



# A technical introduction to IBM App Connect Enterprise

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# Agenda

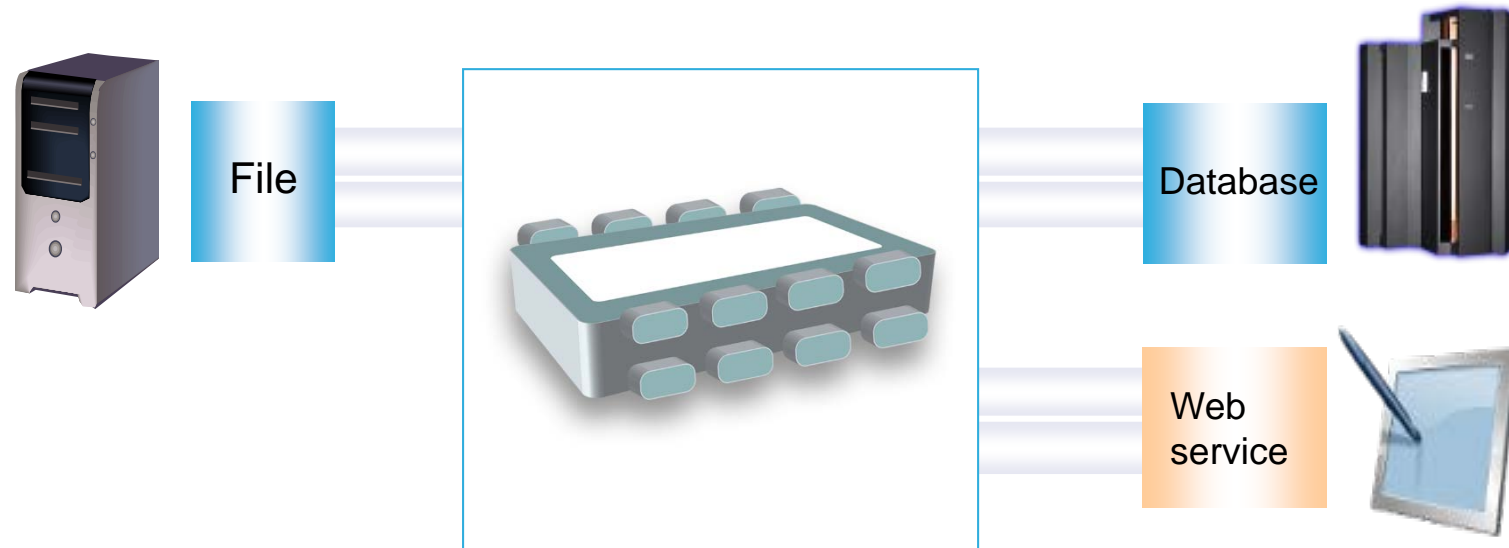
- What is App Connect Enterprise
- Key concepts
- Product overview
- Getting Started

# What do we mean by Integration?

- IT systems consist of many logical **endpoints**
  - Off-the-shelf applications, services, web apps, devices, appliances, custom built software... + now cloud services
- These systems can reside in many different environments whether on-premise or in a cloud data centre
- Endpoints expose a set of inputs and outputs, which comprise
  - Protocols - e.g. MQ, TCP/IP, HTTP, File system, FTP, SMTP, POP3, Kafka etc.
  - Message Formats - e.g. Binary (C/COBOL), XML, Industry (SWIFT, EDI, HL7), User-defined
- Integration is about connecting these endpoints together in meaningful ways
  - Route, Transform, Enrich, Filter, Monitor, Distribute, Decompose, Correlate, Fire and Forget, Request/Reply, Publish/Subscribe, Aggregation, Fan-in, Complex Event Processing...

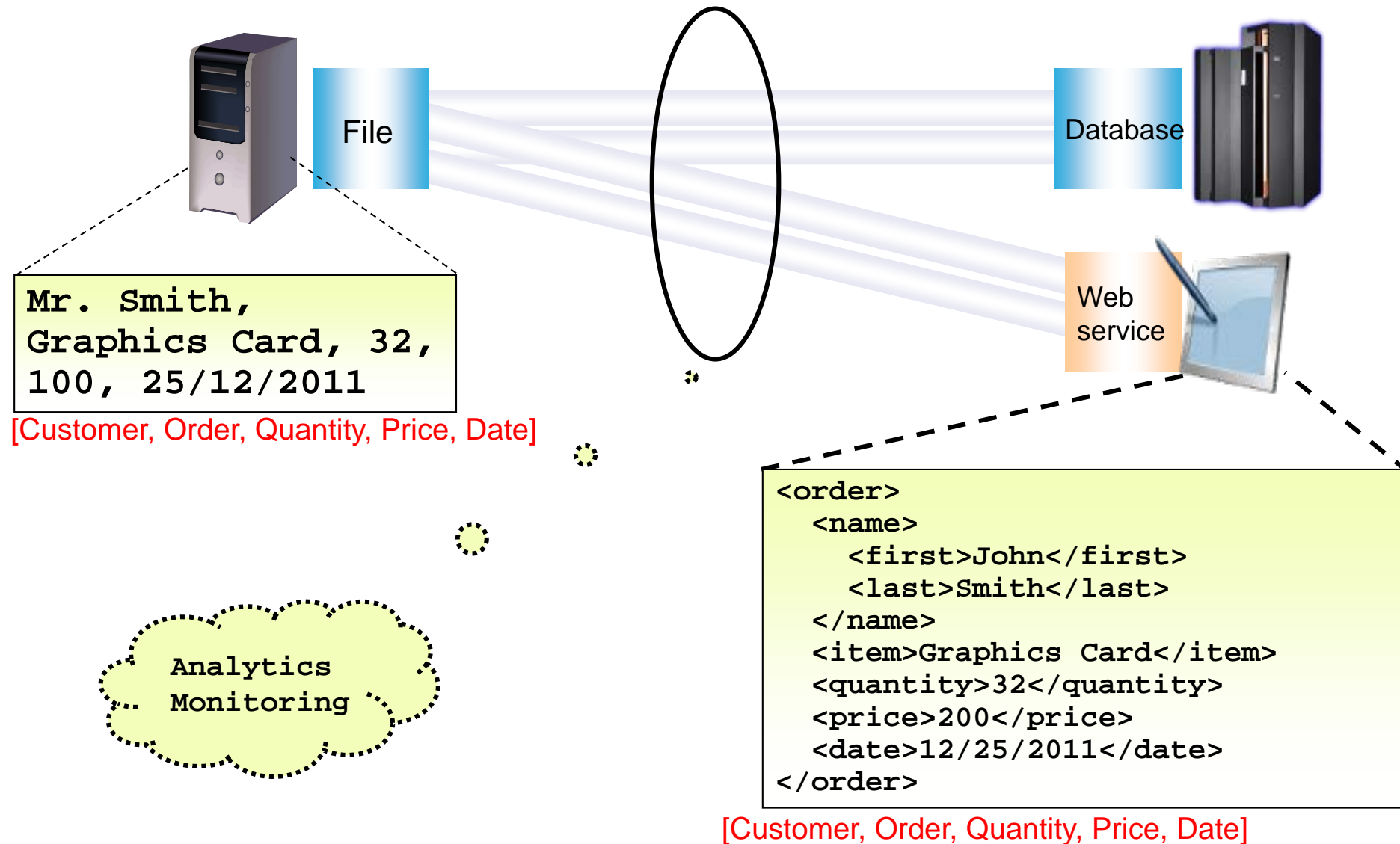


# Integration solutions are about reducing cost!



- Integration solutions simplify integration!
  - Avoids rewrites in response to new integration requirements
  - Simplifies maintenance by reducing expensive coupling
  - Flexibility adding anonymity between producers and consumers of data
  - Adds insight into applications and business value they bring

# Example integration



# IBM App Connect Enterprise

- Provides endpoints and the ability to connect to other endpoints
  - Off-the-shelf applications, services, web apps, devices, appliances, custom built software... + now cloud services
- Provides connectivity to systems residing in many different environments whether on-premise or in a cloud data centre
- Protocols and Message Formats
  - Protocols - e.g. MQ, TCP/IP, HTTP, File system, FTP, SMTP, POP3, Kafka etc.
  - Message Formats - e.g. Binary (C/COBOL), XML, Industry (SWIFT, EDI, HL7), User-defined
- Build, host + consume APIs
- Mediation Patterns
  - Route, Transform, Enrich, Filter, Monitor, Distribute, Decompose, Correlate, Fire and Forget, Request/Reply, Publish/Subscribe, Aggregation, Fan-in, Complex Event Processing...



# A brief history of IBM Integration

**MQSeries Integrator (MQSI)**

**V2**

**WebSphere MQ Integrator (WMQI)**

**V2.1**

**WebSphere Business Integration Message Broker (WBIMB)**

**V5**

**WebSphere Message Broker (WMB)**

**V6 / V6.1 / V7 / V8**

**WebSphere  
Enterprise Service  
Bus (WESB)**

**IBM Integration Bus (IIB)**

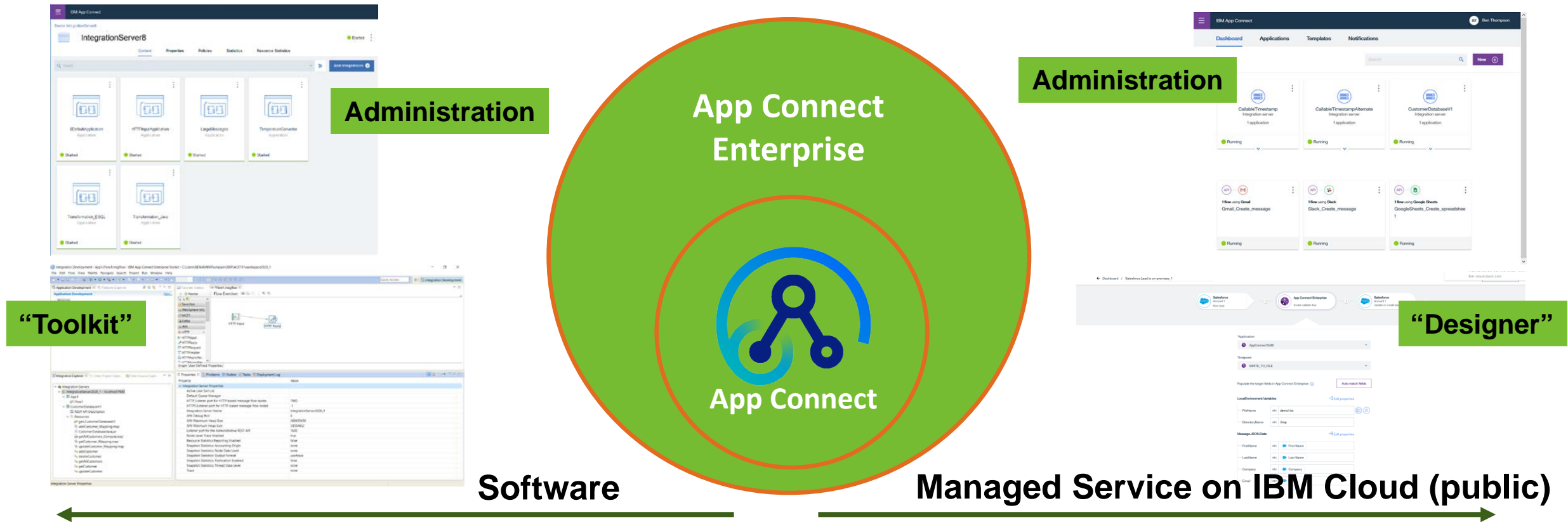
**V9 / V10**

**IBM App Connect Enterprise (ACE)**

**V11**

# IBM App Connect Enterprise (ACE)

- Integrations are developed using the ACE Toolkit
- Integrations deployed in a dedicated runtime or as part of our App Connect service on IBM Cloud
  - Entitlement included to IBM App Connect iPaaS (Integration Platform as a Service) for cloud application connectivity



- Run and manage **IBM App Connect Enterprise** in any location or cloud exactly as you need it



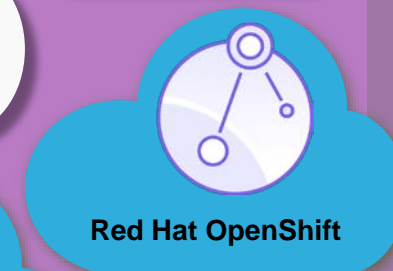
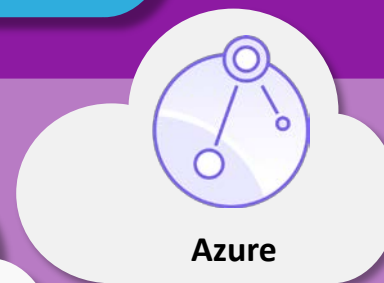
IBM App Connect Enterprise

Celebrating  
**20** years

- On-premise software



- Run it yourself in any cloud, public or private



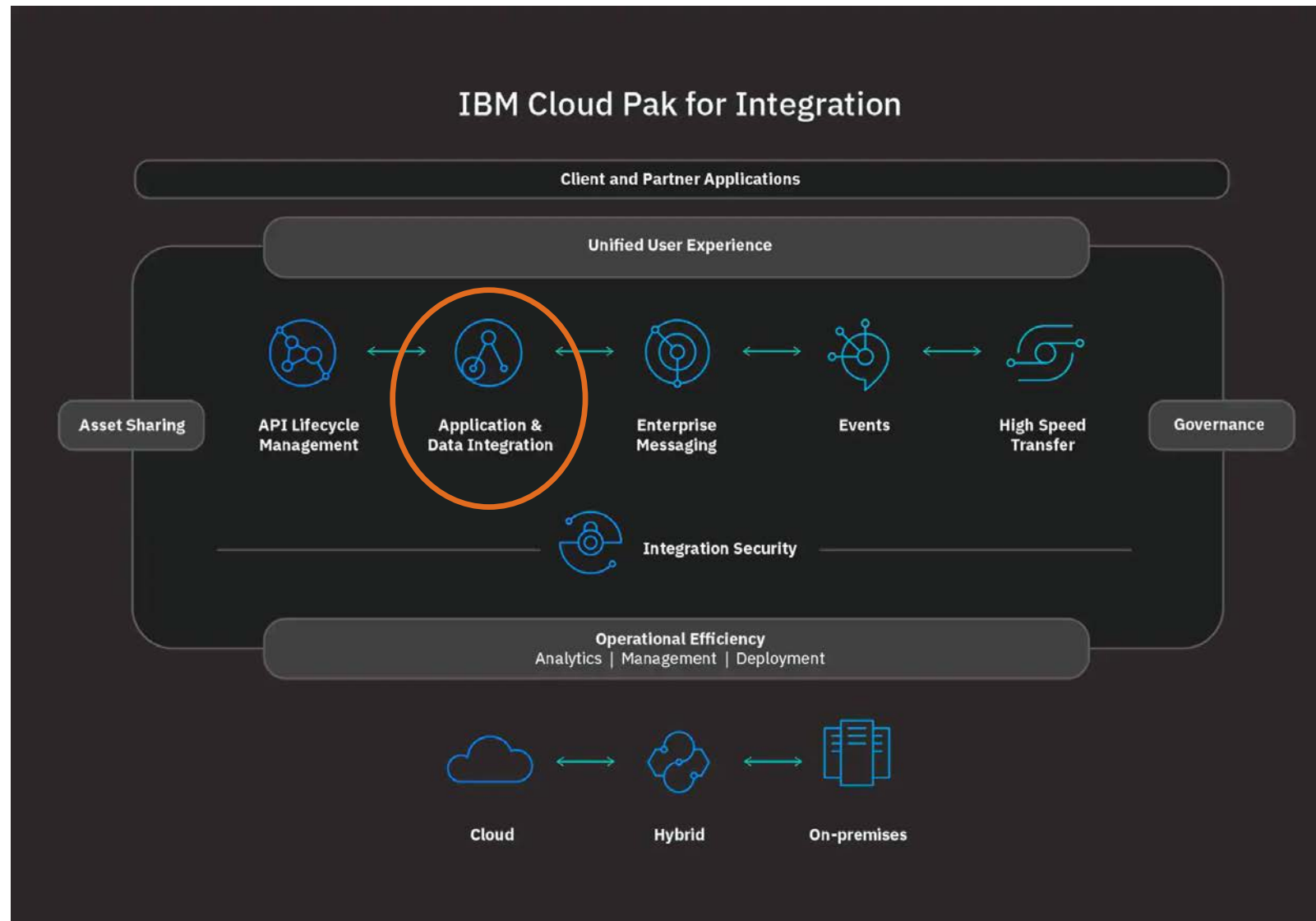
- Let IBM host it for you with its managed SaaS App Connect service in public cloud



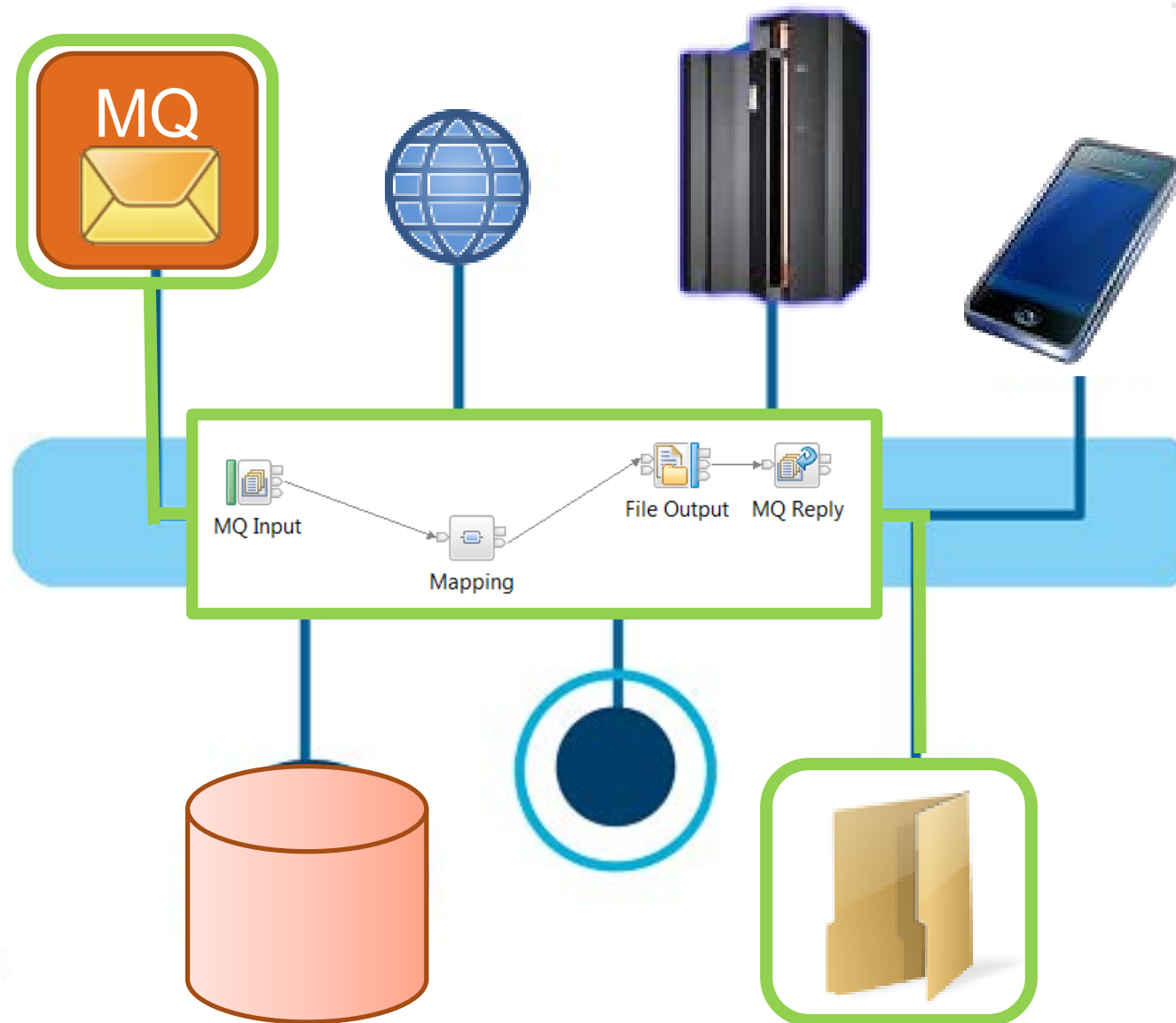
# IIB on z/OS ?

- **Statement of Direction: IBM Integration Bus on IBM Z platform**
- **Jan 21, 2020**
- [http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep\\_ca/3/897/ENUS220-083/index.html&lang=en&request\\_locale=en](http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/3/897/ENUS220-083/index.html&lang=en&request_locale=en)

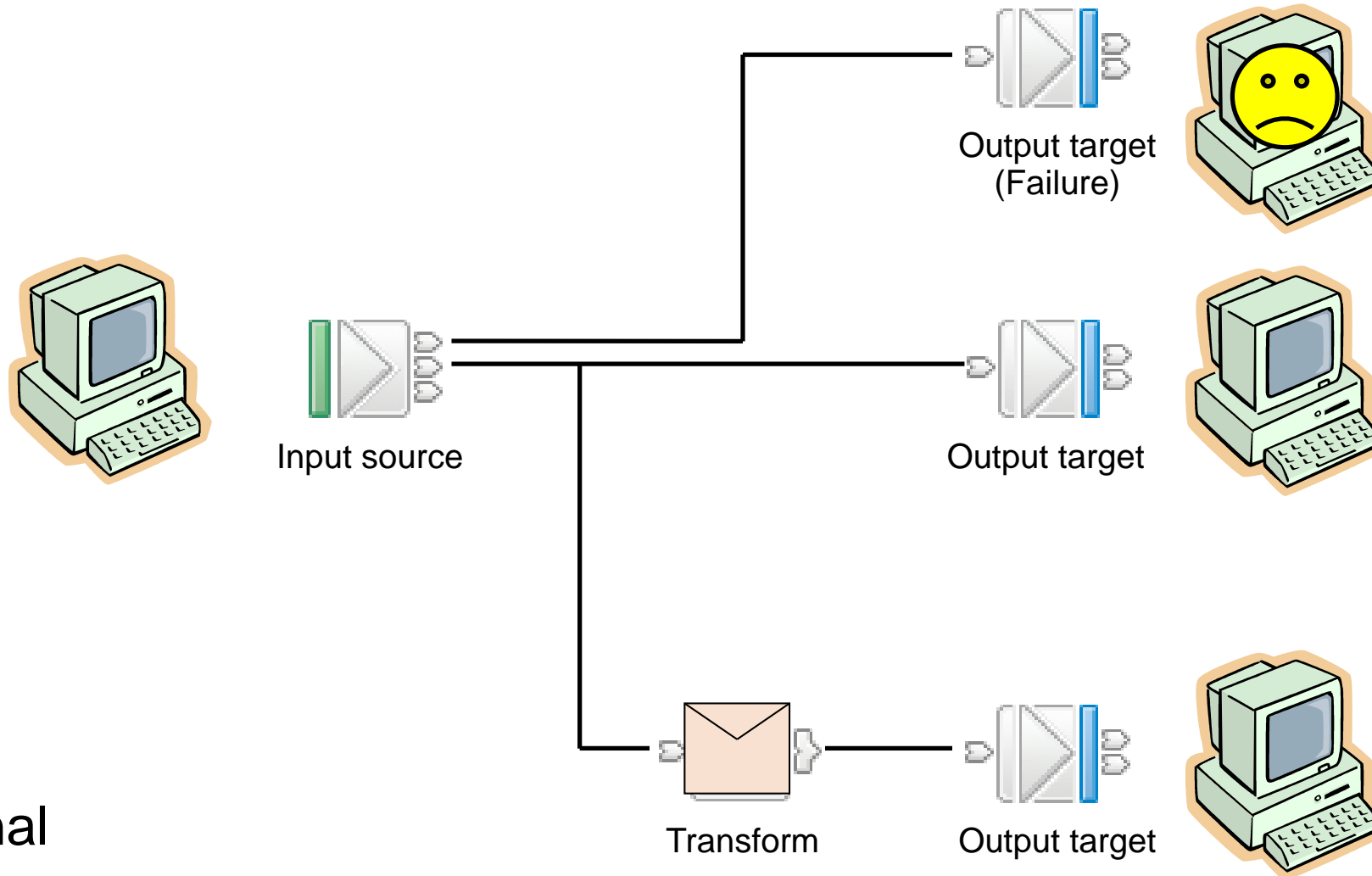
# Also available as part of Cloud Pak for Integration



# Key Concepts

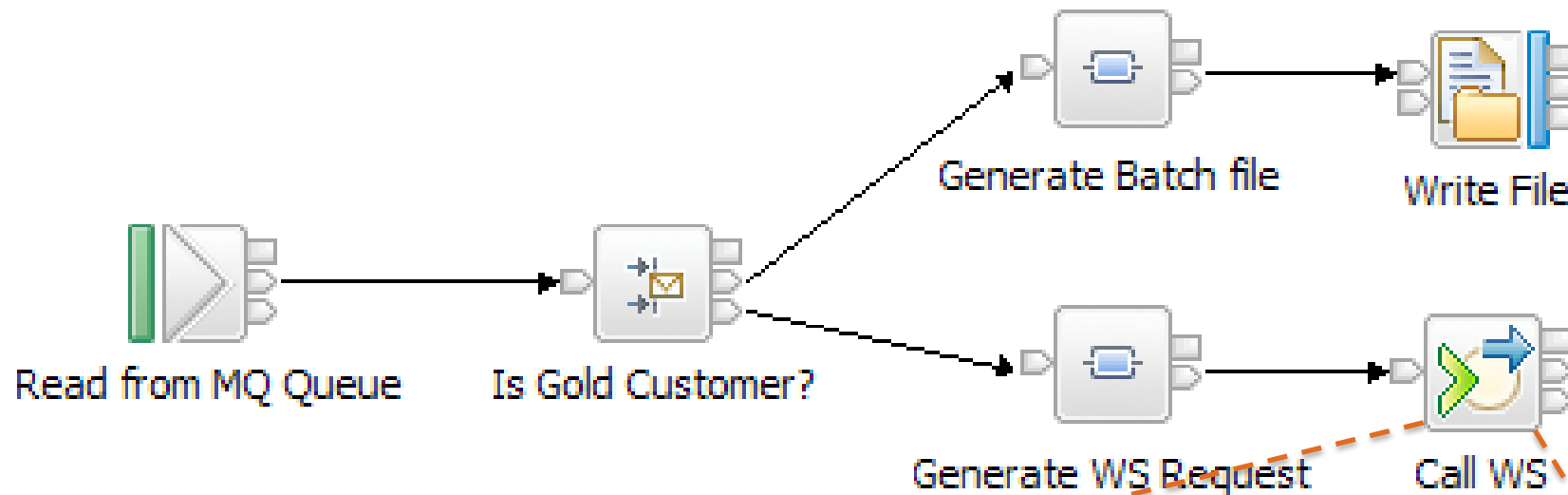


# Message flows



- Reusable
- Scalable
- Transactional

# Message flow example



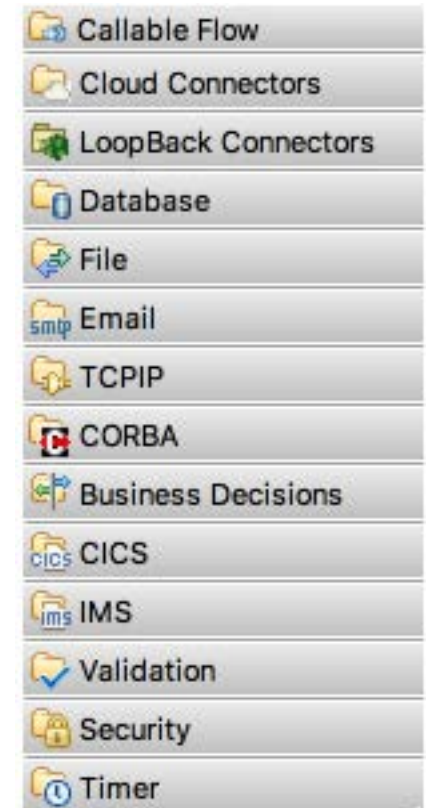
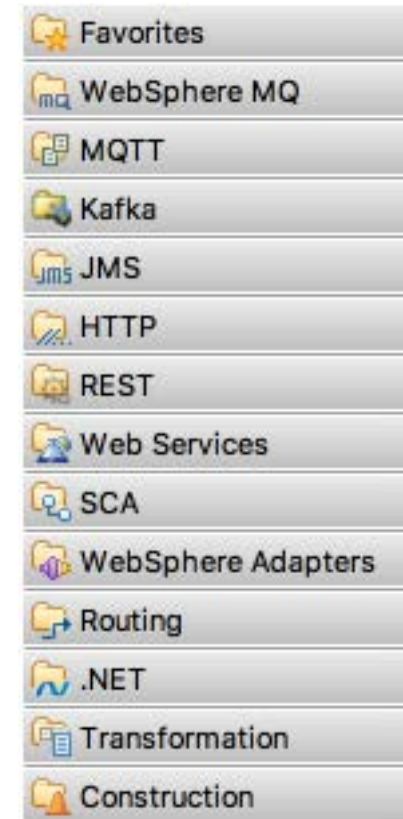
**HTTP Request Node Properties - HTTP Request**

Settings for working with the HTTPRequest node. [More...](#)

Description	
Basic	Web service URL* <input type="text" value="http://example.org/MyWebService"/>
HTTP Settings	<i>e.g. http://server/path/to/service</i>
SSL	Request timeout (sec)* <input type="text" value="120"/>
Response Message Parsing	
Parser Options	

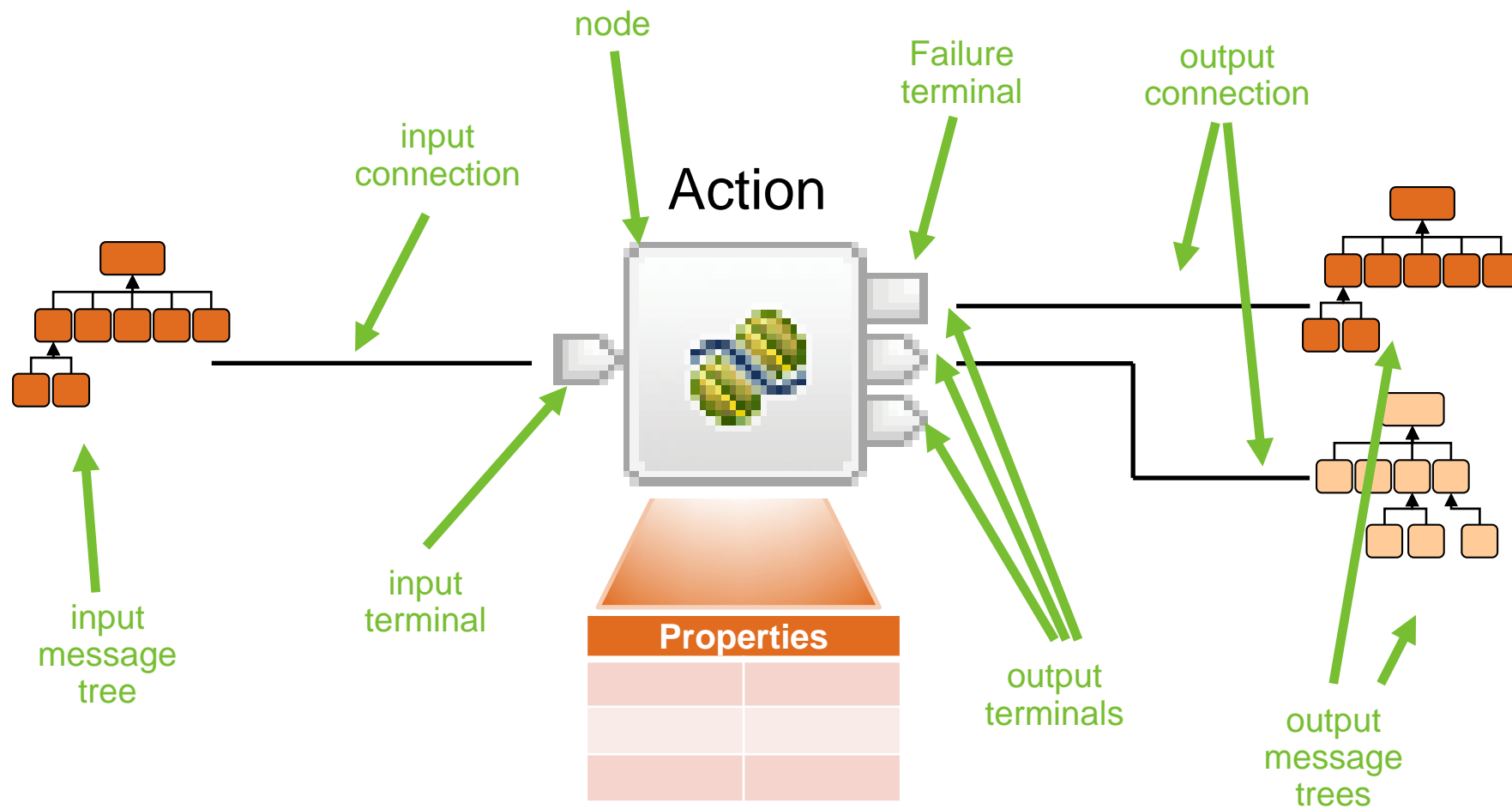
# Nodes

- The building blocks of message flows
- Each node type performs a different (input, output or processing) action
- Many different node types
  - Grouped into logical categories in the editor

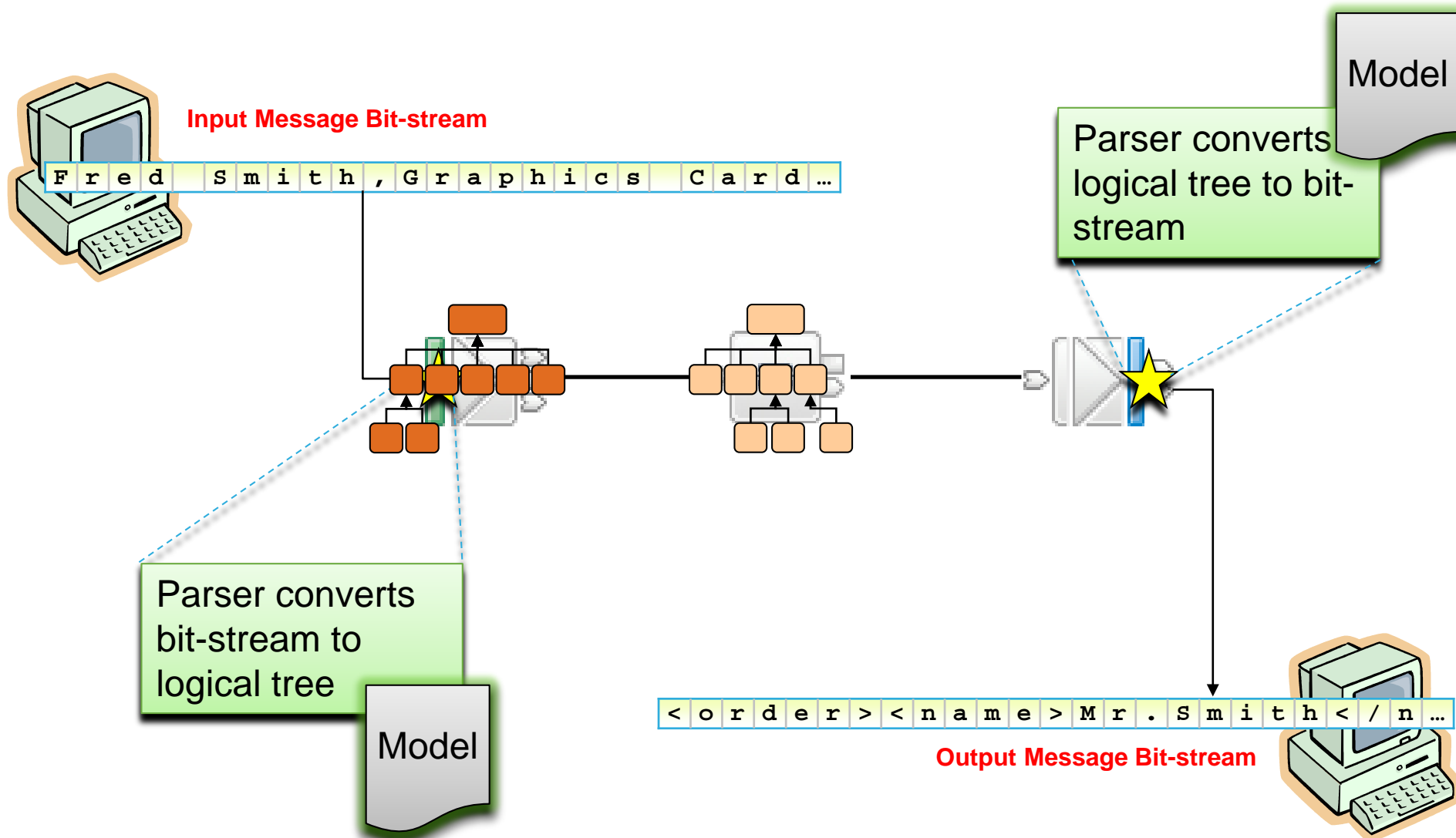




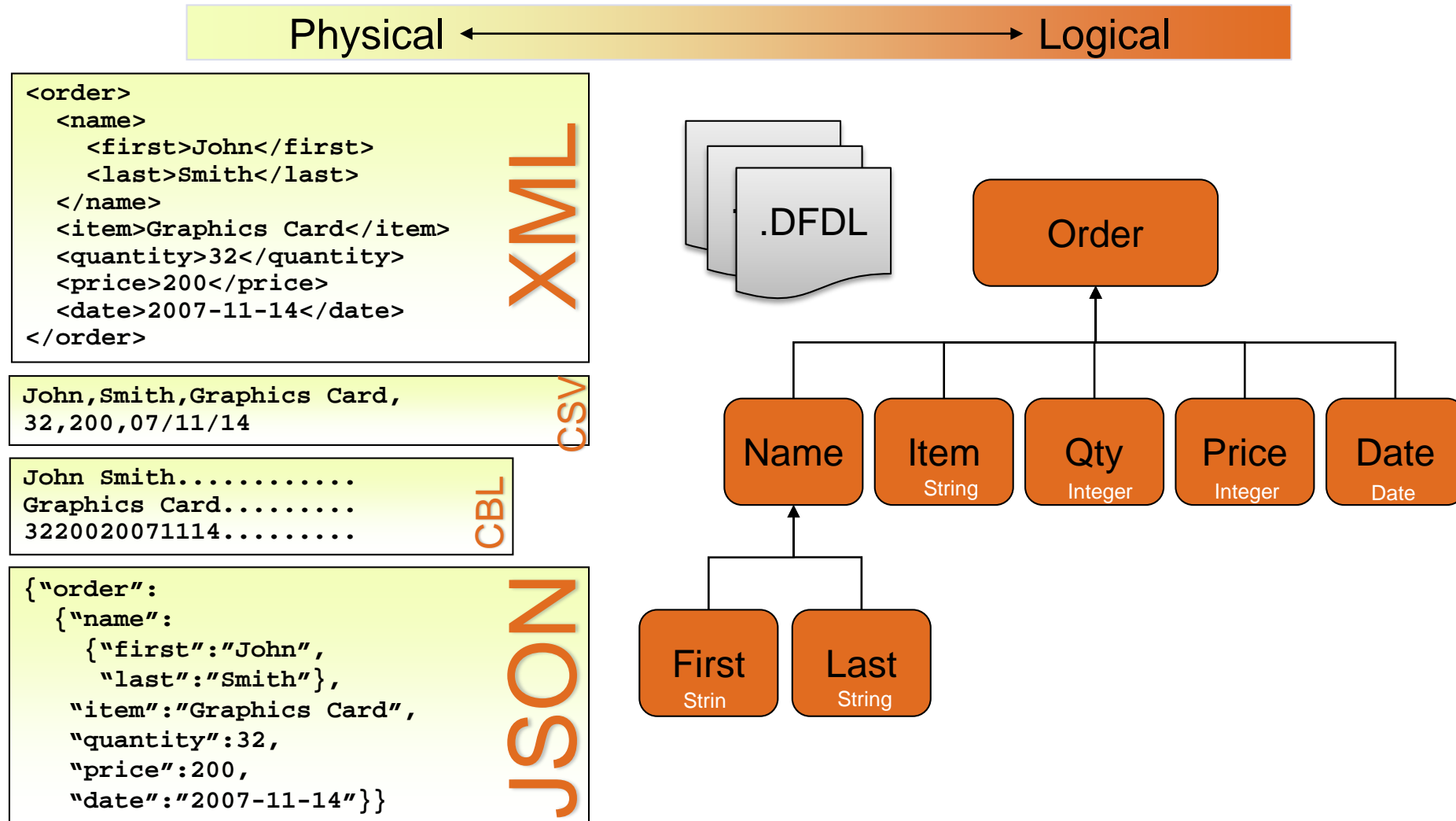
# Node Anatomy



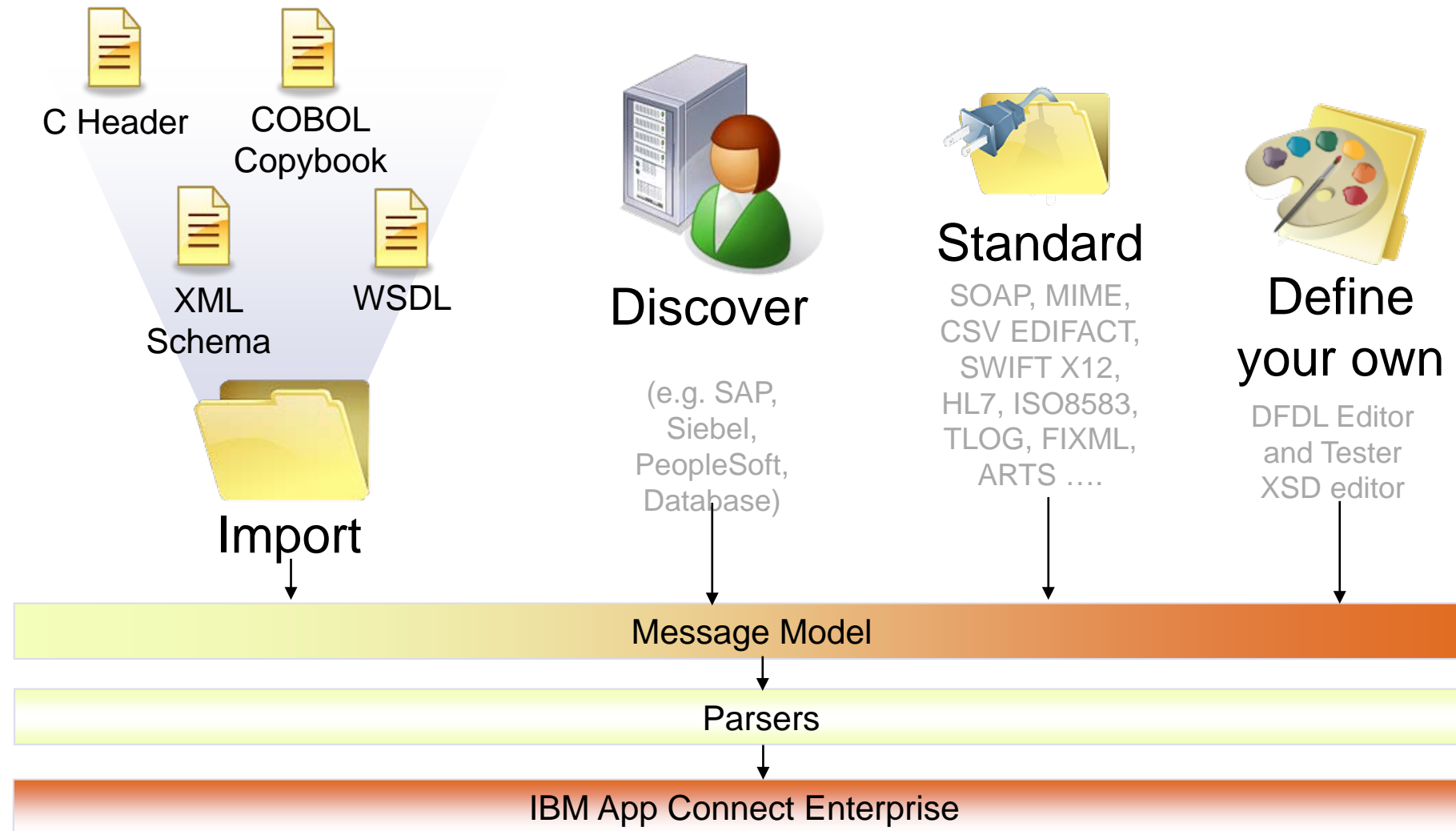
# The Parser and Message Tree



# Message Model



# Creating Message Models





# Powerful transformation and programming options



## Compute

- Describe powerful transformations quickly
- Uses SQL-based language (ESQL)



## JavaCompute

- Uses Java programming language
- Ability to use XPath, JAXB



## .NETCompute

- Invoke general purpose logic in any .NET supported language
- Windows only



## Mapping

- Graphical, easy to use
- Drag and Drop fields, apply functions



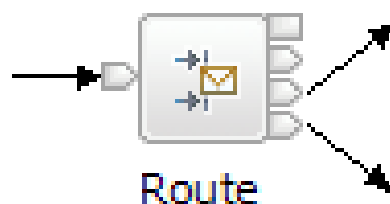
## XSL Transform

- XML to XML Transformation
- Uses standard XSL Stylesheets

# Easily address message elements



```
public class jcn extends MbJavaComputeNode {
    public void evaluate(MbMessageAssembly assembly) throws MbException {
        ...
        String lastName =
            (String)assembly.getMessage().evaluateXPath("/Body/Order/Name/Last");
        ...
    }
}
```



Route Node Properties - Route

Filter table\*

Filter pattern	Routing output terminal
<code>\$Body/Order/Price &gt; 1000</code>	BigSpenders
<code>\$Body/Order/Price &lt; 200</code>	Cheapskates

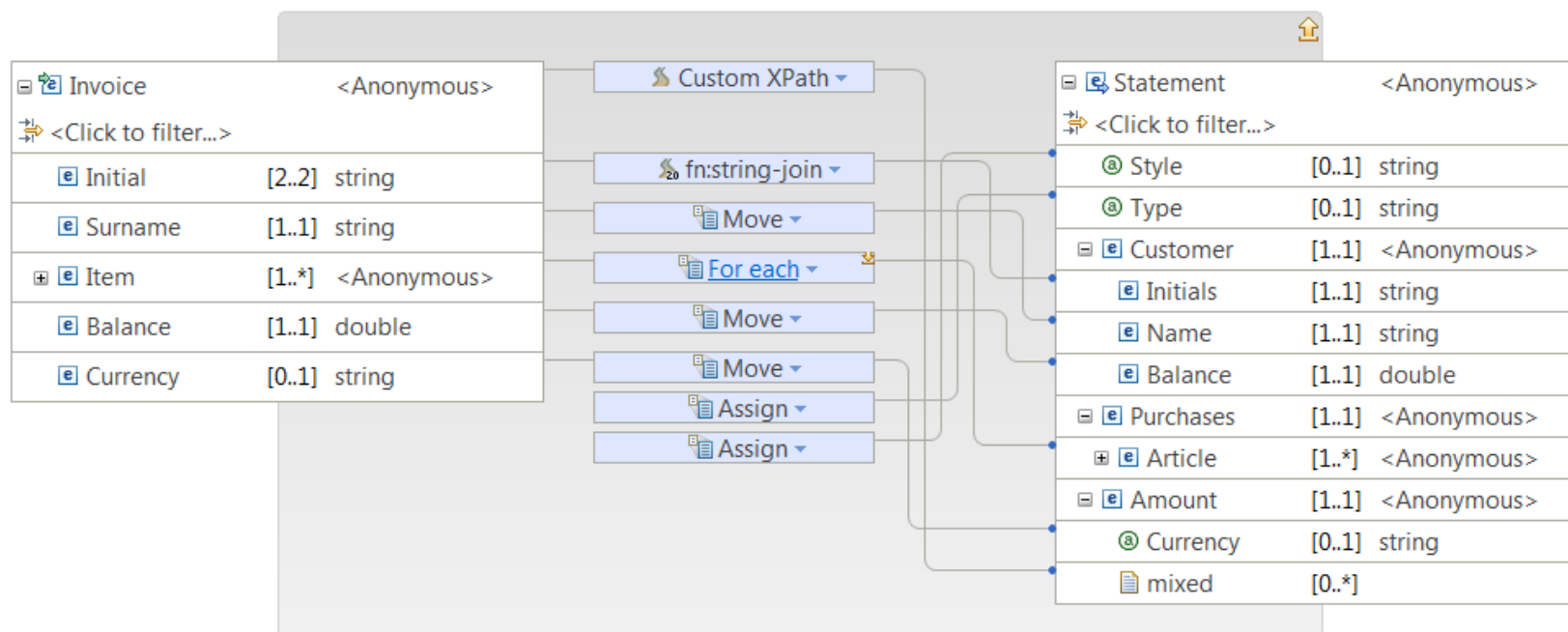


```
IF Body.Order.Date < '2008/01/01' THEN
    INSERT INTO Database.OldOrders (LastName,Item,Quantity)
    VALUES (Body.Order.Name.Last,
            Body.Order.Item,
            Body.Order.Quantity);
ENDIF;
```

# Easily address message elements

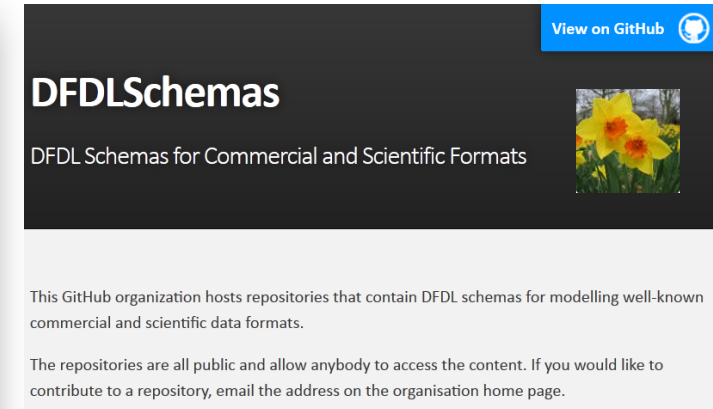
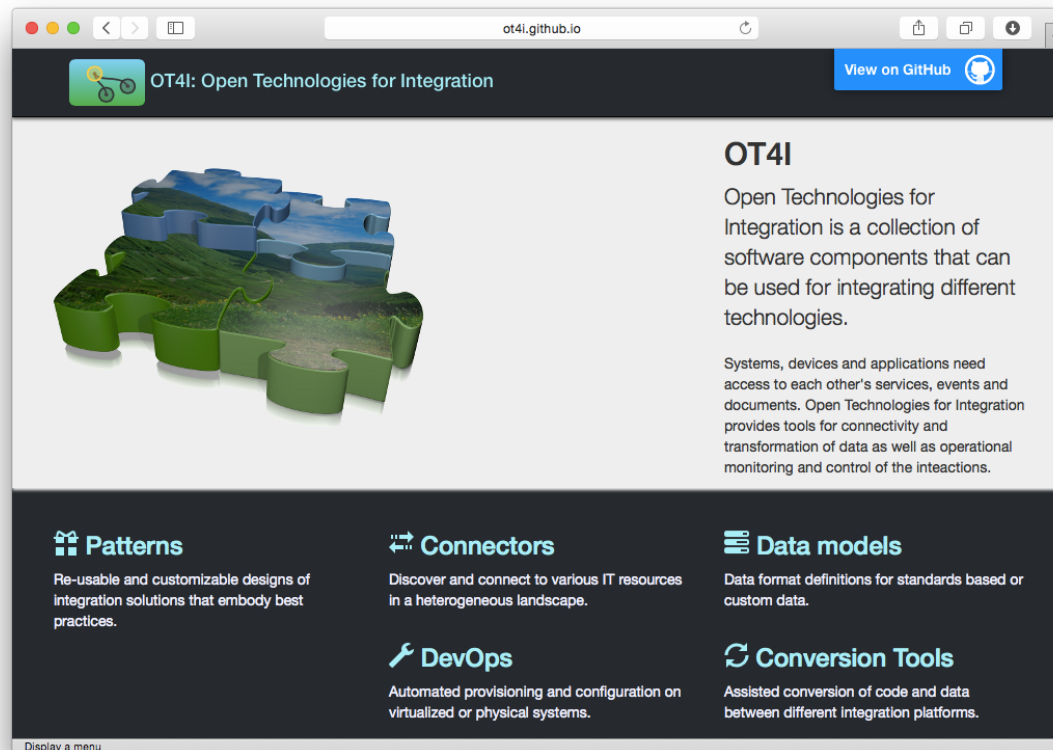


## Mapping



The **Mapping** node allows the message tree to be referenced by creating visual mappings from one field to another..

# IBM and third-party extensions



Many other nodes and features available through product extensions

Write your own User-Defined Nodes or Connectors

Native node framework available in C and Java

OT4i connector framework provides means to implement full lifecycle, including endpoint discovery

# Applications and Libraries

## Integration Services and REST APIs

- Specialized containers to develop, deploy and manage your integration solutions.



- Application
  - Group resources for a specific integration solution



- Library
  - Group common resources for reuse
  - Can be deployed once (shared) or build into an application (static)



- REST API
  - Specialized application - Implement a REST API described by a swagger document.

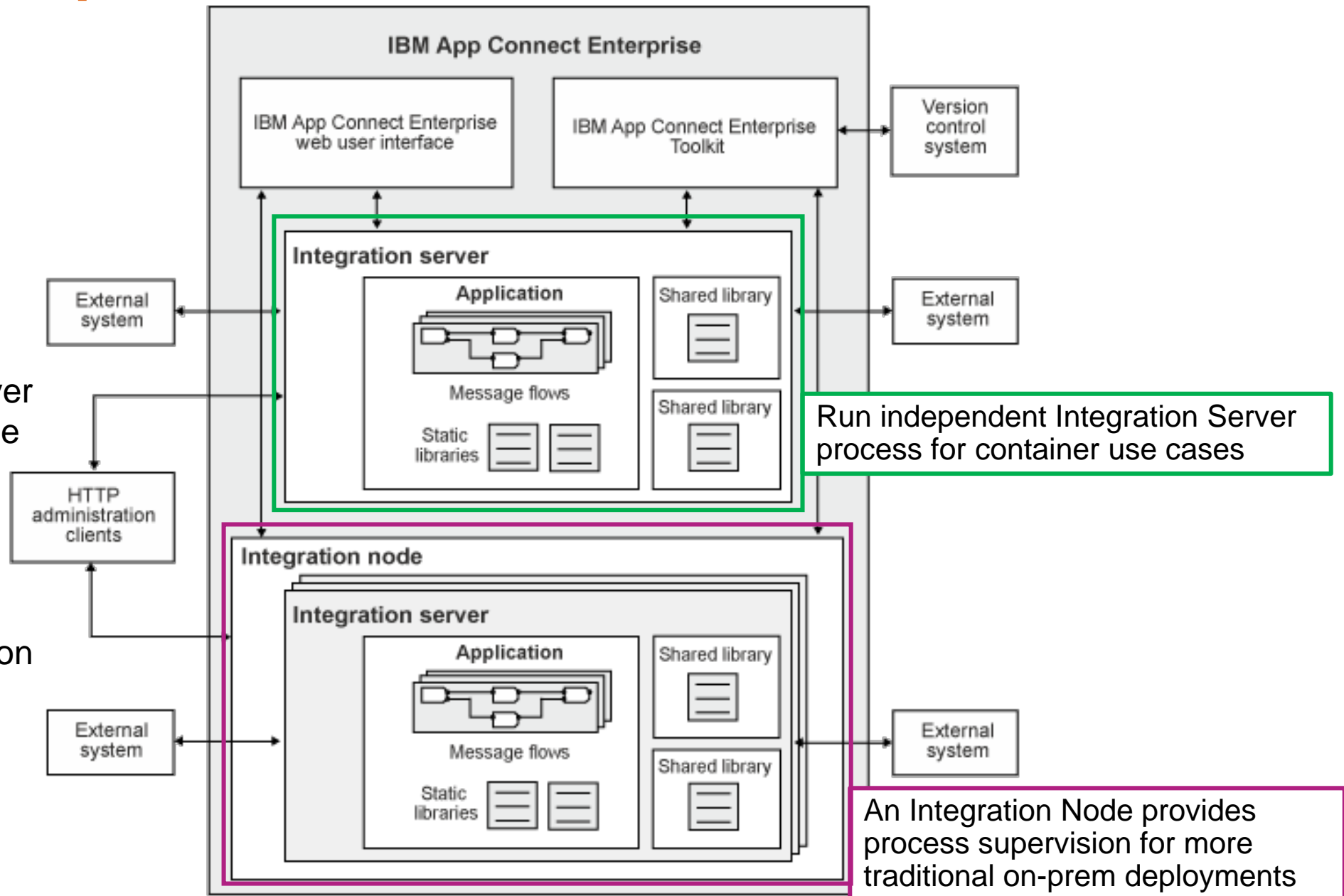


- Integration Service
  - Specialized application – Implement a Web Service described by a WSDL

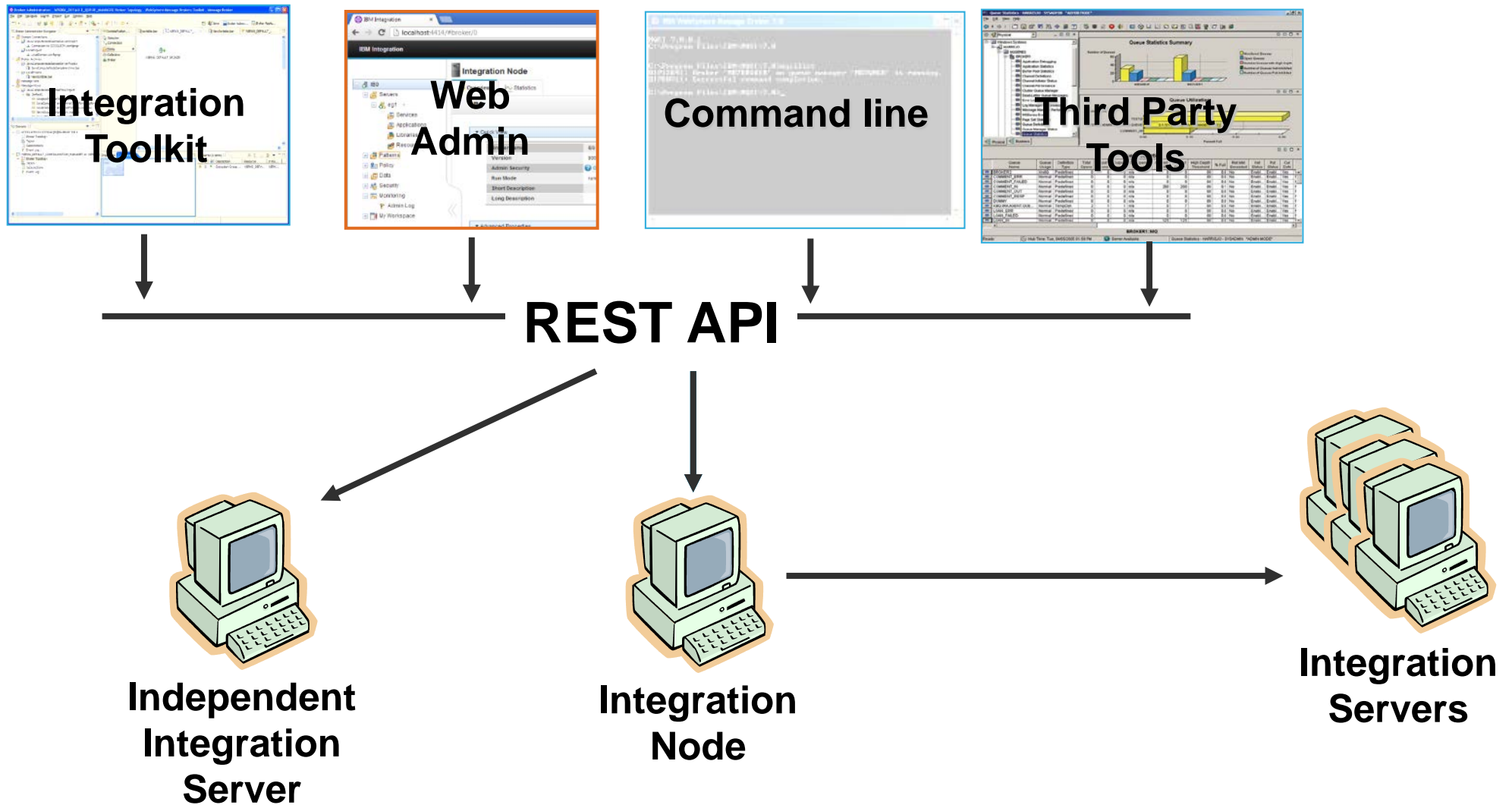


# Runtime Components

- Architected for
  - Performance
  - Scalability
  - Resiliency
- An Integration Server provides the runtime environment for message flows
- 2 main operating modes for Integration Servers
  - Independent
  - Node-owned



# Overview of administration options



# Administration using the Web User Interface

The screenshot displays the IBM App Connect Web User Interface. The main header shows 'IBM App Connect' and the server context 'Server: Default / API: HR\_Service\_ODBC'. The left sidebar contains a search bar and a list of applications: 'BTM\_Trades Application' and 'PING\_Basic Application', both marked as 'Started'. The main content area shows the 'HR\_Service\_ODBC' service configuration. It includes tabs for 'Documentation', 'Contents', and 'Properties'. The 'Contents' tab is active, displaying a list of resources. A search bar is present above the list. The resources are listed in a table with columns 'Name' and 'Type'. The resources include 'getEmployee\_getEmployee.map' (Map), 'getEmployee\_getEmployeeESQL.esql' (ESQL file), 'HR\_Employee\_and\_Department\_Services.json' (JSON file), and 'HRDB'. A 'Deploy a BAR file' dialog box is open in the foreground, prompting the user to 'Select a BAR file to deploy:' and providing a dashed box for file selection. The dialog has 'Cancel' and 'Deploy' buttons.

IBM App Connect

Server: Default / API: HR\_Service\_ODBC

HR\_Service\_ODBC

Documentation Contents Properties

REST API Base URL: [http://myhost.adomain.com:7600 :1/HR\\_Services/resources](http://myhost.adomain.com:7600 :1/HR_Services/resources) OpenAPI docume: <http://myhost.ado>

Search

/departments

getDepartments

createDepartment

DepartmentKey}

getDepartment

updateDepartment

deleteDepartment

Sort by: Name

Type

- ☐ Applications
- ☐ Services
- ☐ REST APIs
- ☐ Shared libraries

State

- ☐ Started
- ☐ Stopped

Other resources

Search

Name	Type
getEmployee_getEmployee.map	Map
getEmployee_getEmployeeESQL.esql	ESQL file
HR_Employee_and_Department_Services.json	JSON file
HRDB	

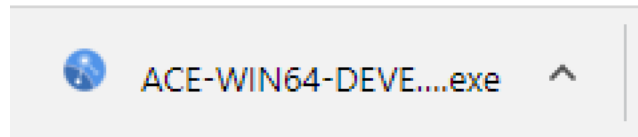
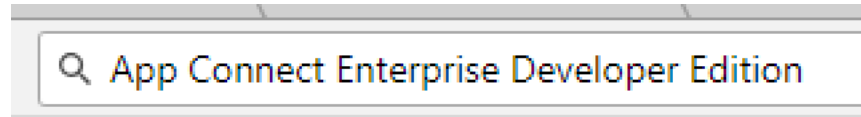
Deploy a BAR file

Select a BAR file to deploy:

Select a BAR file or drag and drop it here

Cancel Deploy

# Getting started



## 1 Download IBM App Connect Enterprise for Developers

⌚ **Duration:** 3-30 minutes, depending on the speed of your internet connection

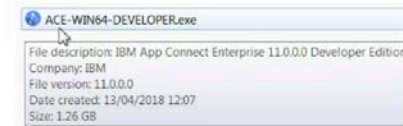
Downloading is straightforward, and only needs you to choose Linux or Windows as your target platform, provide some details about your interest, and agree to the license.

To download now, click [Download](#)

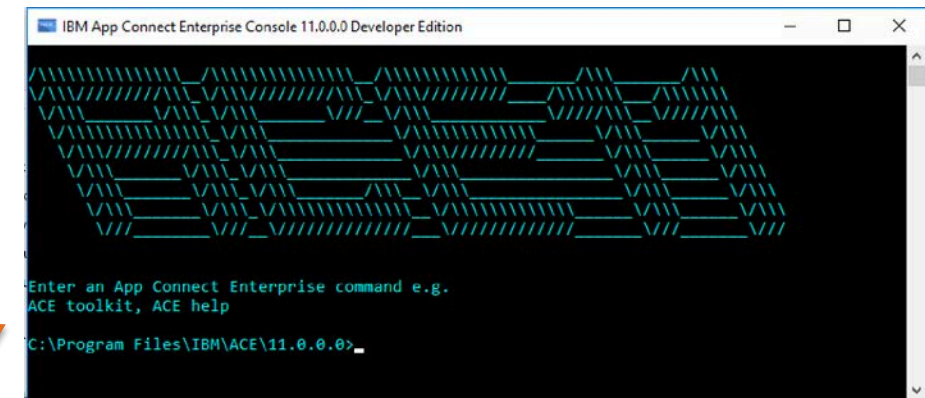
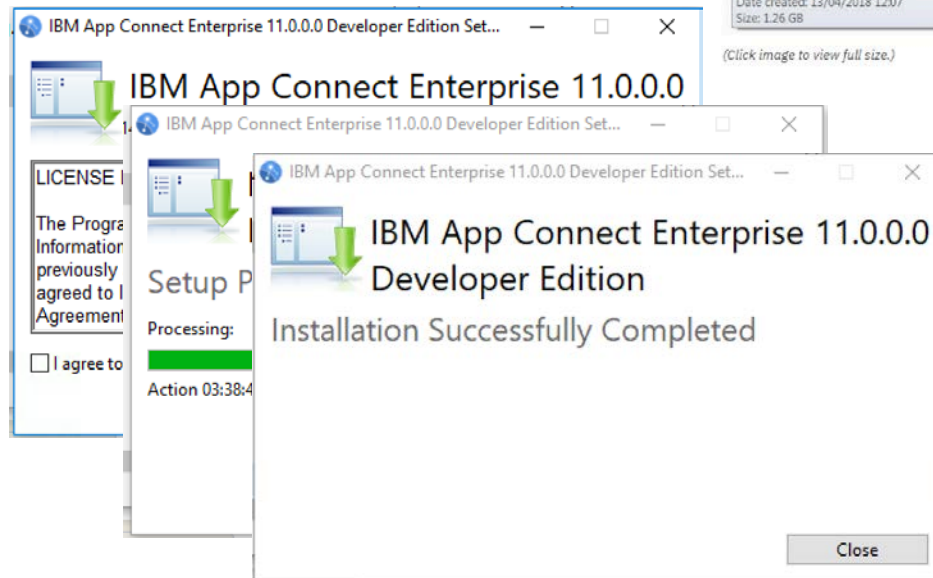
**Tip:** If the download page does not show the options for IBM App Connect Enterprise, such as ACE-WIN64-DEVELOPER.exe, it is probably due to an issue with your browser cache for the page; either opening the page link in a private/incognito window or clearing your browser cache should get you the correct page and options.

Provide the required details, confirm your Privacy selection and acceptance of the license, select the download option that you want (in this example, Windows installable: ACE-WIN64-DEVELOPER.exe 1.26 GB), and then click the Download button.

☐ **Result:** The software is on your computer, and you are ready to install IBM App Connect Enterprise for Developers.



(Click image to view full size.)



# Tutorials Gallery



## Show Me

Here you can explore and learn about IBM Integration Bus using tutorials.

What are you interested in?

### Tool Capabilities

Explore Integration Bus concepts by following simple tutorials

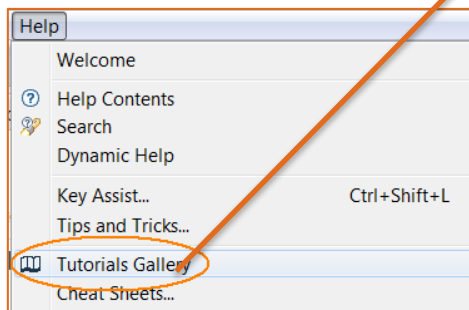
#### Integration services (SOAP/HTTP inputs)

Transformation using a Map in a message flow  
Transformation using ESQL in a message flow  
Transformation using Java in a message flow  
Transformation using Java (JAXB) in a message flow  
Transformation using XSL in a message flow  
Transformation using .NET in a message flow  
Large messaging  
HTTP Input to drive a message flow  
Receiving MQTT messages by subscribing to MQTT topics  
Modeling CSV data by using DEDL

Learn about integration services that use SOAP/HTTP inputs in IBM Integration Bus by exploring this simple example.

[View Details](#)

[Start Tutorial](#)



Transformation using a Map in a message flow

[View Details](#)

[IBM Knowledge Center](#)

Learn how to use a Mapping node to transform data using a Map in an IBM Integration Bus message flow by exploring this simple example.

[Back To Gallery](#)

Create  
Prepare  
Run

Import project

Click **Import** and the **Transformation\_Map** application will be imported into your workspace.

The **Transformation\_Map** message flow will be opened for you.

Find out more

- [Developing integration solutions from scratch](#)

Import



# Summary

- Universal connectivity from anywhere, to anywhere
- Comprehensive protocols, transports, data formats and processing
  - Connect to applications, services, systems and devices
  - Understands the broadest range of data formats
- Simple programming with patterns and graphical data flows
  - Patterns for top-down, parameterized connectivity of common use cases
  - Graphical data flows represent application and service connectivity
- Extensive management, performance and scalability
- IBM App Connect Enterprise fully managed service
  - Sign up for a free trial
- Download and use Developer Edition
  - Fully functional and free (for dev / test)