

MuleSoft Certified Developer – Integration and API Associate (Mule 3) Certification Exam

Summary

A *MuleSoft Certified Developer – Integration and API Associate (Mule 3)* should be able to successfully work on basic Mule 3 projects with guidance and supervision. The *MCD – Integration and API Associate (Mule 3)* exam validates that a developer has the required knowledge and skills to design, build, test and debug, deploy, and manage basic APIs and integrations: moving from Anypoint Platform to Anypoint Studio and back. S/he should be able to:

- Use MuleSoft-hosted Anypoint Platform to take a basic API through all the steps of its lifecycle: design, build, deploy, manage, and govern.
- Use Anypoint Studio to build, test, and debug basic integrations and API implementations.
- Connect to a range of resources including databases, files, web services, SaaS applications, and JMS queues.
- Perform basic data transformations using DataWeave.
- Control message flow and handle errors.
- Process batch records.

Format

- Format: Multiple-choice, closed book, proctored online or in a testing center
- Length: 60 questions
- Duration: 120 minutes (2 hours)
- Pass score: 70%
- Language: English

The exam can be taken a maximum of 5 times, with a 24 hour wait between each attempt.

Cost

The exam can be purchased with one of the following. Each includes a coupon for one free retake.

- \$250
- 1 Flexible Training Credit (FTC)
- A voucher obtained by attending the instructor-led *Anypoint Platform Development: Fundamentals (Mule 3)* course

Additional retakes (attempts 3 to 5) are \$125 or 0.5 FTC off and do not come with a free retake.

Validity

The certification expires two years from the date of passing.

Preparation

The best preparation for the exam is to take the instructor-led *Anypoint Platform Development: Fundamentals (Mule 3)* course and to complete the accompanying Do-It-Yourself (DIY) exercises. **Candidates should be familiar with all of the content in the course and be able to apply the concepts in actual projects.**

The following resources are available to assist in a candidate's preparation:

- **Instructor-led training: Anypoint Platform Development: Fundamentals (Mule 3)**
 - Recommended as the most effective and efficient method of preparation
 - 5-day class
 - Private and public classes available
 - Onsite and online classes available
 - Includes a certification voucher for this exam
- **Self-study training: MuleSoft.U Development Fundamentals (Mule 3)**
 - 30+ hours of video-based training with 60+ exercises to teach you the basics
 - All content available instantly to be completed at any time and pace
 - Supported by the peer-to-peer MuleSoft training forum
 - Does NOT include a voucher for this exam
- **Self-assessment quiz**
 - 5+ multiple-choice questions for each course module
 - Identifies strengths and weaknesses
 - Comparable difficulty to the proctored exam
- **Do-it-yourself exercises**
 - 10+ DIY exercises to get experience with and apply the knowledge gained in class
 - Starting code and solutions provided
 - Can be completed in any order

Topics

The exam validates that the candidate can perform the following tasks.

Note: DEV:FUN3 is the acronym for the instructor-led or self-study version of the Anypoint Platform Development: Fundamentals (Mule 3) course. DEV:DIY3 is the acronym for the Development Fundamentals (Mule 3) Self-Assessment Quiz & DIY Exercises materials.

Explaining Application Network Basics	Resources
<ul style="list-style-type: none"> • Explain MuleSoft’s proposal for closing the IT delivery gap • Describe the role and characteristics of the “modern API” • Describe the purpose and roles of a C4E • Define and describe the benefits of API-led connectivity and application networks • Define and correctly use the terms API, API implementation, API interface, API consumer, and API invocation • Describe the basics of the HTTP protocol and characteristics of requests and responses • Describe the capabilities and high-level components of Anypoint Platform for the API lifecycle 	<ul style="list-style-type: none"> • DEV:FUN3 Module 1 • DEV:FUN3 Module 2
Designing and Consuming APIs	
<ul style="list-style-type: none"> • Describe the lifecycle of the “modern API” • Use RAML to define API resources, nested resources, and methods • Identify when and how to define query parameters vs URI parameters • Use RAML to define API parameters, requests, and responses • Use RAML to define reusable data types and format independent examples • Read a RAML spec and formulate RESTful requests with query parameters and/or headers as appropriate 	<ul style="list-style-type: none"> • DEV:FUN3 Module 3 • DEV:DIY3 Exercise 3-1 and 4-1
Accessing and Modifying Mule Messages	
<ul style="list-style-type: none"> • Describe the Mule message data structure • Use transformers to set message payloads, message properties, and flow variables • Write MEL expressions to access and modify message payloads, message properties, and flow variables • Enrich Mule messages using the Message Enricher 	<ul style="list-style-type: none"> • DEV:FUN3 Module 6 • DEV:DIY3 Exercise 6-1

Structuring Mule Applications	
<ul style="list-style-type: none"> Parameterize an application using property placeholders Define and reuse global configurations in an application Break an application into multiple flows using private flows, subflows, and the Flow Reference component Specify what data (payload, message properties, flow variables) is persisted between flows when a Flow Reference is used Specify what data (payload, message properties, flow variables) is persisted between flows when a Mule message crosses a transport boundary Specify what data (payload, message properties, flow variables) exists in a flow before and after a call in the middle of a flow to an external resource 	<ul style="list-style-type: none"> DEV:FUN3 Module 7 DEV:DIY3 Exercise 7-1 and 7-2
Building API Implementation Interfaces	
<ul style="list-style-type: none"> Manually create a RESTful interface for a Mule application Describe the features and benefits of APIkit Use APIkit to create implementation flows from a RAML file Describe how requests are routed through flows generated by APIkit 	<ul style="list-style-type: none"> DEV:FUN3 Module 4 DEV:DIY3 Exercise 4-1
Routing Messages	
<ul style="list-style-type: none"> Use the Choice router to route messages based on conditional logic Use the Scatter-Gather router to multicast messages Use Filters to filter Mule messages Validate data using the Validation module 	<ul style="list-style-type: none"> DEV:FUN3 Module 10 DEV:DIY3 Exercise 10-1 and 10-2
Handling Errors	
<ul style="list-style-type: none"> Describe the default exception strategy in a Mule application Define a custom global default exception strategy for an application and identify in what situations it will be used Define exception strategies for flows Combine multiple catch exception strategies in a choice exception strategy 	<ul style="list-style-type: none"> DEV:FUN3 Module 9 DEV:DIY3 Exercise 9-1 and 9-2

Transforming Data with DataWeave	
<ul style="list-style-type: none"> • Write DataWeave scripts to convert JSON, XML, and Java data structures to different data structures and data types • Use DataWeave operators • Define and use custom data types • Apply correct DataWeave syntax to coerce data types • Apply correct DataWeave syntax to format strings, numbers, and dates • Call Mule flows from a DataWeave script • Call global MEL functions from a DataWeave script 	<ul style="list-style-type: none"> • DEV:FUN3 Module 11 • DEV:DIY3 Exercise 11-1
Using Connectors	
<ul style="list-style-type: none"> • Retrieve data from a Database using the Database connector • Retrieve data from a REST service using HTTP Request • Use a Web Service Consumer connector to consume SOAP web services • Use the Transform Message component to pass arguments to a SOAP web service • List, read, and write local files using the File connector • List, read, and write remote files using the FTP connector • Use the JMS connector to publish and listen for JMS messages 	<ul style="list-style-type: none"> • DEV:FUN3 Module 4 • DEV:FUN3 Module 8 • DEV:FUN3 Module 12 • DEV:DIY3 Exercise 4-1, 8-1, 12-1, and 12-2
Processing Records	
<ul style="list-style-type: none"> • List and compare and contrast the methods for processing individual records in a collection • Explain how Mule messages are processed by the Foreach scope • Use the Foreach scope to process records • Explain how Mule messages are processed in a Batch job • Use a Batch element with Batch Steps, Batch Filters, and a Batch Commit to process records • Use the Poll component to trigger a flow • Describe the features, benefits, and process to use watermarking • Configure watermarks in the Poll scope • Persist data between flow executions using the Object Store 	<ul style="list-style-type: none"> • DEV:FUN3 Module 12 • DEV:FUN3 Module 13 • DEV:DIY3 Exercise 13-1

Debugging and Troubleshooting Mule Applications	
<ul style="list-style-type: none"> • Use breakpoints to inspect a Mule message during runtime • Install missing dependencies and drivers to a Mule project • Read and decipher Mule log error messages 	<ul style="list-style-type: none"> • DEV:FUN3 Module 6 • DEV:FUN3 all WTs • DEV:DIY3 Exercise 6-1 • DEV:DIY3 all exercises
Deploying and Managing APIs and Integrations	
<ul style="list-style-type: none"> • Package Mule applications for deployment • Deploy applications to CloudHub • Use CloudHub properties to ensure deployment success • Create and deploy API proxies • Connect an API implementation to API Manager using autodiscovery • Use policies, including client ID enforcement, to secure an API • Create SLA tiers and apply SLA based policies 	<ul style="list-style-type: none"> • DEV:FUN3 Module 5 • DEV:DIY3 Exercise 5-1 and 5-2 • Configuring API Autodiscovery in a Mule 3 Application

Delivery methods

The exam is administered via the Kryterion Webassessor testing platform. The exam can be taken in-person at a testing center or online using a web camera.

In-person at a Kryterion Testing Center:

- [Over 1000 locations worldwide](#)
- [Onsite instructions](#)
- [Test-taker guide](#)

Online using the Kryterion Webassessor testing platform:

- Requires a webcam - a laptop webcam can be used, an external camera is not required
- Requires internet connectivity with 1 Mbps upload, 1 Mbps download, jitter <50ms, ping <200ms
- [Check internet speed and reliability](#)
 - Note: Some candidates are expelled from the exam for an unstable connection even after checking reliability with the tool. If you think your connection could potentially be unreliable, we **strongly** recommend scheduling your exam at a test center.
- [Online instructions](#)
- [Test-taker guide](#)

Registration

To register for the exam:

- Go to <https://training.mulesoft.com/webassessor>.
- Create a user profile.
- Log in.
- Select Register for an Exam.
- Select the **MuleSoft Certified Developer – Integration and API Associate (Mule 3.9)** exam.
- Select either the Online Proctoring Option or the Kryterion Test Center option.
- On the payment screen, select to pay by credit card or enter a voucher/coupon code.

Note: A fee applies if an exam is cancelled or rescheduled within 72 hours of its scheduled time, even if the exam was purchased with a voucher.

More information

For more information, visit <http://help.learn.mulesoft.com>.