Module 8: Consuming web services

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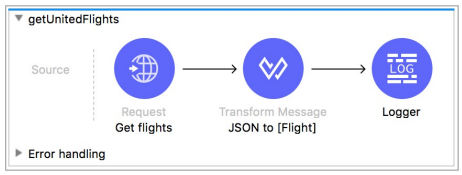
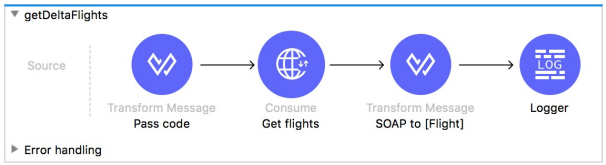
Goal

Call an operation of an API in Exchange

Call a RESTful web service

Call a SOAP web service





```
Flight.java
1  package com.mulesoft.training;
2
3  public class Flight implements
4
5      /**
6       *
7       */
8      private static final long
9
10     String flightCode;
11     String origination;
12     int availableSeats;
13     String departureDate;
14     String airlineName;
15     String destination;
16     double price;
17     String planeType;
```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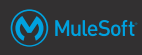
At the end of this module, you should be able to



- Consume web services that have an API (and connector) in Exchange
- Consume RESTful web services
- Consume SOAP web services
- Pass parameters to SOAP web services using the Transform Message component
- Transform data from multiple services to a canonical format

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Consuming web services that have an API (and connector) in Exchange

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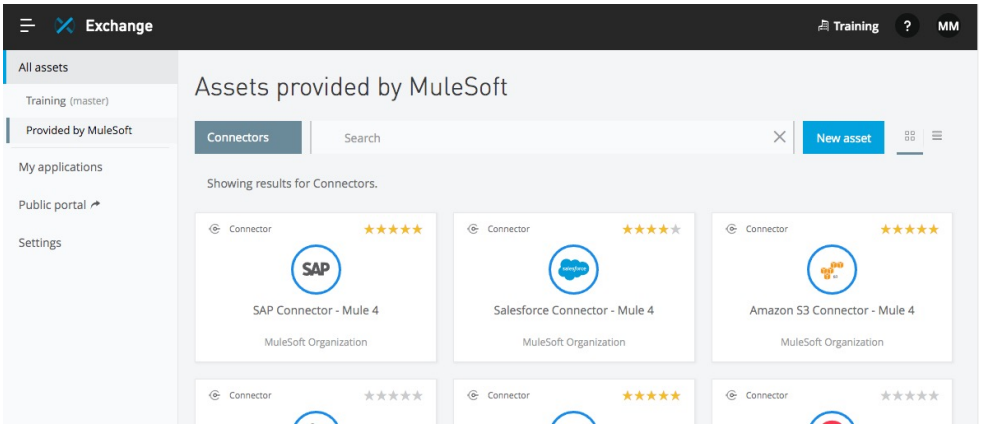
Connectors in Anypoint Exchange

MuleSoft

- Many connectors in Exchange package an easy way to make calls to APIs



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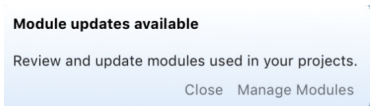
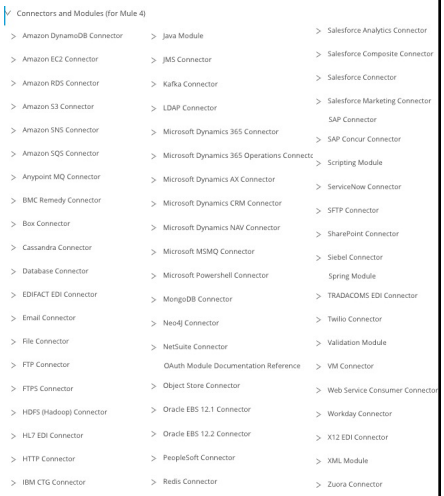
Connectors and modules

MuleSoft

- **Modules** are extensions to the Mule runtime that you can use when building a Mule app
  - HTTP, Database, Salesforce, SAP, Slack, Validation, Java, and many more
  - Studio notifications for new versions of used modules



- **Connectors** are modules that connect to an external server
  - HTTP, Database, Salesforce, SAP, Slack
- For module reference
  - https://docs.mulesoft.com/connectors/



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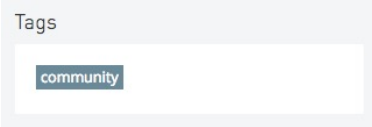
Connector types specify creator and support level

MuleSoft

- The type of selector is specified in its tags on Exchange



	Premium	Select	MuleSoft Certified	Community
Additional cost	x			
Updated APIs	x	x		
Fully tested	x	x		
MuleSoft Support	Tier 1-3	Tier 1-3	Tier 1 (From developer: T2/T3)	Tier 1
Connector examples	HL7 SAP Siebel	Salesforce Workday	AS/400 Oracle JD Edwards Microsoft Azure Storage	LinkedIn Slack

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Connector support levels

MuleSoft

- Tier 1
  - MuleSoft will isolate the problem and diagnose it
- Tier 2
  - MuleSoft will find a workaround
- Tier 3
  - MuleSoft will fix the code

	Premium	Select	MuleSoft Certified	Community
Not included in Platform license	x			
Tier 2-3 Support	x	x		
Tier 1 Support	x	x	x	x

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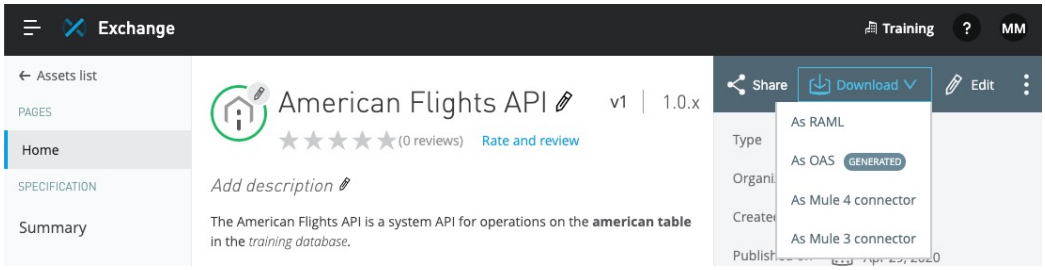
Connectors are automatically generated for APIs added to Exchange

MuleSoft

- **REST CONNECT** is the tool that generates connectors for RESTful APIs
  - Resides in Exchange and automatically invoked when an API is added to Exchange
  - Works for both RAML 1.0 or OAS API specifications added to Exchange
  - Both Mule 3 and Mule 4 connectors are generated
- You can use the connector in Anypoint Studio or Flow Designer
- Download connectors from the download drop-down menu in Exchange



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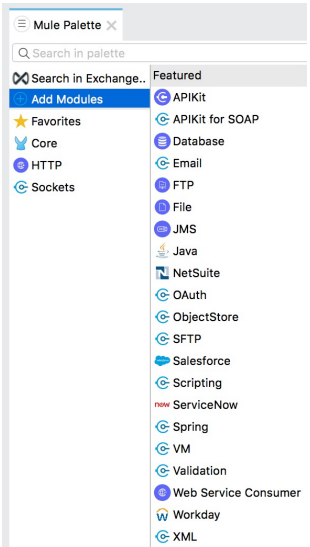
Connectors in Anypoint Studio

MuleSoft

- Some modules are **pre-installed** in Studio
  - HTTP, Database, Salesforce, Validation, Java
- Some modules are **not pre-installed** in Studio
  - SAP, Slack
  - Generated REST connectors



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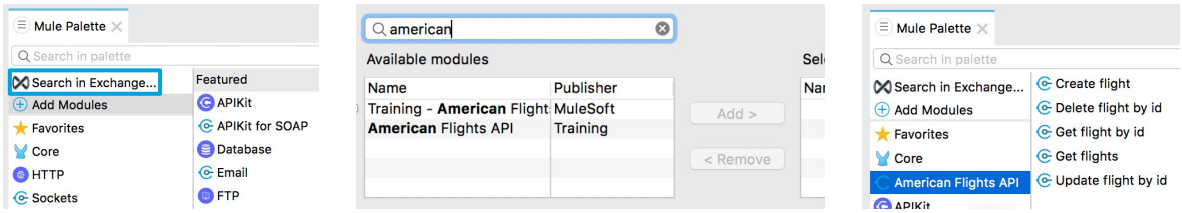
Adding connectors from Exchange

MuleSoft

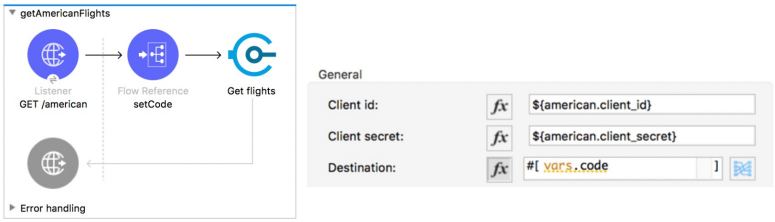
- If connectors are not pre-installed in Anypoint Studio, you can search Exchange and add them to a project



Walkthrough 8-1: Consume a RESTful web service that has an API (and connector) in Exchange

MuleSoft

- Create a new flow to call the American RESTful web service
- Add a REST connector from Exchange to an Anypoint Studio project
- Configure and use a REST connector to make a call to a web service
- Dynamically set a query parameter for a web service call



Consuming RESTful web services

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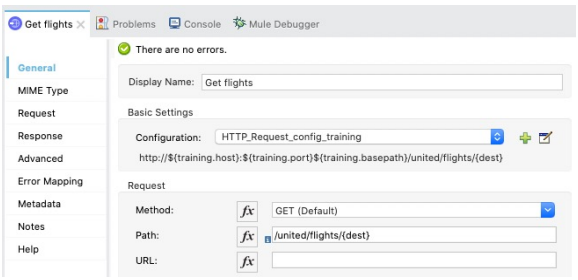
Consuming RESTful web services

MuleSoft

- First check and see if there is an existing Anypoint Connector in Studio or Exchange to connect to the service provider

- If there is not, use the **HTTP** connector and its **Request** operation
  - Configure the operation and/or global element configuration
  - Specify any headers, query parameters, or URI parameters to pass to the call



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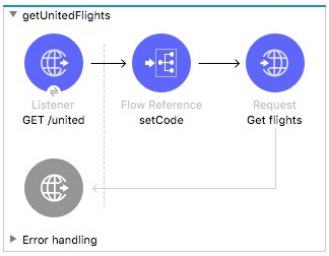
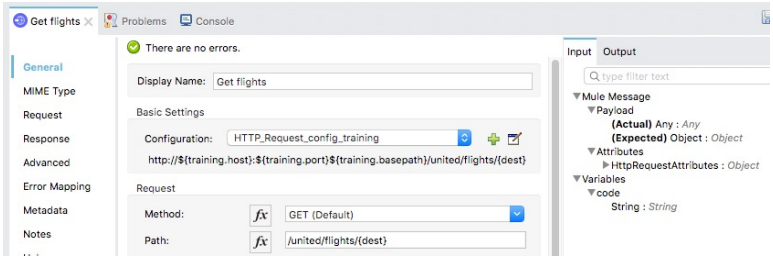
Walkthrough 8-2: Consume a RESTful web service

MuleSoft

- Create a new flow to call the United RESTful web service
- Use the HTTP Request operation to call a RESTful web service
- Dynamically set a URI parameter for a web service call
- Add metadata for an HTTP Request operation's response





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Consuming SOAP web services

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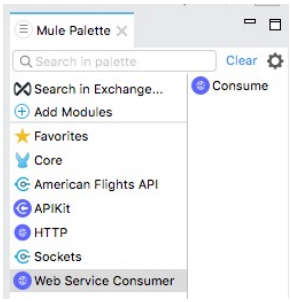
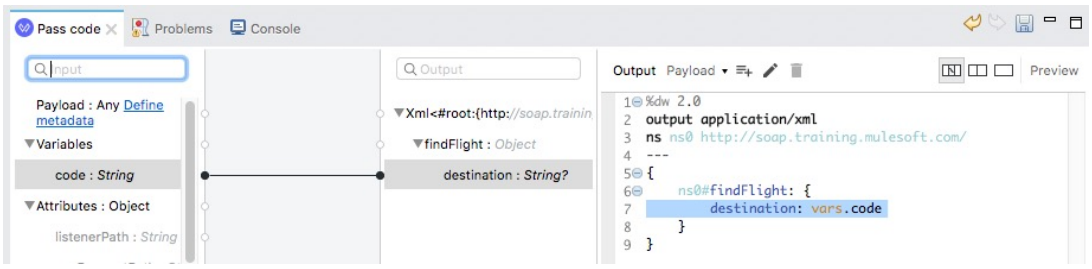
Consuming SOAP web services

- First check and see if there is an existing Anypoint Connector in Studio or Exchange to connect to the service provider
- If there is not, use the **Web Service Consumer** connector
  - Add the Web Service Consumer module to the project
  - Configure a global element configuration, which includes the location of the WSDL
  - Use the Consume operation
  - Select the SOAP operation to invoke



Passing data to a SOAP web service

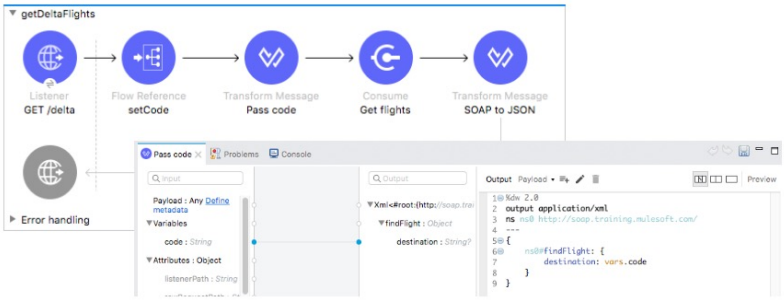
- Use the **Transform Message** component to pass arguments to a SOAP web service
  - Could also be used to set the required input payload to the SOAP operation
- When you add it before the Consume operation, DataSense is used to create metadata for the input that includes the arguments



Walkthrough 8-3: Consume a SOAP web service

MuleSoft

- Create a new flow to call the Delta SOAP web service
- Use the Web Service Consumer connector to call a SOAP web service
- Use the Transform Message component to pass arguments to a SOAP web service



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Combining data from multiple services

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Combining data from multiple services

- Data from different services is pretty much always going to be in different formats
- To combine the data sets, you need to transform each of them to a canonical, or standard format
  - In this module, you will use a Java class as the canonical format
  - In module 11, you will learn to use the DataWeave format as a canonical format

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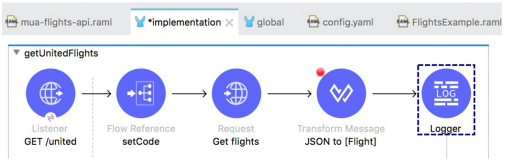
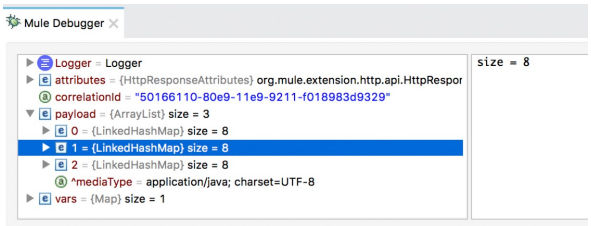
Walkthrough 8-4: Transform data from multiple services to a canonical format

- Define a metadata type for the Flight Java class
- Transform the results from RESTful and SOAP web service calls to a collection of Flight objects





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Summary

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Summary

MuleSoft

- To consume a web service, first look to see if it has a **connector in Anypoint Exchange**
  - Easiest way to consume a web service
  - Connectors for APIs specifications added to Exchange are generated automatically by REST Connect
- Use the **HTTP Request** operation to consume any REST web service
  - With or without URI parameters and query parameters
  - With or without a RAML definition
- Use the **Web Service Consumer** connector to consume any SOAP web service
- Use the Transform Message component to pass arguments to SOAP web services

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