Essentials of Service Development for IBM DataPower Gateway V7.5

WE751 (Classroom)

ZE751 (Self-paced)

Course description

This course teaches you the essential skills that are required to configure, implement, and troubleshoot services that are developed on the IBM DataPower Gateways (IDG) with firmware version 7.5.0, regardless of use case.

The DataPower Gateways allow an enterprise to simplify, accelerate, and enhance the security capabilities of its XML and web services deployments, and extend the capabilities of its service-oriented architecture (SOA) infrastructure. The gateways also extend these capabilities into the JSON, REST, and Mobile application areas.

Through a combination of instructor-led lectures and hands-on lab exercises, you learn how to develop and debug services that are implemented on the DataPower gateways. These skills include WebGUI and Blueprint Console navigation, service type selection, basic multi-protocol gateway configuration, creating and using cryptographic objects, and configuring SSL connections. You also learn how to use various problem determination tools such as logs, monitors, and probes, and techniques for testing DataPower services and handling errors.

Hands-on exercises give you experience working directly with a DataPower Gateway. The exercises focus on skills such as creating multi-protocol gateways, working with cryptographic and SSL objects, configuring service level monitoring, troubleshooting services, handling errors in a service policy, and deploying a service from a pattern.

For information about other related courses, see the IBM Training website:

http://www,ibm.com/training

General information

Delivery method

Classroom or self-paced virtual classroom (SPVC)

Course level

ERC 1.1

Product and version

IBM DataPower Gateway Version 7.5.0

Audience

This course is designed for integration developers who configure service policies on IBM DataPower Gateways.

Learning objectives

After completing this course, you should be able to:

* Describe how DataPower gateways are configured
* Create and configure cryptographic objects
* Configure Secure Sockets Layer (SSL) to and from DataPower gateways
* Configure a multi-protocol gateway (MPGW) to handle multiple protocols from a single service
* Configure a service level monitoring (SLM) policy to control message traffic
* Use logs and probes to troubleshoot services
* Use patterns to define and deploy new services
* Configure message transformation and routing by using style sheets (XSL) and GatewayScripts
* Handle errors in service policies

Prerequisites

Before taking this course, you should successfully complete course VW750, *Technical Introduction to IBM DataPower Gateway Appliance V7.5.0*. This free webcast is available at *https://youtu.be/yYk5Bzuie4g* or *https://mediacenter.ibm.com/media/t/1\_fb2tsml1*. You should also be familiar with:

* Security-based concepts and protocols
* XML-related technologies such as XML schema, XPath, and XSLT
* JavaScript programming
* Web service and REST basics

Duration

2.5 days

Skill level

Basic

|  |
| --- |
| Classroom (ILT) setup requirements |
| Processor | Intel Pentium 2.26 GHz or faster |
| GB RAM | 8 |
| GB free disk space | 80 |
| Network requirements | LAN / Internet / Fixed IP |
| Other requirements | The communication link between the student workstations and the DataPower gateway should be approximately 1.5 megabits/second (“T1” line).The network administrator needs to open the following ports for bidirectional communication between the lab workstations and the DataPower gateway:* dp\_WebGUI\_port: Port number that is configured on the DataPower gateway from the web GUI interface; usually port 9090
* dp\_xml\_mgmt\_port: Port number that is configured on the DataPower gateway for the XML management interface; usually port 5550
* 12010 - 12309: Ports that students use to access their services on the DataPower gateway; the port range assumes 30 students (xx01x - xx30x)
* 389: Port that students and the DataPower gateway use to access the LDAP server that runs on the student image
* 9080: Port that students and the DataPower gateway use to access the FLY airlines Booking Service web service that runs on the DataPower gateway
* 2068: Port that students and the DataPower gateway use to access the FLY airlines Baggage Service web service that runs on the DataPower gateway
* 22: DataPower SSH CLI (Command Line Interface)
 |

Notes

The following unit and exercise durations are estimates, and might not reflect every class experience. If the course is customized or abbreviated, the duration of unchanged units will probably increase.

This course is an update of the following previous courses:

* WE601, *Accelerate, Secure and Integrate with IBM DataPower V6*
* WE701, *Accelerate, Secure, and Integrate with IBM DataPower V7*
* WE711, *Accelerate, Secure and Integrate with IBM DataPower v7.1*

Course agenda

|  |
| --- |
| Course introductionDuration: 15 minutes |

|  |
| --- |
| Unit 1. Quick introduction to developing on DataPowerDuration: 45 minutes |
| Overview | This unit introduces the developer environment for a DataPower Gateway. It presents the WebGUI and the Blueprint Console as the entry point for DataPower development, and provides a high-level view of the common pages for service development. |
| Learning objectives | After completing this unit, you should be able to:* Log in to the WebGUI and Blueprint Console
* Navigate around the WebGUI and the Blueprint Console interfaces
* Identify the primary functions of the menus on the navigation bar
* Start the creation of a DataPower service
* Identify the typical areas of a service configuration page
* Save configuration definitions in memory and on the file system
* List the file directories that are commonly used for development
* Support any non-English languages that are enabled on the gateway
 |

|  |
| --- |
| Exercise 1. First exposure to the DataPower developer environmentDuration: 45 minutes |
| Overview | In this exercise, you use the WebGUI and Blueprint Console to examine a multi-protocol gateway, edit the gateway, and test the service by using a browser and by using the cURL command. |
| Learning objectives | After completing this exercise, you should be able to:* Log in to the WebGUI
* Use the navigation bar
* Use an object catalog
* Connect to the Blueprint Console
* Import a service
* Edit a multi-protocol gateway
* Review the actions in a policy editor
* Test a service from a browser and a cURL command
* Export a service
 |

|  |
| --- |
| Unit 2. Services overviewDuration: 30 minutes |
| Overview | This unit describes the service types that are supported on the DataPower gateway. You examine, at a high level, what a service is and what it can communicate with. You also review the characteristics of each service type, and examine the relationships between the XML-based services. |
| Learning objectives | After completing this unit, you should be able to:* Define what a DataPower service is
* List the supported services on the DataPower gateway
* Describe the similarities and differences in the features that each DataPower service supports
 |

|  |
| --- |
| Unit 3. Structure of a serviceDuration: 1 hour and 30 minutes |
| Overview | Enterprises purchase DataPower gateways to provide application-related solutions. The key component that DataPower developers configure is a DataPower service. In this unit, you learn about the components that comprise a DataPower service, and the relationships between them. You learn about the front-side access, the back-side connection to the application server, and some of the service-wide settings. You also learn how to construct the service policy that controls the processing within the service. |
| Learning objectives | After completing this unit, you should be able to:* List the basic structural components of a service and describe their relationships
* List the ways that a service configures its front-side access and back-side connections
* Use the policy editor to configure a service policy
* Create a service policy with actions that process the client request or server response
* List some of the processing actions and describe their functions
* Configure service-wide settings such as:
	+ Service type: static back-end, dynamic back-end, and loopback proxy
	+ XML Manager
	+ URL rewriting
 |

|  |
| --- |
| Exercise 2. Creating a BookingService gatewayDuration: 45 minutes |
| Overview | This exercise shows you how to create a basic multi-protocol gateway (MPGW). You learn the basic steps necessary to implement a message flow within the DataPower gateway. You use the SoapUI tool to send a SOAP message to the MPGW that you created. After DataPower processes the message, a response SOAP message is sent back to SoapUI and displayed in the response window. |
| Learning objectives | After completing this exercise, you should be able to:* Create a multi-protocol gateway
* Test the message flow by using the SoapUI graphical test tool
 |

|  |
| --- |
| Unit 4. Multi-protocol gateway serviceDuration: 1 hour |
| Overview | This unit describes the features of the multi-protocol gateway in the DataPower Gateway. The gateway allows a many-to-many service mapping: multiple transport protocols can access a list of operations, and more than one back-end service can provide the implementation for these operations. |
| Learning objectives | After completing this unit, you should be able to:* Configure a multi-protocol gateway to provide a service over a set of different protocols
* Configure a connection to a static back-end service
* Configure a connection to a dynamic back-end by use of a processing rule to select a back-end service at run time
 |

|  |
| --- |
| Unit 5. Problem determination toolsDuration: 30 minutes |
| Overview | This unit describes the troubleshooting tools that are available for debugging problems on the DataPower gateway. Several tools are available for various problems, ranging from low-level networking tools to probes that aid in debugging service policies. The logging utilities are available for capturing information that the DataPower objects generate. |
| Learning objectives | After completing this unit, you should be able to:* Capture information by using system logs for messages that pass through the DataPower gateway
* Configure a multi-step probe to examine detailed information about actions within rules
* List the problem determination tools that are available on the DataPower gateway
 |

|  |
| --- |
| Exercise 3. Enhancing the BookingService gatewayDuration: 1 hour |
| Overview | This exercise shows you how to add validation, filtering, and transformation to a multi-protocol gateway (MPGW). These steps involve working with the actions and policy editor. You use the system log to debug the service behavior. |
| Learning objectives | After completing this exercise, you should be able to:* Perform advanced configuration of an MPGW
* Configure a document processing policy with more actions
* Test the MPGW policy by using the graphical SoapUI tool
* Perform basic debugging by using the system log
 |

|  |
| --- |
| Unit 6. Handling errors in a service policyDuration: 30 minutes |
| Overview | Errors might occur when a service processes messages. The developers of services need to plan for error handling within those services. In this unit, you learn how to use the On Error action, the error rule, and the MPGW’s error policy to control error handling. |
| Learning objectives | After completing this unit, you should be able to:* Configure an error policy
* Configure an On Error action in a service policy
* Configure an error rule in a service policy
* Describe how On Error actions, error rules, and error policies are selected during error handling
 |

|  |
| --- |
| Exercise 4. Adding error handling to a service policyDuration: 45 minutes |
| Overview | In this exercise, you add an On Error action and an error rule to a service policy, and create an error policy at the service level. |
| Learning objectives | After completing this exercise, you should be able to:* Configure an error policy at the MPGW service level
* Configure a service policy with an On Error action
* Configure a service policy with an Error rule
 |

|  |
| --- |
| Unit 7. DataPower cryptographic tools and SSL setupDuration: 45 minutes |
| Overview | This unit describes how to use the cryptographic tools to create keys and certificates, and how to secure connections by using SSL to and from the DataPower gateway. You also learn how to set the DataPower objects that are used to validate certificates and configure certificate monitoring to ensure that only valid certificates exist on the gateway. |
| Learning objectives | After completing this unit, you should be able to:* Explain how to use the DataPower tools to generate cryptographic keys
* Create a crypto identification credential object that contains a matching public and private key
* Create a crypto validation credential to validate certificates
* Set up certificate monitoring to ensure that certificates are up to date
* Configure an SSL server profile that accepts an SSL connection request from a client
* Configure an SSL client profile that initiates an SSL connection from a DataPower service
* Configure an SSL SNI server profile that supports SNI requests
 |

|  |
| --- |
| Exercise 5. Creating cryptographic objects and configuring SSLDuration: 1 hour |
| Overview | This exercise shows you how to create cryptographic objects in DataPower, and how to use them to configure SSL connections. You create the cryptographic objects that you need to support an SSL connection: crypto key, crypto certificate, crypto identification credentials, and crypto validation credentials. These objects are used as part of an SSL client profile, SSL server profile, or SNI SSL server profile that defines one end of an SSL connection. You create and modify multi-protocol gateways (MPGWs) to use an SSL connection between them. |
| Learning objectives | After completing this exercise, you should be able to:* Generate crypto keys by using the DataPower cryptographic tools
* Create a crypto identification credential by using a crypto key object and a crypto certificate object
* Validate certificates by using a validation credential object
* Create an SSL client profile that initiates an SSL connection request from a DataPower service
* Create an SSL server profile that accepts an SSL connection request from a client
* Create an SNI SSL server profile that accepts an SSL connection request with an SNI extension from a client
 |

|  |
| --- |
| Unit 8. Service level monitoringDuration: 30 minutes |
| Overview | Service level management is the monitoring and management of message traffic that concerns quality of service (QoS) indicators such as throughput, response time, and availability. Within DataPower, service level monitoring (SLM) is a tool that helps support those activities. This unit defines the DataPower version of SLM and describes various ways to configure SLM. |
| Learning objectives | After completing this unit, you should be able to:* Identify the SLM functions that the DataPower gateway provides
* Create an SLM policy object by using the Blueprint Console
* Create an SLM Statement
* Create an SLM Resource Class object
 |

|  |
| --- |
| Exercise 6. Implementing a service level monitor in a multi-protocol gatewayDuration: 30 minutes |
| Overview | In this exercise, you specify SLM criteria to a multi-protocol gateway. You then send a series of requests, and observe the responses and log entries. To receive SLM-only log messages, you create a custom log target. |
| Learning objectives | After completing this exercise, you should be able to:* Specify service level monitoring criteria for a multi-protocol gateway
* Inspect and edit an SLM policy object
* Create an SLM Resource Class object
* Create a custom log target for SLM events
 |

|  |
| --- |
| Unit 9. Patterns for service configuration Duration: 30 minutes |
| Overview | This unit describes patterns as used by DataPower. It explains how a pattern is initially created and made available for use, and how a new service can be created from an existing pattern. |
| Learning objectives | After completing this unit, you should be able to:* Explain what a DataPower pattern is, and describe its purpose
* Describe how a pattern is created
* Generate a new service from a pattern
 |

|  |
| --- |
| Exercise 7. Using a DataPower pattern to deploy a serviceDuration: 30 minutes |
| Overview | In this exercise, you play the role of a pattern deployer. You specify the values for the exposed points of variability (POV) in a specific pattern, and deploy the pattern into a new generated service. |
| Learning objectives | After completing this exercise, you should be able to:* Import a pattern
* Specify the values for the points of variability in the pattern
* Deploy the pattern into a generated service
 |

|  |
| --- |
| Unit 10. Course summaryDuration: 15 minutes |
| Overview | This unit summarizes the course and provides information for future study. |
| Learning objectives | After completing this unit, you should be able to:* Explain how the course met its learning objectives
* Access the IBM Training website
* Identify other IBM Training courses that are related to this topic
* Locate appropriate resources for further study
 |

For more information

To learn more about this course and other related offerings, and to schedule training, see **ibm.com**/training

To learn more about validating your technical skills with IBM certification, see **ibm.com**/certify