

# BizTalk Adapters

Connecting to systems from BizTalk

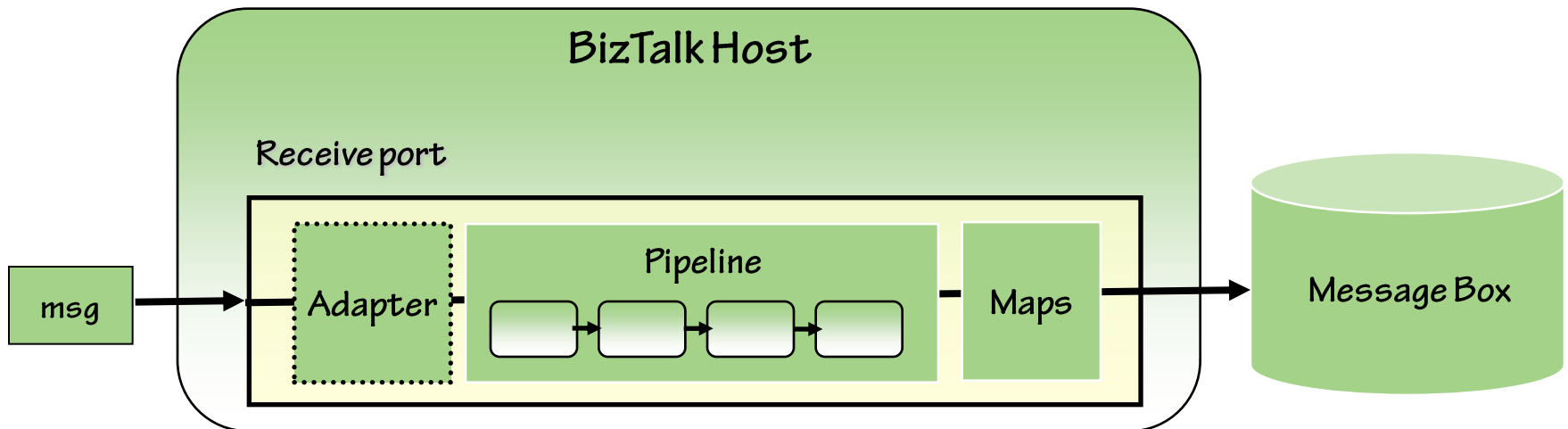


# Outline

- Adapter fundamentals
- Configuring adapters
- Securing adapters
- Writing custom adapters
- New, common adapters

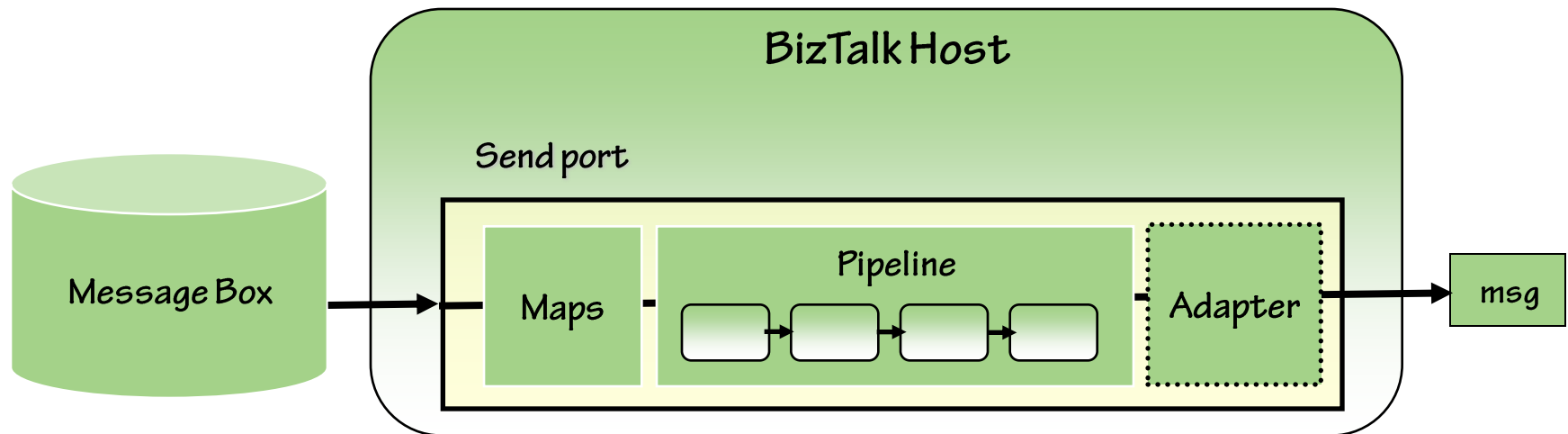
# Receiving Messages

- **Adapter receives raw document/data and submits message**
  - Message passes through pipeline
  - Message is processed by a matching map on the port
  - Message type is used to match source of the map



# Sending Messages

- **Orchestration or messaging engine sends message**
  - Matching map applied to the data
  - Pipeline executed on the message
  - Adapter given message to transmit



# Two-way ports

- **A *two-way port* combines two one way operations**
  - Orchestration or messaging engine sends message
  - Matching map applied to the data
  - Pipeline executed on the message
  - Adapter given message and transmits
  - Adapter receives raw response and submits message
  - Message passes through pipeline
  - Message is processed by a matching map on the port
- **There are different directionalities**
  - Request Response Ports (Receive)
  - Solicit-Response Ports (Send)

# Static vs. dynamic ports

- **Adapter details can be specified statically or dynamically**
  - Determined by how you configure the port
- **Static ports**
  - Adapter is chosen and specified in the port configuration
  - Transport/address details configured on port
- **Dynamic ports**
  - Address carried in message context determines adapter
  - Transport can be configured via various message properties

# Adapters included with BizTalk

- **Adapters can be categorized based on their communication**

- *Transport adapters* focus on a network API

- *Application adapters* focus on connecting to an application

- |                |                                 |                    |
|----------------|---------------------------------|--------------------|
| ▪ File         | ▪ JD Edwards One World          | ▪ DB2              |
| ▪ MSMQ         | ▪ JD Edwards Enterprise One     | ▪ CICS             |
| ▪ FTP          | ▪ Oracle E Business Suite       | ▪ IMS              |
| ▪ SMTP         | ▪ Oracle Database               | ▪ RPG              |
| ▪ HTTP         | ▪ Peoplesoft                    | ▪ VSAM             |
| ▪ SOAP         | ▪ Siebel eBusiness Applications | ▪ Other host files |
| ▪ WCF (7)      | ▪ Tibco Messaging               |                    |
| ▪ POP3         | ▪ Tibco Rendezvous              |                    |
| ▪ WSS          | ▪ MySAP                         |                    |
| ▪ Websphere MQ | ▪ EDI                           |                    |
| ▪ SQL          |                                 |                    |

See <http://www.microsoft.com/biztalk/evaluation/adapter/default.aspx> for current list

# Adapter hosting

- **Adapters are hosted in a process**
  - They can be hosted in-process or in an external process (IIS)
- ***Adapter handlers* tie adapters to hosts**
  - Adapters can have multiple handlers
  - Send handlers distinguished from receive handlers

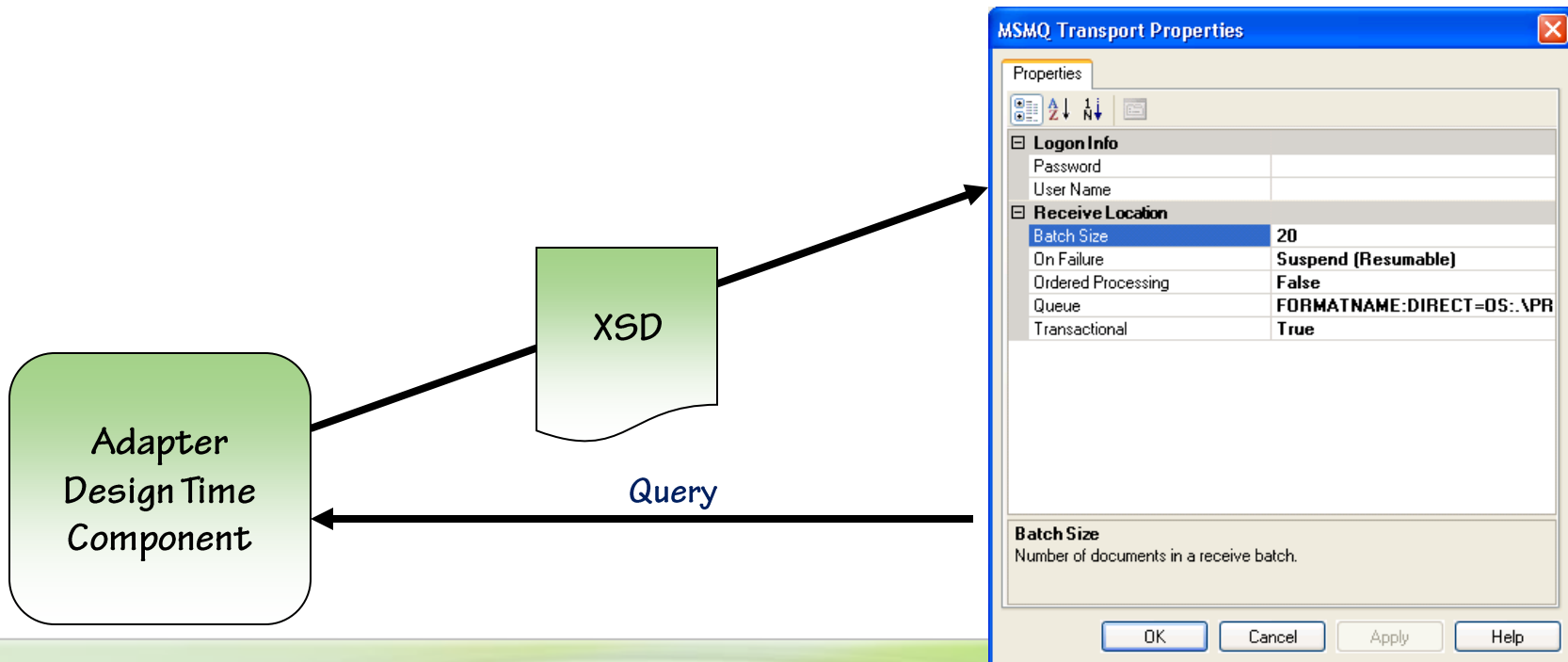


# Adapter configuration

- **Adapters have *runtime* and *design time* components**
  - Adapters provide configuration information as XSD and WSDL
  - Design time components produce configuration
  - Runtime components consume configuration

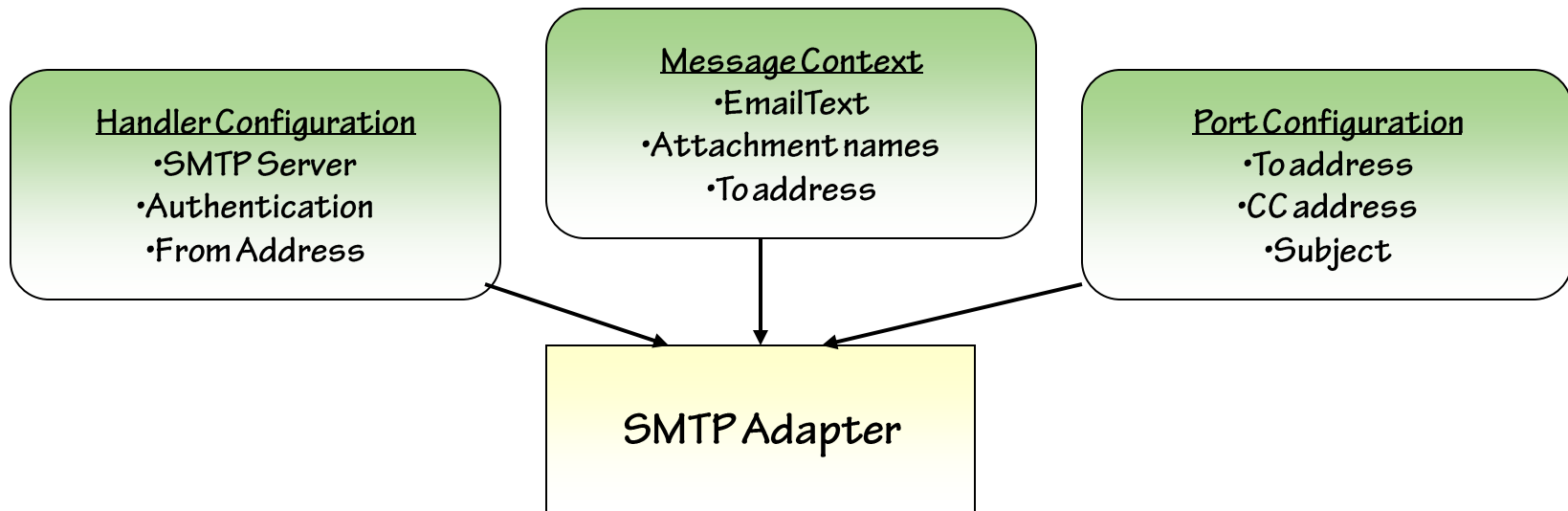
# Adapter configuration

- Adapter design-time component returns XSD
  - BizTalk Explorer and admin tool use XSD for property page



# Configuring adapters

- **Adapter configuration is defined at three levels**
  - Handler – information relevant to all instances in that host
  - Port – information relevant to the individual port
  - Dynamic – message context properties
- **Adapter receives all configuration information**



# Generating items

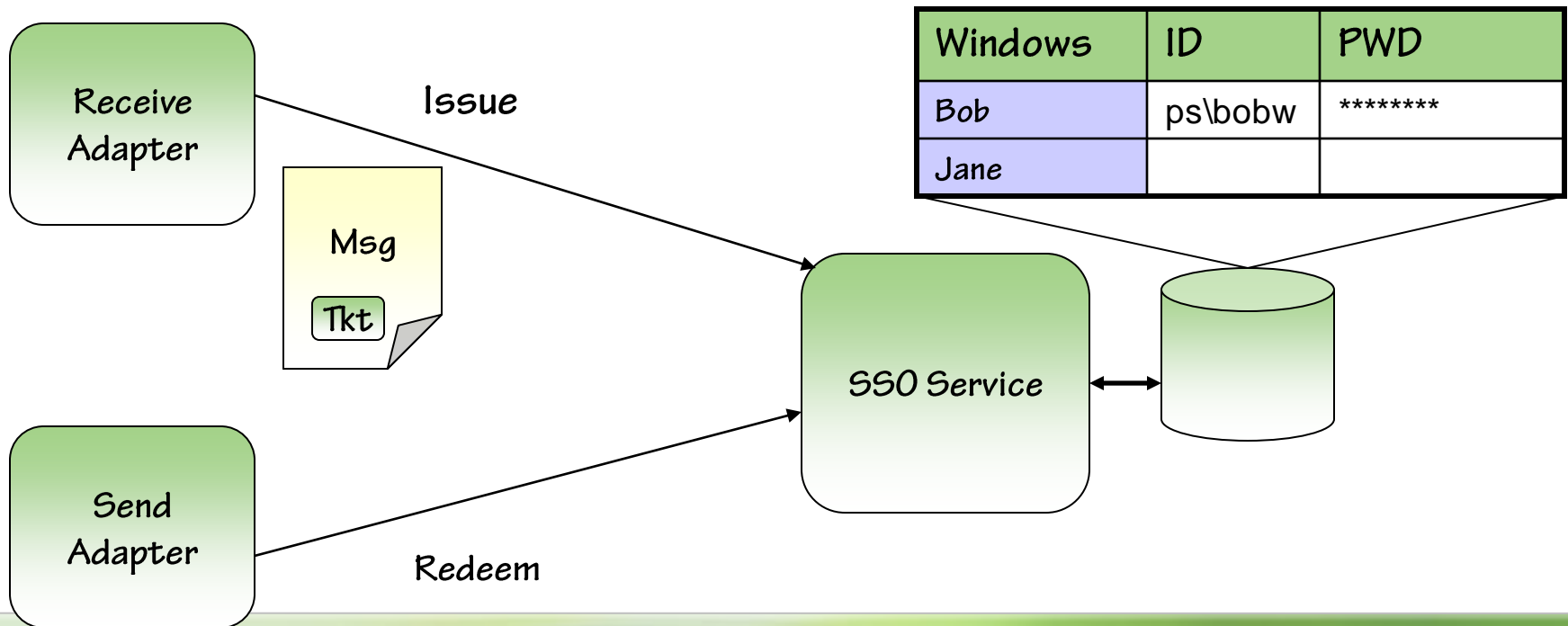
- **Some adapters require metadata to use various features**
  - Hence, adapters can support generating artifacts
  - Accessed using the *Add Generated Items* wizard in VS.NET
  - Most common with application adapters
- **Adapter returns WSDL files**
  - Schema from WSDL become XSD files in project
  - Wizard generates orchestration with ports based on WSDL

# Securing adapters

- **Adapters become a security barrier for BizTalk Server**
  - Receive and send require different security considerations
- **Receiving**
  - Authentication for message submission
  - Party resolution
  - Data security (signing and encryption)
- **Sending**
  - Authentication to external systems
  - Identity of caller
  - Data security

# Adapter security with SSO

- Use SSO to authenticate to external system as interactive user
  - User's Windows credentials collected when message submitted
  - SSO Ticket created and added to the message context
  - Send port redeems ticket to get credentials for the application



# Custom adapters

- ***Adapterframework* can be used to build custom adapters**
  - Connect to internal LOB applications
  - Provide support for custom transport
  - Add or change features in a current adapter
- **New WCF LOB adapter SDK attempts to simplify adapter development**
  - Simplified API for connection management/pooling
  - Optionally support metadata browsing
  - Built on the WCF channel model (future direction for messaging at MS)
  - Adapters can be used from any WCF capable client (does not require BizTalk)

# Custom adapters with adapter framework

- **Design time component**

- Create XSD for handler and port configuration
- Create WSDL or dynamic UI to support adding generated items

- **Run time component**

- Create send adapter
- Create receive adapter

- **Deployment**

- Deploy assemblies
- Update registry with metadata
- Add adapter to BizTalk Server Administration console
- Configure handler properties



# Custom adapter development with WCF LOB SDK

- **Design time component**
  - Implement metadata browsing and/or searching
  - Metadata is exposed via interfaces and objects (XSD is handled for you)
- **Run time component**
  - Implement appropriate inbound and outbound handlers
  - Manage connections / pool
- **Deployment**
  - Deploy assemblies
  - Update machine.config with binding extension
  - Use WCF-Custom adapter to consume using the custom binding

# SQL adapter

- **Used to for messaging integration with SQL Server**
  - One way receive adapter
  - Solicit-response send adapter
- **Use Add Generated Items to get the starting schema**
- **Not intended for large data migration or copying**
  - SSIS or DTS still used for bulk load, etc.

# SQL receive adapter

- **Receive adapter works by polling database**
  - TSQL or Stored procedure called
  - Generally have this call somehow mark the records as read
  - Use FOR XML AUTO to return XML data\*
  - During metadata generation return schema using xmldata directive

```
SELECT OrderID, OrderDate
FROM Orders
Where OrderDate is not null
--remove xmldata after metadata generation
FOR xml auto, xmldata
```

**\* Limitation of the wizard, not the adapter itself**

# SQL send adapter

- **Send adapter uses stored procedure or updategram**
  - Schema is defined with attributes for parameters
  - Updategrams provide support for inserting or updating data
  - Updategrams can support updating multiple tables
- **Optionally, send XML message as a single parameter**
  - Use OpenXML in the stored procedure to work with the message
- **Adapter uses message to determine updategram vs stored proc**

# MSMQ/T adapters

- **MSMQT adapter was released with BizTalk Server 2004**
  - Provided support for large messages (up to 4 GB)
  - Wrote messages directly to the message box database
  - Mimicked the MSMQ service which caused some setup conflicts
  - No physical queues to manage and no visibility into queues
  - Deprecated in BizTalk Server 2006
- **MSMQ “classic” adapter ships with 2006**
  - Works with standard MSMQ infrastructure
  - Supports MSMQ 2.0 and 3.0

# Summary

- Adapters deal with receiving and transmitting messages
- Adapter configuration based on XSD and WSDL
- Artifacts can be generated for messages and ports
- Common transport adapters provide a broad range of options

# References

- **Adapter learning resources**
  - <http://msdn.microsoft.com/biztalk/learning/adapt/default.aspx>
- **Working with the SQL adapter**
  - [http://msdn.microsoft.com/library/default.asp?url=/library/en-us/BTS\\_2004WP/html/1e2e50f7-6609-4eb2-a9a1-3a951700f840.asp](http://msdn.microsoft.com/library/default.asp?url=/library/en-us/BTS_2004WP/html/1e2e50f7-6609-4eb2-a9a1-3a951700f840.asp)
- **Writing effective adapters**
  - [http://msdn.microsoft.com/library/default.asp?url=/library/en-us/BTS\\_2004WP/html/1e2e50f7-6609-4eb2-a9a1-3a951700f840.asp](http://msdn.microsoft.com/library/default.asp?url=/library/en-us/BTS_2004WP/html/1e2e50f7-6609-4eb2-a9a1-3a951700f840.asp)
- **Writing adapters with the WCF LOB Adapter SDK**
  - <http://msdn2.microsoft.com/en-us/biztalk/bb905478.aspx>