



Module 2: Introducing Anypoint Platform



At the end of this module, you should be able to



- Describe the benefits of Anypoint Platform and MuleSoft's approach to be successful with it
- Describe the role of each component in building application networks
- Navigate Anypoint Platform
- Locate APIs and other assets needed to build integrations and APIs in Anypoint Exchange
- Build basic integrations to connect systems using Flow Designer

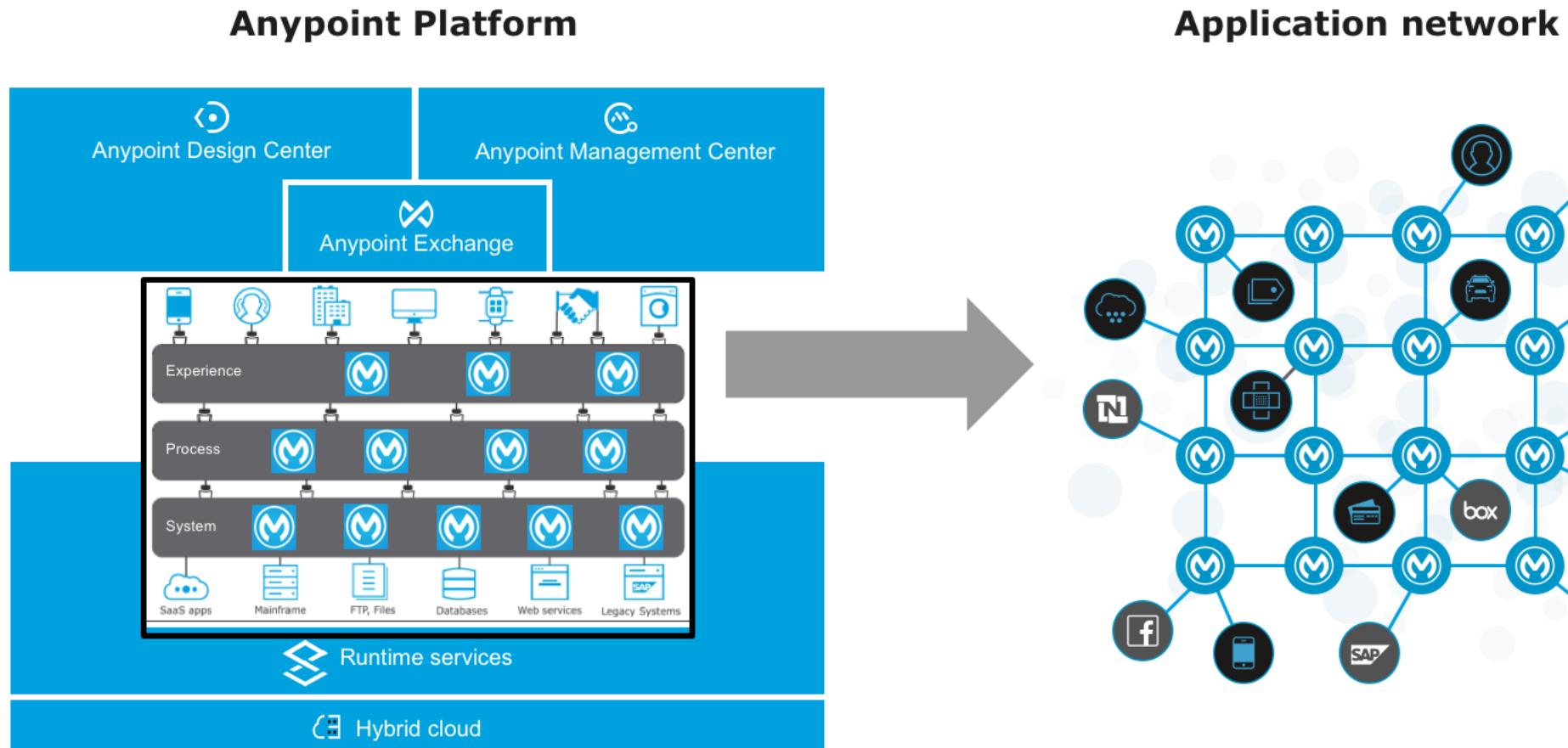
A screenshot of the Anypoint Platform web interface. The top navigation bar includes links for 'Training', a help icon, and 'MM'. The main content area is divided into several sections:

- Design Center**: A section for creating Mule applications and APIs, featuring a 'Start designing' button.
- Quick Start**: A callout box for connecting SaaS applications, mentioning 'Gather and manipulate data from multiple sources, then export the data to your systems or users.'
- Exchange**: A section for discovering and sharing reusable APIs, connectors, and templates, with a 'Discover & share' button.
- Management Center**: A sidebar listing various management tools:
 - Access Management**: Manage users, business groups, and audit logs.
 - API Manager**: Manage clients, policies, SLAs, traffic, and alerts.
 - Runtime Manager**: Deploy, manage & monitor deployed applications.
 - Data Gateway**: Access data with Salesforce Connect.
 - MQ**: Send messages using queues & pub-sub services.
 - Visualizer**: Visualize your Application Network.
 - Monitoring**: Monitor, search, alert & troubleshoot.

Introducing Anypoint Platform



Anypoint Platform uniquely enables the building of an application network



All contents © MuleSoft Inc.

4



All contents © MuleSoft Inc.

The most advanced enterprise platform for designing, developing and managing APIs and integrations

- Uniquely built as a single product
- Deploy anywhere
- Wide range of use cases



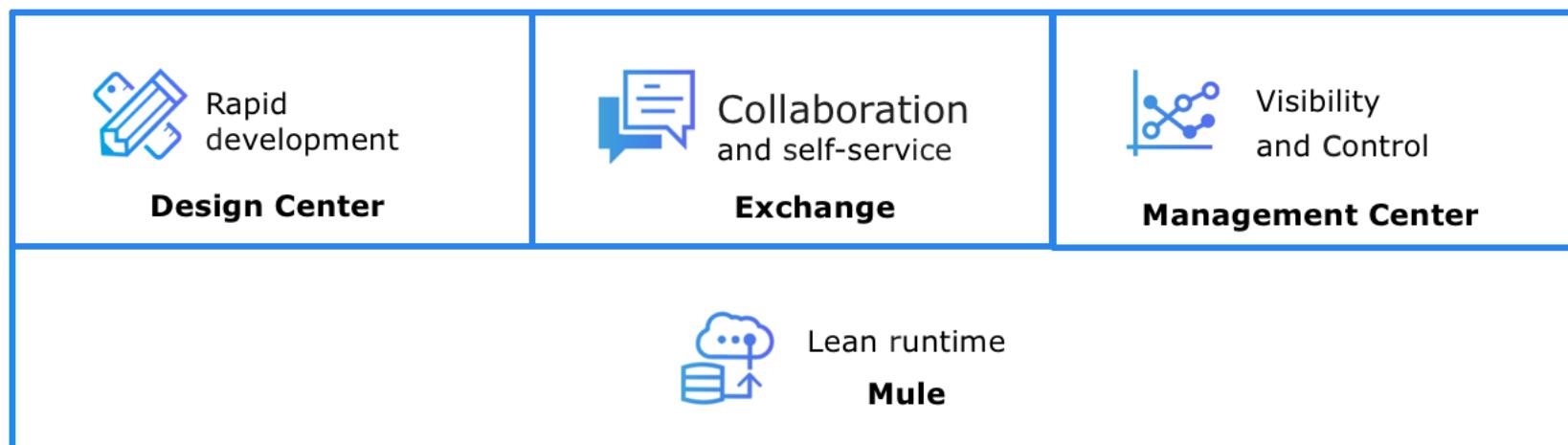
1 Design Center, 1 Mgmt Center, 1 Runtime



Specialists

Admin, Ops,
DevOpsAd-hoc
integrators

App devs

On-premises &
Private Cloud

Hybrid

Hosted by
MuleSoft

Cloud service providers



Pivotal Cloud Foundry

Design once, deploy anywhere



Anypoint Design Center

Anypoint Management Center



On-prem



Private cloud



fully managed iPaaS



Databases



FTP, Files



Web services



SaaS Apps



On-prem Apps



Social Apps



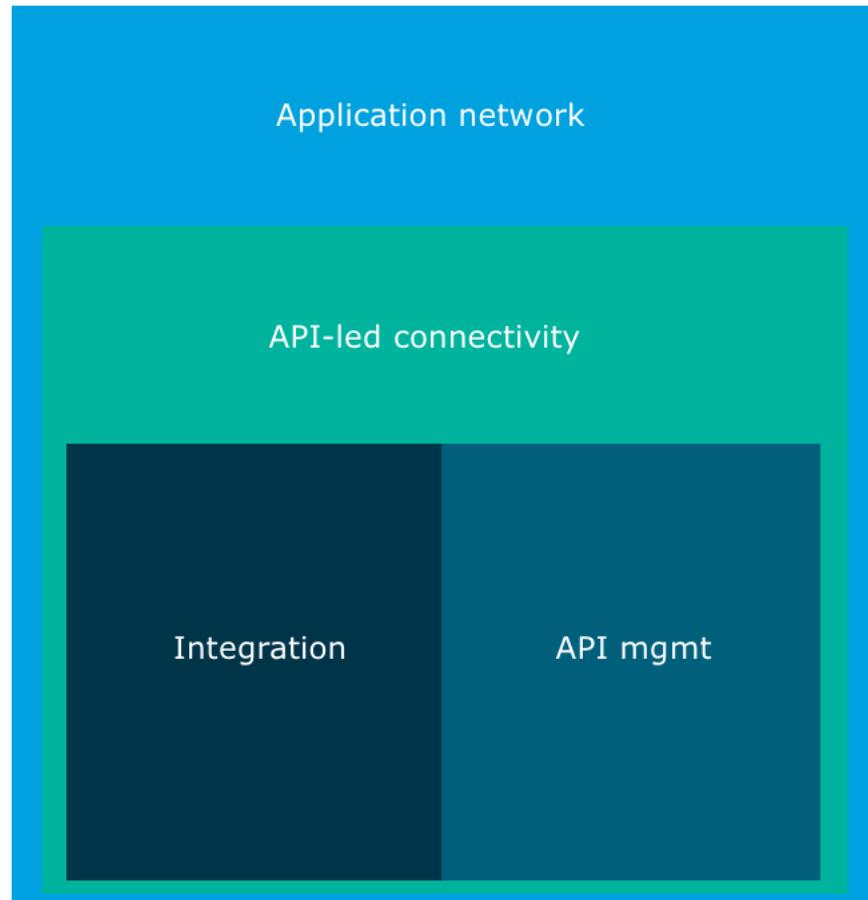
IoT



Partners

All contents © MuleSoft Inc.

Unique benefits for each layer



Speed of delivery



Actionable visibility



Secure by design



Future-proof architecture



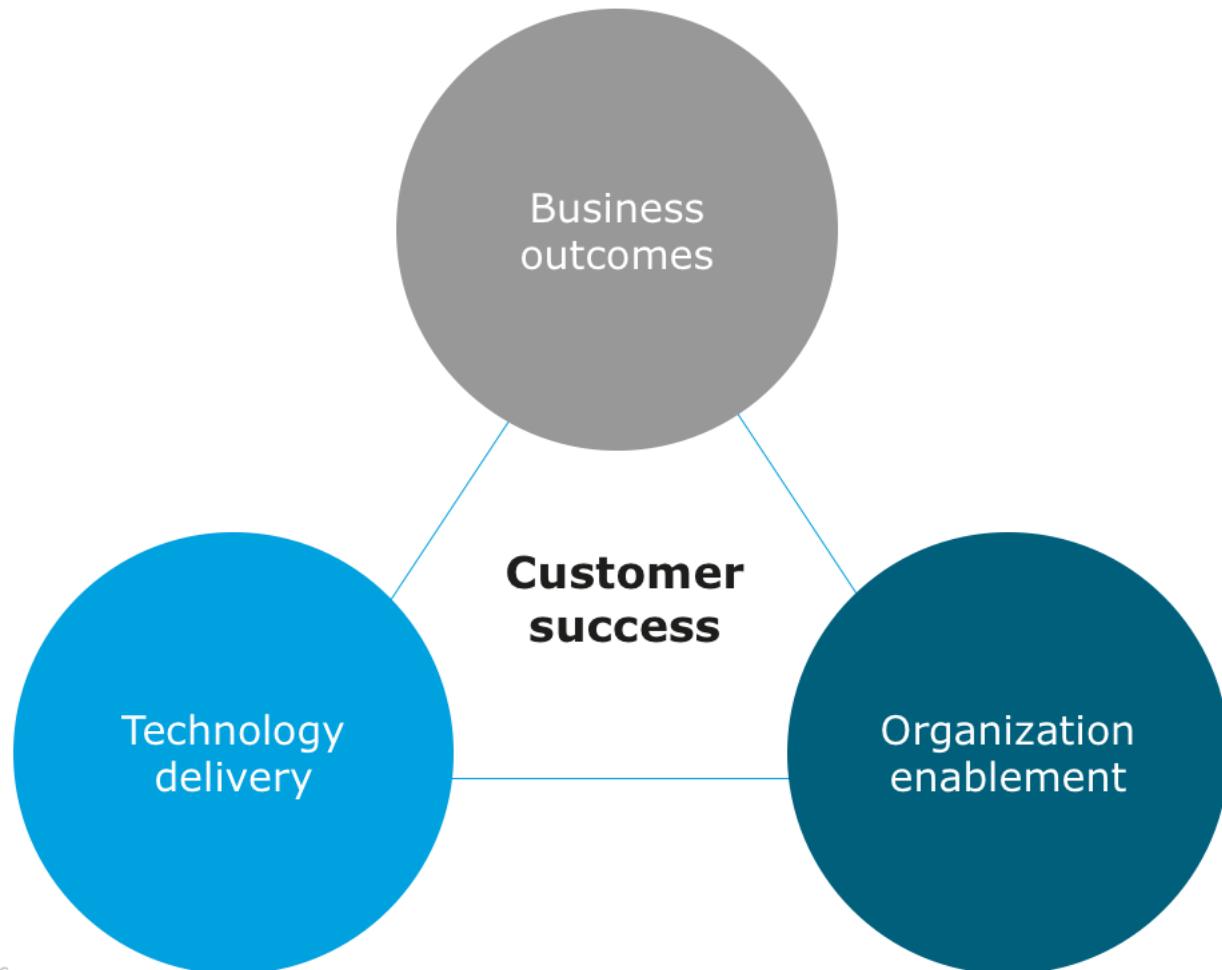
Intentional self-service

All contents © MuleSoft Inc.

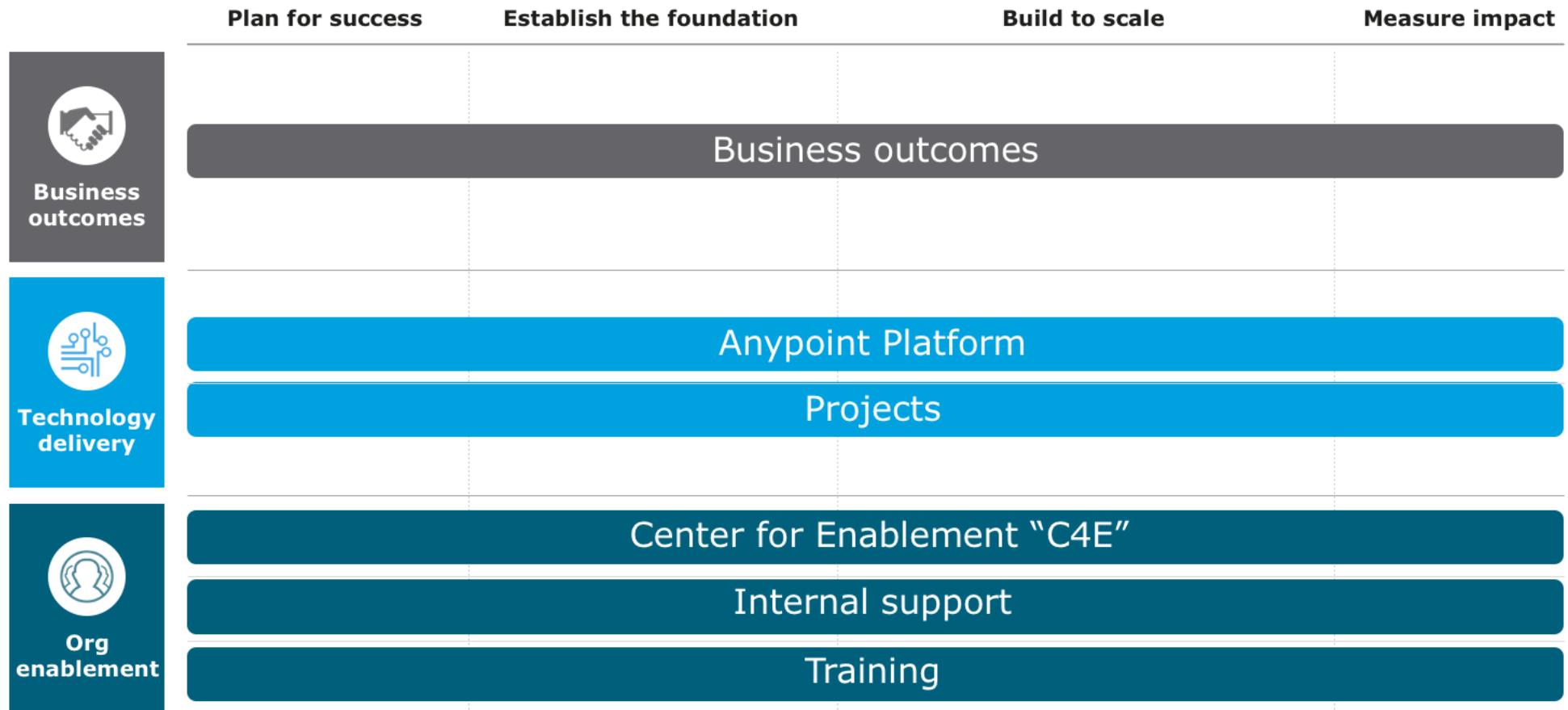
Achieving success with Anypoint Platform



MuleSoft's approach is centered around 3 core pillars



Defining the path to achieve success





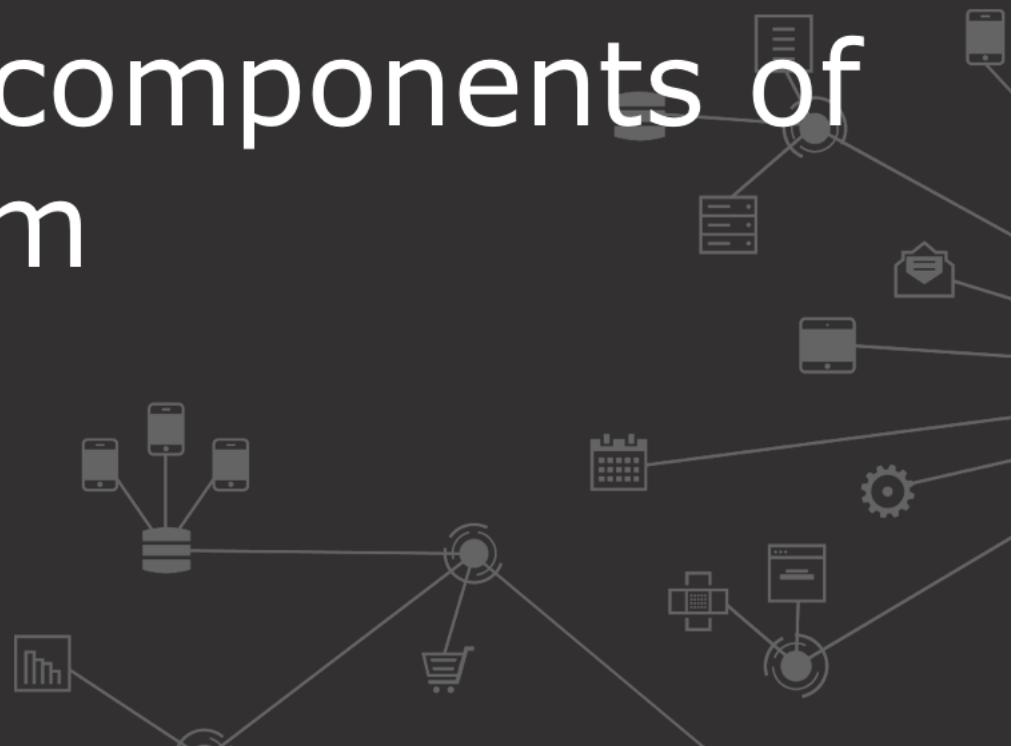
MuleSoft has a blueprint for you to follow

	Plan for success	Establish the foundation	Build to scale	Measure impact
 Business outcomes	<ul style="list-style-type: none"> Agree on business outcomes and KPIs Develop the overall success plan 	Monitor and manage	Refresh the success plan	Measure business outcomes
 Technology delivery	<ul style="list-style-type: none"> Define Anypoint platform vision and roadmap Design Anypoint platform architecture and implementation plan 	Deploy Anypoint Platform	Refine and scale Anypoint Platform	Measure Anypoint platform KPIs
	<ul style="list-style-type: none"> Prioritize IT projects and quick wins Staff and onboard the project teams 	<ul style="list-style-type: none"> Define reference architecture Launch initial projects and quick wins 	<ul style="list-style-type: none"> Onboard additional project teams Launch additional projects 	Measure project KPIs
 Org enablement	<ul style="list-style-type: none"> Assess integration capabilities Establish the C4E operating model 	<ul style="list-style-type: none"> Build and publish foundational assets Evangelize 	Drive consumption	Measure C4E KPIs
	<ul style="list-style-type: none"> Onboard MuleSoft Determine the internal support operating model 	<ul style="list-style-type: none"> Staff, train and launch team Publish support guidance and self-serve materials 	Monitor Anypoint Platform	Measure support KPIs
	<ul style="list-style-type: none"> Agree on initial roles Train the initial team(s) 	<ul style="list-style-type: none"> Develop the broader training plan Launch experiential learning opportunities 	Update training plan	Conduct skills assessment

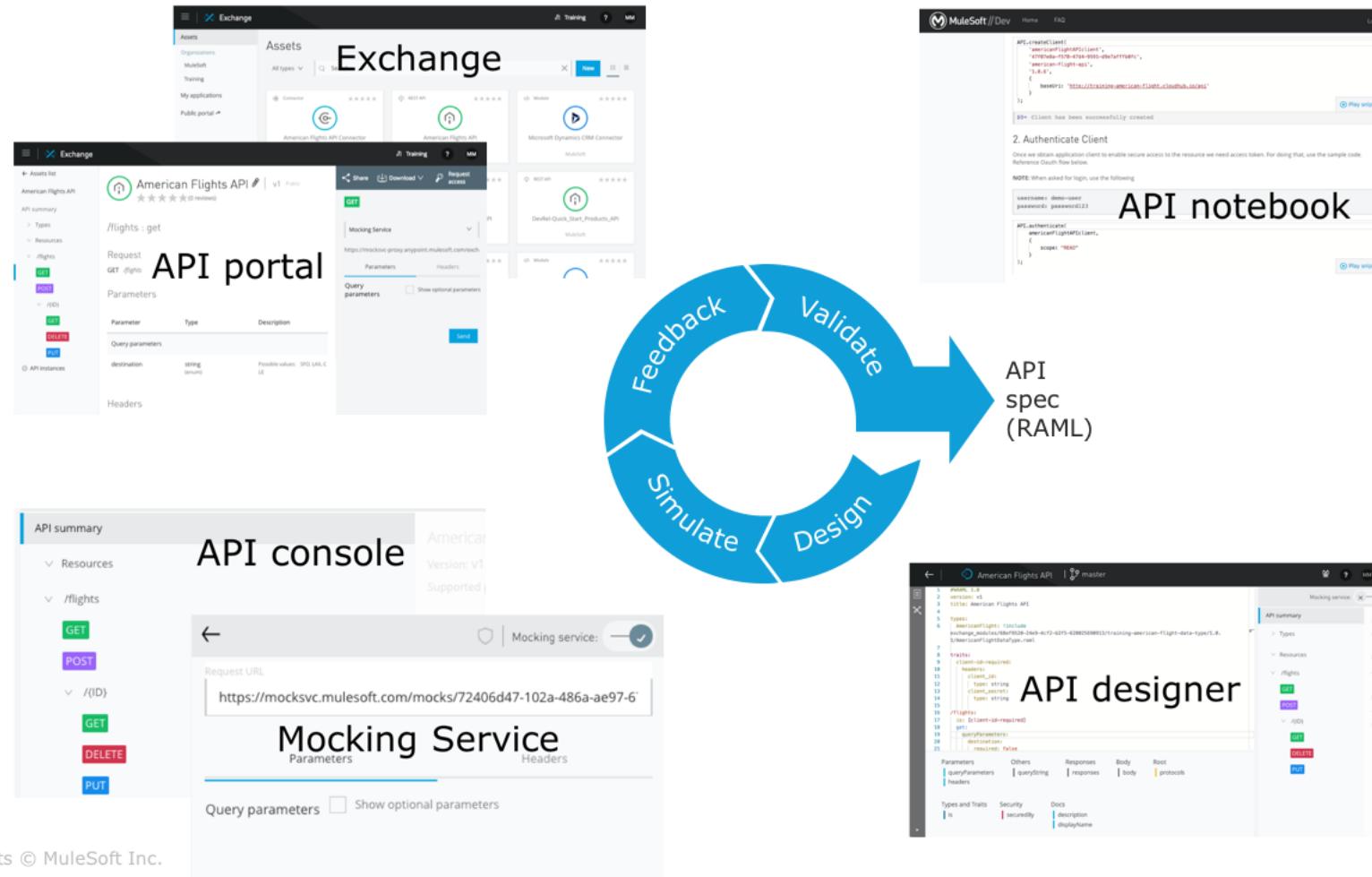
All contents © MuleSoft Inc.

Note: For details about individual steps, contact your MuleSoft Customer Success Manager

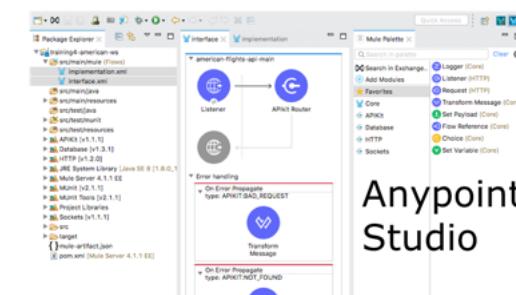
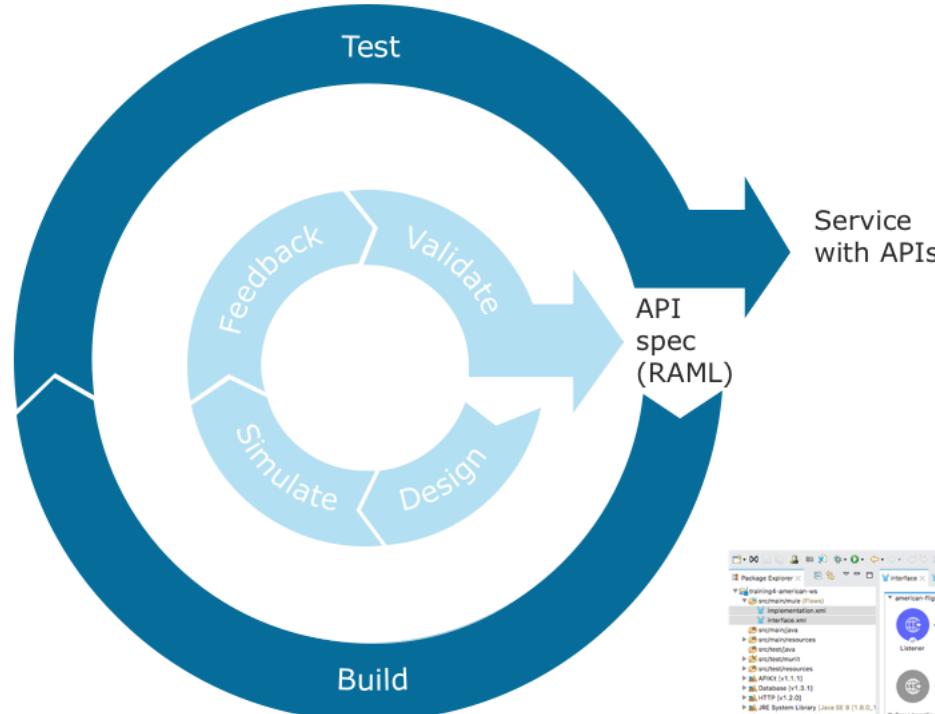
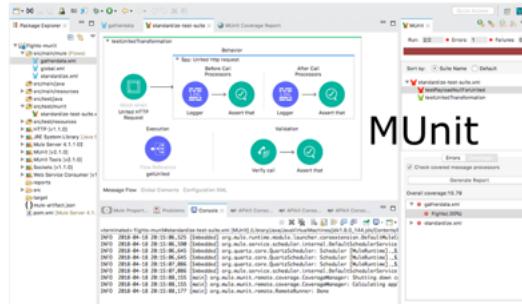
Introducing the components of Anypoint Platform



API development cycle: API specification



API development cycle: API implementation



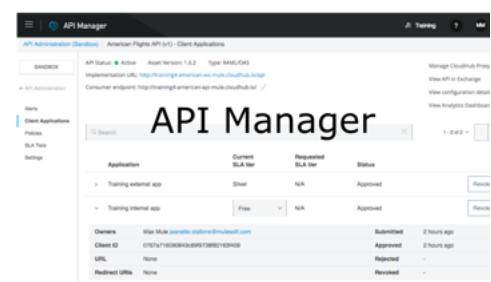
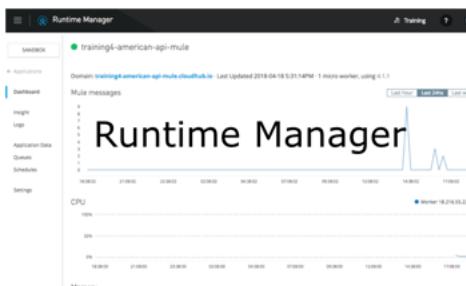
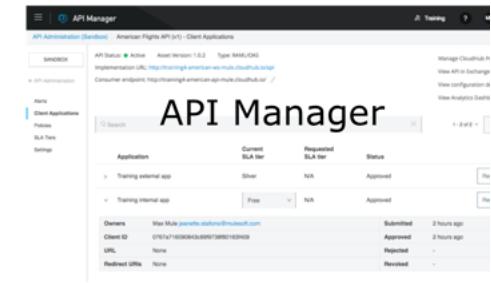
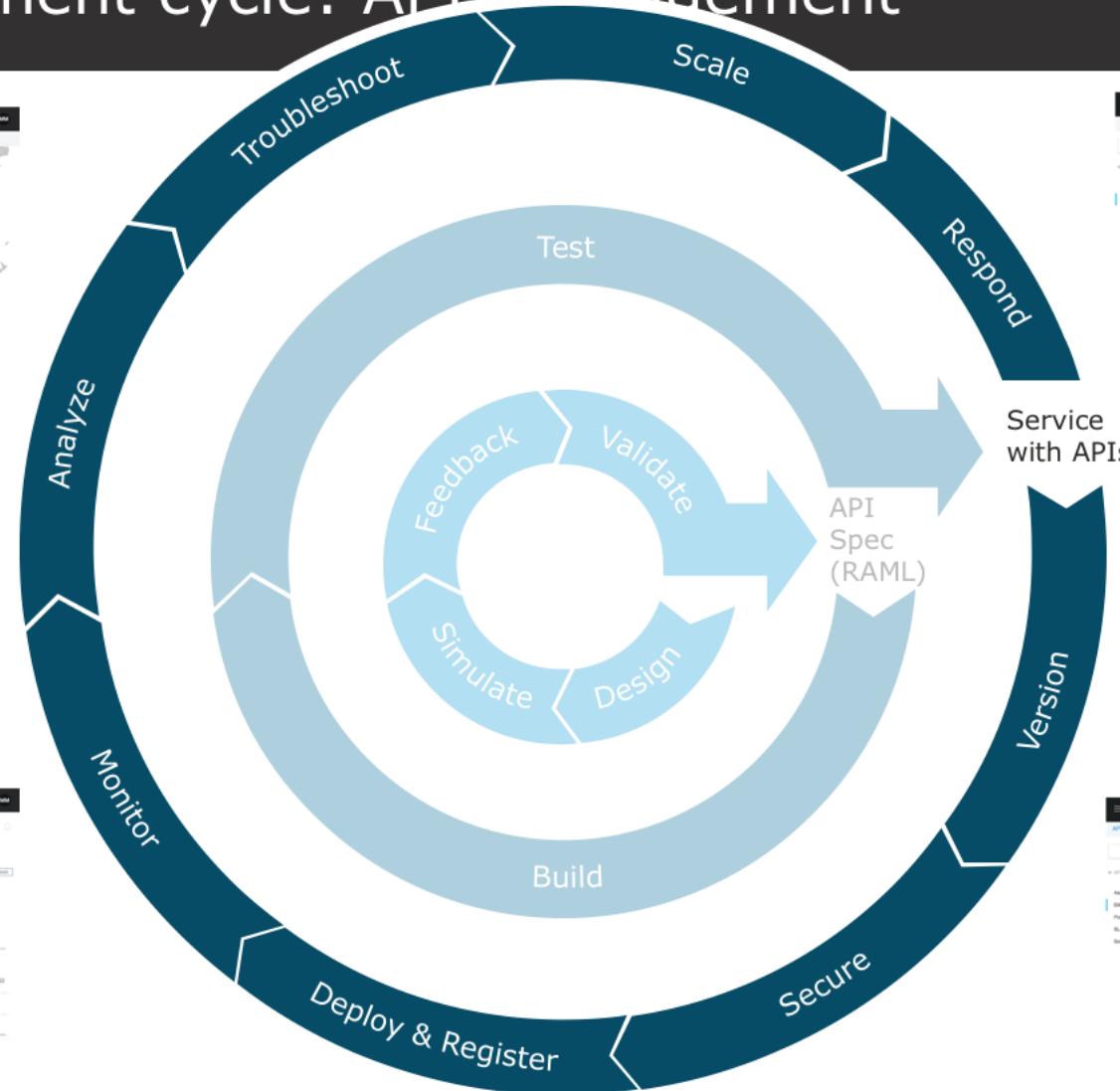
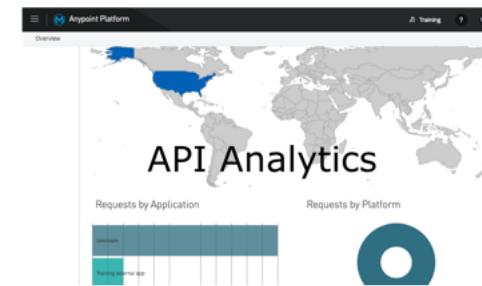
Anypoint
Studio

All contents © MuleSoft Inc.

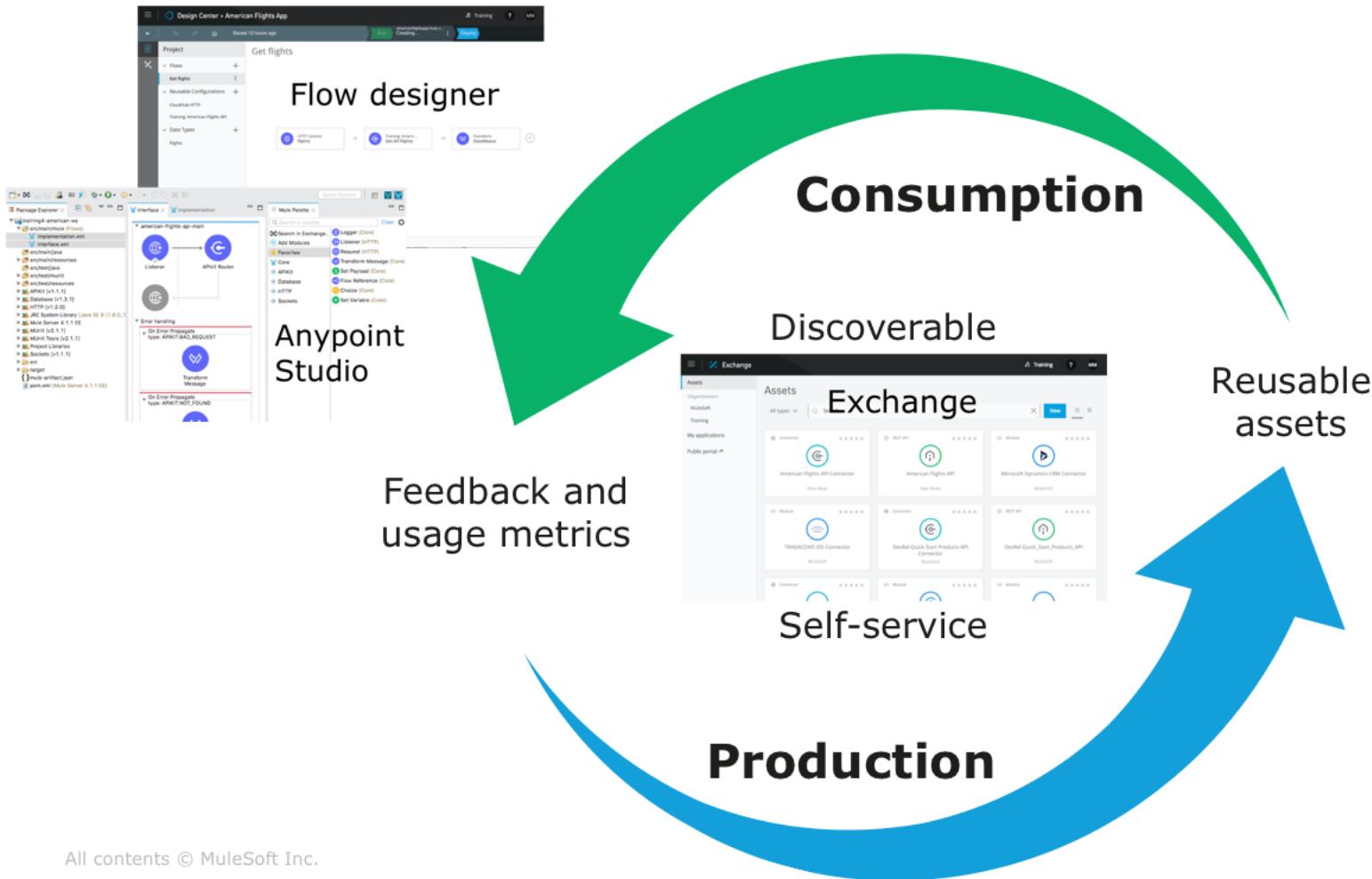
15



API development cycle: API management



API lifecycle: Discovery and consumption



All contents © MuleSoft Inc.

17

Anypoint Exchange



- A library of assets
- The central repository that is critical to the success of building an application network
- Ensures assets are published somewhere they can be discovered and reused



A screenshot of the Anypoint Exchange web interface. The top navigation bar includes 'Exchange', 'Training', a help icon, and a user icon. On the left, a sidebar menu shows 'All assets' (selected), 'Training (master)', 'Provided by MuleSoft', 'My applications', 'Public portal', and 'Settings'. The main content area is titled 'All assets' with a search bar and a 'New asset' button. It displays four asset cards: 'SAP Connector - Mule 4' (Connector, SAP logo, 5 stars, MuleSoft Organization), 'Salesforce Connector - Mule 4' (Connector, Salesforce logo, 5 stars, MuleSoft Organization), 'Amazon S3 Connector - Mule 4' (Connector, Amazon S3 logo, 5 stars, MuleSoft Organization), and 'Accelerator for Healthcare' (Custom, MuleSoft logo, 5 stars, MuleSoft Organization).

All contents © MuleSoft Inc.

20

What does (and should) Exchange contain?



- MuleSoft-provided **public** assets available in all accounts to all users
 - You can work with MuleSoft to get APIs and connectors certified and added
- **Private** content only available to people in your org
 - Assets added by anyone in your org are added to your private Exchange
- Your organization should populate it to contain everything you need to build your integration projects
 - Including APIs, connectors, diagrams, videos, links, and more

All types
Connectors
Templates
Examples
REST APIs
SOAP APIs
HTTP APIs
API Spec Fragments
Custom

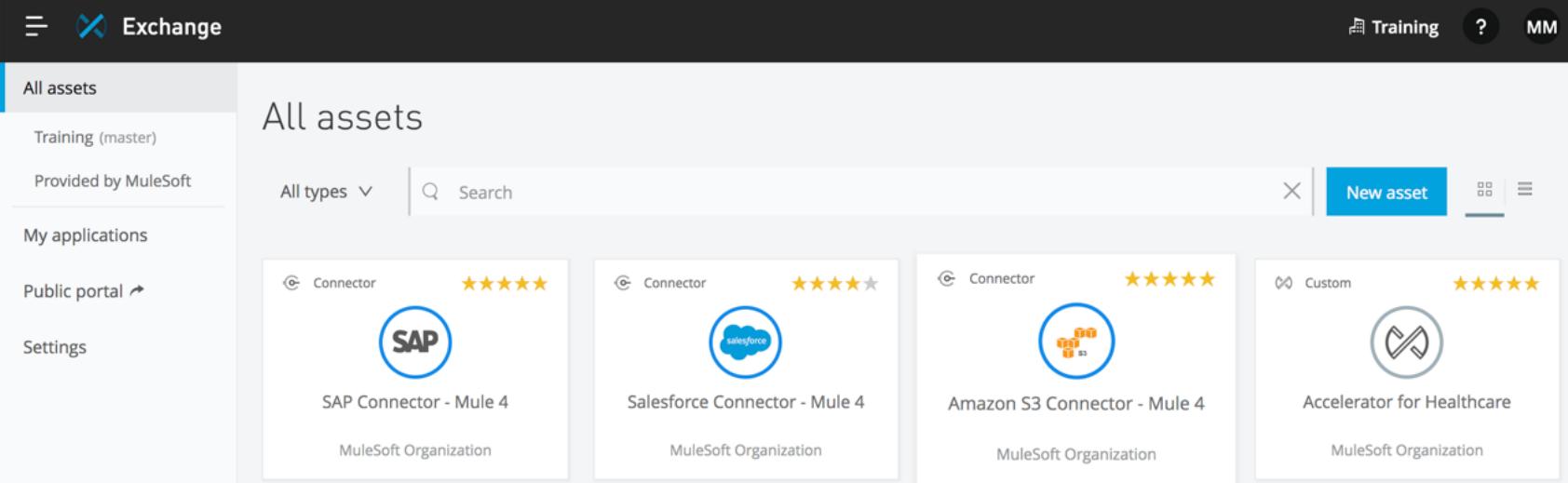
REST APIs and API portals in Anypoint Exchange



- When a REST API is added to Exchange, an **API portal** is automatically created for it
- An API portal has
 - Auto-generated **API documentation**
 - An **API console** for consuming and testing APIs
 - An **automatically generated API endpoint** that uses a **mocking service** to allow the API to be tested without having to implement it
- API portals can be shared with both internal and external users
- In the last module, you used a public API portal created from Anypoint Exchange for a private organization (Muletraining)

REST connectors in Anypoint Exchange

- When a RAML 1.0 API specification is added to Exchange, a **connector** is automatically created for it
 - The connector can be used in Mule applications to make calls to that API
 - REST Connect is the name of the technology that performs this conversion

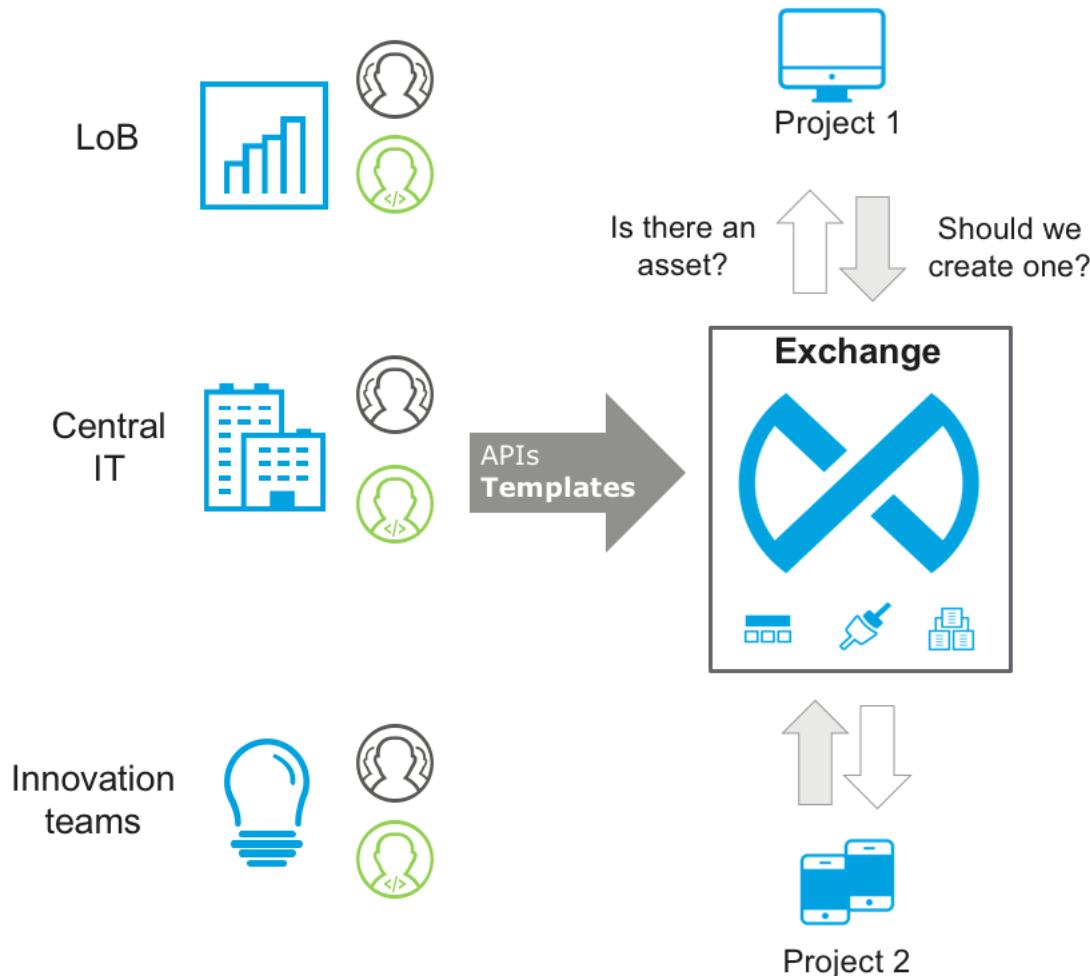


The screenshot shows the Anypoint Exchange interface. The left sidebar has a 'Training (master)' section selected. The main area displays four assets:

- SAP Connector - Mule 4**: Connector, 5 stars, SAP logo icon.
- Salesforce Connector - Mule 4**: Connector, 4.5 stars, Salesforce logo icon.
- Amazon S3 Connector - Mule 4**: Connector, 5 stars, Amazon S3 logo icon.
- Accelerator for Healthcare**: Custom, 5 stars, healthcare icon.

A 'New asset' button is visible in the top right corner.

Using Exchange: Success of C4E in action



Walkthrough 2-1: Explore Anypoint Platform and Anypoint Exchange



- Explore Anypoint Platform
- Browse Anypoint Exchange
- Review an API portal for a REST API in Exchange
- Discover and make calls to the Training: American Flights API in the public Exchange

A screenshot of the Anypoint Exchange web interface. The top navigation bar includes 'Exchange' (with a gear icon), 'Training' (with a play icon), a question mark icon, and a 'MM' icon. On the left, a sidebar menu lists 'All assets', 'Training (master)', 'Provided by MuleSoft' (which is selected and highlighted in blue), 'My applications', 'Public portal', and 'Settings'. The main content area is titled 'Assets provided by MuleSoft' and 'REST APIs'. It displays a grid of API cards. One card is selected, showing 'Training: American Flights API' with a 5-star rating and a green circular icon with a house and a person. Other visible cards include 'Appian API' (MuleSoft Organization, 5 stars), 'PayPal Payments API' (MuleSoft Organization, 5 stars), and several other partially visible cards with 5-star ratings and green circular icons.

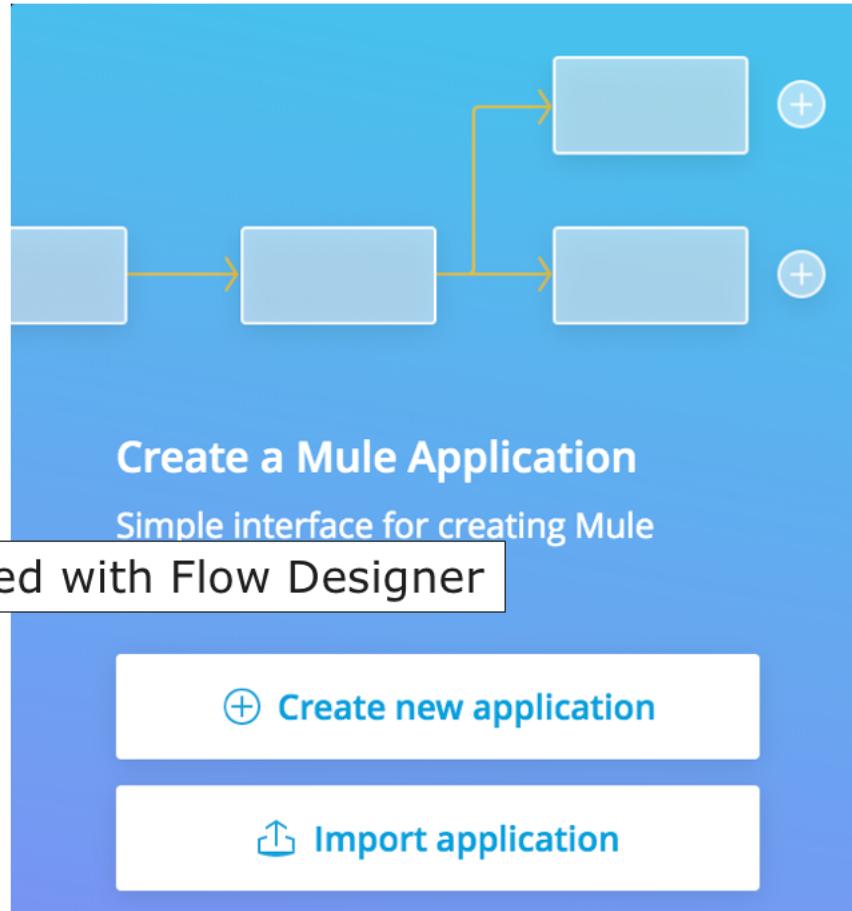
All contents © MuleSoft Inc.

25

Building integration applications and APIs with Design Center



Design Center anatomy



```
%RAML 1.0
title: DevRel-Quick Start Products API
version: v1.0
baseUri:
http://quick-start-store.us-w1.cloudhub.io/api

securitySchemes:
basic:
description: |
This API supports Basic Authentication.
type: Basic Authentication
```

Create an API Specification

Interface for designing, documenting,
and testing API sp

Created with API Designer

+ Create API specification

+ Create fragment



Design Center applications

Application	Purpose	In this course	Additional courses
Flow Designer	Web app for building integration apps that connect systems and consume APIs	2 WTs	<ul style="list-style-type: none">• Anypoint Platform: Flow Design
API Designer	Web app for designing, documenting, and mocking APIs	Module 3	<ul style="list-style-type: none">• Anypoint Platform: API Design
Anypoint Studio	Desktop IDE for implementing APIs and building integration applications	Module 4 In Fundamentals: Modules 6-13	

Both Flow Designer and Anypoint Studio create Mule applications



- **Mule applications** can be created
 - Visually using Flow Designer or Anypoint Studio
 - By writing code (primarily XML) using Anypoint Studio (or other tools)
- Under the hood, Mule applications are Java applications using Spring
- Mule applications are deployed to a **Mule runtime**
 - Mule runtimes can be MuleSoft-hosted in the cloud (CloudHub) or customer-hosted in the cloud or on-prem

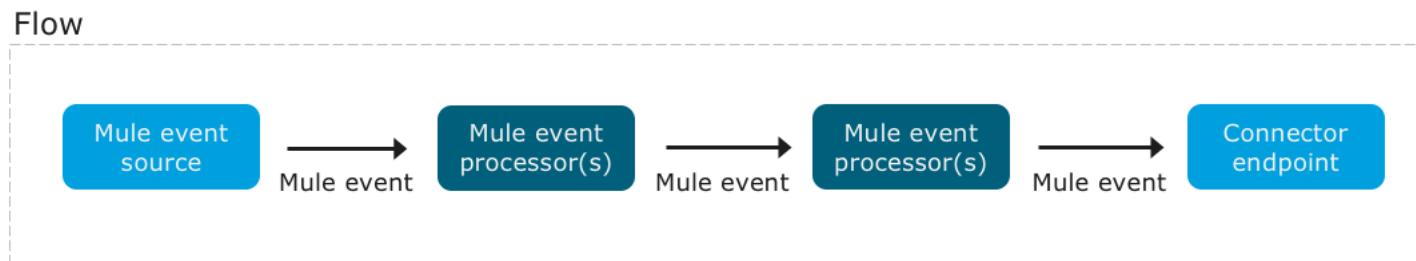
Mule is the runtime engine of Anypoint Platform



- **A lightweight Java-based enterprise service bus (ESB) and integration platform** that allows developers to connect apps together quickly and easily, enabling them to exchange data
 - Acts as a transit system for carrying data between apps (the Mule)
 - Can connect all systems including web services, JMS, JDBC, HTTP, & more
- **Decouples point-to-point integrations** by having all (non-Mule) apps talk to the bus (to a Mule runtime) instead of directly to each other
- **Can be deployed anywhere**, can integrate and orchestrate events in real time or in batch, and has universal connectivity
- **Enforces policies for API governance**

Mule 4 applications and flows

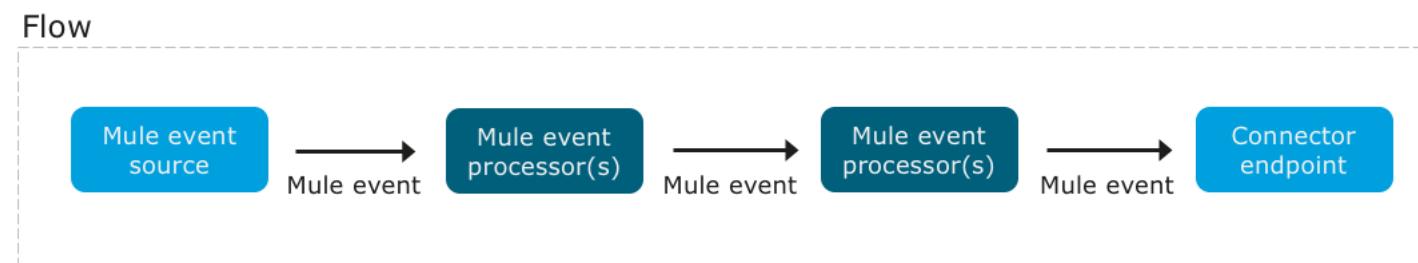
- Mule applications receive events, process them, and route them to other endpoints
- **Mule applications** accept and process a **Mule event** through a series of **Mule event processors** plugged together in a **flow**



- An application can consist of
 - A single flow
 - Multiple flows
 - Multiple flows connected together

What's in a typical Mule 4 flow?

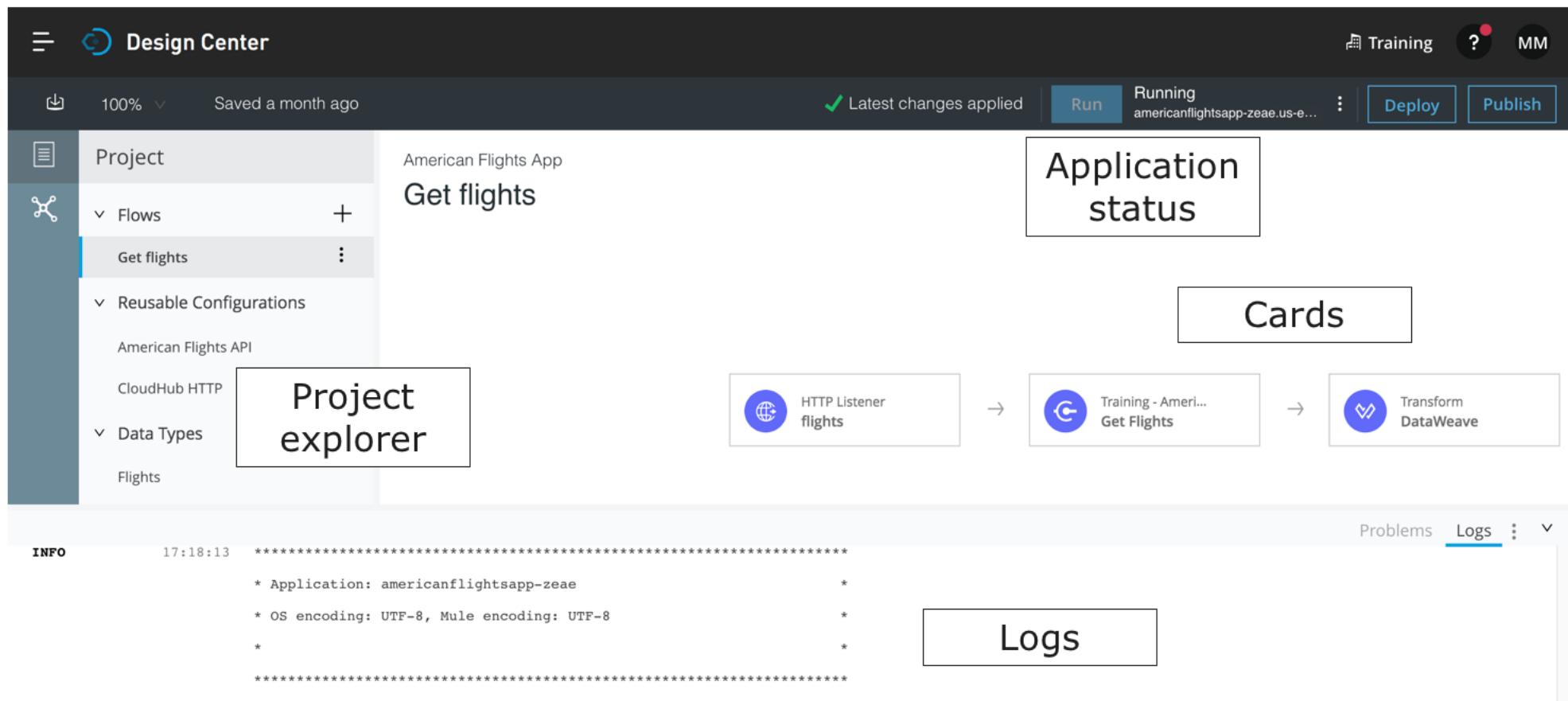
- A **Mule event source** that initiates the execution of the flow
 - Can be triggered by an event such as
 - A consumer request from a mobile device
 - A change to data in a database
 - The creation of a new customer ID in a SaaS application
- **Mule event processors** that transform, filter, enrich, and process the event and its message



Creating integration applications with Flow Designer



Flow Designer anatomy



The screenshot shows the MuleSoft Anypoint Studio interface. On the left, the **Project explorer** sidebar lists the project structure: American Flights App, Get flights flow, Reusable Configurations, American Flights API, CloudHub HTTP, and Data Types (Flights). The **Application status** section indicates the application is running. The **Cards** section displays three components: HTTP Listener flights, Training - Ameri... Get Flights, and Transform DataWeave. The **Logs** section shows INFO logs for the application starting at 17:18:13.

```
INFO    17:18:13 **** Application: americanflightsapp-zeae ****  
INFO    17:18:13 * OS encoding: UTF-8, Mule encoding: UTF-8 *  
INFO    17:18:13 * * * * * Starting Bean: listener
```

Running Flow Designer applications



- When you create a Mule application project in Design Center
 - A new application is created and opened in Flow Designer
 - **The application is deployed to a MuleSoft-hosted Mule runtime (called a CloudHub worker) in the cloud and started**
- When you make changes to the application in Flow Designer and are ready to test it
 - You need to run the application again – which updates the application deployed to the worker



CloudHub workers

- **A worker is a dedicated instance of Mule that runs an app**
- Each worker
 - Runs in a separate container from every other application
 - Is deployed and monitored independently
 - Runs in a specific worker cloud in a region of the world
- Workers can have a different memory capacity and processing power
 - Apps can be scaled vertically by changing the worker size
 - Apps can be scaled horizontally by adding multiple workers
- There are workers in different environments
 - Design (for Flow Designer apps only), Sandbox, Production, ...
 - Apps can be promoted from one environment to another

Worker size
0.1 vCores
0.1 vCores
500 MB memory
0.2 vCores
1 GB memory
1 vCore
1.5 GB memory
2 vCores
3.5 GB memory

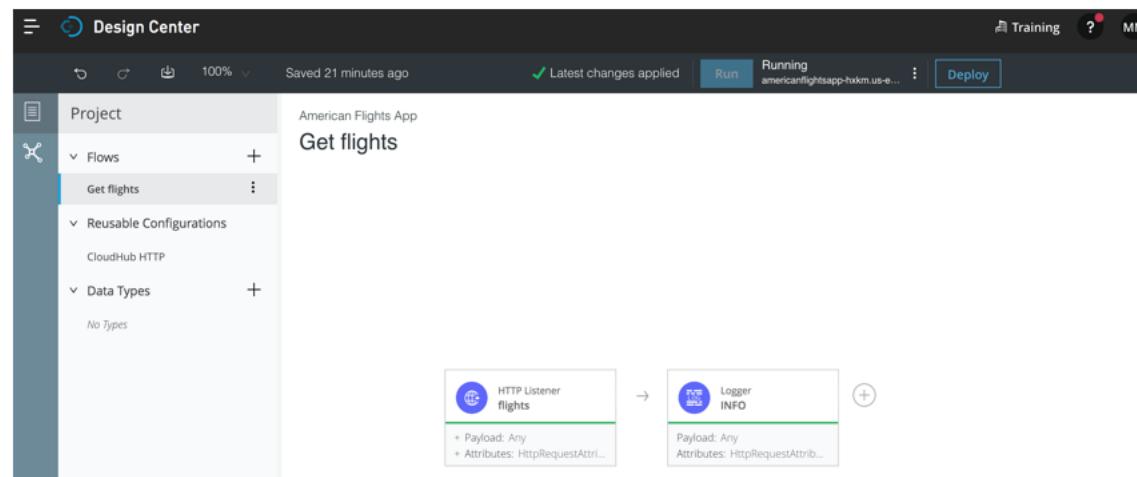
All contents © MuleSoft Inc.



Walkthrough 2-2: Create a Mule application with Flow Designer



- Create a new Mule application project in Design Center
- Create an HTTP trigger for a flow in the application
- Add a Logger component
- Run and test the application
- View application information in Runtime Manager



All contents © MuleSoft Inc.

38

Accessing, querying, and transforming data



Accessing and modifying Mule 4 event data



- The data that passes through flows in the app
- Metadata contained in the message header
- The core info of the message - the data the app processes
- Metadata for the Mule event - can be defined and referenced in the app processing the event

Transforming data with DataWeave

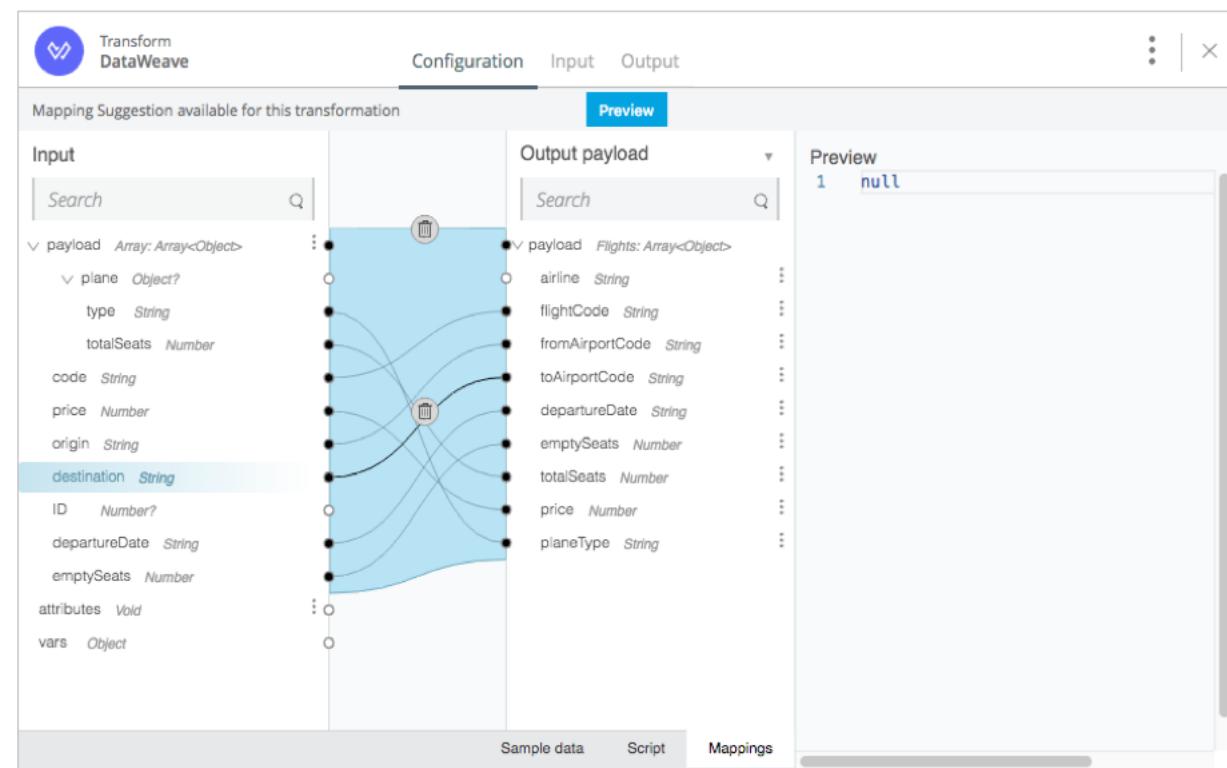
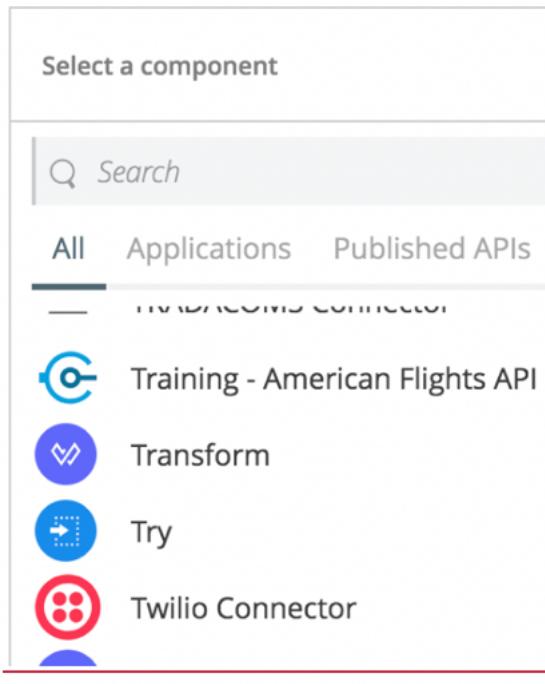


- DataWeave 2.0 is the expression language for Mule to access, query, and transform Mule 4 event data
- A JSON-like language that's built just for data query and transformation use cases
 - Full-featured and fully native framework
- Fully integrated with Flow Designer (and Anypoint Studio)
 - Graphical interface with payload-aware development



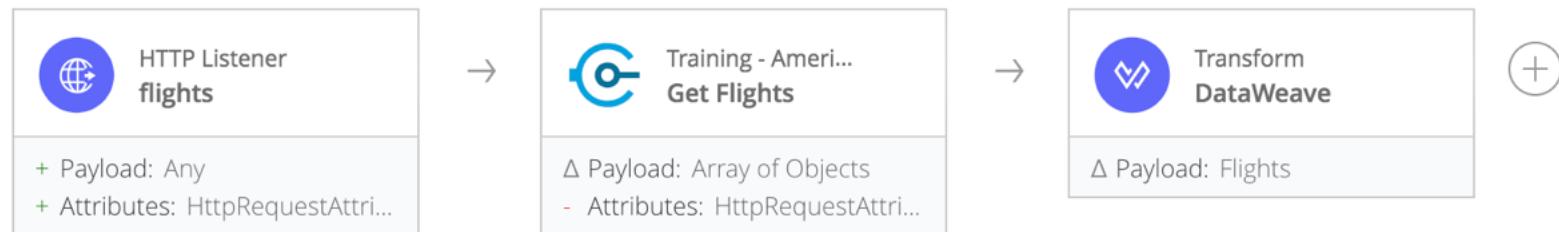
The Transform component

- Has input, output, and preview sections with both drag-and-drop and script editors



Walkthrough 2-3: Create an integration application with Flow Designer that consumes an API

- Examine Mule event data for calls to an application
- Use the Training: American Flights API in Anypoint Exchange to get all flights
- Transform data returned from an API to another format

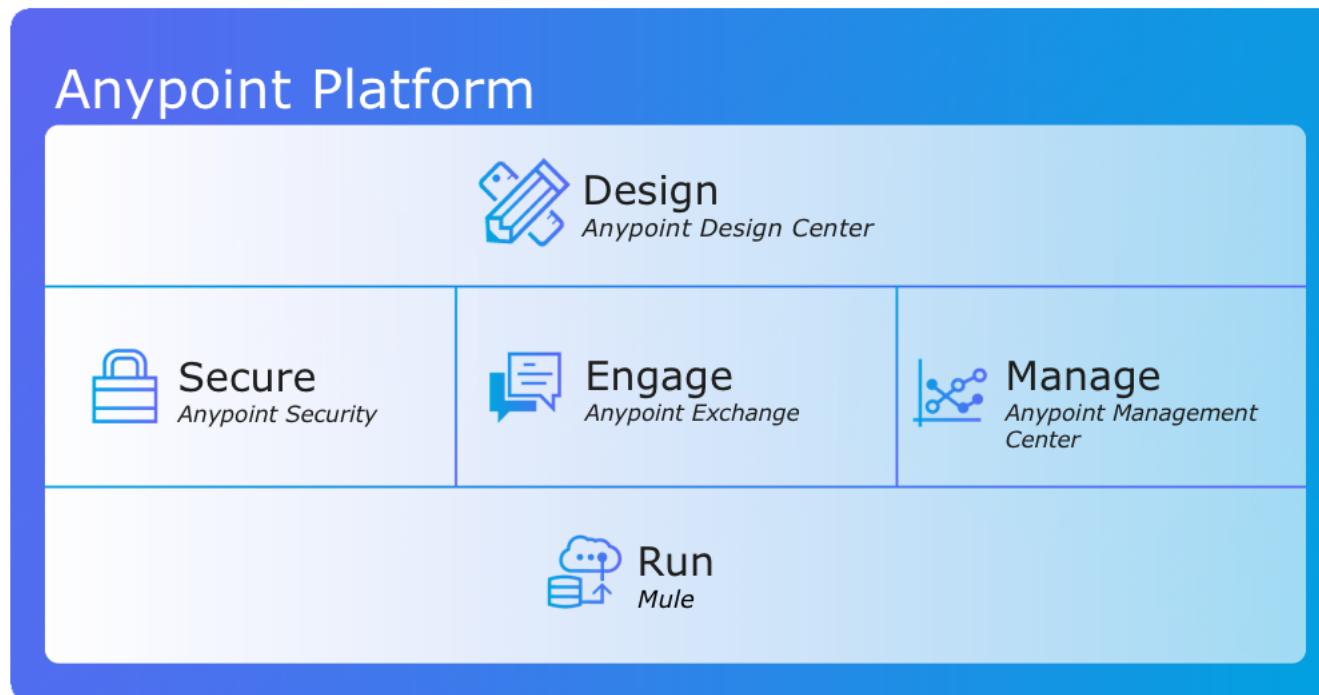


Summary



Summary: Anypoint Platform

- **Anypoint Platform** is a unified, hybrid integration platform that creates a seamless **application network** of apps, data, and devices with **API-led connectivity**



All contents © MuleSoft Inc.

Summary

- Use **Anypoint Exchange** as a central repository for assets so they can be discovered and reused
 - Populate it with everything you need to build your integration projects
- Use **Flow Designer** to build integration applications
 - These are Mule 4 applications that are deployed to a Mule runtime
 - To learn more, take the 1-day *Anypoint Platform: Flow Design* course
- **Mule runtimes** can be MuleSoft-hosted in the cloud (CloudHub) or customer-hosted in the cloud or on-prem
- **DataWeave 2.0** is the expression language for Mule to access, query, and transform Mule 4 event data