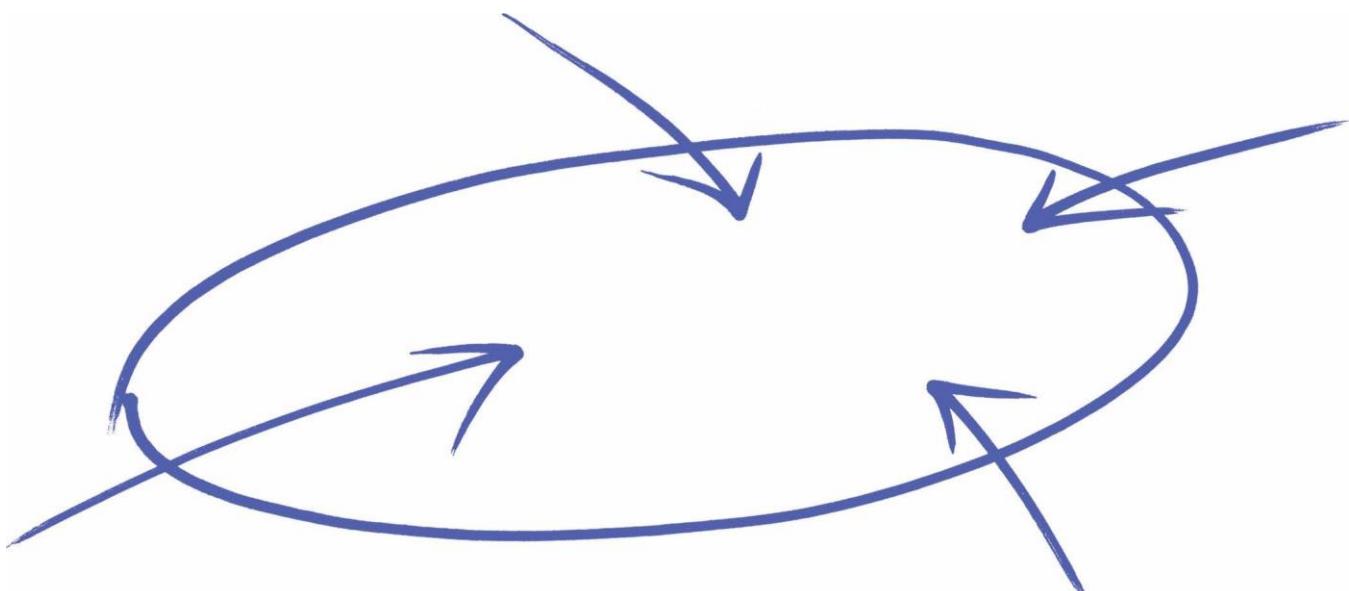




IBM® Sterling B2B Integrator

Sterling B2B Integrator Fundamentals

Course# ODC6105G
Student Guide
Version# 6.2



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May 2024

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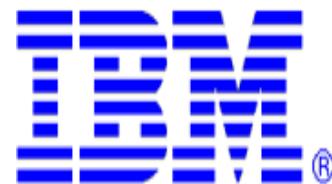
IBM® Sterling B2B Integrator

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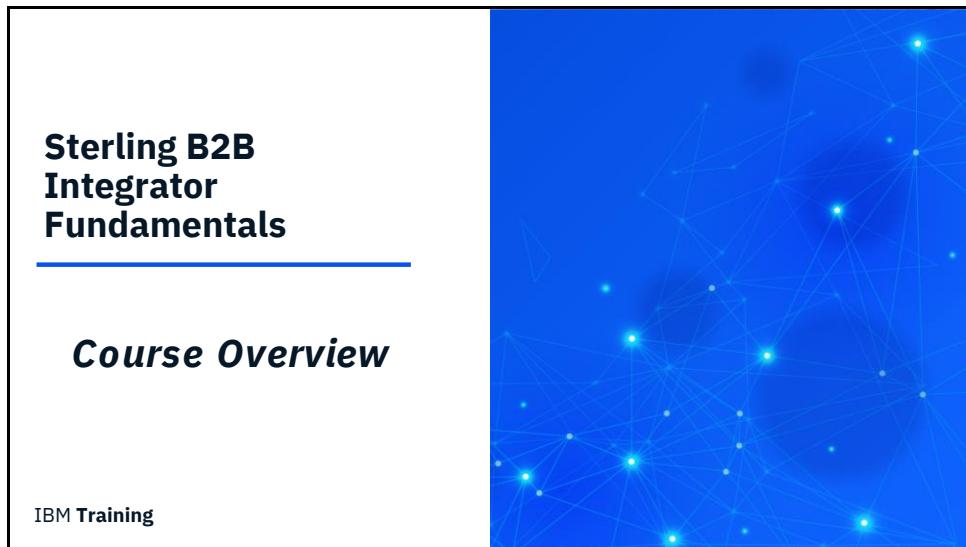
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Course Overview



The slide features a white header section with the title "Sterling B2B Integrator Fundamentals" and a blue footer section with the text "IBM Training". The main content area is titled "Course Overview" and contains a blue background with a network of glowing nodes and connections.

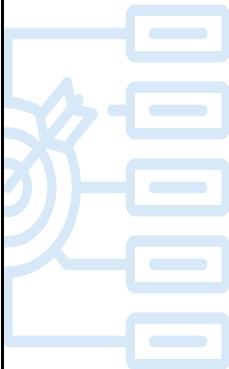
Welcome to the IBM Sterling B2B Integrator Fundamentals course. This course provides an overview and fundamental understanding of how the IBM Sterling B2B Integrator product processes files and data.



The slide features a white header section with a blue icon of a server or database and the text "Introduction". The main content area contains a bulleted list of course topics: Course Objectives, Training Environment, Course Prerequisites, Course Agenda, and References. The slide has a blue footer section with the text "IBM Training © 2022 IBM Corporation" and the number "2".

We will go over a brief introduction to the course, including the learning environment, the agenda for the course, and cover any references that might be needed during the course.

Course Objectives



- Basics of IBM Sterling B2B Integrator
- Execute, track, and troubleshoot a business process
- Create new business processes using the Graphical Process Modeler (GPM)
- Create service configurations and maps to be used by a business process
- Migrating assets from one environment to another

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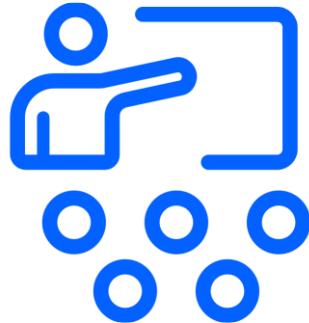
The primary course objectives are:

- to teach the basics of the product (including menus, monitoring health, and how the product works)
- work with business processes (executing, tracking, and troubleshooting)
- creating new business processes (this course focuses on using the GPM, but any Text/XML editor could also be used and advantages/disadvantages of each will be discussed)
- creating assets (such as service configurations and maps) needed for a business process to function as intended
- and other housekeeping items such as migrating assets from one environment to another

Training Environment

- **If on-site:**
 - Location of necessary facilities (bathrooms, lunch rooms, emergency exits, etc.)
- **If instructor-led:**
 - Start time and expected end time
 - Breaks
 - Lunch
 - Meeting Etiquette
 - Meeting Software (if virtual)
- **Lab Environment**
- **Course Documentation**

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If meeting on-site, we'll discuss location of necessary facilities, start time, expected end time for each day of class, breaks and lunch lengths, approximate timing, etiquette including when it is okay to ask questions and how best to get the instructors attention if there are questions.

If meeting virtually, we'll discuss meeting software, virtual meeting etiquette such as staying on mute unless asking/answering a question or relating information pertinent to class, the importance of treating this time as if you are actually in a classroom and to attempt to minimize work/personal distractions.

Lab Environment: Individual SkyTap Virtual Machine Environments:

Linux Server with:

- DB2 Database
- Sterling B2B Integrator
- Server-side directories and exercise files

Windows 10 Client with:

- Web Browser
- PuTTY
- FileZilla
- Email Client
- Client-side folders and exercise files

Course Documentation:

You should have a Student Guide and an Exercise Guide

Note: Make sure you have your lab environment link. Even though everyone has their own lab environment, instructors can get on your environment to assist as needed.

Course Prerequisites

- **Hard prerequisites:**
 - None
- **Good to have prerequisites:**
 - Development experience
 - Experience working with SQL
 - Client/Server Applications
 - Experience navigating through the IBM Sterling B2B Integrator menus
 - Experience working with EDI X12 Documents

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Given this is a fundamentals course, there are no hard prerequisites. However, the following prerequisites are greatly beneficial:

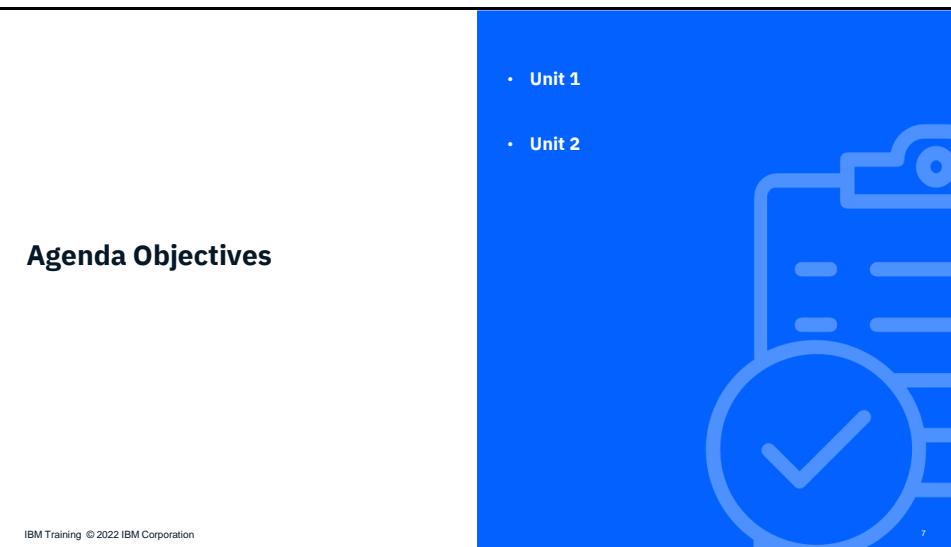
- Development experience (with any programming language) as this course is heavy on business process development
- Experience working with SQL will help with XPath and some exercises
- Client/Server Applications as the product is running on a server and tools such as the GPM act like clients
- Experience in the product (even just navigating the menus) as this will not be the first time seeing the product
- and Experience with EDI X12 Documents as there are exercises working with Inbound EDI Orders

Introduction Summary

- Course Objectives
- Training Environment
- Course Prerequisites

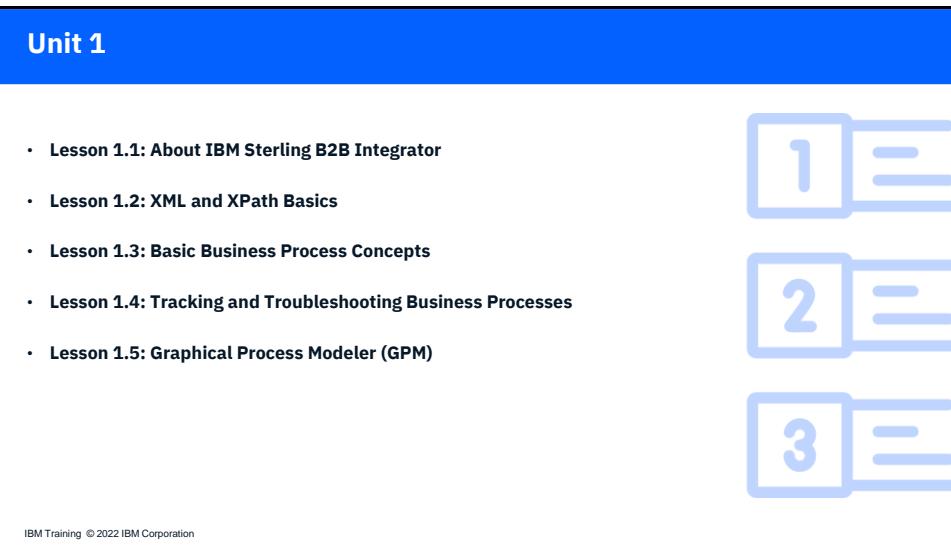
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6



The slide has a white left panel and a blue right panel. In the top right corner of the blue panel, there is a white icon of a clipboard with a checklist and a large checkmark inside a circle. Below the icon, the number '7' is visible. On the left panel, the text 'Agenda Objectives' is centered. On the right panel, there is a bulleted list: '- Unit 1' and '- Unit 2'. At the bottom left of the slide, the text 'IBM Training © 2022 IBM Corporation' is displayed.

The course work is split into two units. The first unit is mostly an overview and introduction to the product along with creating the first business process. The second unit is building business processes to perform specific types of tasks and how the product interacts with its environment.



The slide has a blue header bar with the text 'Unit 1' in white. The main content area is white. On the right side, there are three blue rectangular boxes, each containing a white number (1, 2, or 3) and a small icon of a clipboard with a checklist. On the left side, there is a bulleted list of five lessons: 'Lesson 1.1: About IBM Sterling B2B Integrator', 'Lesson 1.2: XML and XPath Basics', 'Lesson 1.3: Basic Business Process Concepts', 'Lesson 1.4: Tracking and Troubleshooting Business Processes', and 'Lesson 1.5: Graphical Process Modeler (GPM)'. At the bottom left, the text 'IBM Training © 2022 IBM Corporation' is visible.

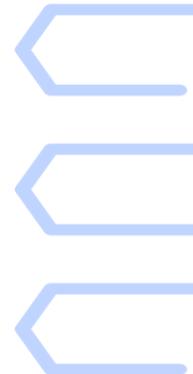
Unit 1 consists of five lessons to review the product:

- An introduction to the IBM Sterling B2B Integrator
- XML and XPath (which are used heavily in the product)
- reading and executing business processes
- tracking and troubleshooting business processes
- and creating the first business process using the GPM

Unit 2

- **Lesson 2.1: Introduction to Service Management**
- **Lesson 2.2: Best Practices**
- **Lesson 2.3: Mapping**
- **Lesson 2.4: Typing Map**
-
- **Lesson 2.6: Tracking System Health**

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Unit 2 consists of six lessons to develop more business processes based on specific tasks needing to be performed:

- An introduction to Service Management
- best practices for business processes in general
- two lessons for maps that business processes use for making decisions
- and a lesson to cover systems health and migrating assets from one environment to another

Agenda Summary

- Unit 1
- Unit 2

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<p>Reference Objectives</p>	<ul style="list-style-type: none">• Online Documentation• Appendices
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11

In this section we will review available online resources along with resources provided in this training class.

<h3>Online Documentation</h3>
<ul style="list-style-type: none">• IBM Sterling B2B Integrator Document on IBM Knowledge Center:<ul style="list-style-type: none">• https://www.ibm.com/docs/en/b2b-integrator/6.1.1• XML Documentation:<ul style="list-style-type: none">• https://www.w3.org/TR/xml/• XPath Documentation:<ul style="list-style-type: none">• https://www.w3.org/TR/1999/REC-xpath-19991116/

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The IBM Knowledge Center has exhaustive documentation on the product. The link is for the version being used in this course but can be updated easily on the site to the version needed.

XML and XPath documentation are for XML Version 1.0 (which is the version used by the product) and include any basic information and standard functions.

The product does have a few additional XPath functions available that are not covered in this course (instructor may discuss them with the class depending on the classes level of XPath experience and provided the instructor is familiar with these functions).

Appendices

- Appendix A: Quiz Answers

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This student guide contains quizzes and Appendix A includes the answers to those quizzes. Answer the quiz first, before reviewing if your answers are correct.

- Online Documentation
- Appendices

Reference Summary

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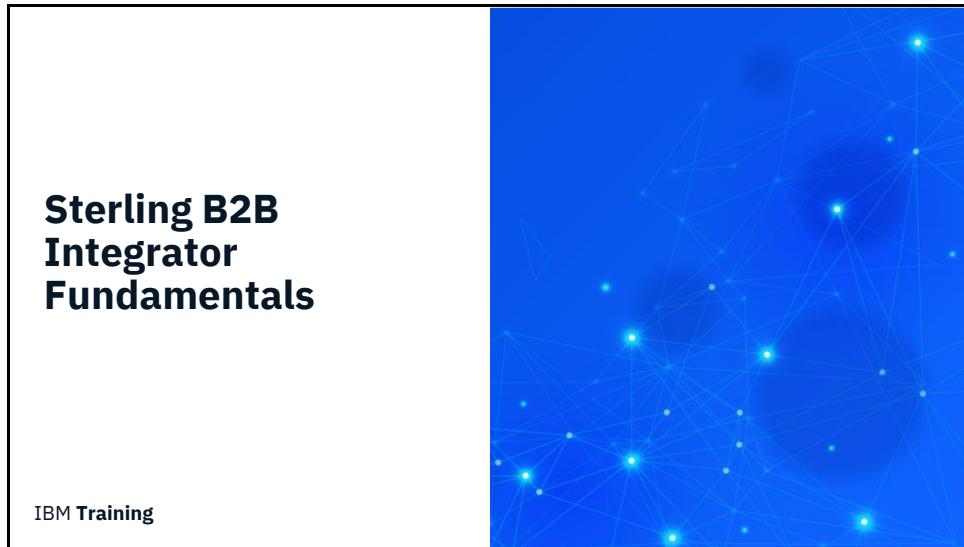


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End of Course Overview. Continue to Unit 1.

Unit 1

1.1 - About Sterling B2B Integrator



Welcome to the IBM Sterling B2B Integrator Fundamentals course. This course provides an overview and fundamental understanding of how the IBM Sterling B2B Integrator product processes files and data.

Unit 1	1.1: About IBM Sterling B2B Integrator 1.2: XML and XPath Basics 1.3: Basic Business Process Concepts 1.4: Tracking and Troubleshooting Business Processes 1.5: Graphical Process Modeler (GPM)
---------------	--

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Unit 1 consists of five lessons to review the product:

- An introduction to IBM Sterling B2B Integrator
- XML and XPath (which are used heavily in the product)
- reading and executing business processes
- tracking and troubleshooting business processes
- and creating the first business process using the GPM

1.1 - About IBM Sterling B2B Integrator

Lesson 1.1: About IBM Sterling B2B Integrator

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Lesson 1.1 Objectives

- Overview of Sterling B2B Integrator
- User Interfaces
- The Administrator Interface
- Components

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Lesson 1-1 will cover:

- a high-level overview of Sterling B2B Integrator (including an exercise to start the product on the Lab Environment)
- a high-level overview of the three user interfaces that will be encountered in this course
- a deeper look at the Admin Console (the other user interfaces will have deeper looks later in the course)
- and an overview of other products that can be integrated into this product

Overview of Sterling B2B Integrator

- **What is IBM Sterling B2B Integrator**
 - Any-to-any integration layer
 - Java-based
 - XML-based
- **Typical Business Process Problems**
 - Slow response time
 - Reliance on manual processing
 - Inability to adopt new standards
 - Limited ability to expand system capacity as business grows

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Sterling B2B Integrator is the next generation end-to-end enterprise integration server for dynamic real-time and near-real time business collaboration and commerce automation. It is a business process-centric transaction engine for modeling and managing processes. It handles complex routing, translation, flexible integration, and real-time interaction with multiple internal systems and external trading partners.

The any-to-any integration layer aspect of the product allows for any type of file to be introduced into the system using any protocol, translated into any other file format, and routed to any destination using any protocol.

The product runs on Java, allowing it to be easily installed on multiple different operating systems so that the company does not have to invest in operating systems and expertise it currently does not utilize.

The product uses the flexibility of XML to script business processes as well as provide a working storage area for those processes that is rich and flexible to the needs of the company.

Reliance on manual processing or other canned software packages can limit the company's ability to respond in a timely manner to its customers and trading partners and do so in a way the other party prefers. They can also limit the ability to quickly increase capacity as needs of the company change.

Overview of Sterling B2B Integrator (continued)

- **Benefits of IBM Sterling B2B Integrator**

- Simplified management
- Consistent and flexible deployments
- Ability to implement complex processes

- **Typical Business Goals**

- Reduce costs
- Increase efficiency
- Increase customer satisfaction
- Increase revenue
- Retain or increase competitive position
- Improve responsiveness

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The benefits of using the product can simplify partner management by allowing for consistent, yet flexible options for interfaces ranging from simply transferring files as is to the most complex need the business might have for translating and routing documents.

The product has many ways it can help reduce costs, increase efficiency, increase customer satisfaction, increase revenue, retain or increase competitive position, and improve responsiveness.

Overview of Sterling B2B Integrator (continued)

- **Where can IBM Sterling B2B Integrator be installed**

- Windows, Linux/UNIX, and AIX are the most common Operating Systems
- Server can be Physical, Virtual, Docker, or Cloud (Public or Private)

- **Assets needed to install IBM Sterling B2B Integrator**

- Database (SQL Server, Oracle, and DB2 are the most common databases)
- Database JDBC Driver
- IBM Sterling B2B Integrator Installation File
- IBM SDK (Java)
- JCE Policy File
- Mail Server and Email Address for alerts
- Passphrase (Needs to be kept in a safe place as it is needed for patches, hot fixes, and inline upgrades)
- CPU and Memory to allocate

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This list of assets needed can be used as a short checklist before installation to ensure everything is ready for the installation process before it begins.

Overview of Sterling B2B Integrator (continued)

- **IBM Sterling B2B Integrator installation process**
 - Unzip installation file
 - Unzip IBM Installation Manager (if using) and install
 - Point the IBM Installation Manager to the B2Bi Repository
 - Select Install option and select the IBM Sterling B2B Integrator product
 - Specify an installation directory and base port
 - Specify the SDK, Mail Server, Passphrase, JCE Policy File
 - Specify the database connection information, the JDBC driver, and test the connection
 - Specify the CPU and Memory allocation
- More specific installation instructions can be found on the IBM Document online:
<https://www.ibm.com/docs/en/b2b-integrator/6.1.1?topic=integrator-general-installation-upgrade-information>

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These steps are general in nature and the order of the steps will vary depending on the installation method and operating system.

User Interfaces

- Administrative Interface (Admin Console)
- Graphical Process Modeler (GPM)
- Map Editor
- Mailbox Browser Interface (MBI)
- Queue Watcher
- API's and Customized UI



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The first three user interfaces will be used during this course. The Admin Console will be discussed in some detail next. The GPM will be introduced in detail in Lesson 1 -5. The map editor will be introduced in detail in Lesson 2-3. We will also take a look at the Mailbox Browser Interface, Queue Watcher, and APIs and Customized UI.

The Administrator Interface

- Exercise 1.1: Starting IBM Sterling B2B Integrator



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Please complete Exercise 1 Activity 1 in the Exercise Guide before proceeding. This will start the IBM Sterling B2B Integrator application on the server so that the menus can be explored as they are discussed further.

The Administrator Interface (continued)

- Business Process:** Menu for working with business processes
- Trading Partner:** Menu for working with trading partners
- Deployment:** Menu for working with other assets
- Operations:** Menu for working with the application



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The top-level menus above will be discussed in further detail for the menu options used in this course. Other top-level menus are for specific protocols, topics not covered in this course, or customized menus.

The Administrator Interface (continued)

- **Business Process Menu**
 - Manager: Menu for working with business process definitions
 - Monitor
 - Advanced Search
 - Business Processes: Menu for searching workflow instances by number
 - Central Search: Menu for searching workflow instances by name
 - Current Processes: menu for viewing recent workflow instances



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The Business Process Manager screen provides the options that you need to create and locate business process definitions. This screen is used to run the Graphical Process Modeler, create new process definitions, and search or list process definitions.

Manager is for maintaining business process definitions and will be used throughout the course.

The Advanced Business Process Search screen provides you the ability to location process instances that were executed on Sterling B2B Integrator using the Location (live or restore tables), Business Process ID, Business Process List (regular and system), State, Status, and Date Range.

The Central Search screen provides you the ability to locate process instances that were executed on Sterling B2B Integrator using the Business Process Name, Status, and Date Range.

The Current Processes screen provides a summary of non-system process instances that were executed in Sterling B2B Integrator. From this screen you can review detailed processing information, view business process definitions, and obtain document information.

Advanced business Process Search, Central Search, and Current Processes will be covered in Lesson 1-4.

Other menu options are not covered in this course.

The Administrator Interface (continued)

- **Trading Partner Menu**
 - Code Lists: menu for maintaining lists within IBM Sterling B2B Integrator



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Code Lists will be used in Lesson 2-1. Other menu options are not covered in this course.

The Administrator Interface (continued)

- **Deployment Menu**
 - Services
 - Configuration: Menu for maintaining services and adapters
 - Maps: Menu for installing and maintaining maps
 - Standards: Menu for installing EDI Standards for the map editor
 - Resource Manager
 - Resource Tags: Menu for preselecting assets to migrate
 - Import/Export: Menu for migrating assets



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The Services Configuration screen provides you the ability to view, create, edit, and delete service and adapter instances. Service Configuration will be used starting in Lesson 2-1.

The Maps screen provides you a place to install the map editor, check in/out maps, and find maps.

The Standards screen provides you the ability download and install standards databases for use in creating the input or output side of a map based on those standards. Maps and Standards will be used starting in Lesson 2-3.

The Resource Tags screen provides you the ability group assets for migration between systems. Resource Manager menu options will be reviewed in Lesson 2-6.

The Import/Export screen provides you the ability to migrate assets from one environment to another. Other menu options are not covered in this course.

The Administrator Interface (continued)

- Operations Menu
- System
 - Troubleshooter



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Troubleshooting will be reviewed in Lesson 1-4. Other menu options are not covered in this course.

Other Interfaces

- **Graphical Process Modeler (GPM)**
 - Used heavily in this course beginning in Lesson 1-5
- **Map Editor**
 - Used in Lessons 2-3 and 2-4 of this course
 - Mapping courses using X12 or EDIFACT also available
- **Mailbox Browser Interface (MBI)**
 - Used for searching, uploading, and downloading mailbox messages
- **Queue Watcher**
 - Used to monitor system health, adjust tuning real-time temporarily, view properties



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Unless specified above, the interface will not be covered in this course.

Other Interfaces (continued)

- **B2Bi API's**
 - Used to maintaining B2Bi assets from external applications, such as (but not limited to):
 - Setting up new trading partners
 - Setting up user accounts
 - Setting up mailboxes
- **Customized UI**
 - All internal and external facing web applications can be:
 - Branded with company logos
 - Use the company colors
 - Custom UI's can be built and placed on the Admin Console menu

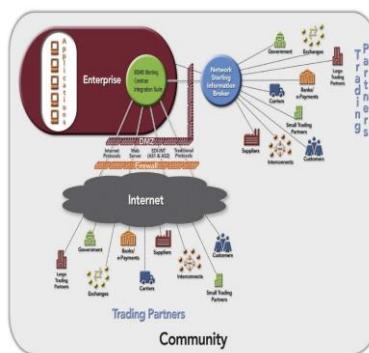


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These interfaces are not covered in this course.

Components

- Where IBM Sterling B2B Integrator fits into the overall company



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Components (continued)

- Other products that integrate with IBM Sterling B2B Integrator:
 - Global Mailbox
 - Partner Engagement Management (PEM)
 - ITX Advanced (Standards Processing Engine)
 - Control Center
 - Secure Proxy
 - Advanced Communications

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Global Mailbox - Provides high availability mailboxing of files across multiple Sterling B2B Integrator environments (often used for disaster recovery capabilities).

Partner Engagement Management (PEM) - A multi-enterprise B2B engagement portal that enables collaboration, interaction, monitoring, and visibility of activity flows between sponsor organizations and their partners, customers, and suppliers.

ITX Advanced (Standards Processing Engine) - External translation engine for WebSphere® Transformation Extender, Sterling B2B Integrator, and XSLT translation maps.

Control Center - Centralized monitoring across multiple IBM Sterling products.

Secure Proxy - Application proxy for a high level of data protection and routing of connections.

IBM Advanced Communications - Provides secure, optimized, and dynamic end-to-end information flows and visibility, managing trading partners, and support for both AS2 and AS4 protocols.

These components are not covered in this course.

Lesson 1.1 Quiz (continued)

1. What protocols can Sterling B2B Integrator use for sending/receiving files?

- a. HTTP
- b. FTP
- c. Message Queues
- d. All of the above (and more)

2. What file formats can Sterling B2B Integrator convert files to/from?

- a. EDI (i.e. X12, EDIFACT, etc.)
- b. CSV
- c. Positional
- d. All of the above (and more)

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.1 Quiz (continued)

3. What User Interface is used for developing Business Processes?

- a. Admin Console
- b. Graphical Process Modeler
- c. Map Editor

4. What function does Sterling B2B Integrator serve for a company?

- a. Storing business logic for making business critical decisions
- b. Routing and visibility of documents flowing into and out of the company
- c. An hub for incoming and outgoing information between the company and its partners
- d. Only b and c
- e. Only a and b
- f. All of a, b, and c

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.1 Summary

- Overview of Sterling B2B Integrator
- User Interfaces
- The Administrator Interface
- Components

1.2 - XML and XPath Basics

Lesson 1.2: XML and XPath Basics

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Lesson 1.2 Objectives

- XML Basics
- XPath Basics

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This lesson will review XML files and XPath functionality that is used to parse data out of XML files. Both concepts are used heavily in business processes.

XML Basics

- **Contents of an XML File:**

- Prolog: XML Version and other directives for the entire file
- Comment: Used to omit (without removing) XML content or informational messages
- Element: Contains attributes, text, and/or other elements (can nest as deeply as needed)
- Attribute: Piece of data on the open tag of an element (uniquely named within element)

- **Element and Attribute name rules:**

- Starts with a letter or underscore
- Case sensitive
- No spaces, but can contain numbers (just not starting with a number)

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XML Files can include instructions and additional information before the actual contents of the XML File. There's no set XML format, but an XML file can be validated with an XSD (not covered in this course).

Comments are not considered part of the document content. They are used to omit XML content without removing it from the file or to provide informational messages.

Elements are case-sensitive, potentially repeating, identifier within an XML file containing content (other elements or data). The name cannot contain spaces and must start with a letter or underscore. Elements consist of an open tag, content, and a closing tag (which can be implied if there is no content).

Attributes are case-sensitive, nonrepeating, identifier on an element's open tag used to store data.

XML Basics (continued)

- **Well-Formed XML Files:**

- A single root node (element)
- Every open tag for an element has a close tag (real or implied)
- Escape characters used or CDATA used for embedding special characters
- Can be validated using a schema definition (DTD or XSD)

- **Escape characters:**

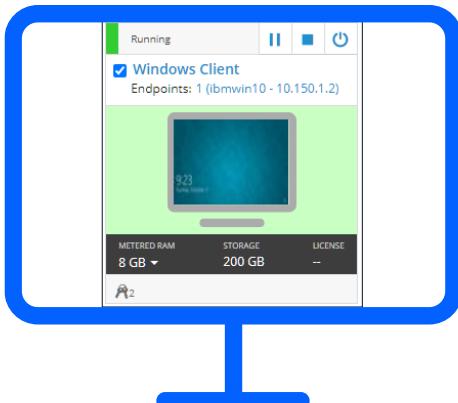
- < <
- > >
- ' ‘
- " “
- & &

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XML files used within the product must be well-formed.

XML Basics (continued)

Exercise 2.1: Reviewing an XML File



Please complete Unit 1's Exercise 2 Activity 1 in the Exercise Guide before proceeding. This will showcase several well-formed XML files.

XPath Basics

- UNIX-style directory notation
- Square brackets for filtering at any level
- Functions for acting on the results of an XPath

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XPath pulls data from an XML File similar to how SQL pulls data from a database. The syntax is different as mentioned in this slide, but the concept is similar.

XPath Basics (continued)

- **UNIX-style directory notation**
 - /root/row/name returns all “name” elements on all “row” elements on the “root” element
 - //name returns all “name” elements anywhere in the XML file
 - row/name returns all “name” elements on all “row” elements under the current context
 - /root/*/name returns all “name” elements on all elements on the “root” element

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The UNIX-style directory provides the path to the data within the XML file. It can be absolute, searchable, or relative as shown on this slide.

It can also include a wildcard as shown on this slide, but it must be an asterisk (*) for any or an exact, case-sensitive name. For example, /root/r*/name would not work as “r*” is not a valid expression.

XPath Basics (continued)

- **Square brackets for filtering at any level**
 - /root/row[1]/name returns all “name” elements on the first “row” element under “root”
 - //name[2] return the second “name” element within the entire XML file
 - /root/row[name/text() = ‘Adam’] returns all “row” elements containing a child “name” element with a text value of “Adam” under “root”
 - /root/row[name/text() = ‘Adam’ and @id = ‘3’] returns all “row” elements containing an “id” attribute with a value of “3” and a child “name” element with a text value of “Adam” under “root”

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Instead of “where” clauses in a SQL statement, XPath uses square brackets to filter the results. A numeric square bracket indicates the position within a set of results to return while a Boolean square bracket works like a “where” clause. Square brackets can be at any level of the XPath Expression and an XPath Expression can have as many square brackets as needed.

XPath Basics (continued)

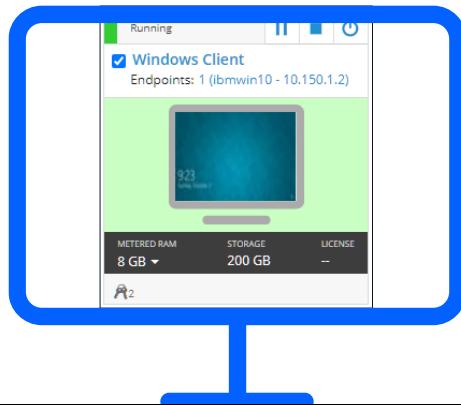
- **Functions for acting on the results of an XPath**
 - sum(/root/row/pay) returns the summation of all “pay” elements on all “row” elements on the “root” element
 - starts-with(/root/row[1]/name[1]/text(), “Adam”) returns a true value if the first “name” element on the first “row” element under “root” starts with “Adam” and returns false otherwise
 - substring(/root/row[1]/name[1]/text(), 1, 4) returns the first four characters of the first “name” element on the first “row” element under “root”

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Functions can return any data type, including a node set. Functions can be nested. Functions can take a single value or a set of data as the input(s).

XPath Basics (continued)

Exercise 2.2: Testing XPath in Visualizer



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Please complete Unit 1’s Exercise 2 Activity 2 in the Exercise Guide before proceeding. This will showcase several XPath functions.

Lesson 1.2 Quiz

- 1. “/ProcessData/Order/OrderNumber” is an example of:**
 - a. An absolute path
 - b. A relative path

- 2. In XPath, “/text()” and “string” perform the same function.**
 - a. True
 - b. False

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.2 Quiz (continued)

- 3. Which of the following is an example of an indexed search using XPath?**
 - a. /ProcessData/Order/item/text()
 - b. /ProcessData/Order/item[3]/price
 - c. /ProcessData/Order/*
 - d. /ProcessData/Order/item

- 4. Which reserved character is used to denote an attribute in XPath searches?**
 - a. *
 - b. \$
 - c. @
 - d. &

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.2 Summary

• XML Basics

• XPath Basics

1.3 - Basic Business Process Concepts

Lesson 1.3: Basic Business Process Concepts

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- What is BPML
- BPML Activities
- Executing BPML

Lesson 1.3 Objectives

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This lesson will cover the structure of BPML files, what activities they support, and how to manually execute BPML code within the product.

What is BPML

- BPML: Business Process Modeling Language
- XML-based Script
- XML Working Space (ProcessData)
- Handle any document format (PrimaryDocument is the default)

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BPML is a validated XML file used like a script to instruct the product of the activities to be performed.

The working space (to store and retrieve run-time values similar to variables or objects in other languages) is also XML, allowing for a rich storage space of data while processing documents. This working space is referred to as ProcessData (as that is the root tag of the working space).

Documents can be in any format. Pointers to the documents are stored in ProcessData. The PrimaryDocument node directly under ProcessData is the default document acted upon or created by activities using, updating, or creating a document.

What is BPML (continued)

- Most activities performed within BPML consist of calling a service or adapter
- Services do work within the JVM (i.e. placing contents of a file into ProcessData)
- Adapters do work outside the JVM (i.e. connecting to a Trading Partner via FTP)
- Other activities in the BPML are for decision making, error handling, etc.
- Activities, Services, and Adapters are placed into the BPML sequentially like a script
- Information passed from the BPML to the Service/Adapter is also XML formatted

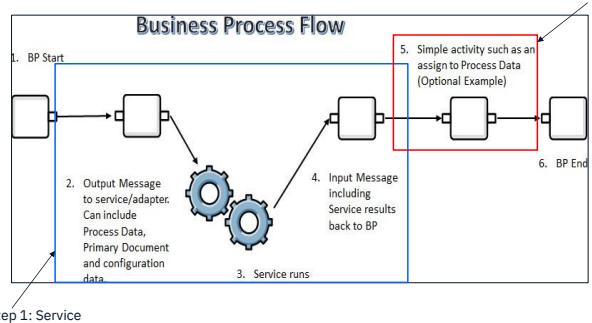
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Decisions, error handling, and other activities (such as assigning values to ProcessData and loop) within the BPML utilize the values in ProcessData via XPath Expressions to make decisions. Services and Adapters can be used to put information into ProcessData that the BPML can use as needed.

Messages passed between the BPML and the Service/Adapter is XML so that parameters and results will already be formatted similar to ProcessData. XPath Expressions are used to move values to/from ProcessData and the Service/Adapter.

What is BPML (continued)

- BPML with two steps might flow similar to:



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This image shows a business process starting, calling a service/adapter (BPML specifies an Output Message sent to the Service, the Service executes and returns the Input Message back to the BPML which is placed into ProcessData by default), performing a simple assign activity (discussed shortly), and the process ending.

BPML Activities

- **Types of Activities:**

- Simple: Perform a single action
- Complex: Perform an ordered set of simple or complex activities
- Process: Rules, Error Handling, etc.

- **Simple Activities:**

- Assign: Update ProcessData with a constant or XPath Expression result
- Produce, Consume, Spawn, Join: Older method for calling child processes
- Repeat: Used within a Choice Activity (listed under complex activities) for looping
- Operation: Call a Server or Adapter

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Most activities will be seen in Lesson 1-5 unless otherwise specified.

Repeat will be in Lesson 2-1, Exercise 8.

Produce, Consume, Spawn, and Join will not be covered in any exercises. Lesson 2-1, Exercise 5 shows the new method to call child processes.

BPML Activities (continued)

- **Complex Activities:**

- Sequence: Named or unnamed group of simple or complex activities
- Choice: Perform zero or one named sequence based on the result of one or more rules
- All: Perform all sequences at the same time (multithreading)

- **Process Activities:**

- Rule: Defines a boolean XPath Expression that can be used in multiple Choice Activities
- OnFault: Used to handle specific or generic errors for a sequence

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All will be in Lesson 2-1, Exercise 8.

OnFault will be in Lesson 2-1, Exercise 3.

BPML Activities (continued)

- **BPML Structure:**

```
<process name="...">
  <rule name="...">*
    <activity (simple or complex)>
  </process>
```

- **Rules and Choices:**

- A named Rule can be used up to twice in a single Choice
- A named Rule can be used in multiple Choices
- A named Rule has a condition node that specifies a boolean XPath Expression
- Rules in a Choice can be tested for a true or false result
- Rules are processed in the order listed in the Choice
- First Rule that matches the expected result “wins” (that named sequence is executed)

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The root node must be “process” with one or more “rule” nodes followed by one and only one activity (usually a sequence).

If no rules on a choice match the expected result, all sequences in the choice are skipped.

BPML Activities (continued)

- **Operation Activities:**

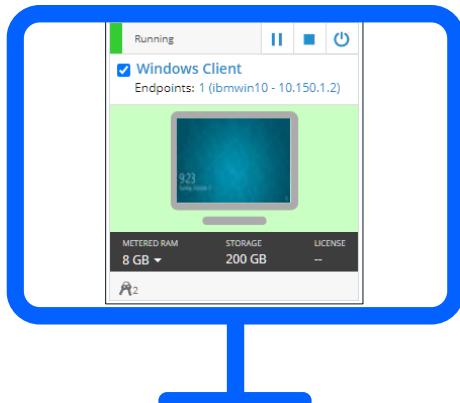
- Contains three child nodes:
 - participant: Name of Service/Adapter to call
 - output: Parameters passed from the BPML to the Service/Adapter
 - input: Results passed from the Service/Adapter to the BPML
- Output/Input nodes are named BPML-centric and contain zero or more assign activities
- Parameters can be configured for specific instances of the Service/Adapter

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Lesson 2-1, Exercise 1 will demonstrate setting up a new File System Adapter and demonstrate how parameters configured on the instance are utilized without needing to be passed by the BPML to the Service/Adapter.

BPML Activities (continued)

Exercise 3.1: Viewing BPML Code in the Admin Console



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Please complete Unit 1 Exercise 3 Activity 1 in the Exercise Guide before proceeding. This will demonstrate how to view BPML code within the Admin Console.

Executing BPML

- **Admin Console > Business Process > Manager**
 - Start the Graphical Process Modeler
 - Check In New Business Process
 - Search for BPML by Name
- **Searching for BPML (partial name or alphabetically)**
 - Source Manager
 - Execution Manager

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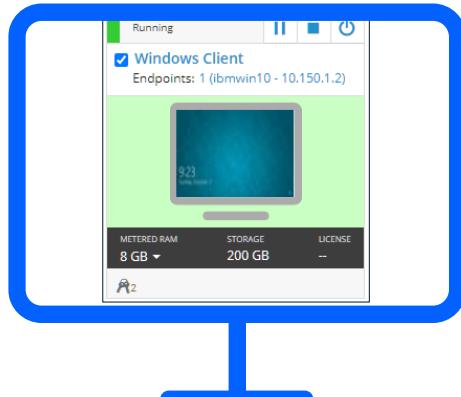
Starting the GPM and checking in new BPML code will be covered in Lesson 1-5.

Source Manager allows for checking out/checking in/editing/deleting existing BPML. This will also be covered in more detail in Lesson 1-5.

Execution Manager allows for updating the default version (version called by the scheduler, adapters, or other business processes), enabling/disabling selected versions, and for executing any enabled version of the business process manually.

Executing BPML (continued)

Exercise 3.2: Executing BPML Code



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Please complete Unit 1 Exercise 3 Activity 2 in the Exercise Guide before proceeding. This will demonstrate how to execute BPML code within the Admin Console which will be used extensively throughout the remainder of this course.

Lesson 1.3 Quiz

1. How many branches with a Choice can be executed as a result of a case statement?

- a. Zero
- b. One
- c. Every branch whose rule evaluates true or false as expected
- d. Only a and b
- e. Depends on the options specified on the Choice

2. Service and Adapters are used to exchange messages between business processes.

- a. True
- b. False



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.3 Quiz (continued)

3. The All activity does not complete until all branches are complete.

- a. True
- b. False

4. Select all elements available in Operations of Services/Adapters.

- a. Output
- b. Participant
- c. Input
- d. Message To Service
- e. Message From Service



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.3 Summary

- What is BPML
- BPML Activities
- Executing BPML

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1.4 - Tracking and Troubleshooting Business Processes

Lesson 1.4: Tracking and Troubleshooting Business Processes

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Lesson 1.4 Objectives

- Current Processes
- Central Search
- Advanced Search
- Troubleshooter

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This lesson will cover the various pages accessible on the Admin Console to track and troubleshoot executed business processes. Restarting, resuming, and terminating business processes will be covered here also.

Current Processes

- **Admin Console > Business Process > Monitor > Current Processes**
 - General processing information of the most recent X number of non-system processes
- **Business Process Instance Status**
 - Green Traffic Light: No errors
 - Red Traffic Light: Encountered Errors, see State for more information
- **Business Process Instance State**
 - Active, Queued, Waiting, Waiting on IO: Not finished (actively running or waiting)
 - Completed (with or without errors encountered): Finished and handled any errors
 - Halting/Halted: Not finished, but will not continue without intervention
 - Interrupted (Manual or Auto): Not finished, but might not continue without intervention
 - Terminated: Manually marked as no longer executing

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Current Processes works well in a low-traffic environment like a training class and possibly a non-production environment. However, high-traffic environment will usually update too quickly to find a process recently started manually.

Number of processes to return is controlled under Accounts > My Account.

Current Processes (continued)

- **General Processing Information Columns**
 - Status (Traffic Light Icon)
 - ID (Link to Detail Processing Information)
 - Name (Link to view BPML)
 - State
 - Started
 - Ended
 - Deadline
 - Parent/Child
 - Expires

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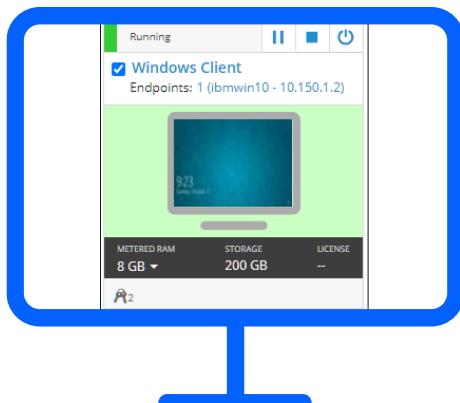
Deadline will show if the process had a specific amount of time to complete before being automatically stopped.

Parent/Child will have an up arrow if the process was invoked by another process, a down arrow if this process invoked one or more other processes, both if this process is a parent and a child, or empty if neither a parent nor a child.

Expires will only have an information link if the instance has been indexed. An instance can only be indexed if it's in a Completed or Terminated state.

Current Processes (continued)

Exercise 4.1: View General Processing Information



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Please complete Unit 1 Exercise 4 Activity 1 in the Exercise Guide before proceeding. This will demonstrate how to view general processing information within the Admin Console which will be used extensively throughout the remainder of this course.

Current Processes (continued)

- **Detail Processing Information includes this information not on General Information**
 - User, Contract ID, and Action
- **Detail Processing Information Columns (for each persisted step)**
 - Step
 - Service
 - Status (Text instead of Traffic Light Icon)
 - Advanced Status (Additional information provided by error or by service)
 - Started
 - Ended
 - Status Report (Text report provided by service)
 - Document (One or more documents linked to Instance Data)
 - Instance Data (ProcessData, Message To Service, Message From Service)

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What steps are persisted and how much supporting information (Status Reports, Documents, and Instance Data) is determined when checking in the business process and will be covered in Lesson 1-5.

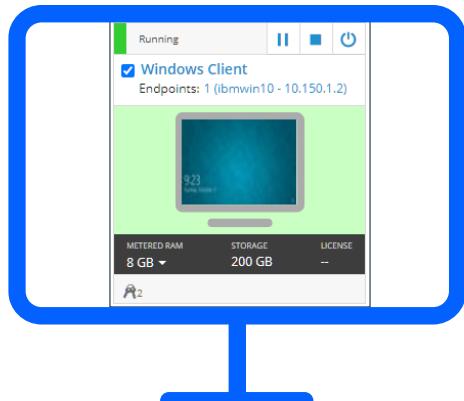
Advanced Status can be used for trapping specific errors as covered in Lesson 2-1.

Instance Data shows the value of ProcessData at the end of the step. Processes will start with Step 0 showing the initial state of ProcessData (and any Documents).

Message To Service and Message From Service will often be empty, but when populated can show what parameters were passed to the service/adapter or results returned from the service/adapter.

Current Processes(continued)

Exercise 4.2: View Detailed Processing Information



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Please complete Unit 1 Exercise 4 Activity 2 in the Exercise Guide before proceeding. This will demonstrate how to view detailed processing information within the Admin Console which will be used extensively throughout the remainder of this course.

Central Search

- **Admin Console > Business Process > Monitor > Central Search**
 - Search by partial Business Process Name
 - Search by status
 - Search by Date/Time Range (defaults to past 24 hours)
- **Returns count of found process instances (up to 1,000)**
 - Click number to see General Processing Information
- **Paginated with 10 instances per page sort by most recent instances first**

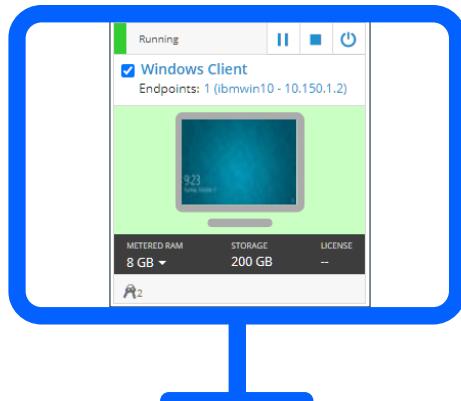
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Very useful screen for quickly finding all instances for a specific business process (or group of business processes similarly named).

The interim page with the instance count is a left-over from when Central Search would search both process instances and documents.

Central Search (continued)

Exercise 4.3: Searching for Business Process Instances using Central Search



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Please complete Unit 1 Exercise 4 Activity 3 in the Exercise Guide before proceeding. This will demonstrate how to find business process instances within the Admin Console using Central Search.

Advanced Search

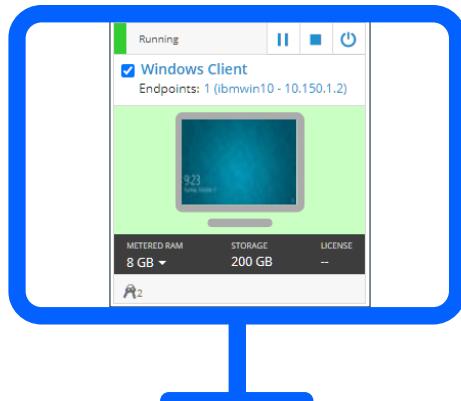
- **Admin Console > Business Process > Monitor > Advanced Search**
 - Business Processes (discussed in this course)
 - Data Flows (Communication and Documents associated to original document)
 - Document
 - Communication Sessions
 - Correlation (Values associated to documents during translation)
 - EDI Correlation (Values associated to document during enveloping and deenveloping)
 - EDIINT (AS2-specific)
 - Other protocol-specific search options
- **Business Processes returns a General Processing Information screen**
 - For a single Workflow Instance ID
 - From a multi-select list of Business Processes, Statuses, States, and Date Range

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There are many advanced search tools. Commonly used ones are listed above. Business Processes will be the only one covered in this course.

Advanced Search (continued)

Exercise 4.4: Searching for Business Process Instances using Advanced Search



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Please complete Unit 1 Exercise 4 Activity 4 in the Exercise Guide before proceeding. This will demonstrate how to find business process instances within the Admin Console using Advanced Search.

Advanced Search (continued)

- **Action (on Detail Processing Information screen)**
 - Options change based on State
 - Stop: Changes state to Halting and halts instance after current step completes
 - Restart: Resume, Simple Restart, Advanced Restart
 - Terminate: Manually mark instance to be finished so it can be indexed
 - XML Report: Generate XML Report of instance
- **Restart options:**
 - Resume: Retry errored step (if Halted or Interrupted) and continue
 - Simple Restart: Restart same process from Step 0 with a new Instance ID
 - Advanced Restart: Start new process using Step 0 (can be a different BPML)

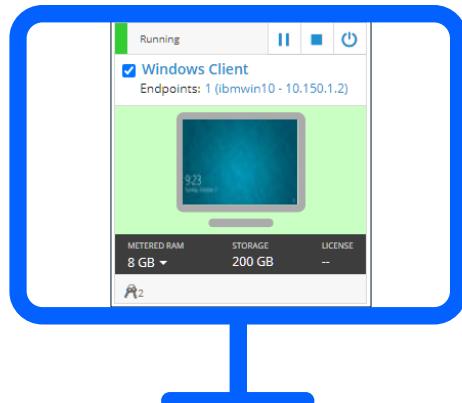
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Terminate will be reviewed in more detail at the end of this lesson.

A stuck process might stay in Halting state until the node executing the current step is restarted. Nothing can be done to a Halting process until the system changes it to a Halted state.

Advanced Search (continued)

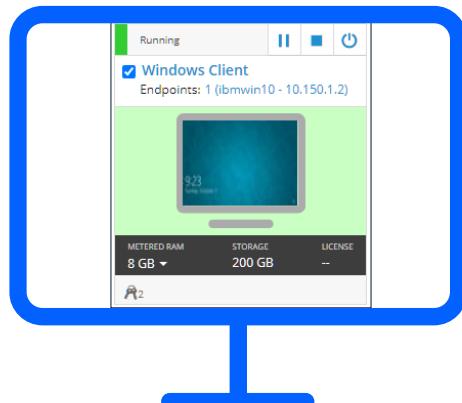
Exercise 4.5: Resuming or Restarting a Business Process Instance



Please complete Unit 1 Exercise 4 Activity 5 in the Exercise Guide before proceeding. This will demonstrate how to perform a resume and a simple restart of a business process instance.

Advanced Search (continued)

Exercise 4.6: Advanced Restarting a Business Process Instance



Please complete Unit 1 Exercise 4 Activity 6 in the Exercise Guide before proceeding. This will demonstrate how to perform an advanced restart of a business process instance.

Troubleshooter

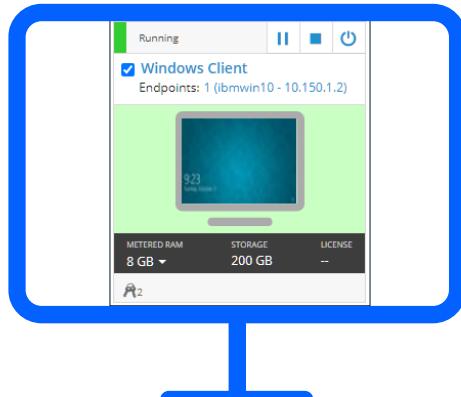
- Operations > System > Troubleshooter
- Many options for system status information
- For business processes, “Business Process Usage” link lists instance counts by state
- Clicking on the instance count will give General Processing Information with mass update
- Mass update action depends on state selected
- Check All checks across all pages (be careful)
- Will not return any results if there are too many processes waiting to be indexed

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Action might include “Terminate and Restart” option. If so, this is preferable to just “Restart” as restarting creates a new Instance ID without terminating the errored Instance ID (meaning the errored process still needs to be dealt with even if the restarted process completes successfully).

Troubleshooter (continued)

Exercise 4.7: Terminating a Business Process Instance using Troubleshooter



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Please complete Unit 1 Exercise 4 Activity 7 in the Exercise Guide before proceeding. This will demonstrate how to terminate a business process instance using Troubleshooter.

Troubleshooter (continued)

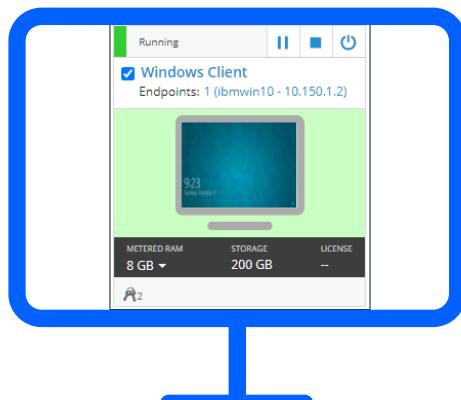
- **Advanced Business Process Search mass update option**
 - Must check option for “Enable Business Process Operations”
 - Must select a single State
 - Same mass update options as Troubleshooter
 - Can still select specific Business Process Instances by Name and Date Range

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Action might include “Terminate and Restart” option. Just like on Troubleshooter, this is preferable to just “Restart” as restarting creates a new Instance ID without terminating the errored Instance ID (meaning the erred process still needs to be dealt with even if the restarted process completes successfully).

Troubleshooter (continued)

Exercise 4.8: Terminating a Business Process Instance from Advanced Search



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Please complete Unit 1 Exercise 4 Activity 8 in the Exercise Guide before proceeding. This will demonstrate how to terminate a business process instance using Advanced Search.

Lesson 1.4 Quiz

- 1. A green traffic light indicates the process instance completed successfully.**
 - a. True
 - b. False

- 2. Which field on the detail process information page is used to access ProcessData?**
 - a. Status Report
 - b. Document
 - c. Instance Data

- 3. An empty Parent/Child column on the general process information page means:**
 - a. The process neither invoked by another process nor invoked any other processes.
 - b. The process failed to read in a designated file.
 - c. The process failed to write output to the designated directory.
 - d. The process completed successfully.

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.4 Quiz (continued)

- 4. A Terminated business process instance can be resumed from the errored step.**
 - a. True
 - b. False

- 5. Select all states for which a process instance is eligible to be archived and purged.**
 - a. Completed
 - b. Terminated
 - c. Halted
 - d. Interrupted

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.4 Summary

- Current Processes
- Central Search
- Advanced Search
- Troubleshooter

1.5 - Graphical Process Modeler (GPM)

Lesson 1.5: Graphical Process Modeler (GPM)

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- Opening the GPM
- Overview of the GPM
- Basic Inventory Process
- Checking In/Out Business Processes
- Text Editor versus GPM

Lesson 1.5 Objectives

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This lesson covers opening and using the GPM to create the basic inventory process, version control of the business process, and the advantages and disadvantages of GPM versus text editors.

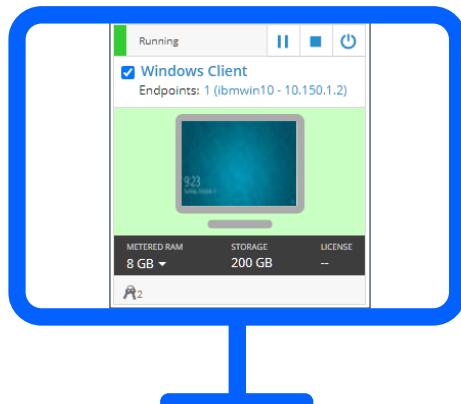
Opening the GPM

- **Two places to open the Graphical Process Modeler**
 - Admin Console Home
 - Business Process > Manager
- **Correct Java Version must be installed on the local client machine**
 - Might have to associate JNLP files with the correct Java Web Start (javaws.exe)
- **Answer appropriately for any Java-related security questions**
 - Might require updating Exception Site List on Java Security Tab in Control Panel
- **Log into the GPM with Sterling B2B Integrator credentials**

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Opening the GPM (continued)

Exercise 5.1: Opening the Graphical Process Modeler



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Please complete Unit 1 Exercise 5 Activity 1 in the Exercise Guide before proceeding. This will demonstrate how to open the GPM which will be used throughout the remainder of this course for business process development.

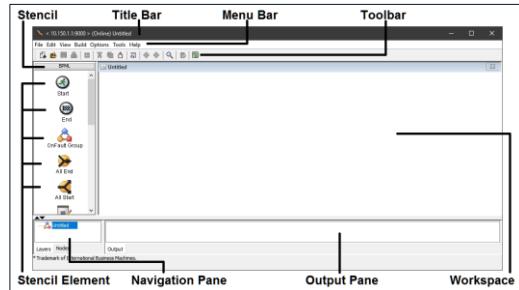
Overview of the GPM

- **Graphical Process Modeler Menus:**
 - File: Open, Close, Save files
 - Edit: Cut, Copy, Paste, Properties, etc.
 - View: Source/Graphical View, Stencils, Panes, Auto Layout, Zoom, Grid, etc.
 - Build: Validate the Business Process
 - Options: Language and other settings
 - Tools: Rule Manager, Add Sub Flow, Source Manager
 - Help: Documentation and About information
- **Toolbar has select menu options for ease of access**

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Overview of the GPM (continued)

- **Graphical Process Modeler Panes**
 - **Stencil** (when one or more stencils are active)
 - **Workspace** (when a business process is opened, or a new business process is started)
 - **Navigation** (Layers and Nodes view)
 - **Output/Editor** (Validation messages and property/service editors when appropriate)



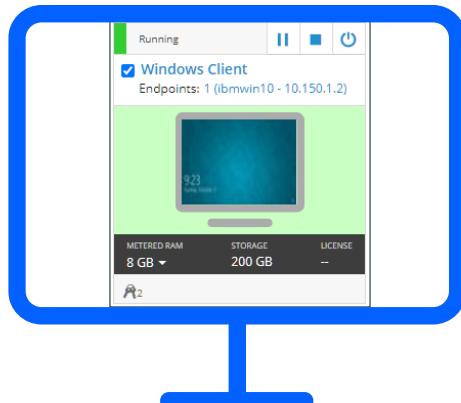
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View the different panes. Stencil: Top Left, Workspace: Top Right, Navigation: Bottom Left, Output/Editor: Bottom Right.

Explore how the top and bottom divider bar can be raised and lowered and the two arrows on the middle bar can be used to maximize and minimize the top and bottom. Also see how the left/right divider bars are independent on top and bottom.

Overview of the GPM (continued)

Exercise 5.2: Working with Stencils



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Please complete Unit 1 Exercise 5 Activity 2 in the Exercise Guide before proceeding. This will demonstrate how to open and close stencils that contain activities, services, and adapters used to build business processes within the GPM.

Overview of the GPM (continued)

- **BPMN Stencil (Non-Service/Adapter Activities)**
 - Start/End: Nodes for the Start and End of the entire Business Process
 - OnFault Group: Used for error handling
 - All Start/End: Nodes for the Start and End of the All Activity
 - Choice Start/End: Nodes for the Start and End of the Choice Activity
 - Sequence Start/End: Nodes for the Start and End of the Sequence Activity
 - Assign: Add a simple assign activity (single assignment to ProcessData)
 - Consume/Produce/Spawn/Join: Nodes used in the old method of invoking child processes
 - Repeat: Node for looping (should only be used within a Choice Activity)
- **All Services Stencil**
 - Contains most services/adapters

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Review all BPMN Stencil options.

Basic Inventory Process

- **Purpose**

- Input: An XML File with a root node of INVENTORY and PRODUCT child nodes
- Action: Determine if an order should be placed to order more products
- Output: A node in ProcessData with the result (assumedly for the calling process to use)

- **Steps (exercises for creating this Business Process)**

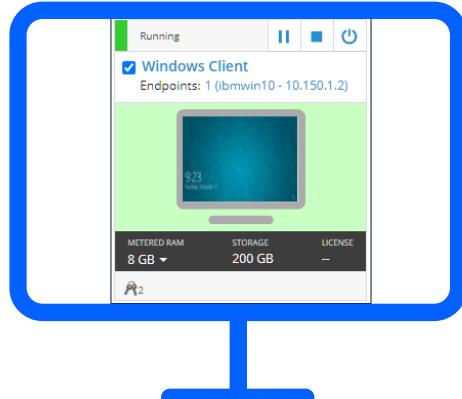
- Start a new business process, move activities from the stencils, link the activities
- Utilize Sub Flows to make the business process easier to understand in the GPM
- Add Rules for making the decision whether to order more products
- Update parameters on simple activities
- Validate and Save the Business Process
- View the BPML generated by the GPM

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Review the purpose and steps that will be used to create this first business process. The steps are purposefully broken into small chunks so that the pace and introduction to various features of the GPM can be done gradually. This business process will be used in future exercises.

Basic Inventory Process (continued)

Exercise 5.3: Moving and Connecting Activities



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Please complete Unit 1 Exercise 5 Activity 3 in the Exercise Guide before proceeding. This will demonstrate how to build the business process steps and connect them in the GPM.

Basic Inventory Process (continued)

- **Sub Flows**
 - Can replace any Sequence Activity (should be named even if it isn't required)
 - Creates a new layer in the business process (shown in the navigation panel)
 - Allows for the business process to be graphically broken up
 - Can be used under existing Sub Flows (nested)
- **Sub Flows are not subroutines**
 - Cannot call a Sub Flow from multiple locations within the same business process
 - Should use a separate business process if code needs to be reusable
- **Sub Flows cannot be copied (contents can, but the Sub Flow itself cannot)**

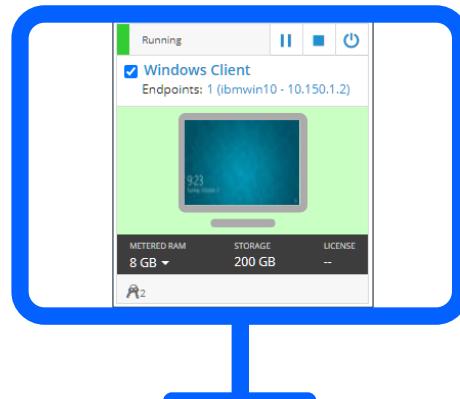
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Sub Flows are not required for the business process to execute. They are simply for making the business process easier to work with in the GPM. This is being demonstrated after creating original process to highlight visual difference. Future exercises will include suggestions for where Sub Flows might be visually beneficial, but will not be required.

One advantage of using Sub Flows from the beginning is that it might be easier to expand a specific section of code graphically without having to make major graphical realignments in the parent flow.

Basic Inventory Process (continued)

Exercise 5.4: Adding Sub Flows



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Please complete Unit 1 Exercise 5 Activity 4 in the Exercise Guide before proceeding. This will demonstrate how to use Sub Flows within the GPM to graphically distribute the business process to make it easier to read.

Basic Inventory Process (continued)

- **Rules**

- Contain a unique name and a condition
- Condition is an XPath expression against ProcessData that returns a boolean

- **Edge Editor**

- Edge Editor displays in the Output/Editor Pane
- Allows for one or more Rule to be associated with the edge (generally use a single Rule)
- Specifies if the branch should be called if the XPath result is true or not true

- **Choice**

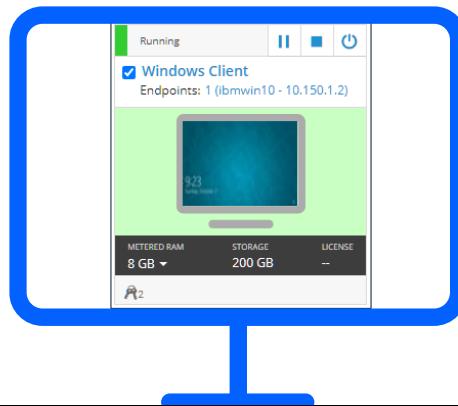
- The order of the cases within the Choice Activity is important
- Order in the GPM is determined by the order in which the edges were created (not edited)

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The reason the order of the cases within a Choice Activity is important is if there are more generic and more specific rules being used within the same Choice Activity. For example, if there are two Rules defined as LE10 = “count(/ProcessData/INVENTORY/PRODUCT) <= 10” and LE100 = “count(/ProcessData/INVENTORY/PRODUCT) <= 100” then the order is important as LE100 would be true every time LE10 is true. So, if LE100 is evaluated before LE10, then the branch for LE10 would never be used because the first successful match is executed.

Basic Inventory Process (continued)

Exercise 5.5: Adding and Assigning Rules



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Please complete Unit 1 Exercise 5 Activity 5 in the Exercise Guide before proceeding. This will demonstrate how to create a rule and apply it to a Choice Activity in the GPM.

Basic Inventory Process (continued)

- **Editors**

- Assign: Simple Assignment of a Single Value to ProcessData
- Service: Configuration for a Service/Adapter
- Edge: Assignment of a Rule to a Choice Activity (seen previously)
- Produce/Consume: Used in the old method of invoking a child process

- **Assign Editor**

- To is required (location in ProcessData for the result to be stored)
- Constant and From are mutually exclusive (From is used for XPath expressions)
- Append (if true, creates a new node with the result even if a node already exists)

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This next exercise will introduce the Service Editor and the Assign Editor.

Basic Inventory Process (continued)

- **Service Editor**

- Name: Used graphically to allow the developer to understand the step
- Participant: Actual name of the service/adapter instance being called
- Output Msg: Output parameters sent from the BPML to the service/adapter
- Input Msg: Input result sent to the BPML from the service/adapter

- **Output/Input Assignments**

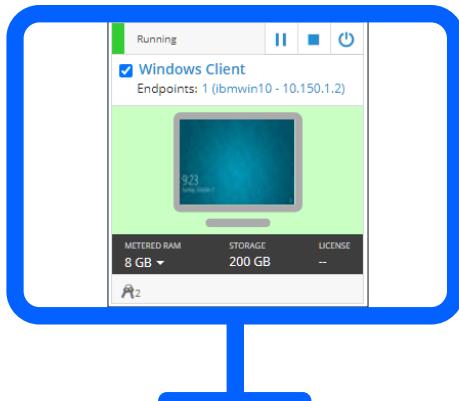
- Name/Value pairs
- Column to denote if value is an XPath expression
- Column to denote if name should be appended

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On Service Editors, most parameters are automatically loaded and populated from the Service/Adapter Instance selected under Participant. Any missing parameters can be added using the “Advanced” button. The default for results is to place all results directly under ProcessData.

Basic Inventory Process (continued)

Exercise 5.6: Element Properties



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Please complete Unit 1 Exercise 5 Activity 6 in the Exercise Guide before proceeding. This will demonstrate how to complete the business process by assigning the parameters to services/adapters and doing simple assigns to ProcessData.

Basic Inventory Process (continued)

- Business Processes must be validated before they can be executed.
- Always or never validate option exists under the Options Menu.
- BPML code can be saved without being valid but should select to not validate.
- Saving the BPML code only saves it locally, checking in makes it available.
- WARNING: Null pointer exceptions can happen when saving.

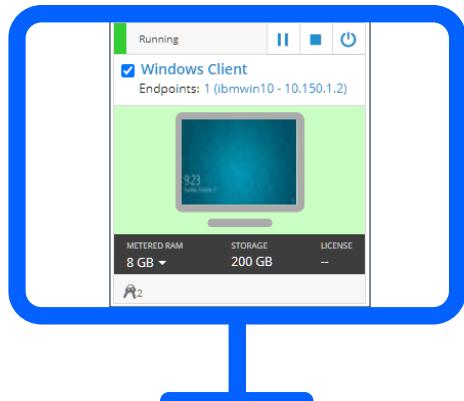
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Checking In will be done in an upcoming exercise. For now, validating and saving will be demonstrated. Validating only validates the syntax, not that it will execute error-free or even execute as desired even if it executes error-free. The business process should still be tested for all appropriate scenarios it is expected to encounter. Negative testing (for error handling) is also recommended.

A null pointer exception will create/overwrite the file to zero bytes. Do not close the GPM if this happens. Attempt to fix the null pointer exception by deleting an edge and adding it back. Sometimes deleting a node and adding it back might be required. Sometimes, it never clears. When saving regularly during the business process development, adding a "version" to the filename being saved can at worse give a save point several steps back. Not saving until completed or overwriting the same file every time could result in a complete loss of the work that was performed.

Basic Inventory Process (continued)

Exercise 5.7: Saving and Validating BP



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Please complete Unit 1 Exercise 5 Activity 7 in the Exercise Guide before proceeding. This will demonstrate how to validate and save the BPML to a local file.

Basic Inventory Process (continued)

- Graphical Process Modeler can show valid BPML code under the View Menu.
- Validation is done when switching to Source View (even if it was just done).
- Source View menu option changes to Graphical View to switch back.

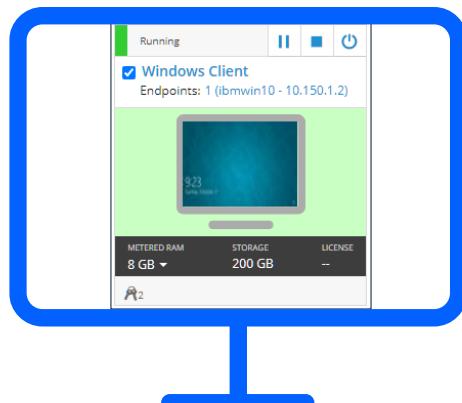
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Reviewing the BPML before checking in the business process can help identify any issues like:

- XPath expressions entered as constants (and therefore won't be evaluated)
- Order of cases within a Choice Activity
- Make it easier over time to read the BPML, allowing for review of BPML within the Admin Console to become easier when troubleshooting process instances

Basic Inventory Process (continued)

Exercise 5.8: Graphical Process Modeler Source View



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Please complete Unit 1 Exercise 5 Activity 8 in the Exercise Guide before proceeding. This will demonstrate how to view the BPML for a valid Business Process within the GPM.

Checking In/Out Business Processes

- **Two Source Managers**
 - Graphical Process Modeler > Tools Menu > Source Manager
 - Admin Console > Business Process > Manager
- **Available settings are the same**
 - Wizard-style check-in process by default
 - GPM allows for Expert Mode under Options Menu for single window-style
- **Checked-In Business Process is independent of any local files**
- **Versions are kept by default allowing for quickly reverting to older code**

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The Graphical Source Manager is for checking in and out code. It cannot be used to execute a business process or review results.

Checking In/Out Business Processes (continued)

- **Priority Queues**

- Default is 4
- Used to tune system (covered in the Admin and Tuning course)
- Use only if company has tuned the system to use different queues

- **Persistence Level Overview**

- Persistence: Saving tracking/troubleshooting information to the database
- Step Status: Metadata about the step (i.e. Step ID, Service Name, Statuses)
- Step Data: Data stored with the step (i.e. Status Report, Document, Instance Data)
- EMO: Engine May Override option allowing service to determine if step status/data persists

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Using Priority Queues other than 4 without tuning the system could result in underperformance of the product.

Checking In/Out Business Processes (continued)

- Persistence Levels

- Full: Everything stored for all steps
- Step Status (Only/EMO): All step status (step data only if needed)
- BP Start Stop (Only/EMO): Everything for First/Last/Erred Steps (or EMO steps)
- System Default: System-Level setting in properties files
- Zero: Nothing (ever)
- Error Only: Only store first/erred step status and data only if there is an error

- Recovery Level

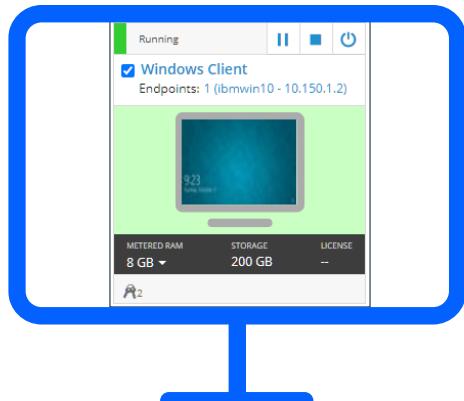
- Determines what should be automatically done with a Halted/Interrupted instance
- System process looks for erred processes and emails if taking an action

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Other settings are covered in the Student Guide. For this training course, all settings will keep the defaults when checking in a business process.

Basic Inventory Process (continued)

Exercise 5.9: Check-In using the Graphical Source Manager

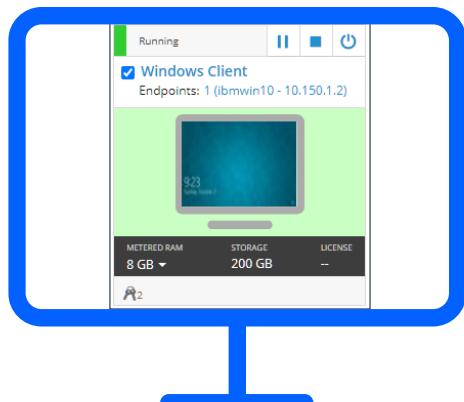


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Please complete Unit 1 Exercise 5 Activity 9 in the Exercise Guide before proceeding. This will demonstrate how to check-in a valid Business Process within the GPM's Source Manager to the product.

Basic Inventory Process (continued)

Exercise 5.10: Check-In using Business Process Manager on the Admin Console

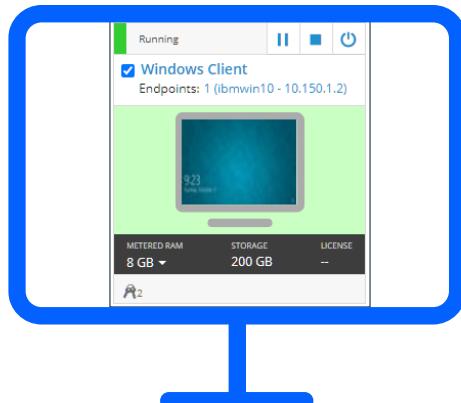


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Please complete Unit 1 Exercise 5 Activity 10 in the Exercise Guide before proceeding. This will demonstrate how to check-in a valid Business Process within the Admin Console's Business Process Manager.

Basic Inventory Process (continued)

Exercise 5.11: Check-Out using the Graphical Source Manager



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Please complete Unit 1 Exercise 5 Activity 11 in the Exercise Guide before proceeding. This will demonstrate how to check-out a valid Business Process within the GPM's Source Manager from the product.

Text Editor versus GPM

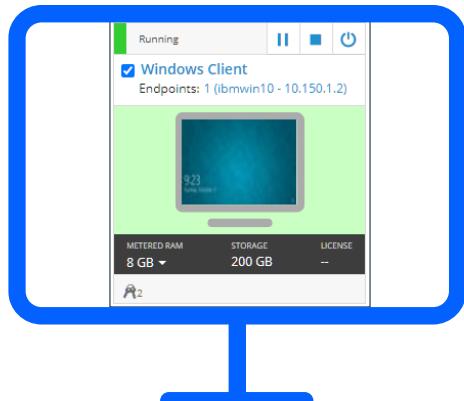
- Admin Console will allow for a new/existing process to be updated via text mode
 - Any text editor (e.g. Notepad, Notepad++, vi, UltraEdit)
 - Any XML editor
- Editing in text mode loses graphical portion (even if only editing a rule)
- Differences (can be used in one but not the other)
 - GPM:
 - Sub Flows
 - Annotations
 - Text Editor:
 - XML Comments
 - Indenting/Extra Blank lines for readability of the BPML

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The next two exercises will be editing in text mode and opening in the GPM to see the results. Then one final exercise to allow for more practice checking out, modifying, and checking in a business process.

Basic Inventory Process (continued)

Exercise 5.12: Editing within Business Process Manager on the Admin Console

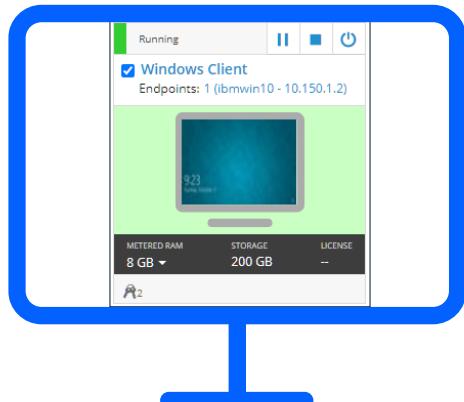


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Please complete Unit 1 Exercise 5 Activity 12 in the Exercise Guide before proceeding. This will demonstrate how to edit a valid Business Process within the Admin Console's Business Process Manager.

Basic Inventory Process (continued)

Exercise 5.13: Viewing Edited BPML in the Graphical Process Modeler

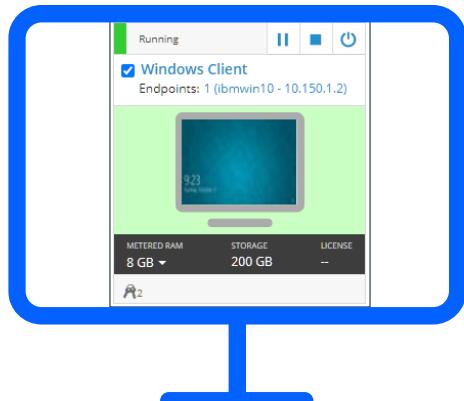


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Please complete Unit 1 Exercise 5 Activity 13 in the Exercise Guide before proceeding. This will demonstrate what happens to the graphical portion of the Business Process when edited via the Admin Console's Business Process Manager.

Basic Inventory Process (continued)

Exercise 5.14: Finalizing Basic Inventory Process



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Please complete Unit 1 Exercise 5 Activity 14 in the Exercise Guide before proceeding. This will provide one more exercise to practice checking out, modifying, and checking in a business process.

Lesson 1.5 Quiz

1. Which service editor option specifies parameters to send to the service?

- a. Config
- b. Message From Service
- c. Input Msg
- d. Output Msg

2. Which of the following GPM elements opens the Edge Editor?

- a. OnFault
- b. Consume
- c. Spawn
- d. Line off a Choice Element



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.5 Quiz (continued)

3. You can open a BPML file in the GPM and view its graphical representation.

- a. True
- b. False

4. Select all true statements regarding Sub Flows.

- a. An internal service used to call other business processes
- b. A Sub Flow is not preserved when editing BPML within the Admin Console
- c. A BPML activity used to make choices about the data
- d. A graphical tool creating another layer in your business process
- e. A Sub Flow allows a Sequence Activity to a single node along its parent flow



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.5 Quiz (continued)

5. The business process checked into Sterling B2B Integrator is separate from the local BPML file used to check it in.

- a. True
- b. False

6. Which language is used to create rules in a business process?

- a. Java
- b. XPath
- c. C#.Net
- d. XSLT



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.5 Quiz (continued)

7. Match the Persistence Level with its description.

Persistence Level	Description
1) BP Start Stop (Engine May Override)	a) Choose this level if you do not need tracking data for your process when it is successful and your recovery does not depend on process step data being saved
2) Step Status Only	b) Choose this level if you know that you do not need persisted status data for successful processing
3) BP Start Stop Only	c) Choose this level if you need only status information for each step and your recovery needs do not depend on additional data being saved
4) Error Only	d) Choose this level if your recovery needs do not depend on data being saved for the processing steps

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 1.5 Summary



- Opening the GPM
- Overview of the GPM
- Basic Inventory Process
- Checking In/Out Business Processes
- Text Editor versus GPM

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Unit 1 Summary



- 1.1: About IBM Sterling B2B Integrator**
- 1.2: XML and XPath Basics**
- 1.3: Basic Business Process Concepts**
- 1.4: Tracking and Troubleshooting Business Processes**
- 1.5: Graphical Process Modeler (GPM)**

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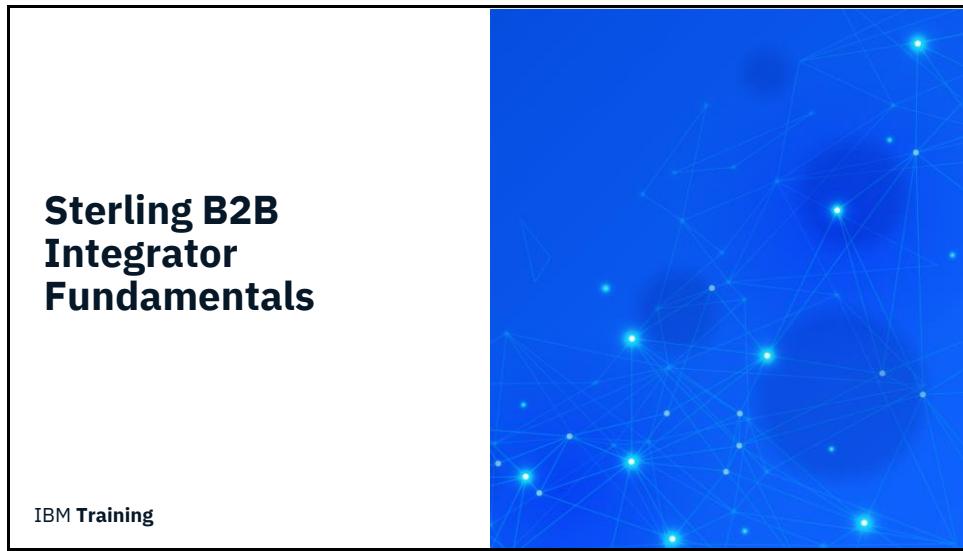
Are there any questions?



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End of Unit 1. Continue to Unit 2.

Unit 2



Welcome to the IBM Sterling B2B Integrator Fundamentals course. This course provides an overview and fundamental understanding of how the IBM Sterling B2B Integrator product processes files and data.

Unit 2	2.1: Introduction to Service Management 2.2: Best Practices 2.3: Mapping 2.4: Typing Map 2.6: Tracking System Health
---------------	---

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2

Unit 2 consists of six lessons to develop more business processes based on specific tasks needing to be performed:

- An introduction to Service Management
- best practices for business processes in general
- two lessons for maps that business processes use for making decisions
- and a lesson to cover systems health and migrating assets from one environment to another

2.1 - Introduction to Service Management

Lesson 2.1: Introduction to Service Management

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Lesson 2.1 Objectives

- Services and Adapter Overview
- File System Adapter
- Error Handling and Emailing
- Command-Line Adapter
- Invoking Child Processes
- Database Connectivity
- Repeating and Multithreading

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4

This lesson covers services and adapters and how to use them within a business process. Several exercises are included to see specific types of activities that can be performed by the product. Protocols such as AS2, FTP, and Web Services are not covered in this course.

Services and Adapter Overview

- **Deployment > Services > Configuration**
- **Services perform work inside the JVM**
 - Any node on the cluster
 - Usually a single instance needed (no need for grouping)
- **Adapters perform work outside the JVM**
 - Each instance tied to a node and a perimeter server (multiple instances likely needed)
 - Client Adapters for establishing a connection to a partner (can be grouped by route)
 - Server Adapters for listening (waiting) for a connection from a partner

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Based on the definition of Services versus Adapters, using anything outside the JVM would include the file system (File System Adapter), operating system (Command Line 2 Adapter), and database (LWJDBC Adapter). These are generally only available as Client Adapters (the product establishes the connection). Some of these have the option of having a single instance used on all nodes of the cluster (like a service).

Each node has an internal perimeter server named “local” for that node. So, even if external perimeter servers are not used, protocol-based adapters (such as HTTP and FTP) are tied to the local perimeter server. If external perimeter servers are used, then two flavors of each adapter might be configured (one for internal traffic and one for external traffic).

In an environment with two nodes (N1 and N2) and four perimeter servers (N1PS1, N1PS2, N2PS1, and N2PS2 in a standard high-availability scenario), external adapters will usually have four instances created for each route into or out of the cluster. Client adapters can be set up in a group so that the business process calling them can reference the group instead of a specific client adapter and the product will pick a route out of the system that is available.

File System Adapter

- **File System Adapter (FSA) Instance Parameters**
 - Collection Folder
 - Filename Filter
 - Include Subfolders
 - Start a Business Process (selecting prompts for process name and schedule)
 - Extraction Folder
 - Assign Filename (selecting prompts for filename to use)
- **Obscuring Files**
 - Can obscure file contents on collect (encrypt while picking up file when starting a process)
 - Can unobscure file contents on extract (decrypt to filesystem if it's obscured in the process)

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The File System Adapter (FSA) is used to pick up and drop off files. For Windows, UNC paths can be used. Otherwise, remote drives must be mounted to the server.

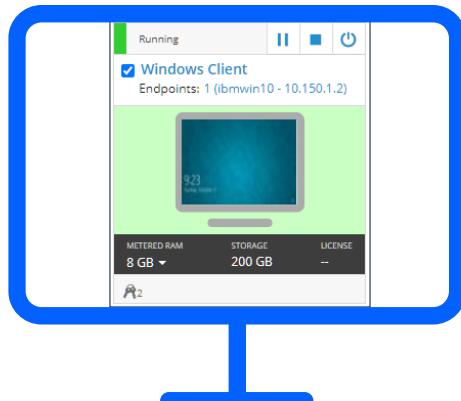
In a clustered environment, shared shares should be used so that all nodes on the cluster can access the same files immediately.

Starting a Business Process will be discussed in more detail after the first exercise.

Obscuring a file in the product can prevent some from seeing the file contents inside the product, but many services and adapters (except for the FTP adapters) do not work with obscured files. So, for translating a file, it must be unobscured first. There are ways to minimize and/or eliminate visibility to documents associated with business process instances that have been covered (and a few other methods not covered in this course).

File System Adapter (continued)

Exercise 1.1: File System Adapter



Please complete Unit 2 Exercise 1 Activity 1 in the Exercise Guide before proceeding. This will demonstrate setting up a new File System Adapter instance and creating a business process to use it.

File System Adapter (continued)

- **Starting a Business Process**
 - Select process name
 - Select to obscure the contents
 - Add up to five parameters
 - Optionally specify a schedule
- **Scheduling options**
 - Timer
 - Daily
 - Weekly
 - Monthly

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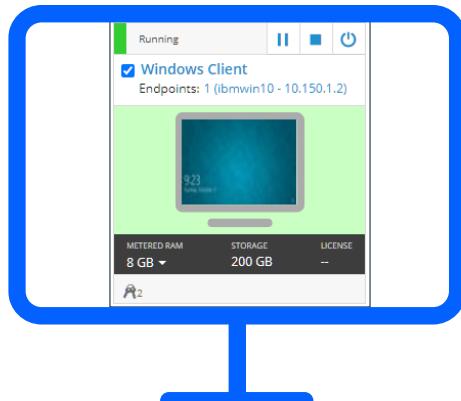
Starting a business process from an adapter is called bootstrapping. It can be done from several adapters: FSA, CLA2, LWJDBC, etc. For the FSA, it is only when collecting files.

The five parameters allow for a generic business process to be called by multiple FSA's that the process can use for making decisions, routing, translating, etc.

Daily, Weekly, and Monthly schedules can be for specific times or a time interval.

File System Adapter (continued)

Exercise 1.2: Bootstrapping using a File System Adapter



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Please complete Unit 2 Exercise 1 Activity 2 in the Exercise Guide before proceeding. This will demonstrate calling a business process from a File System Adapter that has been scheduled.

Error Handling and Emailing

- **OnFault Activity**
 - Specific Error Code Handling (Advanced Status)
 - Generic Error Handling (catch-all for any other error)
 - Tied to a Sequence Activity (will “bubble up” errors to parent sequences)
- **Location**
 - BPML: At end of a sequence element
 - GPM Sequence Activity: Linked to Sequence Start Activity
 - GPM Sub Flow: Linked to Sub Flow Node in the Parent Flow
- **Creates new layers for each error code being handled (blank for generic) in GPM**

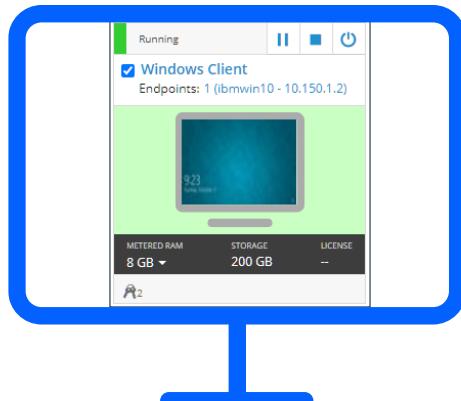
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Error handling allows for the business process to act appropriately given error conditions that occur. This can range from fixing the issue (i.e. setting a default value) to simply sending an email and stopping the business process from proceeding.

By handling the errors, this allows the state of the business process instance to become “Completed” instead of “Halted” (and therefore does not need to be terminated or resumed). Depending on how the error is handled, the business process instance might need to be restarted, but that can be done from either state.

Error Handling and Emailing (continued)

Exercise 1.3: Error Handling using OnFault



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Please complete Unit 2 Exercise 1 Activity 3 in the Exercise Guide before proceeding. This will demonstrate handling errors within a business process and sending emails.

Command-Line Adapter

- **Command Line 2 Adapter flow**
 - Environment and Script/Executable Parameters specified
 - Optional Input Document (copied to working directory)
 - Script/Executable called
 - Optional Output Document (copied from working directory)
 - Return Status logged to ProcessData (errors are not assumed)
- **Restrictions for Script/Executable**
 - Must not pause for human interaction (not even “press any key to continue”)
 - Will execute under credentials of the CLA2 process (or Windows Service)
 - Certificates used for encryption and authentication

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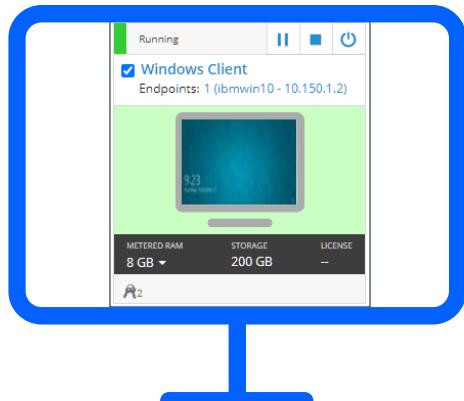
A CLA2 process is installed with the product and can be started (or not) when the product is started.

CLA2 can be installed on any server. The product connects to it over the CLA2's listening port. If multiple clustered environments are going to use the same CLA2, all environments need the same certificates loaded (each install has different certificates by default).

Errors are not assumed based on the return code. Depending on the script/executable, a return code of 16 might be considered a success and a return code of 0 might be considered a failure. Use a choice to inspect the return code and act appropriately. A BP Exception Service exists that can be used to throw an error (and either halt the process or redirect the process to an OnFault Activity).

Command-Line Adapter (continued)

Exercise 1.4: Executing a Command Line Script



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Please complete Unit 2 Exercise 1 Activity 4 in the Exercise Guide before proceeding. This will demonstrate calling a command line script from a business process.

Invoking Child Processes

- **Invoke Modes**
 - Asynchronous (ASYNC): Call child and continue parent
 - Synchronous (SYNC): Call child and wait for it to complete
 - Inline (INLINE): Treat child as part of the main process
- **For INLINE and SYNC Modes, errors can be handled by the parent process**
- **Default version of child process is called**

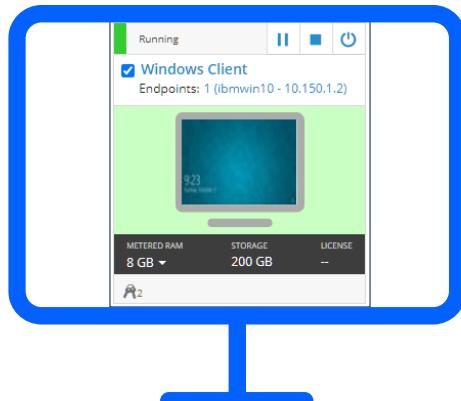
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There is also an embedded mode which is rarely used. It works like an INLINE invoke but does not persist any steps.

Part of ProcessData can be passed to the child process (SYNC or ASYNC mode), but that is covered in the Advanced BP course.

Invoking Child Processes (continued)

Exercise 1.5: Invoking a Child Process



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Please complete Unit 2 Exercise 1 Activity 5 in the Exercise Guide before proceeding. This will demonstrate calling a child process using the Invoke Business Process Service.

Database Connectivity

- Connect to any type of database.
- Results are returned as XML as a new Primary Document.
- Depending on the database type, columns might be all upper case.
- Can be any SQL (DDL, Insert, Update, Delete, Select, Function, and Stored Proc).
- Credentials used on database connection determines permissions.

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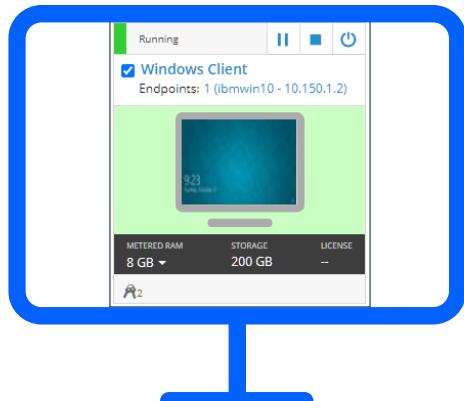
The four main database types for the product are Oracle, SQL Server, DB2, and MySQL. However, if a JDBC driver exists for the database, it can be connected to from the product.

SQL Server will not automatically upper-case column names for example, but Oracle will (even if the SQL has the column names as lower case).

Since any SQL can be executed, tread lightly – especially when access the product's database.

Database Connectivity (continued)

Exercise 1.6: Code List Setup within the Admin Console

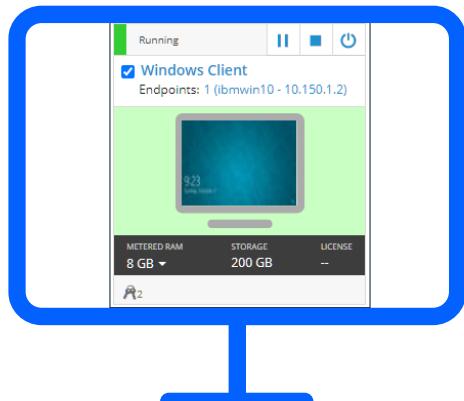


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Please complete Unit 2 Exercise 1 Activity 6 in the Exercise Guide before proceeding. This will demonstrate setting up a Code List within the Admin Console.

Database Connectivity (continued)

Exercise 1.7: Lightweight JDBC Database Connectivity



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Please complete Unit 2 Exercise 1 Activity 7 in the Exercise Guide before proceeding. This will demonstrate executing SQL statements against a database.

Repeating and Multithreading

- Looping requires a Choice Activity to prevent infinite loops.
- A Repeat Activity references a named Sequence or Choice Activity to restart.
- Multithreading is done with the All Activity.
- Multithreading within a process is not dynamic.

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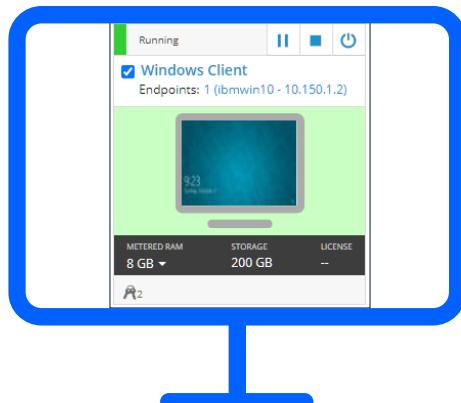
As demonstrated in the next exercise, the Wait Service is used along with the repeat and all activities. The Wait Service is preferred as it releases the thread so another process can execute while the current process is waiting.

The Choice Activity required for the Repeat Activity determines if work needs to be done. The Advanced BP course looks at several ways to perform loops.

If you need to have zero or more activities done at the same time (i.e. after splitting a file), then call a different process in async mode. The All Activity is only useful for doing distinct, separate, enumerated activities from the same starting point.

Repeating and Multithreading (continued)

Exercise 1.8: Wait Service



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Please complete Unit 2 Exercise 1 Activity 8 in the Exercise Guide before proceeding. This will demonstrate the All Activity.

Lesson 2.1 Quiz

1. What is the difference between a Service and an Adapter?

- a. A Service performs work outside of the JVM and an Adapter performs work inside the JVM
- b. A Service performs work inside of the JVM and an Adapter performs work outside the JVM
- c. An Adapter is a special type of Service
- d. A Service is a special type of Adapter

2. A connection being established to a trading partner over FTP is done with:

- a. An SFTP Client Adapter
- b. An FTP Server Adapter
- c. An FTP Client Adapter
- d. An FTP Begin Session Service



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.1 Quiz (continued)

3. Bootstrapping is:

- a. When a Service starts a child process
- b. When an Adapter starts a child process
- c. When you can't find the problem so you have an energy drink to help you focus

4. Error handling should be:

- a. Done only on processes that are business critical
- b. Done after an error is encountered
- c. Done at the end of project by adding it to all business processes created
- d. As business processes are created



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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.1 Summary



- Services and Adapter Overview
- File System Adapter
- Error Handling and Emailing
- Command-Line Adapter
- Invoking Child Processes
- Database Connectivity
- Repeating and Multithreading

2.2 - Best Practices

Lesson 2.2: Best Practices

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Lesson 2.2 Objectives

- Assign Service
- ASYNC Mode
- Release Service

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This lesson covers a few best practices for business processes to make them more efficient within the product.

Assign Service

- Assign Service replaces multiple consecutive simple assign activities as one step.
- Assignments are done in order and can reference prior assigns.
- Target of assignment must be unique.
- Considered more efficient than even two simple assign activities.

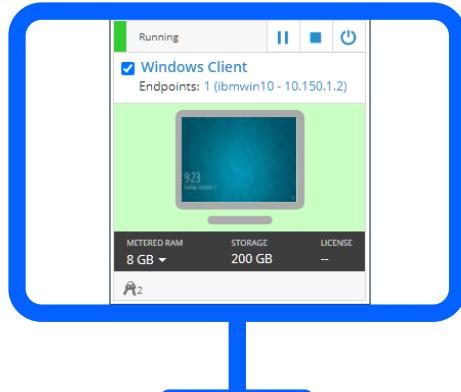
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The Assign Service is preferred to using multiple simple assign activities when those activities can be done consecutively. It's more efficient than even two simple assign activities because fewer steps are persisted and time is not required to update ProcessData between assignments (ProcessData is updated at the end of the Assign Service).

The only downside is that the "to" attribute in the list of assignments must be unique.

Assign Service (continued)

Exercise 2.1: Assign Service



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Please complete Unit 2 Exercise 2 Activity 1 in the Exercise Guide before proceeding. This will demonstrate the Assign Service.

ASYNC Mode

- Multiple child processes running concurrently.
- Parent process can complete without waiting for the child processes to complete.
- Sterling B2B Integrator is tuned to perform more processes with fewer steps.
- Allows for overall processing to be restarted at more incremental points.

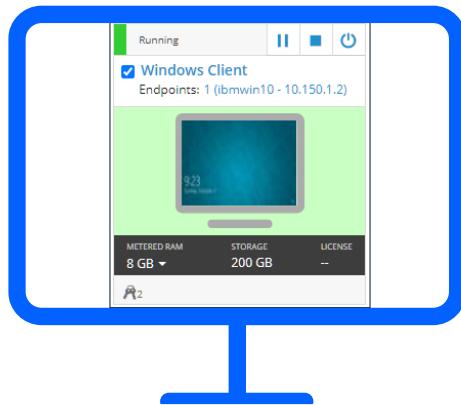
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The product is tuned to be more efficient when executing 1,000 processes with 10 steps each than for executing 10 processes with 1,000 steps each.

Having child processes allows for a restart to occur at each point a new process was started. If a file is received with 100 invoices that need to be broken into 15 files (one per trading partner), then starting each of the 15 files as a new child process allows for the invoices for a single partner to be restarted without affecting the other partners and also allows for the entire 100 invoices to be restarted if needed as the parent process can be restarted just like any of the child processes.

ASYNC Mode (continued)

Exercise 2.2: Invoke Business Process Service in ASYNC Mode



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Please complete Unit 2 Exercise 2 Activity 2 in the Exercise Guide before proceeding. This will demonstrate calling a child process asynchronously.

Release Service

- Release Service has one parameter: TARGET.
- TARGET must be set using the Advanced button on the Message To Service.
- TARGET is an XPath Expression of the elements in ProcessData to remove.
- TARGET should not have the “XPath” column checked.
- Using a pipe can reduce the number of consecutive Release Services.

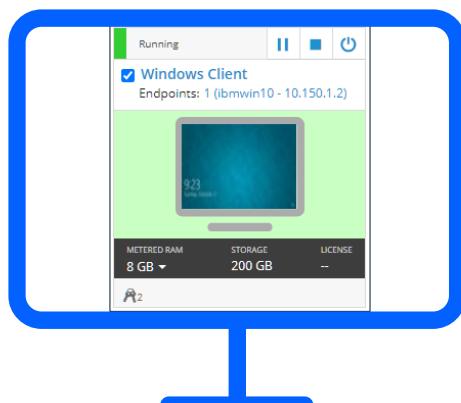
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While the TARGET parameter is an XPath Expression, the expression itself needs to be passed to the service and not the result of the expression. Therefore, the “XPath” column should remain unchecked. Alternately, the XPath Expression can be quoted if the “XPath” column is checked.

A pipe in an XPath expression is an “or” operator. But when used to remove elements, it means it will remove all of them (remove this, and this, and this, ...) because the Release Service is checking each element to determine if it matches the XPath Expression.

Release Service (continued)

Exercise 2.3: Release Service Exercise



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Please complete Unit 2 Exercise 2 Activity 3 in the Exercise Guide before proceeding. This will demonstrate cleaning up ProcessData.

Lesson 2.2 Quiz

- 1. Select all instances when ASYNC Mode should be used.**
 - a. The calling process does not need the results from the child process
 - b. The child processes need to be executed in order and without overlapping
 - c. Only when at least two child processes will be executed

- 2. The TARGET parameter on the Release Service needs the “XPath” box checked.**
 - a. True
 - b. False

- 3. The Assign Service is more efficient than how many simple assign activities?**
 - a. 1
 - b. 2
 - c. 3

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.2 Summary

- Assign Service
- ASYNC Mode
- Release Service

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2.3 - Mapping

Lesson 2.3: Mapping

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Lesson 2.3 Objectives

- **Installing Map Editor and Standards**
- **Map Editor Overview**
- **XML Encoder Maps**
- **Checking In and Using Maps**

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This lesson covers installing the map editor and standards, an overview of the map editor, XML Encoder Maps in greater detail, and includes an exercise for checking in and using a map.

Installing Map Editor and Standards

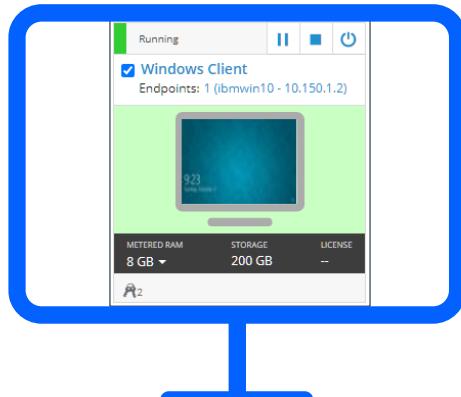
- Deployment > Maps
- Deployment > Standards
- Installed on a Windows Client
- Standard Windows Installation Wizard
- Requires Java 1.7 (or higher, but might require using RegEdit for higher versions)

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The installation of the standards is used to build the INPUT or OUTPUT side of the map based on EDI Standards (such as an X12 850 Document we will use for an exercise). The map editor will function without it, but it would then require the developer to build the EDI document like any other document.

Installing Map Editor and Standards (continued)

Exercise 3.1: Install Map Editor

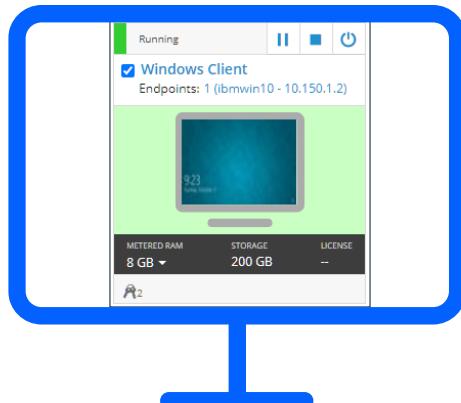


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Please complete Unit 2 Exercise 3 Activity 1 in the Exercise Guide before proceeding. This will demonstrate installing the Map Editor which is needed for future exercises.

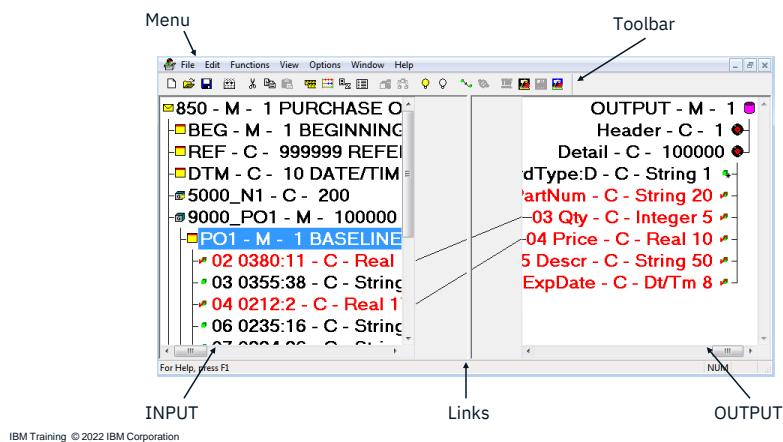
Installing Map Editor and Standards (continued)

Exercise 3.2: Install Standards



Please complete Unit 2 Exercise 3 Activity 2 in the Exercise Guide before proceeding. This will demonstrate installing the Standards Database which is needed for future exercises.

Map Editor Overview



Review all menus and the toolbar. Ideally, you've used the Map Editor before. If not, this lesson and the next lesson will have sufficiently detailed exercises for the types of maps used in this course.

XML Encoder Maps

- INPUT Side Only (non-XML)
- Converts entire document into XML using the names on the INPUT side
- Allows entire non-XML file to be converted to XML to be placed into ProcessData
- Compiles differently than all other types of maps

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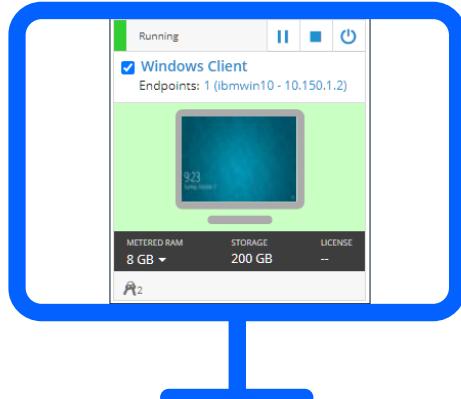
The XML Encoder Map is to be used to convert non-XML files into XML quickly so they can be placed into ProcessData (or used in an XSLT). Thus, only non-XML files need an XML Encoder Map as the XML Encoder Service (as seen previously) does not need a map to place an XML file into ProcessData.

The compilation is different than other types of maps because it only has the INPUT side and does a Light-Weight Compile (.ltx compiled file instead of a .txo compiled file).

Use a regular translation map (covered in the mapping course) or a typing map (covered in the next lesson) if only part of the input file is needed in ProcessData. While this would be less efficient on the CPU initially, it is more efficient long term as it keeps the size of ProcessData smaller than loading the entire file.

XML Encoder Maps (continued)

Exercise 3.3: Create an XML Encoder Map



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Please complete Unit 2 Exercise 3 Activity 3 in the Exercise Guide before proceeding. This will demonstrate creating an XML Encoder Map that can be used for placing non-XML files into ProcessData as XML.

Checking In and Using Maps

- XML Encoder Maps are checked in like any other type of map.
- Map names must be unique across all types of maps.
- For the GPM, use Refresh Services to update the list of maps.
- The XML Encoder Maps can only be used by the XML Encoder Service.

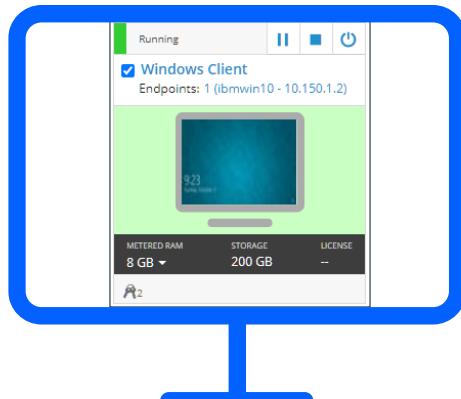
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All maps are versioned.

Even though the compiled map is different, an XML Encoder Map must still be uniquely named against any other map, regardless of type, in the environment.

Checking In and Using Maps (continued)

Exercise 3.4: Use an XML Encoder Map in a Business Process



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Please complete Unit 2 Exercise 3 Activity 4 in the Exercise Guide before proceeding. This will demonstrate using the XML Encoder Map.

Lesson 2.3 Quiz

- 1. Where do you define delimiters in an EDI Map?**
 - a. Root Element
 - b. Group
 - c. Segment
 - d. Element

- 2. Why is the delimiter setting optional for an XML Encoder map that uses EDI Input?**

- 3. What is the default extension for a map in the Map Editor?**

- a. .mxl
- b. .txo
- c. .txl
- d. .lnx

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.3 Summary

- **Installing Map Editor and Standards**
- **Map Editor Overview**
- **XML Encoder Maps**
- **Checking In and Using Maps**

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2.4 - Typing Map

Lesson 2.4: Typing Map

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Lesson 2.4 Objectives

- Typing Map Overview
- Building a Typing Map
- Using a Typing Map

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This lesson covers typing maps and how to use them.

Typing Map Overview

- Typing Maps pull part of a file to XML output specifically for use in ProcessData.
- Multiple Typing Maps can be used on the same Typing Service (first one wins).
- Only Required and Optional XML elements listed in the Typing Service are used.
- XML elements can be any valid XML name.
- No repeating or child XML elements

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Since typing maps pull part of the INPUT, an OUTPUT side is required, and the map is compiled normally. It also means and XML file on the INPUT side is valid as only part of it will be returned in the output.

The Typing Service takes a space-delimited list of typing maps, so more generic typing maps should be listed after more specific typing maps.

For a typing map to be successful, all required XML elements must be returned (and any optional XML elements it happens to return will also be placed into ProcessData).

The only real limitation for a typing map is that it expects uniquely named XML elements in the output with no child elements.

Building a Typing Map

- Both INPUT and OUTPUT sides are required.
- OUTPUT side must be nonrepeating XML.
- The INPUT side should be scoped to the entire file (use a group if needed).
- The INPUT side can contain any rules and/or temp records as needed.

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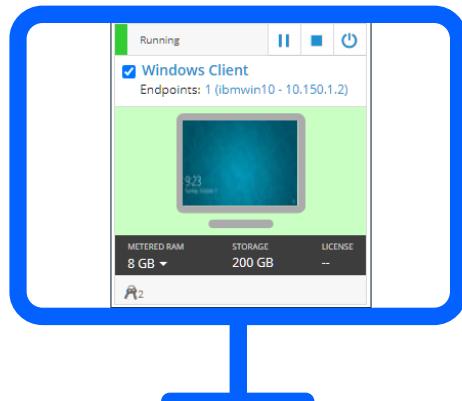
Because a file can contain multiple documents, it is generally best to have the INPUT side scoped to the entire file. Otherwise, the first document might make a typing decision for the entire file.

Splitting the file before (or after) using a typing map depends on the reason the typing map is being used.

INPUT side of a typing map can use any normal INPUT side functionality for a regular translation map.

Building a Typing Map (continued)

Exercise 4.1: Build a Typing Map



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Please complete Unit 2 Exercise 4 Activity 1 in the Exercise Guide before proceeding. This will demonstrate building a Typing Map for getting specific information from a file into ProcessData.

Using a Typing Map

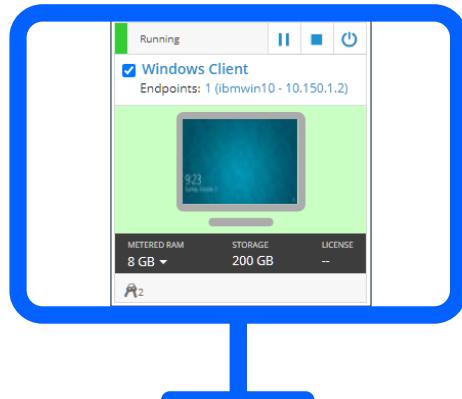
- Typing Maps are checked in like any other type of map.
- Map names must be unique across all types of maps.
- For the GPM, use Refresh Services to update the list of maps.
- The Typing Maps can only be used by the Typing Service or Translation Service.

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While a typing map must meet certain criteria so it can be used with the typing service, it can also be used with a translation service. The difference is that the translation service takes only one map name and returns the output as a new PrimaryDocument instead of placing the XML results directly into ProcessData.

Using a Typing Map (continued)

Exercise 4.2: Use a Typing Map in a Business Process



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Please complete Unit 2 Exercise 4 Activity 2 in the Exercise Guide before proceeding. This will demonstrate using a Typing Map within a business process.

Lesson 2.4 Quiz

- 1. The output side of a Typing Map can be any format.**
 - a. True
 - b. False

- 2. Generic Typing Maps should be listed before Specific Typing Maps in the Service.**
 - a. True
 - b. False

- 3. The output from the Typing Map must be:**
 - a. One of a handful of predetermined XML node names
 - b. Any valid XML node name
 - c. The same XML node names on all Typing Maps in the list
 - d. Limited to only 10 XML nodes or less

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.4 Summary

- Typing Map Overview
- Building a Typing Map
- Using a Typing Map

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2.5 - Tracking System Health

Lesson 2.6: Tracking System Health

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Lesson 2.6 Objectives

- Status Reports
- Archiving and Restoring
- Migrating Assets
- Deleting Business Processes

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This lesson covers status reports, archiving/restoring business processes, migrating assets, and deleting business processes.

Status Reports

- Status Report column of Detail Processing Information page
- Service-specific
- Troubleshooting errors

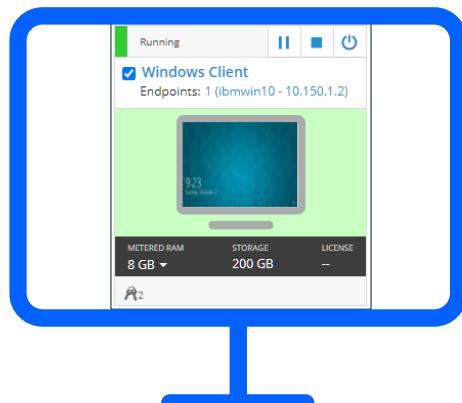
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Status Reports can be used for troubleshooting errors. Most errors will have an Advanced Status, Status Report (usually with more details), or both.

Some services will generate status reports for successful executions. For example, the FSA will generate a status report every instance it is called. This is enabled by default, but can be disabled by passing the correct parameter in the BPML.

Status Reports (continued)

Exercise 6.1: Troubleshooting Report



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Please complete Unit 2 Exercise 6 Activity 1 in the Exercise Guide before proceeding. This will give you the opportunity to review a troubleshooting report.

Archiving and Restoring

- Old business process instance data (step status and documents)
- Archived to disk (separate, external process needed to permanently delete)
- Archive occurs after indexing, then flags process to be purged when expired
- Archiving is optional (process can be set to be purged without archiving)

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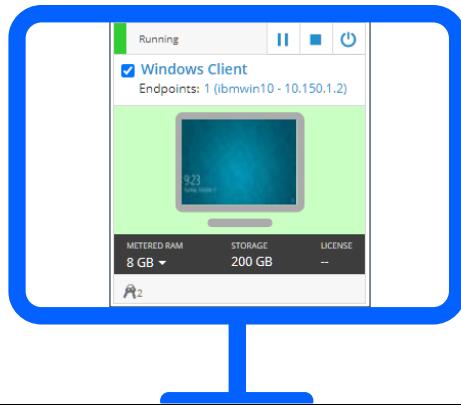
Life span is how long the process instance data is stored in the database. After this life span (or after all associated mailbox messages have been deleted), the process instance data is deleted from the database. In order to troubleshoot older processes, this information can be archived to disk before it is purged.

System default life span settings can be set under Operations > Archive Manager > Configuration. Individual business processes can be configured differently while being checked in.

To balance database size, the life span and persistence level (discussed previously) can be configured appropriately. For example, if Full Persistence is used, the Life Span might be set to 7 days. However, if BP Start/Stop Persistence is used, the Life Span might be set to 14 days. In both scenarios, the database might be directionally the same size (actual results will vary by environment).

Archiving and Restoring (continued)

Exercise 6.2: Update Archive Configuration



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Please complete Unit 2 Exercise 6 Activity 2 in the Exercise Guide before proceeding. This will give you the opportunity to update the archive configuration.

Archiving and Restoring (continued)

- Archived data can be loaded into special restore tables for troubleshooting.
- Some search menus will automatically search restore tables, but others must specify.
- After troubleshooting, the restore tables should be cleaned.

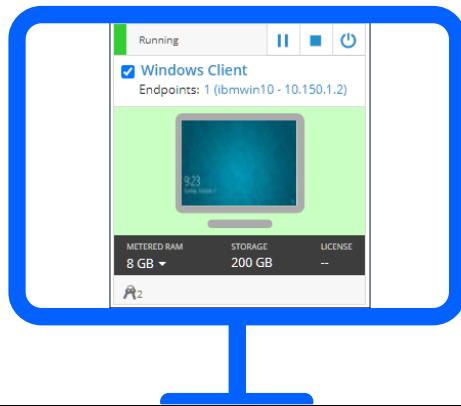
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Central Search will include the restore tables automatically. Advanced Business process Search needs to be told to search the restore tables.

Unless someone else is actively troubleshooting on the same environment, the restore tables should be cleaned when done. Otherwise, the restore tables could grow over time, mitigating the benefits of purging to keep the database within a reasonable size.

Archiving and Restoring (continued)

Exercise 6.3: Perform Restore



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Please complete Unit 2 Exercise 6 Activity 3 in the Exercise Guide before proceeding. This will give you the opportunity to restore some business processes and troubleshoot them.

Migrating Assets

- Deployment > Resource Manager > Import/Export
- Select specific assets by type
- XML or JAR (Install Bundle)
- 10MB file limit on import
- Temporary passphrase might be needed.

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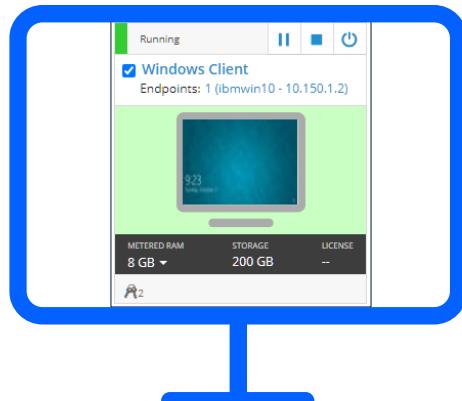
Some assets might be under a broader selection. For example, Code Lists are under Trading Partner Data.

JAR files are more compact (compressed file format) and can hold more assets than an XML file. Maps are usually the asset that takes the most space. Even then, several JAR files might be required to migrate a large number of maps.

For certain assets, the data is encrypted in the database. Since the source environment and target environment might have different system passphrases, the export file might require a temporary passphrase (specific to that export file). The encrypted data is decrypted using the source system's passphrase and encrypted with the temporary passphrase to be stored in the export file. When importing, the temporary passphrase (which must be provided by the user performing the import) is used to decrypt the data from the file and the target system's passphrase is used to encrypt it to store it in the database.

Migrating Assets (continued)

Exercise 6.4: Exporting Assets

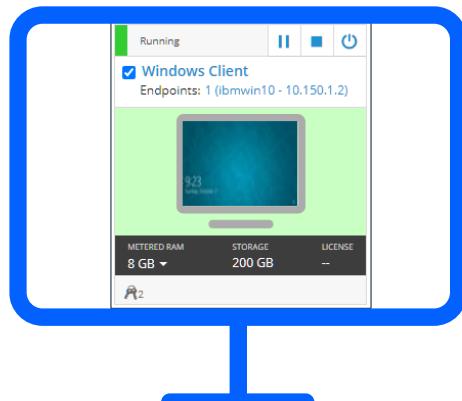


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Please complete Unit 2 Exercise 6 Activity 4 in the Exercise Guide before proceeding. This will give you the opportunity to export assets from one environment.

Migrating Assets (continued)

Exercise 6.5: Importing Assets



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Please complete Unit 2 Exercise 6 Activity 5 in the Exercise Guide before proceeding. This will give you the opportunity to import assets into an environment.

Migrating Assets (continued)

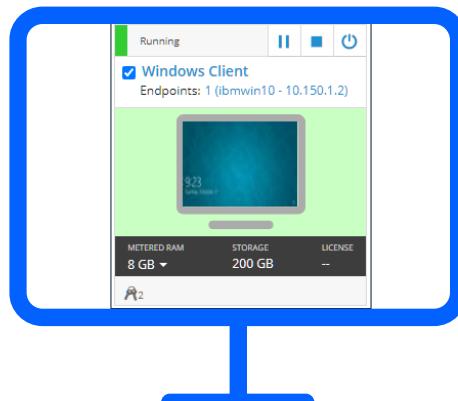
- Deployment > Resource Manager > Resource Tags
- Allows for assets to be tagged throughout a project, then exported using the tag.
- When using a Resource Tag, all tagged assets are selected (no unselect option).
- Resource Tag can be created when importing into the target system.

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Since tagged assets are automatically selected and no option is provided to unselect certain assets, a project with a large number of map changes might surpass the 10MB file limit (even for an Install Bundle). In this case, the Resource Tag needs to be broken apart, or used for reference while manually selecting the assets to export.

Migrating Assets (continued)

Exercise 6.6: Setting Up a Resource Tag

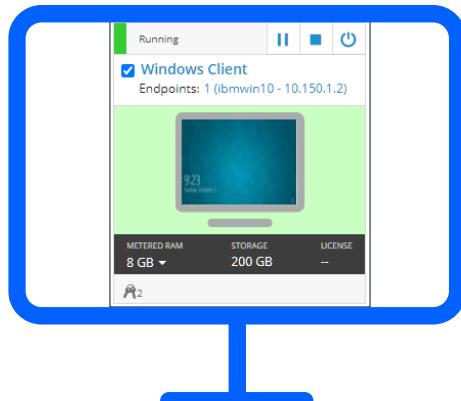


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Please complete Unit 2 Exercise 6 Activity 6 in the Exercise Guide before proceeding. This will give you the opportunity to set up a resource tag.

Migrating Assets (continued)

Exercise 6.7: Exporting and Importing with Resource Tags



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Please complete Unit 2 Exercise 6 Activity 7 in the Exercise Guide before proceeding. This will give you the opportunity to use a resource tag for exporting and importing.

Deleting Business Processes

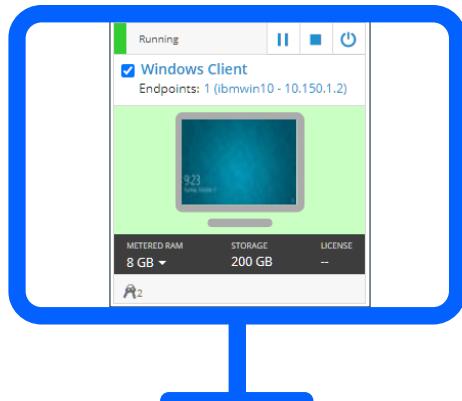
- Delete all/specific versions of a business process (Purge removes instance data).
- Can only delete if the version has no instances in the live tables.
- Permanently deletes from environment (no undo).
- Does not delete any local files or exported copies of the business process.

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Since deleting a business process instance is permanent, it is highly recommended to export a copy of the BPML before deleting it.

Deleting Business Processes (continued)

Exercise 6.8: Deleting a Business Process



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Please complete Unit 2 Exercise 6 Activity 8 in the Exercise Guide before proceeding. This will give you the opportunity to delete a business process.

Lesson 2.6 Quiz

- 1. Archiving deletes expired process instance data and Purge moves it to disk.**
 - a. True
 - b. False
- 2. Restored data is loaded into special restore tables in the database.**
 - a. True
 - b. False
- 3. By default, at what interval does the system recovery business process run?**
 - a. Every 15 minutes
 - b. Every 45 minutes
 - c. Every 30 minutes
 - d. Every 60 minutes

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.6 Quiz (continued)

4. How do you troubleshoot an Invalid Service Configuration error?

- a. Fix the incorrect parameter and restart the node
- b. Install and configure the service followed by restarting the node
- c. Restart the node
- d. Determine the missing parameter and update the business process

5. Select the file types you can use for migrating assets.

- a. XML
- b. JAR
- c. Zip
- d. RAR
- e. bpml

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.6 Quiz (continued)

6. When can a business process be exported but not deleted?

- a. Unarchived or purged instance data still exists in the system
- b. The delete flag is set to "no" in the properties file
- c. Export and delete are the same thing
- d. Unarchived or purges instance data is already exported

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Please attempt to answer these questions before looking up the answers in Appendix A of the Student Guide.

Lesson 2.6 Summary



- Status Reports
- Archiving and Restoring
- Migrating Assets
- Deleting Business Processes

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Unit 2 Summary

- 2.1: Introduction to Service Management
- 2.2: Best Practices
- 2.3: Mapping
- 2.4: Typing Map
- 2.6: Tracking System Health

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Do you have any questions?



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End of Unit 2. Continue to Course Wrapup.

Course Wrapup

Sterling B2B Integrator Fundamentals

Wrap Up

IBM Training



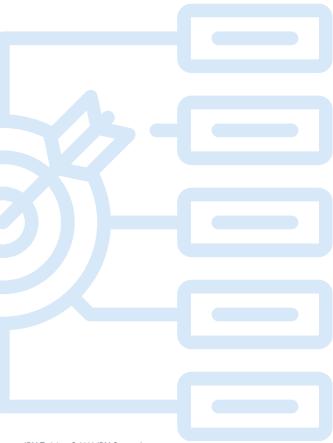
Course Wrap Up

- Objectives
- Unit 1 Lesson Review
- Unit 2 Lesson Review



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Course Objectives



- Basics of IBM Sterling B2B Integrator
- Execute, track, and troubleshoot a business process
- Create new business processes using the Graphical Process Modeler (GPM)
- Create service configurations and maps to be used by a business process
- Migrating assets from one environment to another

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The primary course objectives were:

- to teach the basics of the product (including menus, monitoring health, and how the product works)
- working with business processes (executing, tracking, and troubleshooting)
- creating new business processes (this course focuses on using the GPM, but any Text/XML editor could also be used and advantages/disadvantages of each will be discussed)
- creating assets (such as service configurations and maps) needed for a business process to function as intended
- and other housekeeping items such as migrating assets from one environment to another

Unit 1 Lesson Review

- **Lesson 1.1: About IBM Sterling B2B Integrator**
- **Lesson 1.2: XML and XPath Basics**
- **Lesson 1.3: Basic Business Process Concepts**
- **Lesson 1.4: Tracking and Troubleshooting Business Processes**
- **Lesson 1.5: Graphical Process Modeler (GPM)**

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Unit 1 consisted of five lessons to review the product:

- An introduction to Sterling B2B Integrator
- XML and XPath (which are used heavily in the product)
- reading and executing business processes
- tracking and troubleshooting business processes
- and creating the first business process using the GPM

Unit 2 Lesson Review

- **Lesson 2.1: Introduction to Service Management**
- **Lesson 2.2: Best Practices**
- **Lesson 2.3: Mapping**
- **Lesson 2.4: Typing Map**
- **Lesson 2.6: Tracking System Health**

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Unit 2 consisted of six lessons to develop more business processes based on specific tasks needing to be performed:

- AN introduction to Service Management
- best practices for business processes in general
- two lessons for maps that business processes use for making decisions
- and a lesson to cover systems health and migrating assets from one environment to another



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End of Course Wrapup. Congratulations on completing the course.

Appendix A

Lesson 1-1 Quiz Answers

1. What protocols can Sterling B2B Integrator use for sending/receiving files?

Answer: d) All of the above (and more)

2. What file formats can Sterling B2B Integrator convert files to/from?

Answer: d) All of the above (and more)

3. What User Interface is used for developing Business Processes?

Answer: b) Graphical Process Modeler (GPM)

4. What function does Sterling B2B serve for a company?

Answer: d) Only b and c

Lesson 1-2 Quiz Answers

1. “/ProcessData/Order/OrderNumber” is an example of ____ .

Answer: a) An absolute path

2. In XPath, “/text()” and “string” perform the same function.

Answer: False (they will return the same value for a single, lowest level node but will return a different value for any node that contains child nodes which also have text values)

3. Which of the following is an example of an indexes search using XPath?

Answer: b)/ProcessData/order/item[3]/price

4. Which reserved character is used to denote an attribute in XPath searches?

Answer: c) @

Lesson 1-3 Quiz Answers

1. How many branches with a Choice can be executed as a result of a case statement?
Answer: d) Only a and b
2. Service and Adapters are used to exchange messages between business processes.
Answer: True
3. The All activity does not complete until all branches are complete.
Answer: True
4. Select all elements available in Operations of Services/Adapters.
Answers: a) Output, b) Participant, and c) Input

Lesson 1-4 Quiz Answers

1. A green traffic light indicates the process instance completed successfully.
Answer: True
2. Which field on the detail process information page is used to access ProcessData?
Answer: c) Instance Data
3. An empty Parent/Child column on the general process information page means ____ .
Answer: a) The process neither invoked by another process nor invoked any other processes
4. A Terminated business process instance can be resumed from the errored step.
Answer: False
5. Select all states for which a process instance is eligible to be archived and purged.
Answers: a) Completed and b) Terminated

Lesson 1-5 Quiz Answers

1. Which service editor option specifies parameters to send to the service?
Answer: d) Output Msg
2. Which line of the following GPM elements opens the Edge Editor?
Answer: d) Line off a Choice Element
3. You can open a BOML file in the GPM and view its graphical representation.
Answer: True
4. Select all true statements regarding Sub Flows.
b) A Sub Flow is not preserved when editing BPML within the Admin Console
d) A graphical tool creating another layer in your business process
e) A Sub Flow allows a Sequence Activity to a single node along its parent flow
5. The business process checked into Sterling B2B Integrator is separate from the local BPML file used to check it in.
Answer: True
6. Which language is used to create rules in a business process?
Answer: b) XPath
7. Match the Persistence Level with its description.
Answer: 1) b 2) c 3) d 4) a

Lesson 2-1 Quiz Answers

1. What is the difference between a Service and an Adapter?
Answer: b) A Service performs work inside of the JVM and an Adapter performs work outside the JVM
2. A connection being established to a trading partner over FTP is done with _____.
Answer: c) An FTP Client Adapter
3. Bootstrapping is _____.
Answer: b) When an adapter starts a child process
4. Error handling should be _____.
Answer: d) As business processes are created

Lesson 2-2 Quiz Answers

1. Select all instances when ASYNC Mode should be used.
Answer: a) The calling process does not need the results from the child process
2. The TARGET parameter on the Release Service needs the “XPath” box checked.
Answer: False
3. The Assign Service is more efficient than how many simple assign activities?
Answer: b) 2

Lesson 2-3 Quiz Answers

1. Where do you define delimiters in an EDI Map?
Answer: a) Root Element
2. Why is the delimiter setting optional for an XML Encoder map that uses EDI input?
Answer: If it's not specified on the XML Encoder Map it can be specified on the XML Encoder Service
3. What is the default extension for a map in the Map Editor?
Answer: a) .mxl

Lesson 2-4 Quiz Answers

1. The output side of a typing map can be any format.
Answer: b) False (XML Only)
2. Generic Typing Maps should be listed before Specific Typing Maps in the Service.
Answer: b) False (first map in the list wins, a generic Typing Map earlier in the list could prevent a more specific Typing Map from being used)
3. The output from the Typing Map must be _____.
Answer: b) Any valid XML node name (however, only expected node names listed as required or optional on the Typing Service step will be pulled into ProcessData)

Lesson 2-5 Quiz Answers

1. Archiving deletes the expired process instance data a Purge moves it to disk.
Answer: False (Archive moves to disk and Purge deletes)
2. Restored data is loaded into special restore tables in the database.
Answer: True
3. By default, at what interval does the system recovery business process run?
Answer: b) Every 45 minutes
4. How do you troubleshoot an Invalid Service Configuration error?
Answer: d) Determine the missing parameter and update the business process
5. Select the file types you can use for migrating assets.
Answers: a) XML and b) JAR (Install Bundle)
6. When can a business process be exported but not deleted?
Answers: a) Unarchived or purged instance data still exists in the system

**End of student guide



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