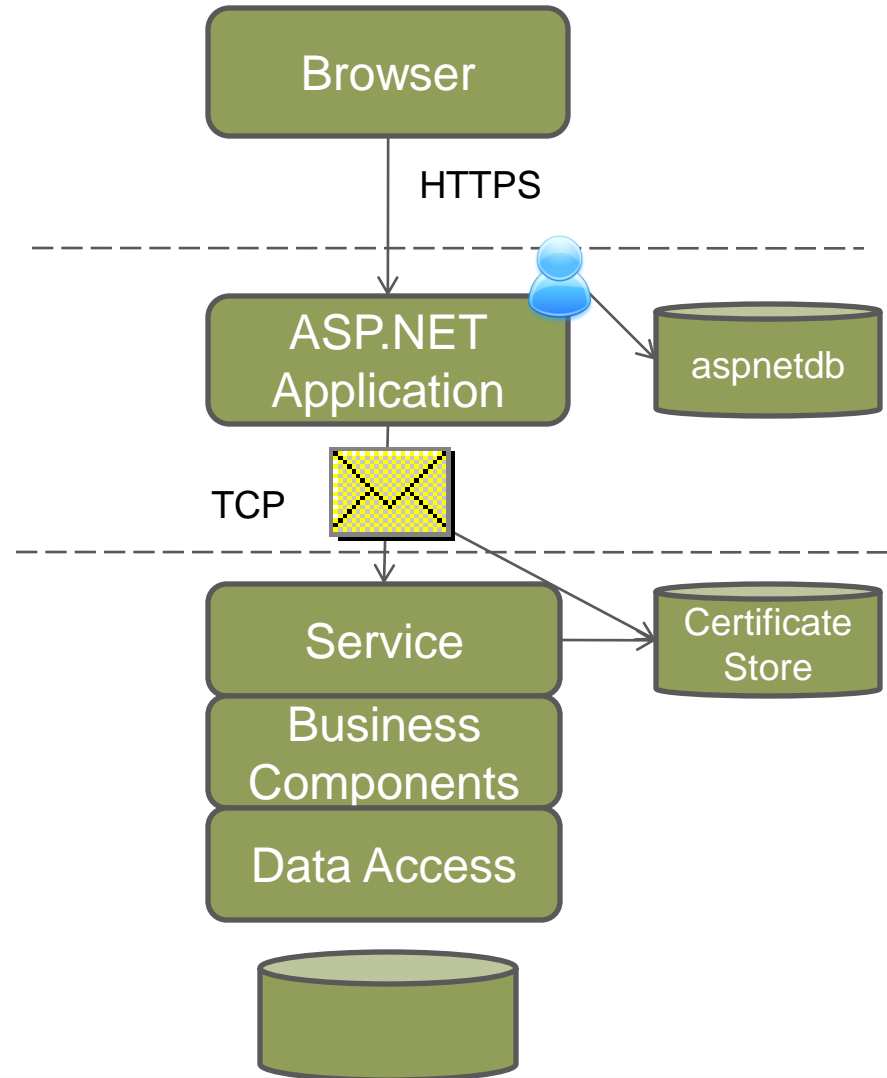
TCP

Service

Business Components

Data Access
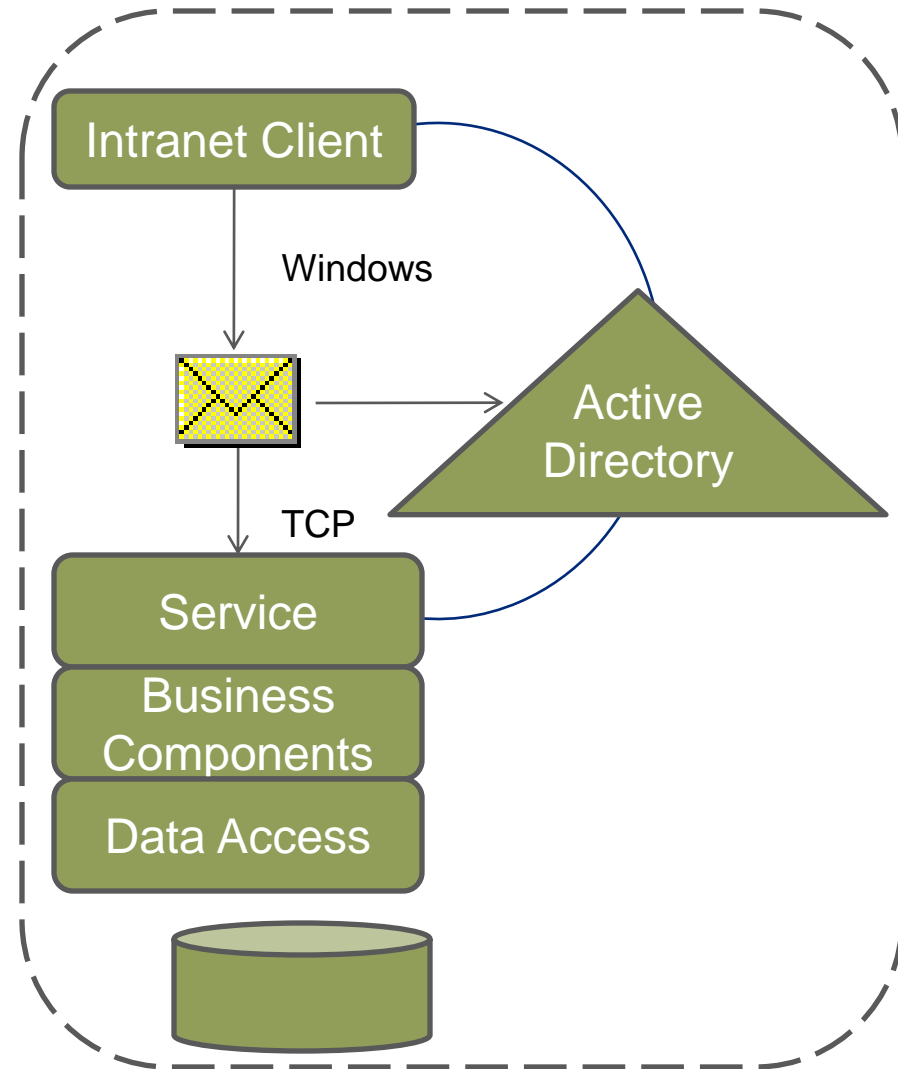
Web Services

- **WCF supports interoperable Web services**
  - **Transfer security provided by the transport (SSL) or via message security**
  - **Username/password authentication (typical, but other options exist)**
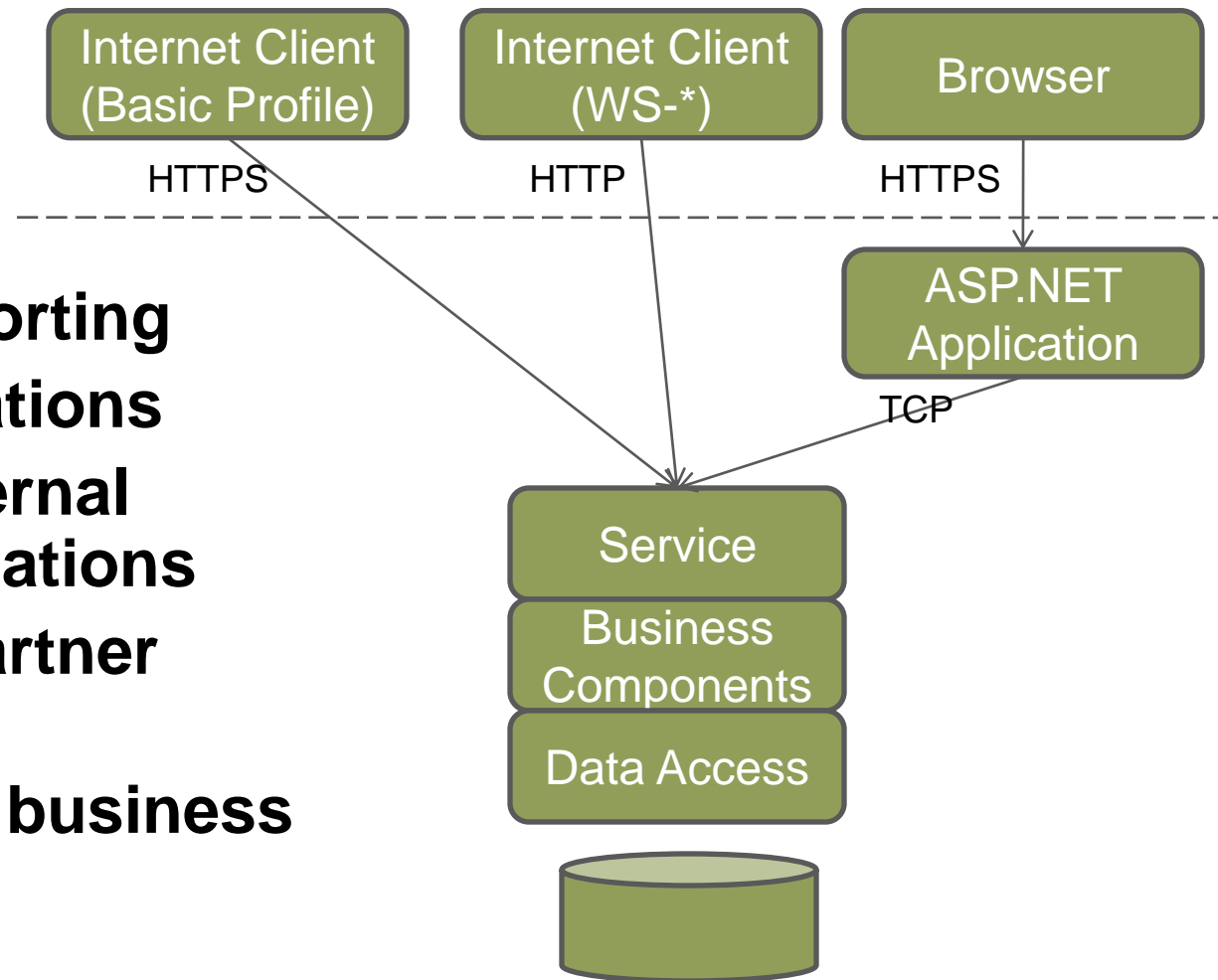- **WS-* protocol support**

Internet Client

Internet Client

HTTPS

HTTP

aspnetdb

basicHttpBinding

wsHttpBinding

Service Business Componen...

Data Access

Web Applications

- **WCF can expose business functionality to web applications**
  - **Mutual certificate authentication behind the firewall**
  - **TCP/binary for performance**
- **Provides a security boundary for ASP.NET applications**
- **Enables distribution of work across process or machine boundaries**

Browser
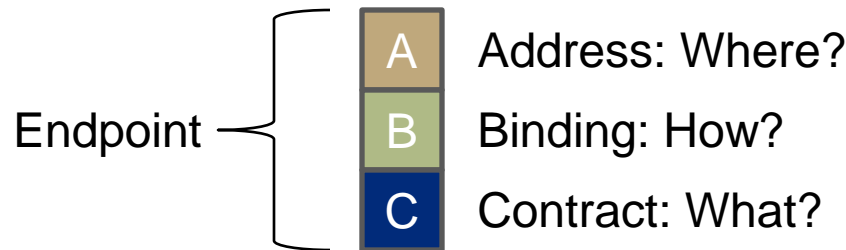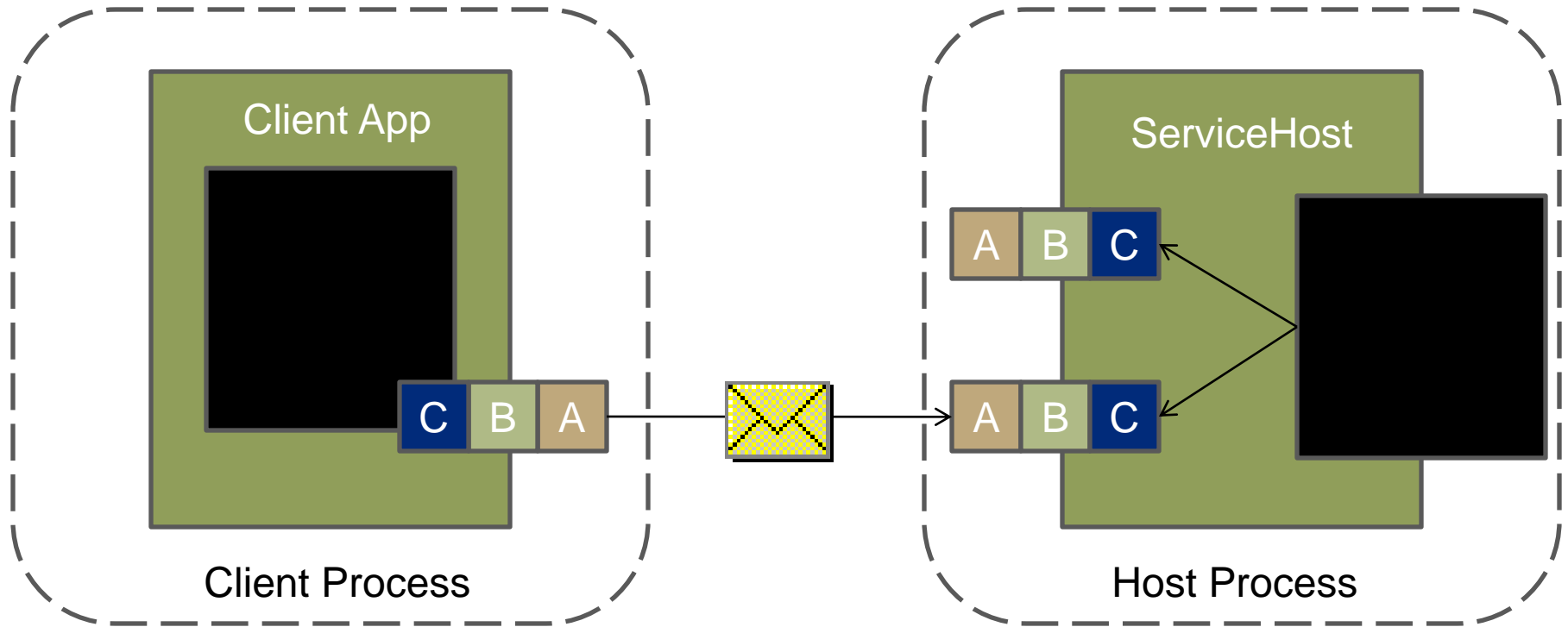
HTTPS

ASP.NET Application

aspnetdb

TCP

Service

Certificate Store

Business Components

Data Access

Agenda

- What is WCF?
- Common Deployment Scenarios
- **Clients and Services**
- SOAP and WS-*
- Is WCF right for my project?

Client and Service Endpoints

Client App

Client Process

| C | B | A |

ServiceHost

| A | B | C |

| A | B | C |

Host Process

Endpoint

A	Address: Where?
B	Binding: How?
C	Contract: What?

DEMO

Hello World
WCF Client/Service

Basic Requirements for Clients and Services

- **At the service:**
  - Define and implement a service contract
  - Construct a ServiceHost instance for the service type, exposing endpoints
  - Open the communication channel

- **At the client:**
  - Requires a copy of the service contract and information about endpoints
  - Construct a communication channel for a particular endpoint and call operations

Agenda

- What is WCF?
- Common Deployment Scenarios
- Clients and Services
- **SOAP and WS-***
- Is WCF right for my project?

SOAP

- **Simple Object Access Protocol**

- **Sample SOAP Envelope:**

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<soap:Header>
   <m:Trans xmlns:m="http://www.w3schools.com/transaction/"
      soap:mustUnderstand="1">234</m:Trans>
</soap:Header>

  <soap:Body xmlns:m="http://www.example.org/stock">
    <m:GetStockPrice>
      <m:StockName>IBM</m:StockName>
    </m:GetStockPrice>
  </soap:Body>

</soap:Envelope>
```

*WS-**

- **WS-Security**
- **WS-Addressing**
- **WS-Reliability**
- **WS-ReliableMessaging**
- **WS-Transaction**
- **And more!**

Agenda

- What is WCF?
- Common Deployment Scenarios
- Clients and Services
- SOAP and WS-*
- **Is WCF right for my project?**

Is WCF right for my project?

- **How does WCF compare to earlier Microsoft communication technologies?**
  - WCF is more powerful and flexible than the earlier technologies. In most cases it performs better too.

- **How steep is the learning curve?**
  - Not steep if you are already familiar with the earlier communication technologies.

- **Is WCF a tried and true technology?**
  - Yes, the RTM version of WCF was released in 2006 and is fully supported by Microsoft.

Performance

Technology	Comparison
ASMX	WCF is 25% to 50% faster
Remoting	WCF is about 25% faster
Enterprise Services	WCF is faster in some cases, and slower in others
WSE	WCF is about 4x faster

Source: Microsoft Whitepaper - A Performance Comparison of Windows Communication Foundation (WCF) with Existing Distributed Communication Technologies

Questions?

Knowledge SYNC
Where Business and Technology Converge

- **Session Content**

- **www.allsoa.wordpress.com**