Integrating Heterogeneous IT Environments Using Microsoft's Integration Solution

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Microsoft Corporation

HP WORLD 2003
Solutions and Technology Conference & Expo

Agenda

- Remaining Enterprise Integration Challenges
- Microsoft's Technical Vision for Enterprise Integration
- Solution Components
  - Host Integration Server
  - **BizTalk Server 2004**
  - Microsoft Visio
  - Microsoft InfoPath
- Bringing it all together

Enterprise Integration
What's Still Missing?

- 80% of the Data in an enterprise resides on the desktop*

- Typical Global 2000 companies – for every SAP user, there are 5 non-SAP users

  - How do the masses tie into business processes?

- System driven integration is only half the battle

- Connecting the Information Worker to Business Processes through the desktop is the missing piece of the puzzle

* Gartner Research

Microsoft's View on Enterprise Integration

- Business Analysts / Information Workers define business processes and business rules

- Developers make business processes actionable by tying them to systems, trading partners and employees

- Business Processes need to be flexible enough to accommodate ad-hoc, human based interactions

- The exchange between Information Workers, Business Analysts, IT Professionals and Developers should be as seamless as possible

- Integration should solve business needs and be actionable for business analysts and information workers

Unique Users with Unique Needs

Information Workers

- **Define Business Process**
- **Define Business Rules**
- **Access to real time data**

IT Professionals

- **Tools for:**
  - **Deployment**
  - **Management**
  - **Monitoring**

Developers

- **Single Integrated Development Environment**
- **Work collaboratively with Information workers**

Technology Infrastructure

◀ ·········· **Standards Across Products** ·········· ▶
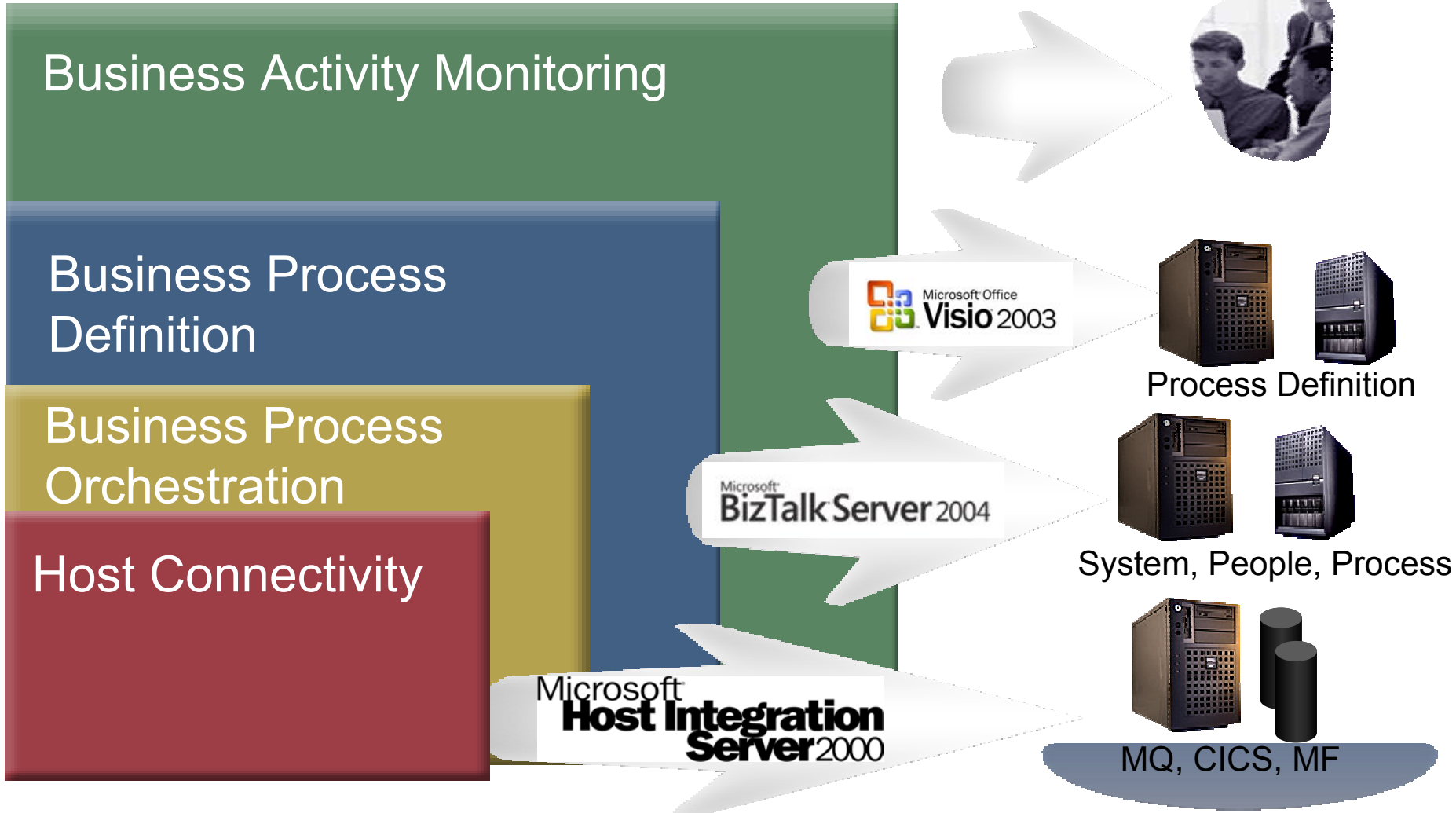
◀ ·········· **Use the tools they already know** ·········· ▶

Integrating the Heterogeneous Enterprise

- **Almost Every Enterprise is Heterogeneous**
  - .NET / J2EE
  - Desktop / Mid Range Unix / Mainframe
  - SQL Server / DB2 / Oracle
  - Multiple Application development environments
  - Multiple Management / Monitoring tools
- **Microsoft solutions are only for Microsoft shops. Right?**
  - Wrong. Single most deployed E-Business Application is SNA Server / Host Integration Server
  - Vast majority of BizTalk Server customers use it in conjunction with J2EE components
  - Connecting to Mainframes through MQSeries is common
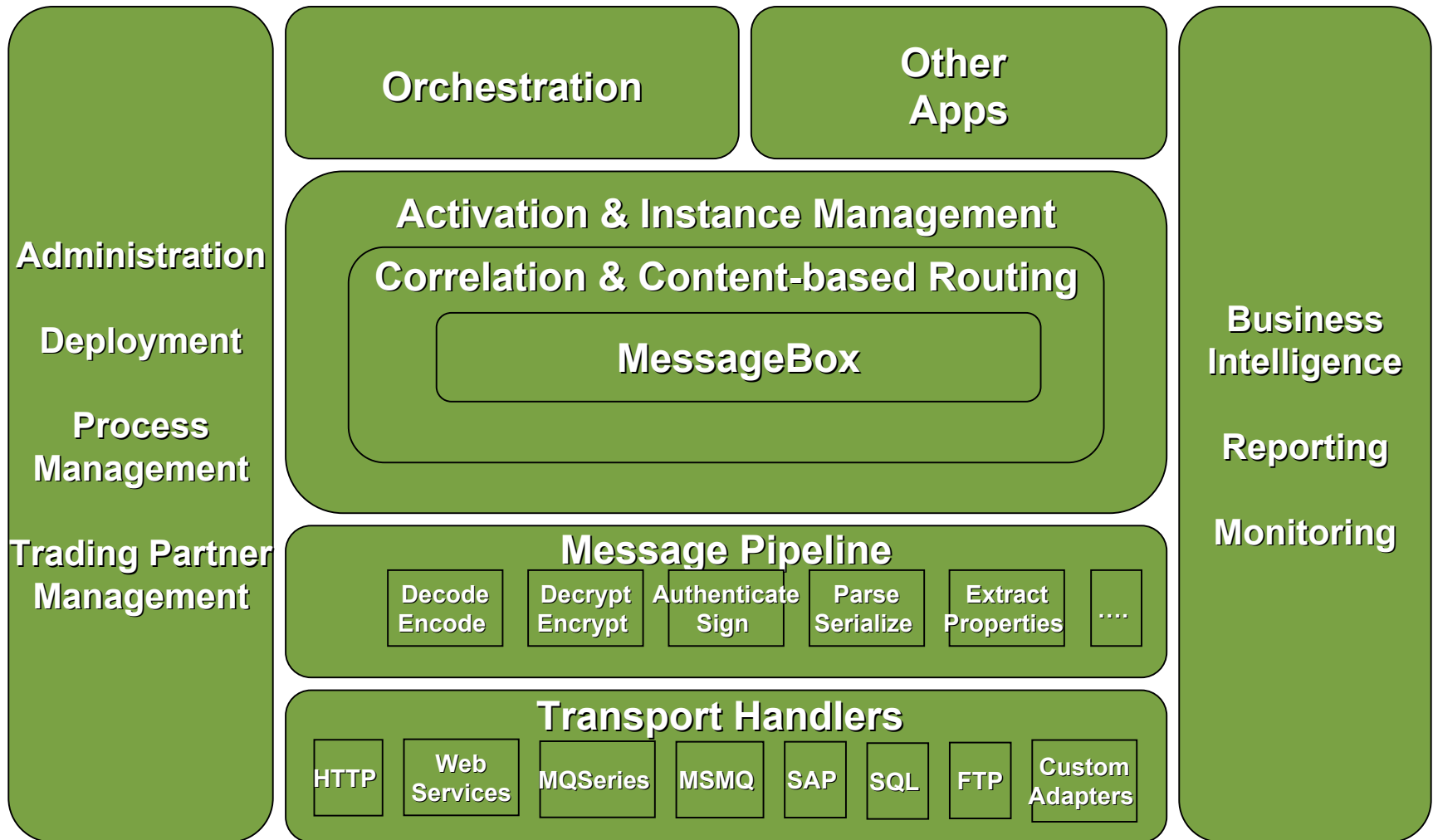
Components of the Integration Solution

Business Activity Monitoring

Business Process Definition

Business Process Orchestration

Host Connectivity

Microsoft Office Visio 2003

Microsoft BizTalk Server 2004

Microsoft Host Integration Server 2000

Process Definition

System, People, Process

MQ, CICS, MF

Host Integration Server 2000

"Integration Components for Host Systems"

- Comprehensive Network Support
  - SNA and TCP/IP Connectivity Support
  - Security integration (password sync, Single Sign-on)
  - Network gateway (Emulation, Printing and File Transfer)
- Comprehensive Data Access
  - Extensive Data Access Providers (DB2, AS/400 and VSAM)
- Comprehensive Application Integration
  - Transactional Integration via COMTI
  - Messaging Integration via MQ Series Bridge (MOM)
- Deployable on Windows NT 4.0 and Windows 2000
- Scalable, secure and manageable
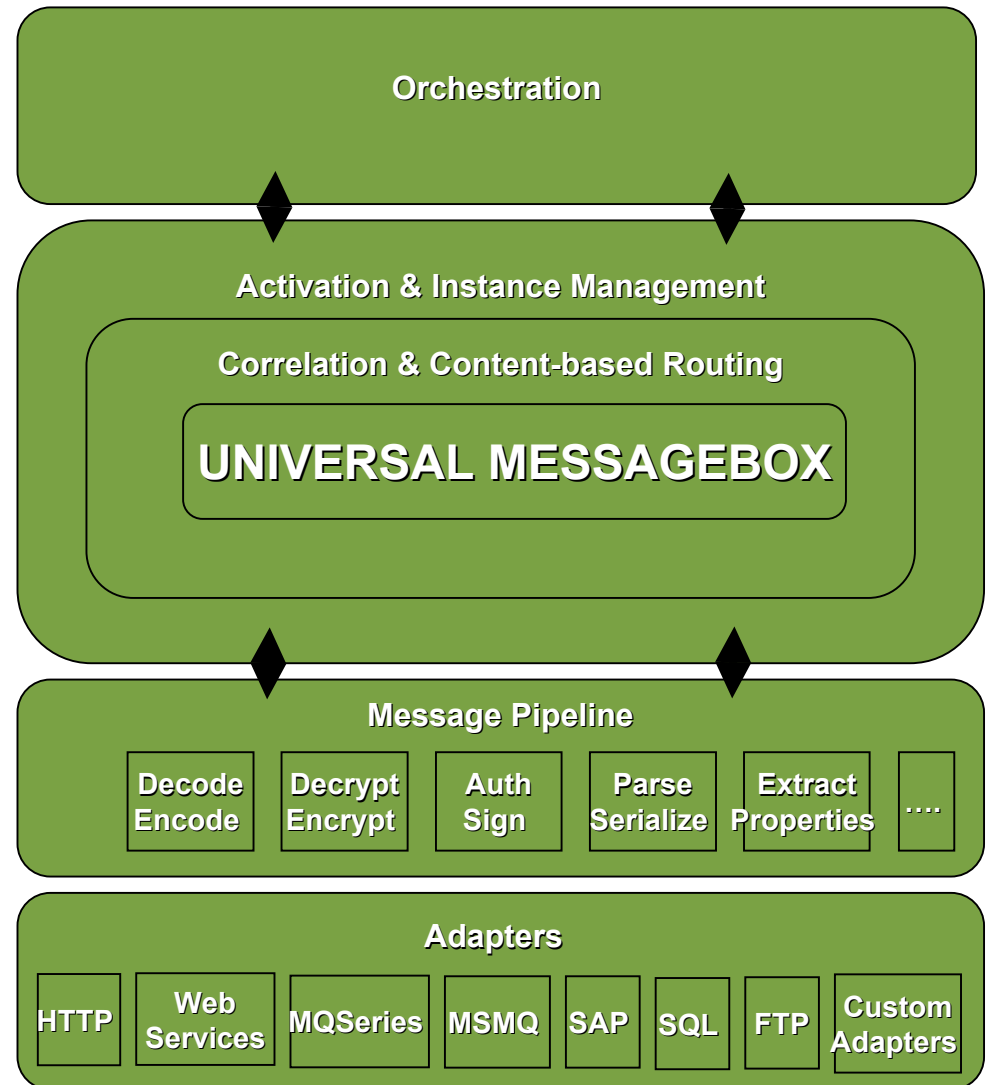
BizTalk Server 2004 Architecture

Orchestration

Other Apps

Administration

Deployment

Process Management

Trading Partner Management

Activation & Instance Management

Correlation & Content-based Routing

MessageBox

Business Intelligence

Reporting

Monitoring

Message Pipeline

| Decode Encode | Decrypt Encrypt | Authenticate Sign | Parse Serialize | Extract Properties | …. |

Transport Handlers

| HTTP | Web Services | MQSeries | MSMQ | SAP | SQL | FTP | Custom Adapters |

BizTalk Solution Flow

XML, Flat File, Binary

Orchestration

XML, Flat File, Binary

Receive Location

Send Port

Transport Adapter

Transport Adapter

Receive Pipeline

XML

Send Pipeline

Tracking Database

MessageBox Database

Config Database

BizTalk Server 2004
Universal MessageBox Architecture

- Consistent scale-out model built on SQL Server 2000 SP3

- Pub/sub architecture

- Stateless servers

- Low-latency high volatility routing

- Large Message support

- Pluggable adapters

- Security and auditing

Orchestration

Activation & Instance Management

Correlation & Content-based Routing

UNIVERSAL MESSAGEBOX

Message Pipeline

| Decode Encode | Decrypt Encrypt | Auth Sign | Parse Serialize | Extract Properties | …. |

Adapters

| HTTP | Web Services | MQSeries | MSMQ | SAP | SQL | FTP | Custom Adapters |

Minimize Time to Implementation
Over 350 Adapters available

Data

Infrastructure

AS/400
ADDS Regent 40
ADDS Viewpoint
ADM11
AFP
ALL-IN-1
Ampex 230
AXIS Navigator
Bull TP
CORBA
Cobol
Cufer T205
DEC VT
Deployment
DG 216
DG5220
DL/1
DMS
EBCDIC
EDI (X12)
EDIFACT
Essbase
Focus
Galileo
Hazeltime 1500
HP 700/92/2392A
IBM 3101
IBM3151/3161
IBM 3270/E
ICL 7561
IDS-II
IN2 SM9400g/j
INFOAccess
Infoman
Java EJB

JMS
KSAM
Loopback
MDIS PRISM 8/9
Microfusion MF-30
MODEL 204
MQSeries
MVS
Mumps
Omnidex
Oracle AQ
P9 ANSI
PACE
PC Monitor
Pick
PT200
QSAM
QUME QVT
Red Brick
RMS
RPG
SCO ANSI

ShareBase
SIF
SUPRA
System 2000
Tandem NonStop/
TS530
Televideo 910-955
Teradata
TI924
Total
VT
WYSE

Oracle
DB2
Sybase
Informix
Progress
CICS
IMS
IMS DC/TM

CA-Datacom/DB
CA-IDMS
CA-Ingres
Ingres
dBase
ADABAS
ISAM
C-ISAM
Cloudbase
ALLBASE/SQL
SQL/DS

XA Transactions
ODBC
OLE DB
JDBC
HTTP/S
FTP
Rdb
Net-ISAM

Applications

Baan
Broadvision
Cove Systems
Covisint
FrontStep
Hogan
i2
Integral
J.D. Edwards
Mapics
McHugh

Mega
Navision
Onyx
Oracle e-bus
Peachtree
PeopleSoft
Peregrine
Pivotal
QAD
Quickbooks
Remedy
RethinkNDo
SAP Scala
ServiceSwitch
Siebel
Staffware
Ultimus
Vantive
Visibility
Walker Int
Worldtrak

Vertical

HIPAA, HL7 (Healthcare)
RosettaNet (High Tech)
CIDX (Chemical)
O/POS & RBI (Retail)
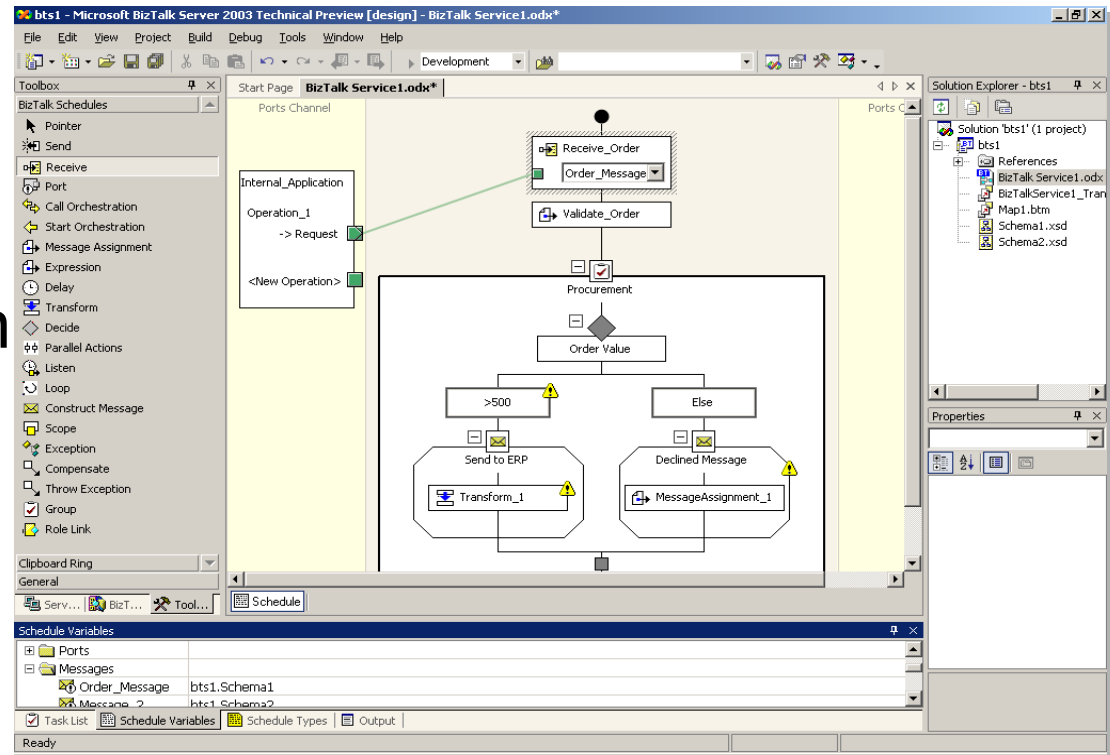FIX, SWIFT (Financial)
cXML, xCBL (Suppliers)

One Developer Experience

- Leverage existing skills
- Harness the .NET framework
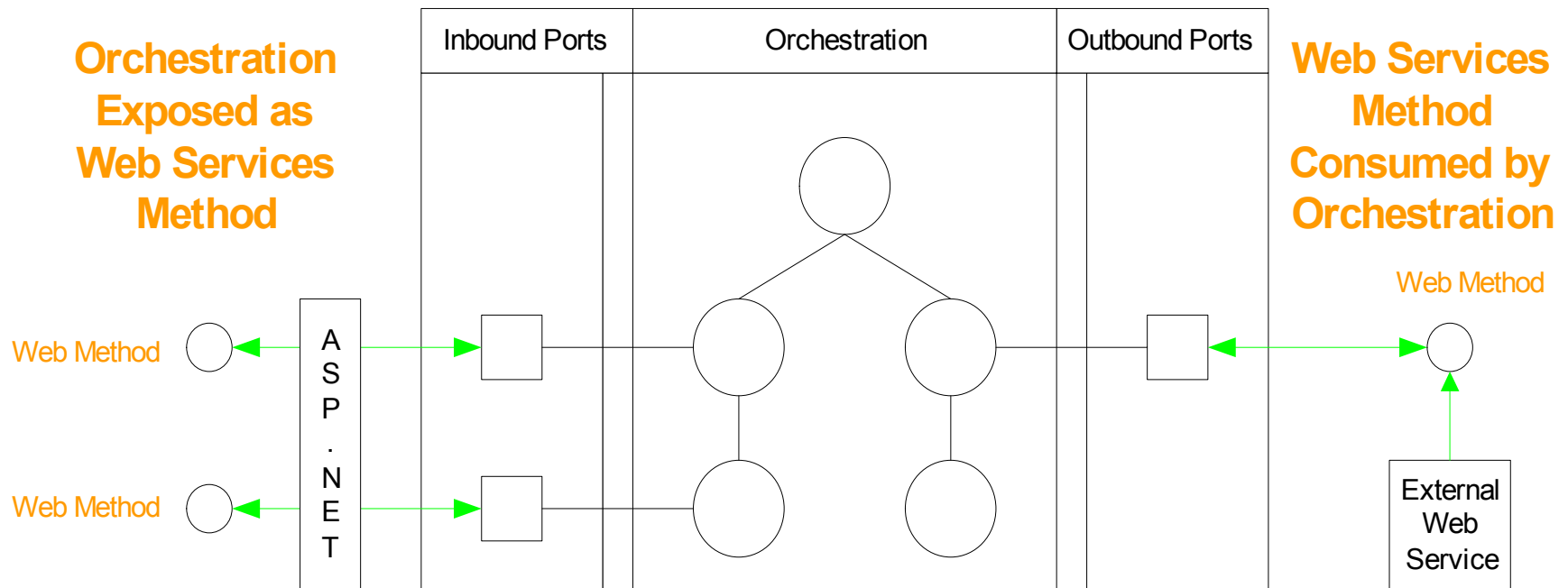- Build with standards
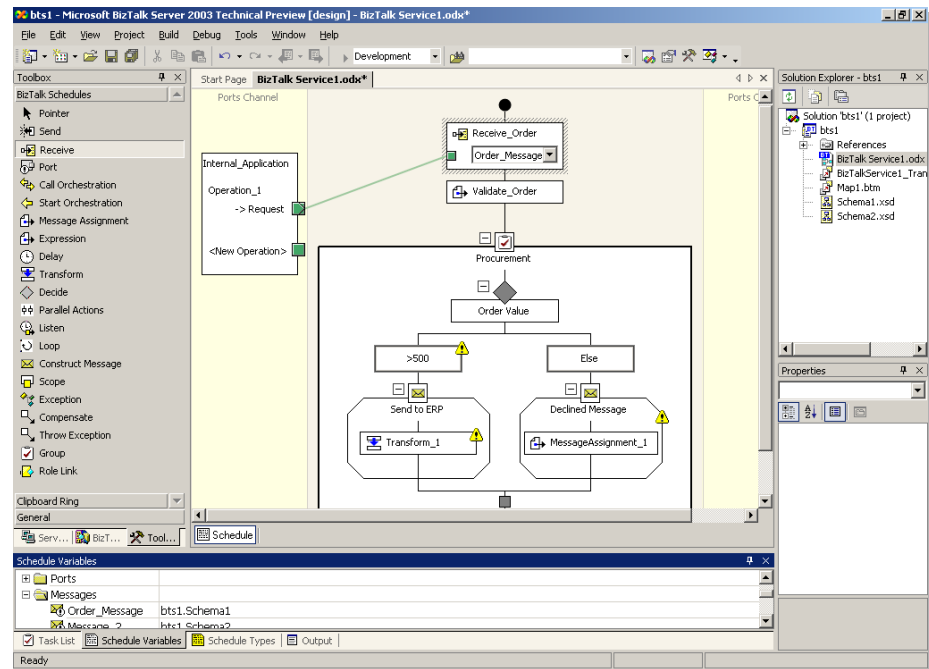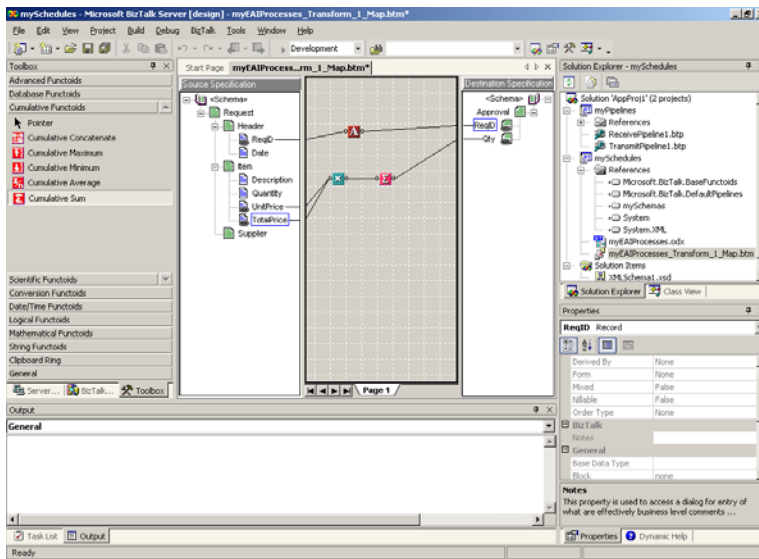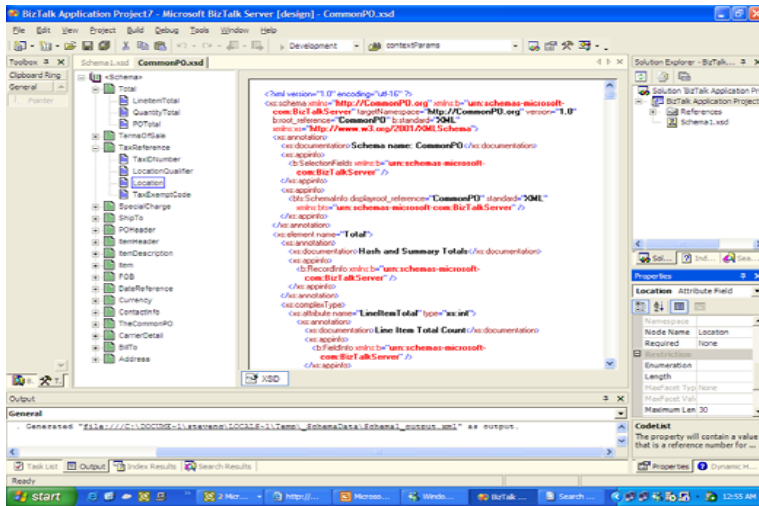
Rich Business Process Design

- ## Nested processes
- ## Long running transactions
- ## Simplified correlation
- ## Flexible mapping between messages
- ## Super-set of BPEL4WS capabilities
    - Business Process Execution Language for Web Services
    - Created by Microsoft, IBM, and BEA for Business Process Interop.
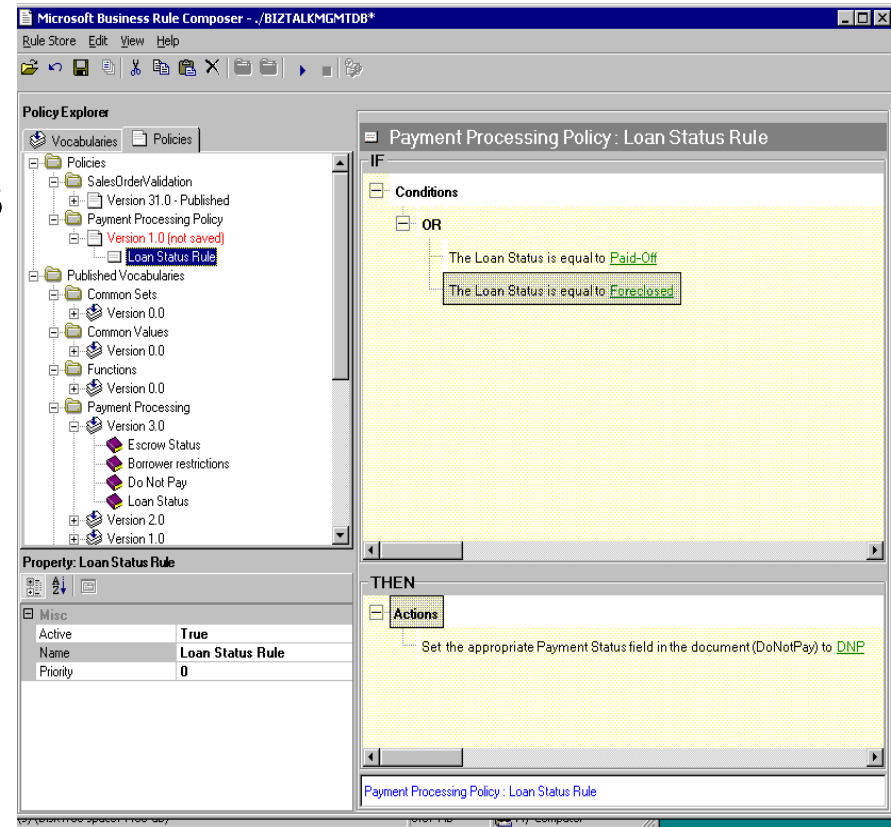   - Specification submitted to OASIS

XML Web Services Overview

Orchestration Exposed as Web Services Method

Web Services Method Consumed by Orchestration

Web Method

Web Method

Web Method

| Inbound Ports | Orchestration | Outbound Ports |

A S P . N E T

External Web Service

Service Oriented Architecture (SOA)

- A development and management architecture for loosely-coupled applications
  - Promotes interoperability and federation
- Web Services are the messaging fabric for a SOA
- Can use .NET programming model and Windows Server to quickly build and host web services (or something else)
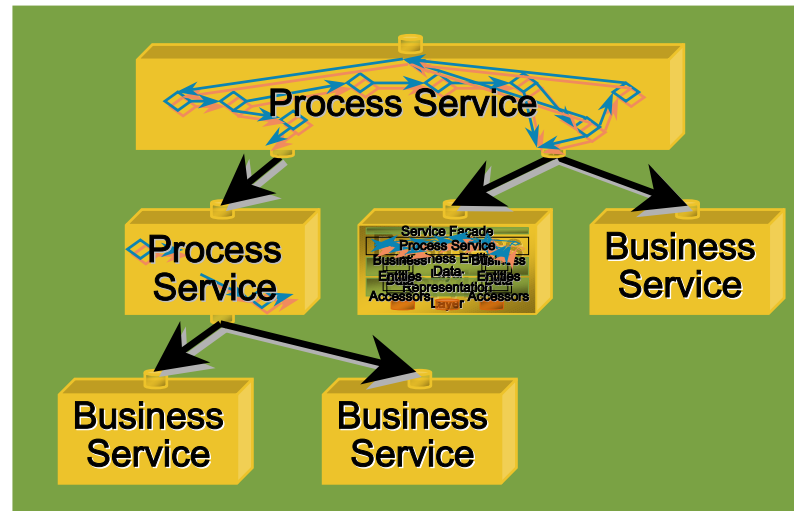
Business Rules/Policy

- Use business process rules for simple cases or complete inference engine for more complex scenarios

- Rules change more often than processes

- Business Rules provide increased flexibility

- Rules are abstracted from process and user code

- Complements orchestration

- Rules engine is high throughput low latency

Additional Rules Scenarios

Business process

Validation Rule:
A valid credit card number must be provided

Discount Rule:
If Customer is a Gold Customer
Then Apply 10% discount

Human based workflow

Customization Rule:
If the purchase amount is over 500
Then obtain Manager's approval

- **Workflow customization**

- **Dynamic Business Policy management**
- **Cross-Field/Constraint Validation**
- **Decision support**

Business Process Automation Engine

Orchestration

Rules

Tracking

- **Key Performance Indicators (KPI) Reasoning**

Business Activity

OLAP

Service **Service** **Service**

Routing Rule:
If the customer wants to buy cars
Then route to Ford dealer

If the customer wants to buy books
Then route to Barnes and Nobles

Purchase Volume Rule:
If the purchase volume is over 100
Then launch the premier procurement process

Messaging Bus

- **Intelligent Routing**
- **Intelligent Notification**

Notification
If purchase order amount is more than $1000
Then notify sales manager

Enterprise Single Sign-on (SSO)

Web Service

SAP

Mainframe App

UNIX App

Active Directory

User Account/Credentials
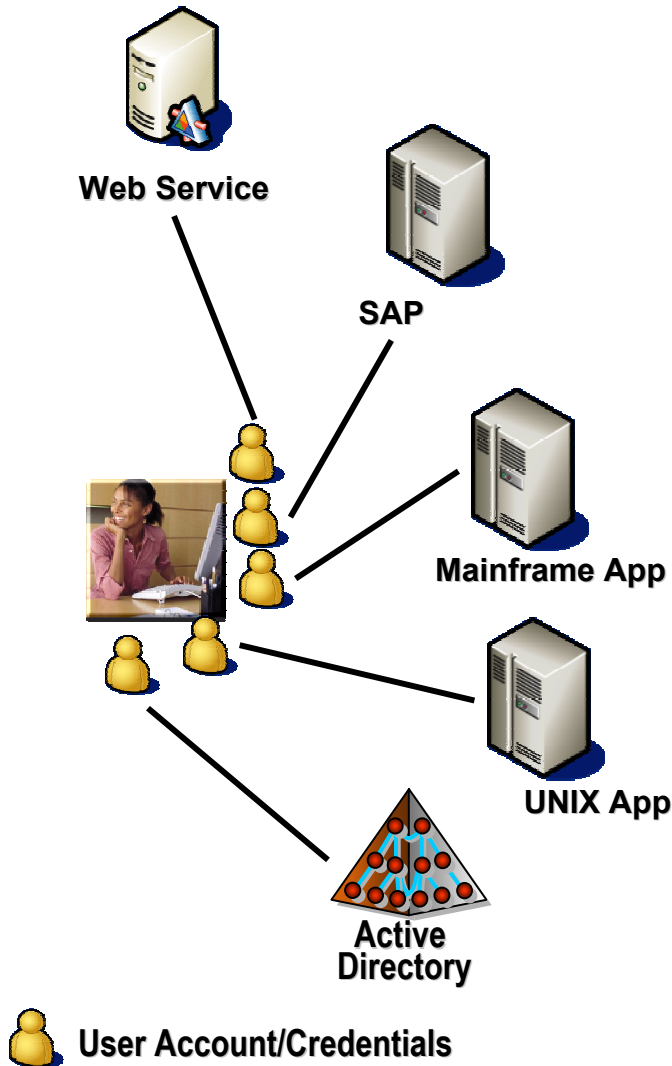
Problem Space

- User
  - Too many credentials
  - Which one for which app
  - Multiple logons
- IT
  - Mapping Accounts
  - Password Management

The Business Impact

- Increases risk of compromise
- Reduced productivity
- Increased helpdesk expenses

Single Sign-on Example

DOMAIN\Username

Get 401K Balance

Web Client

Mainframe

SNA Server

IIS - Web Server
and BizTalk Server

Mainframe Adapter
in BizTalk & COMTI

BizTalk
HTTP
Receive
Transport

Validate and Redeem Ticket

SSO Service 2

Issue Ticket

Get Credentials for
DOMAIN\Username for
Mapped Application

SSO Service 1

BizTalk
Message Box

SSO
Credential
Database
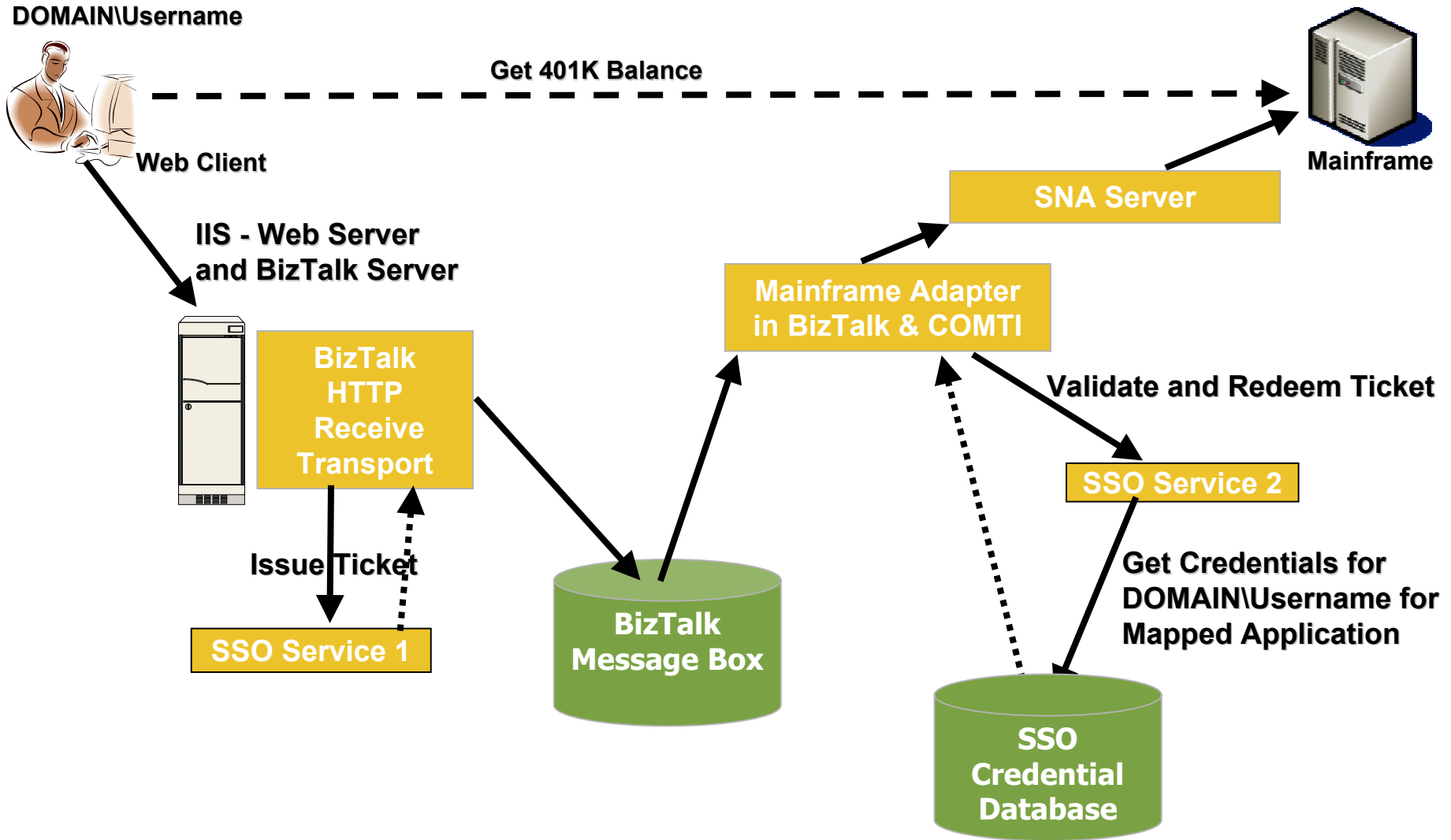
Business User: Activity Monitoring and Services (BAS)
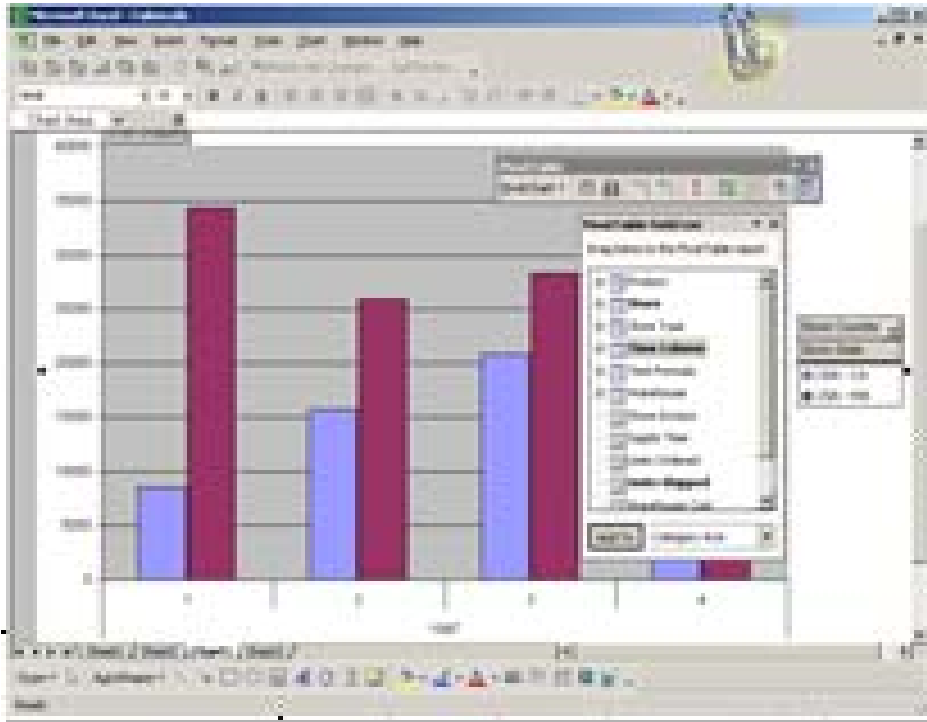
- Ask real-time questions
  - How long is production taking right now?

- Ask aggregation questions
  - How much money did we make last month?

- Use Data from documents or Process

- Complements existing SQL BI solutions

BizTalk Server → **SQL OLAP**

Business Activity Monitoring and Services Overview

Business Analyst

Excel Workbook

Business End User (Information Worker)

Defines business data to collect and how to interpret

View Business Activities and perform everyday business operations

Business Activity Services XML

Windows SharePoint Services Website

Business Activity Query Web Service

Developer
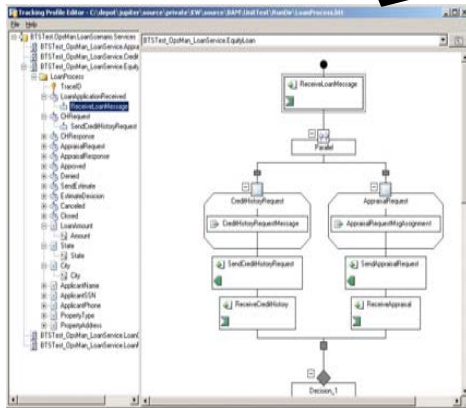
BAS Storage

Human Workflow Services

- Simple authoring of workflow by performing business actions

- Workflow responsive to task responses, business policy and organizational changes

- Real-time visibility into workflow activities

- Focused on workflow for people
  - Tracking of tasks, actions and processes
  - Composition of actions into dynamically evolving processes
  - Instantiation of Activity Models that are captured or predefined processes

- Integration of machine processes with human workflow
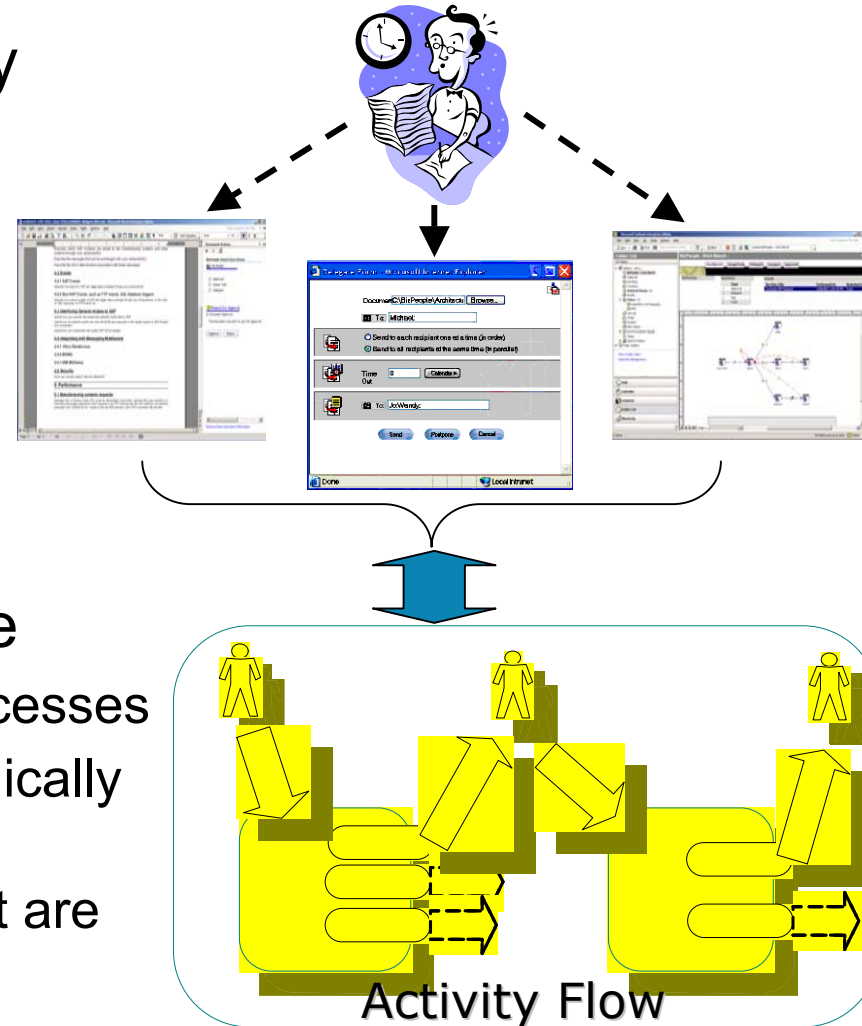
Activity Flow

Workflow Building Blocks

Task

Action
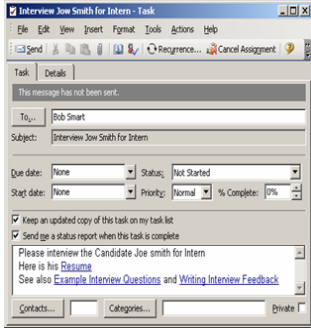
Activity Model

• Communication with Actor

Task
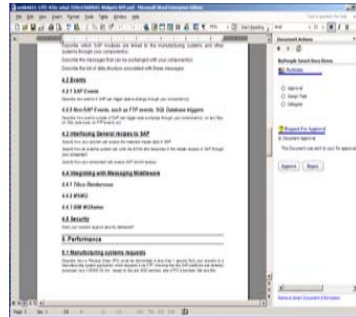
• WF Services feature
• Composable at runtime
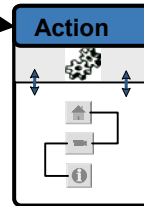
Action
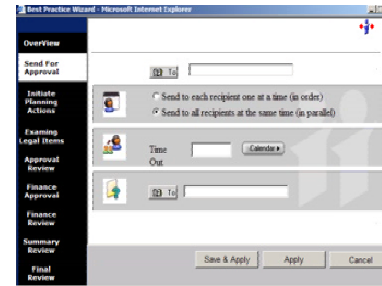
• WF Services feature
• A priori composition
• of Actions

Task

Task

Task

Action

Action

Activity Flow
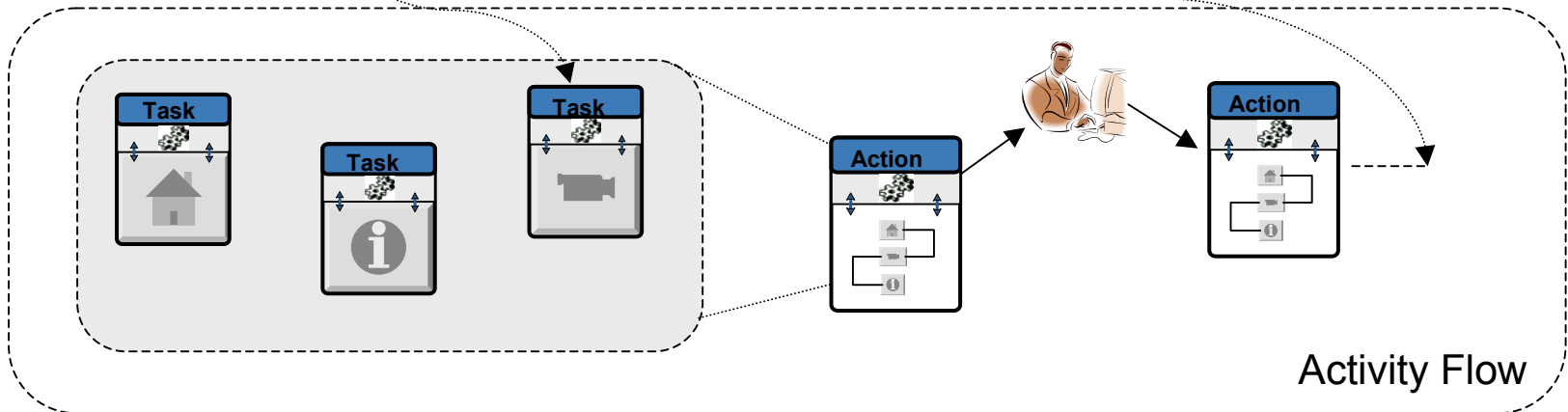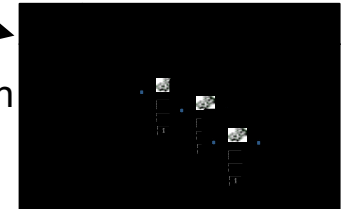
Real-Time Tracking For Admin And Debugging

- View a process end-to-end
- Track
  - Messages
  - Processes
- Debug
  - Suspend
  - Resume
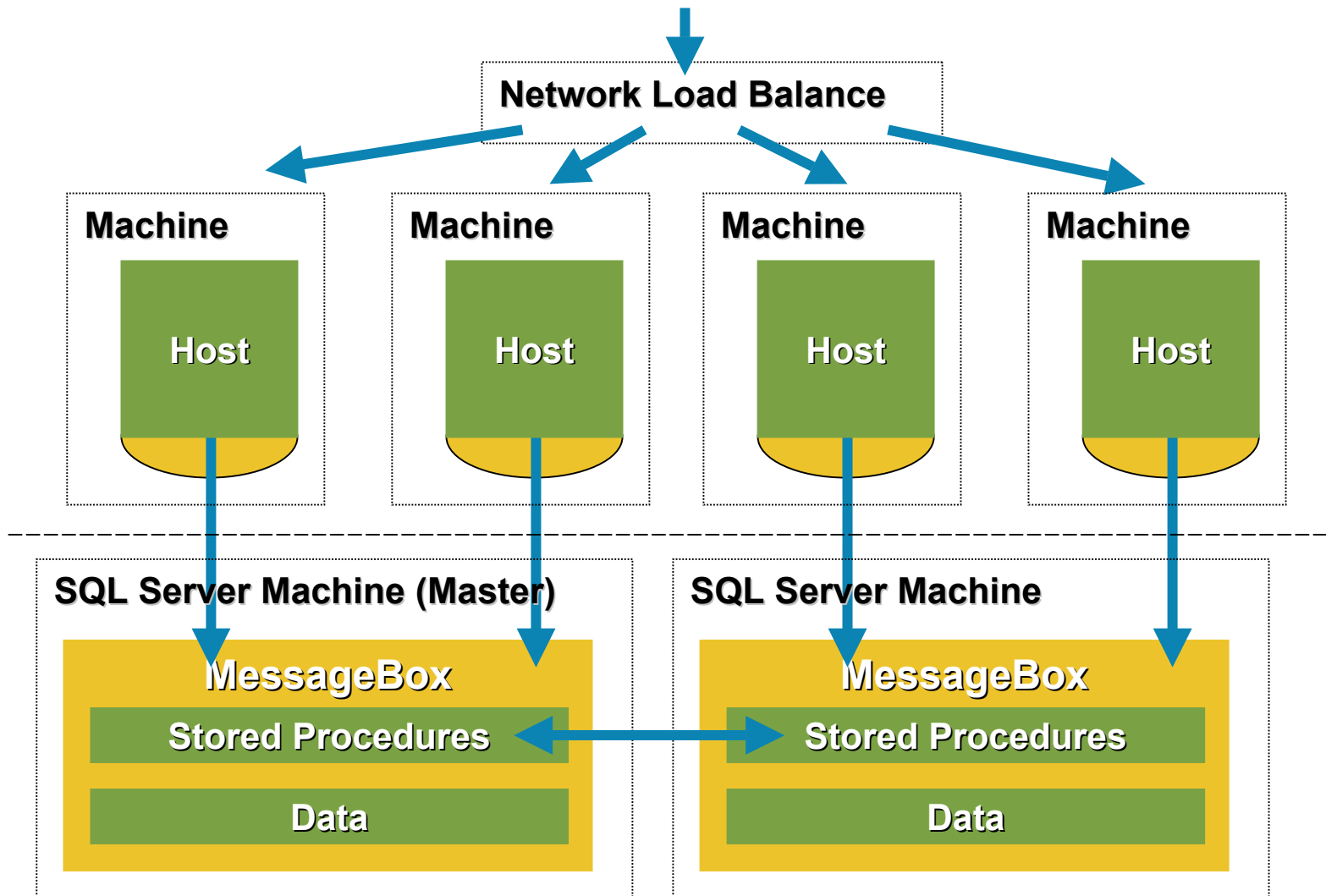- Manage suspended messages

- **Versioned deployment based on the .NET framework**
- **One console to**
  - Manage server farm including adapters
  - Scale solution to new servers
    - New Processing Servers
    - New Database Servers
  - Create secure boundaries
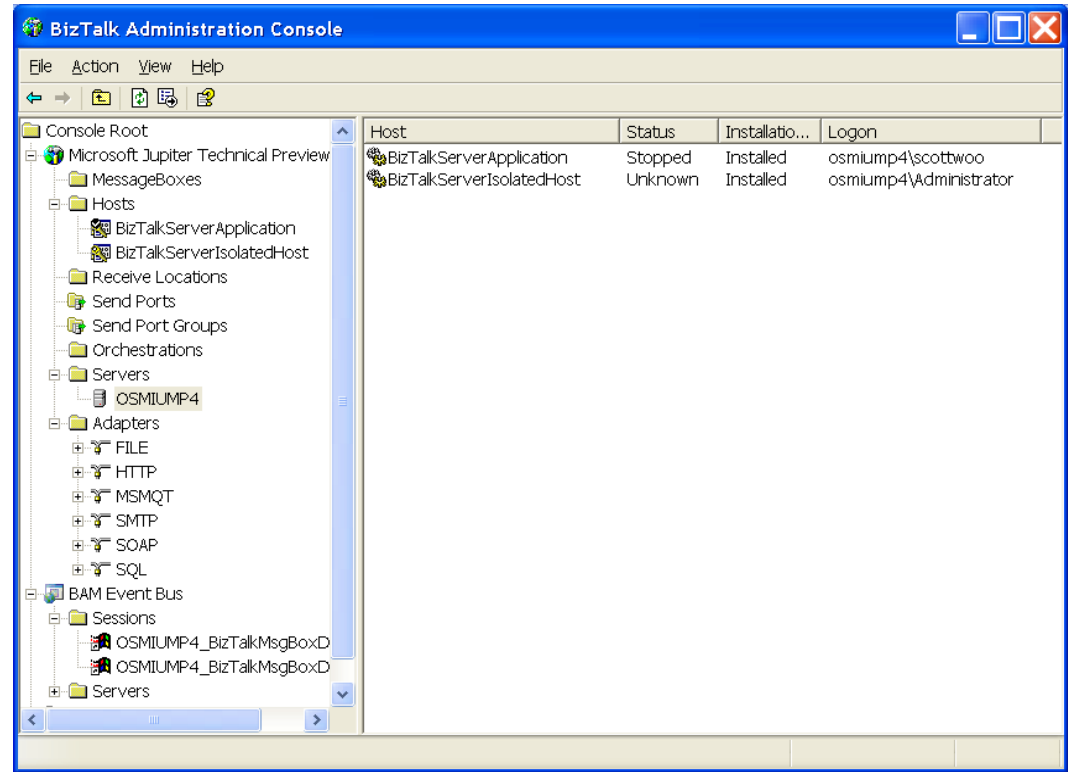
Scaling Out Processor Machines
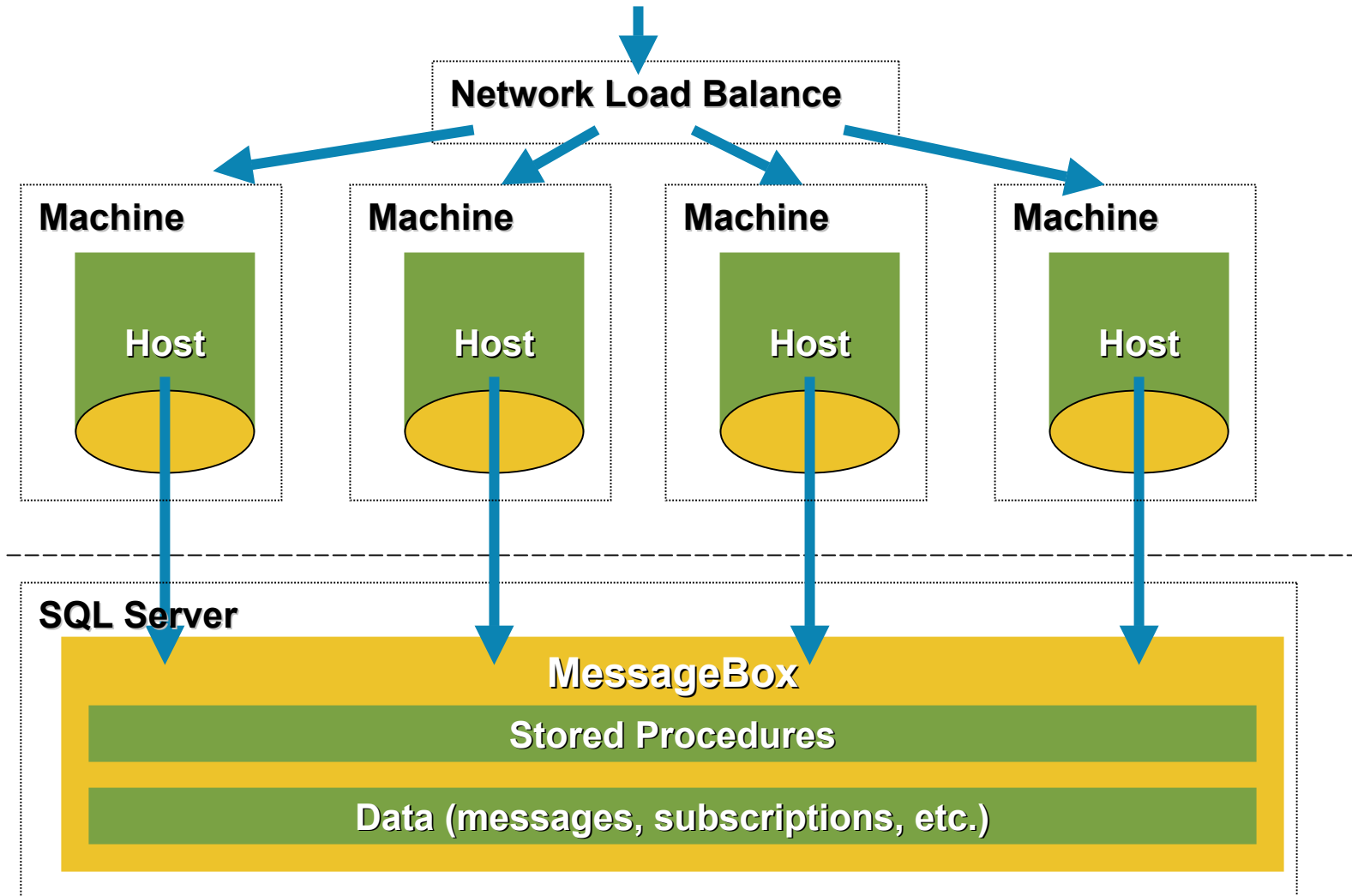
Scaling Out Storage

Hub: Large Scale Trading Partner Management

- Manage relationships with thousands of trading partners

- Relationship is separated from process increasing reusability

- Enable

    - Easy configuration of new trading partners

    - Communicate across heterogeneous messaging and transport protocols

    - Deal with large variety of data formats

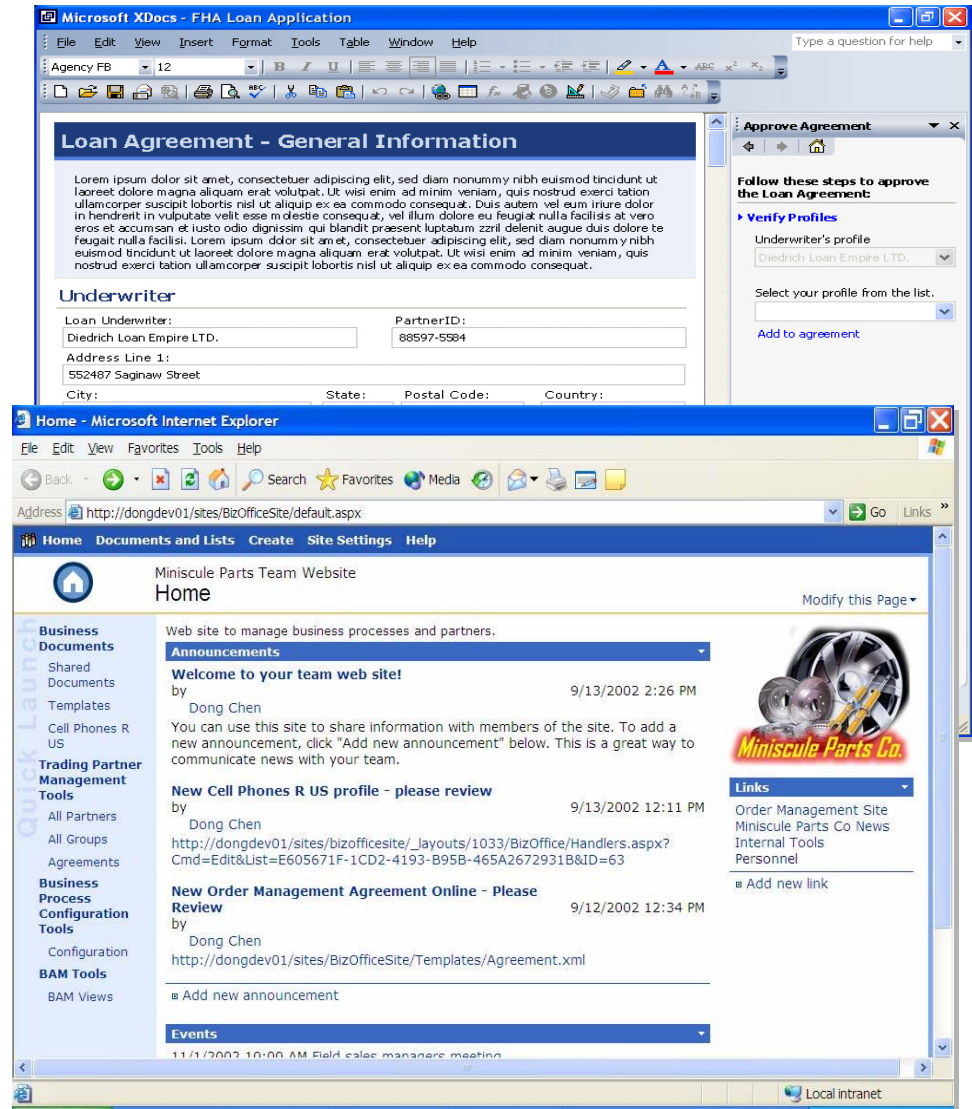   - Enable Multi-party Business Processes
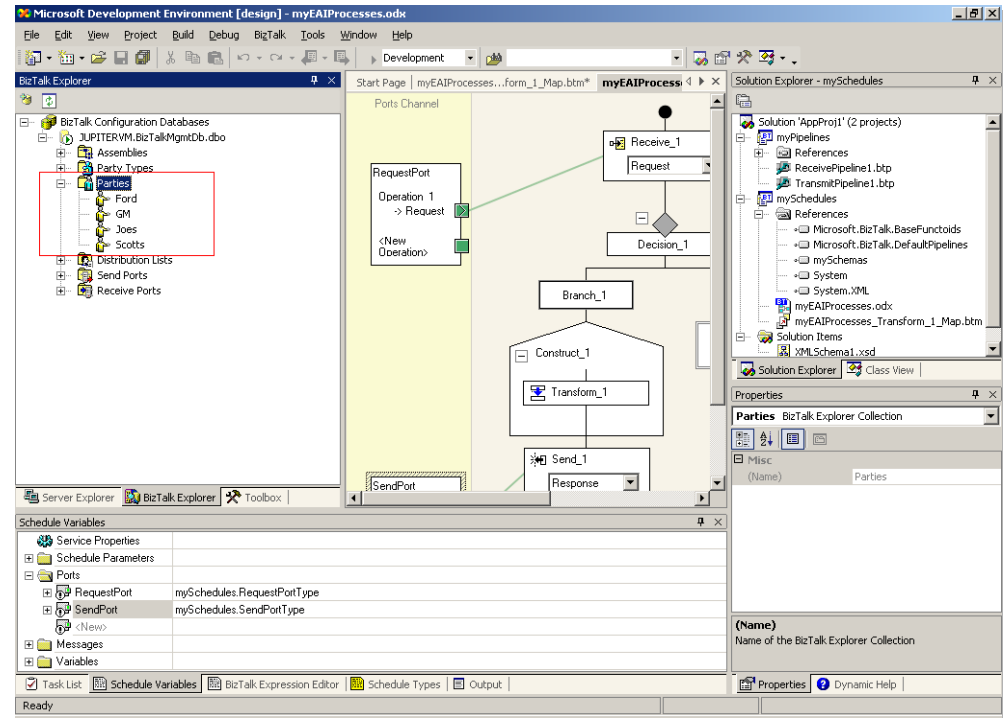
Spoke: Rapid Trading Partner Roll-Out

- Next generation SEED technology

- Trading partner obtains package

- Trading partner completes deployment with simple Office wizard

- Trading partner manages orders with Windows SharePoint Services

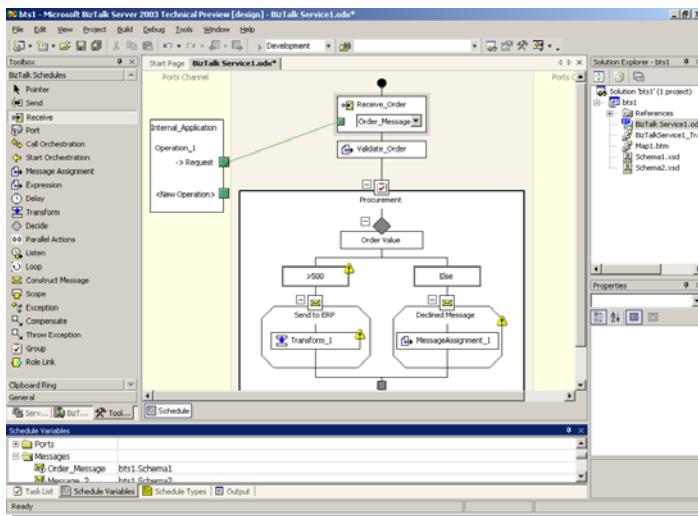- Web Services available to any client

- User Interface leverages WSS

Simplifying the interaction of Business Analysts and Developers
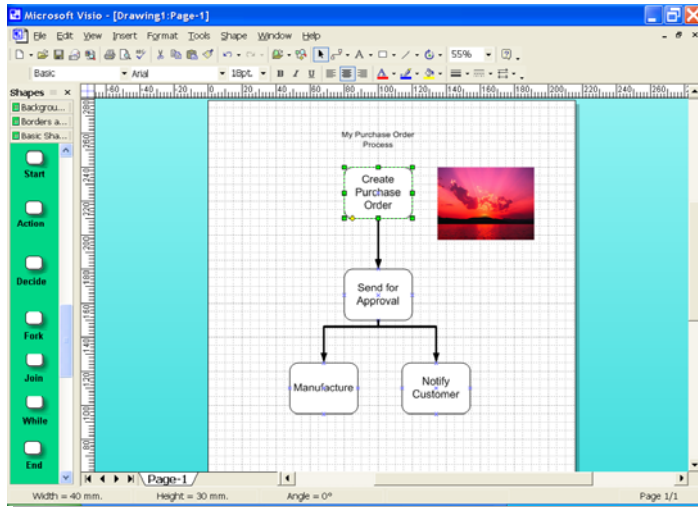
Business Analysts - Construct Business Process (Visio)

Bidirectional & collaborative

Developers - Tie processes in with systems and other processes (BizTalk Orchestration)

Office/InfoPath Integration

- ## Scenarios
  - Route InfoPath documents through the enterprise
  - Input data from InfoPath documents into enterprise systems
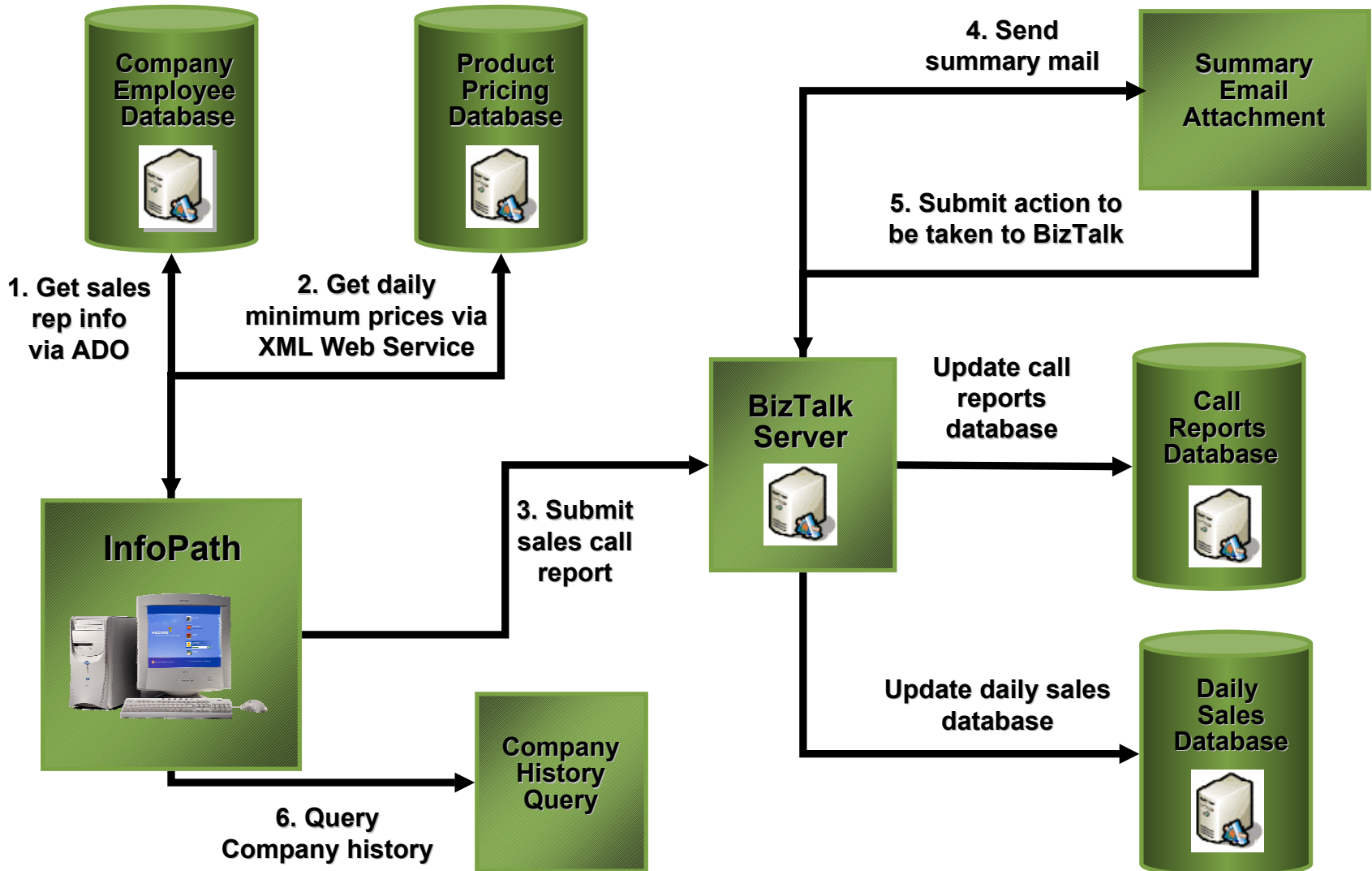- ## Capabilities
  - Open XML Schema directly inside BizTalk
  - Send from InfoPath through XML Web Services to BizTalk
  - Much, much more…

Example:
BizTalk and InfoPath

Company Employee Database

Product Pricing Database

4. Send summary mail

Summary Email Attachment

5. Submit action to be taken to BizTalk

1. Get sales rep info via ADO

2. Get daily minimum prices via XML Web Service

InfoPath

3. Submit sales call report

BizTalk Server

Update call reports database

Call Reports Database

Company History Query

6. Query Company history

Update daily sales database

Daily Sales Database

What makes Microsoft unique?

- **Reducing Complexity**
  - Use Microsoft Office Tools for Business Analysts and Information Workers to define, manage and react to business processes
  - Single Integrated Development Environment for developers

- **Empowering Organizations**
  - Empower customers through great software to solve their integration challenges and meet their goals
  - Seamless hand-off of information from Information Workers to Developers
  - Allowing the right people in the organization to make an impact

- **Understanding Time to Value**
  - Days not weeks
  - Lowering the cost of implementation

Microsoft Enterprise Integration

Analysts agree

"Gartner's placement of BizTalk Server in the Leader Quadrant for integration demonstrates the product's vision and underlines its ability to provide a scalable and reliable integration solution for any enterprise."

—Gartner, Inc.
May 2003

"They're really the company that has emerged from nowhere and made itself a player with the BizTalk product. BizTalk is probably the easiest to use in the integration market."

—Chris Dial
Analyst, Forrester Research

High Volume Customers

Customers with over 200,000 messages per day	High Volume B2B Customers
Marks & Spencer – 2500 / second*	AkzonNobel – 5000
Lotte Magnet – 100 / second	Lotte Management – 1500
Itau – 100 / second	Osram Sylvania – 800
London Drug – 52 / second	Marks & Spencer – 500
Waste Management – 35 / second	ASUS – 500
CNF / Emery – 20 / second	Kinpo Electronics – 350
Ford – 10 / second	New York Times – 140

* With no unplanned downtime in 24 months

Microsoft Enterprise Integration

Real customers, solving real problems

"By building our event notification solution using BizTalk Server, we were able to bring a solution to market a year and a half earlier than if we had developed it internally, which gives us a definite competitive advantage."

—Ron Berger
Managing Director of IT
Emery Forwarding
Menlo Worldwide Technologies

"BizTalk Server brings us greater agility because we can use it to tie together systems throughout the company."

—Bill Greene, Manager
Certified Supplier Business Center
Cinergy

"By automating transactions, we can eliminate the manual effort and touch points in everything we do, which will have a considerable impact on speed and efficiency, not to mention reduced costs."

—David Smith
Vice President of Information Technology
PPG Industries

Summary

- Make the Hard Stuff Simple
  - Connecting systems and processes with the desktop
  - Unique tools for unique users
    - <u>Developers</u>: Visual Studio .NET
    - <u>IT Professionals</u>: Windows – standard, repeatable process
    - <u>Information Workers</u>: Rich Office view into business
- Standards
  - Fully Leverage Mature Standards (XML, XSD)
  - Champion Emerging Standards (XML WS, WS-I)
  - Partner with Industry to build frontier standards (BPEL)
- Beta availability now at
  - http://www.microsoft.com/BizTalk

Microsoft Windows Server System Online Books

http://msdn.microsoft.com/servers/books

- "Real-world" customer deployments and integration stories

- Task-based IT books that go beyond help files and white papers

- Scenario-based development books with comprehensive code samples to solve real problems

- Partnership with ISVs, consultants, and technical specialists

- Books available by product:
  - BizTalk Server, Content Management Server, SQL Server, Exchange Server

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