

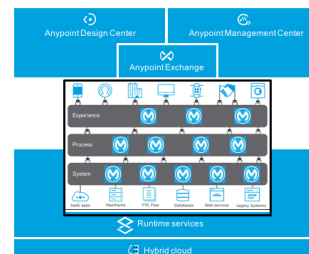


Module 2: Introducing Anypoint Platform

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

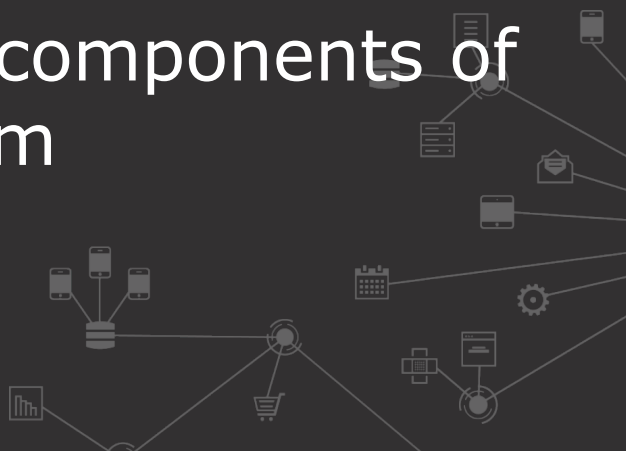


- Identify all the components of Anypoint Platform
- Describe the role of each component in building application networks
- Navigate Anypoint Platform
- Locate APIs and other assets needed to build integrations and APIs in Anypoint Exchange
- Build basic integrations to connect systems using flow designer



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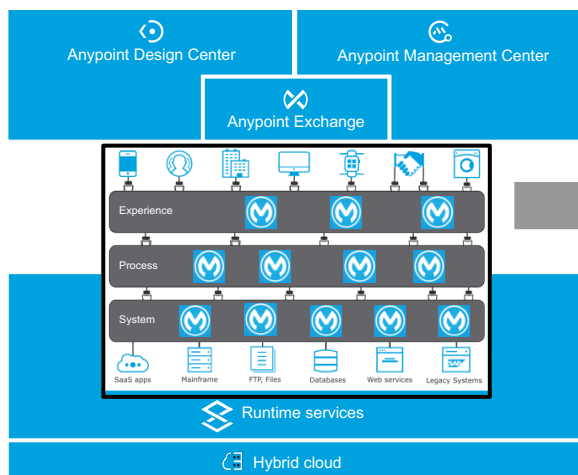
Introducing the components of Anypoint Platform



Anypoint Platform uniquely enables the building of an application network



Anypoint Platform



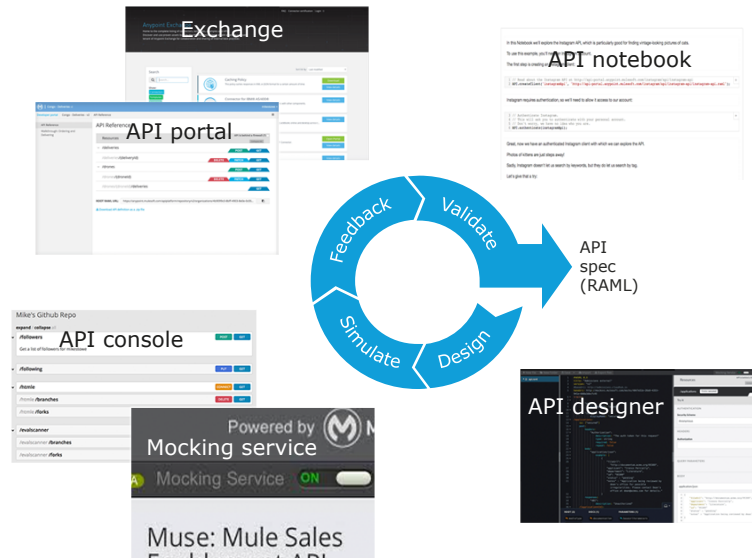
Application network



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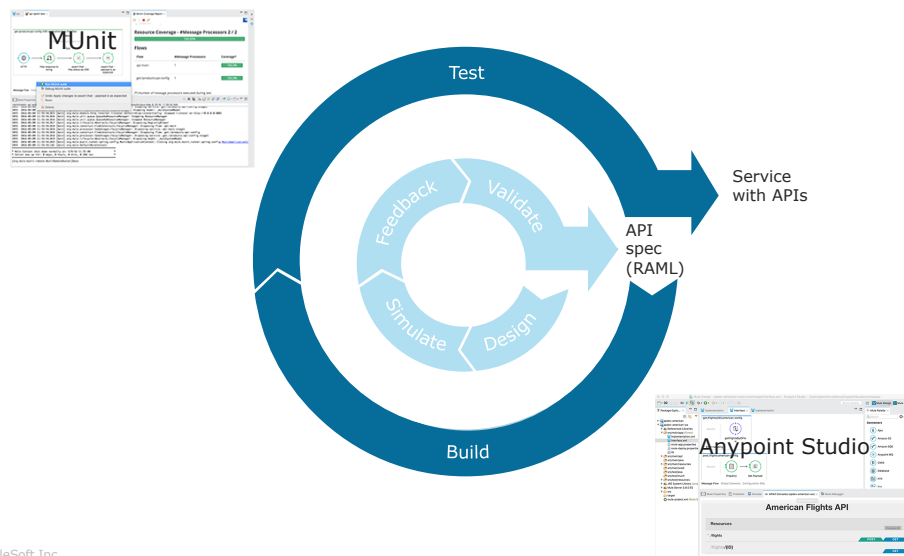
API development cycle: API specification



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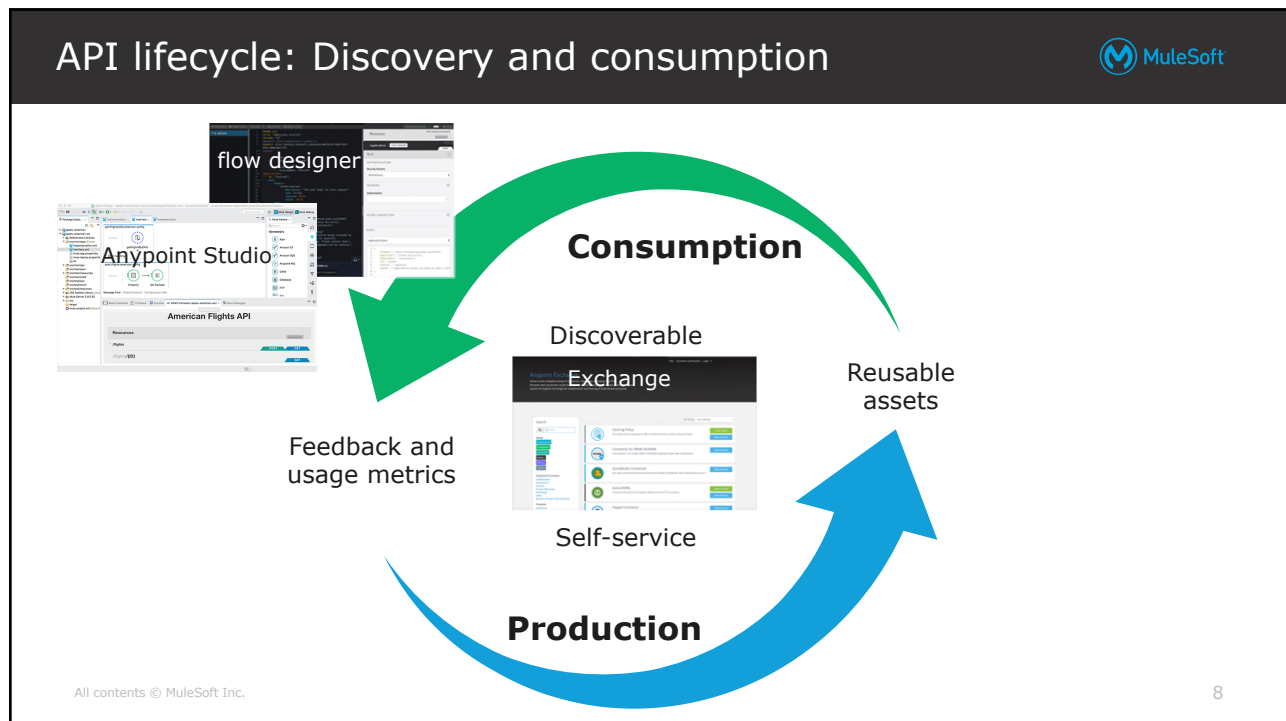
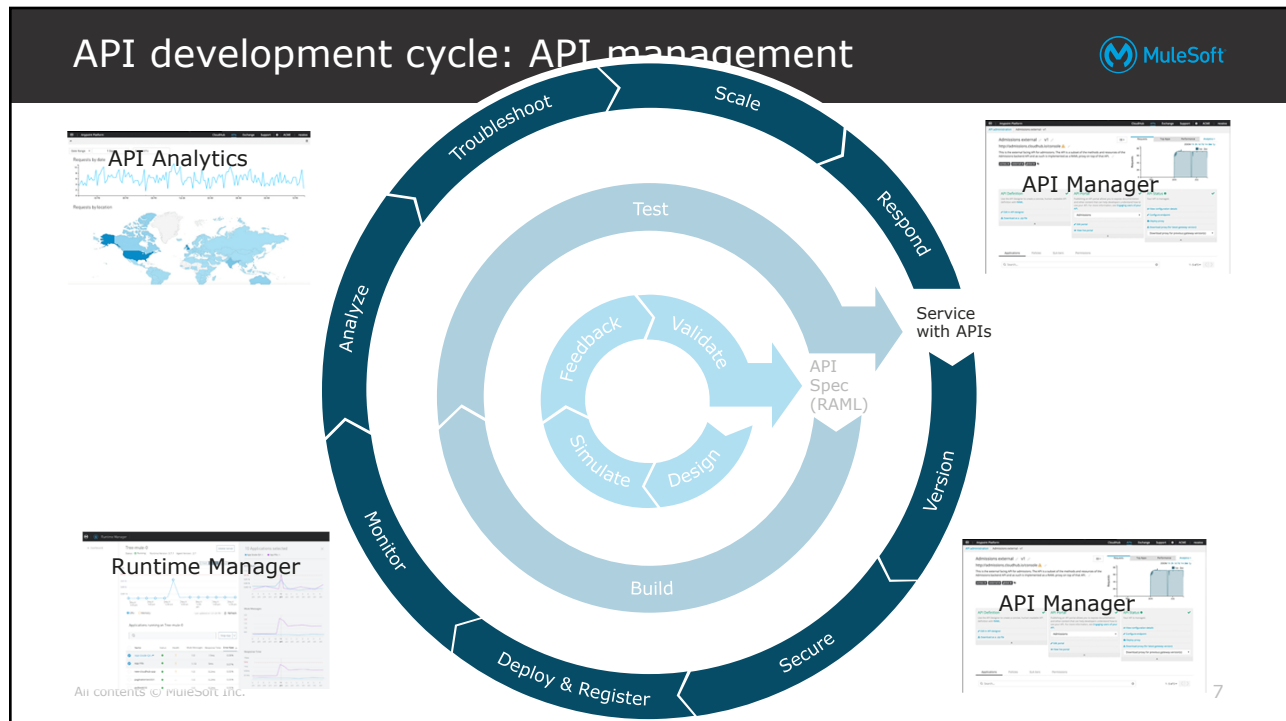
5

API development cycle: API implementation

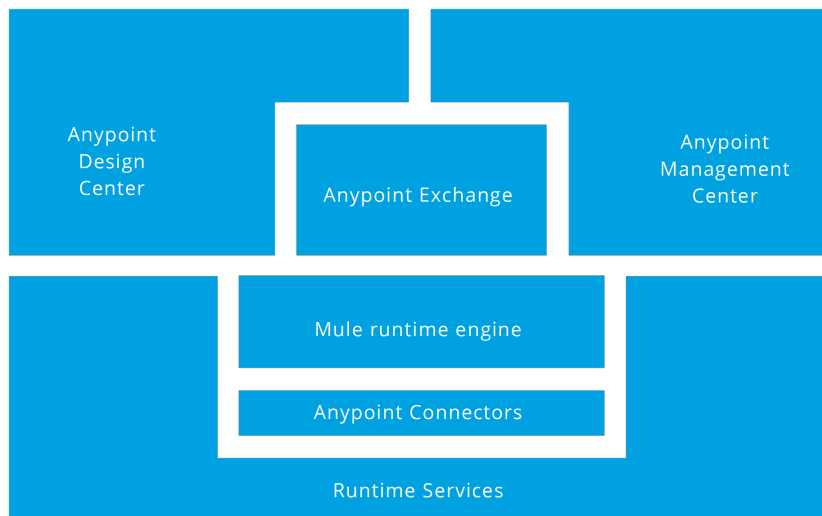


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Anypoint Platform: The components



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Anypoint Platform



- **A unified, highly productive, hybrid integration platform that creates a seamless application network of apps, data, and devices with API-led connectivity**
- A collection of runtimes, frameworks, tools, and web applications
 - **Tools and frameworks** for building applications
 - **Mule runtime** for running applications and applying policies
 - MuleSoft-hosted in the cloud or customer-hosted (on-prem or in the cloud)
 - **Web application** for
 - Discovering and learning about APIs and other assets
 - Building integration applications that consume APIs
 - Deploying, running, managing, and monitoring applications
 - Defining and managing APIs

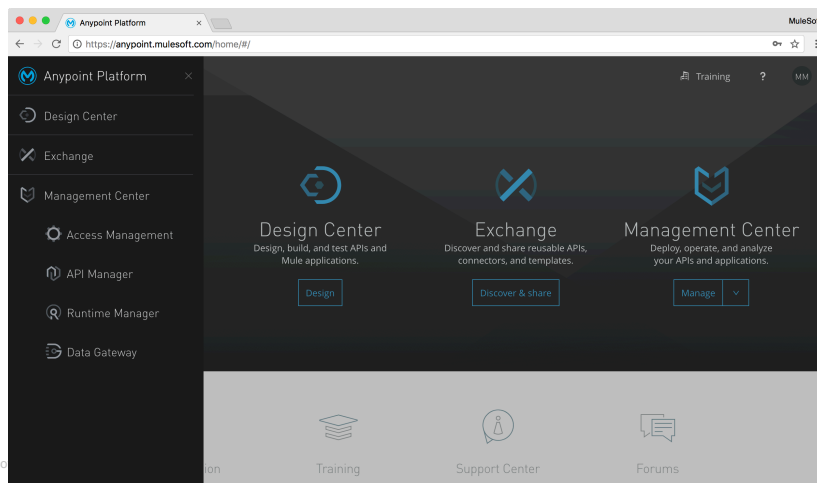
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Anypoint Platform: The web application



- MuleSoft-hosted in the cloud at anypoint.mulesoft.com
- Customer-hosted as part of Anypoint Platform Private Cloud Edition



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Core functionality of the web application



| | | |
|--|--|--|
| API designer | Designing APIs | Anypoint Platform × Design Center Exchange Management Center Access Management API Manager Runtime Manager Data Gateway |
| flow designer | Building integration apps that consume APIs | |
| Exchange | Sharing, discovering, and exploring all the resources needed for your integration projects including creating public portals | |
| API console, mocking service, API notebook | Testing and simulating APIs | |
| Access Management | Managing users | |
| Runtime Manager | Deploying apps to the cloud or on-prem Managing and monitoring applications | |
| API Manager | Managing and monitoring APIs | |

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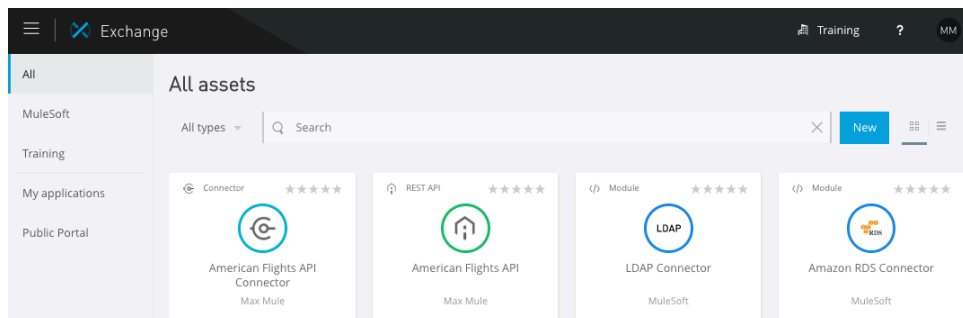
12

Introducing Anypoint Exchange

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



14

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 |
| RAML fragments |
| Custom |

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REST APIs and API portals in Anypoint Exchange

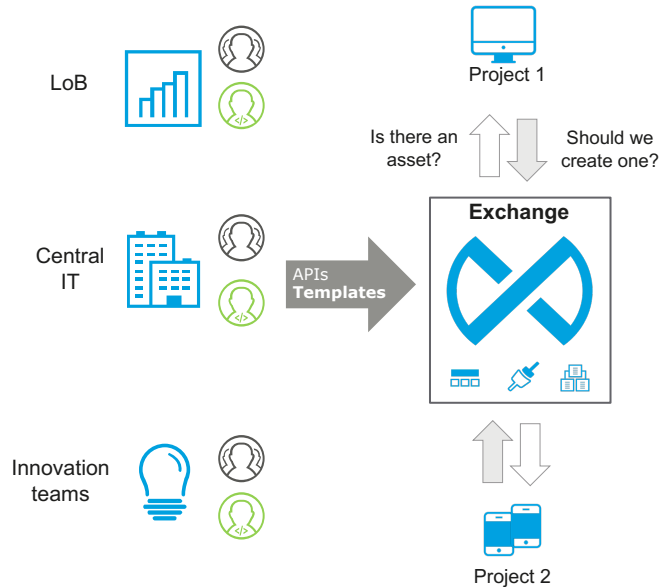


- **API portals** are automatically created for REST APIs added to Exchange
- An API portal has
 - Auto-generated **API documentation**
 - An **API console** that provides a Postman-like experience for consuming and testing APIs
 - An **automatically generated API endpoint** that uses a **mocking service** to allow the API to be tested without having to implement it
- API portals can be shared with both internal and external users

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Using Exchange: Success of C4E in action



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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 & make calls to the Training: American Flights API

The screenshot shows the Anypoint Exchange interface for the 'Training: American Flights API'. The API is listed as version 1.0 with 7 reviews. The endpoint is `/flights : Get all flights`. The request is a GET request to `http://training-american-ws.cloudhub.io/api/flights`. The parameters section shows a query parameter `destination` of type `string (enum)` with possible values `SFO, LAX, CLE`. The response is a 200 OK status with a JSON body containing flight details.

| Parameter | Type | Description |
|-------------|---------------|--|
| destination | string (enum) | Destination airport code Possible values: SFO, LAX, CLE |

```

{
  "id": 1,
  "code": "EE38sd",
  "price": 400,
  "departureDate": "2017/07/26",
  "origin": "SFO",
  "destination": "SFO",
  "timestamp": "2017-07-26T10:00:00Z"
}
  
```

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Building integration applications and APIs with Design Center



Design Center anatomy



Design Center anatomy

Design Center

Training ? MM

Projects Search...

| Name | Project Type | Last Update |
|---|-------------------|-----------------|
| American Flights Example | API Fragment | July 27th, 2017 |
| MUA Flights API | API Specification | July 27th, 2017 |
| MUA Flight Data Type | API Fragment | July 27th, 2017 |
| American Flight Data Type | API Fragment | July 27th, 2017 |
| American Flight Example | API Fragment | July 27th, 2017 |
| American Flights App | Mule Application | July 27th, 2017 |
| Training American Flights API | API Specification | July 27th, 2017 |

Get Started

+ Create

- API Specification
- API Fragment
- Mule Application
- Get Anypoint Studio

American Flights App

Created with API designer

Created with flow designer

Created July 27th, 2017

Created by stallons

Environment 0d6bd95d-e1d2-461d-8b2e-ad0ab31edd64

Status Ready to deploy

Deployment uri americanflightsapp-jlkb.cloudhub.io

Open

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 | <ul style="list-style-type: none"> • Anypoint Platform Development: Fundamentals • Anypoint Platform Development: Advanced • Anypoint Platform Development: DataWeave |

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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

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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**

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Mule runtime editions and versions



- There are different **editions** of the Mule runtime
 - Community edition (CE): Open-source
 - Enterprise edition (EE): Hardened code line with support and additional capabilities
 - Support, additional connectors, batch, caching, security, templates, and more
- There are different **versions** of each Mule runtime
 - 3.7.X, 3.8.X, and more
- **Flow designer** uses Mule 4.0.X EE (an early access version of Mule 4)
- By default, the latest **Anypoint Studio** uses Mule 3.9 EE
 - You can install other versions and select which one to use

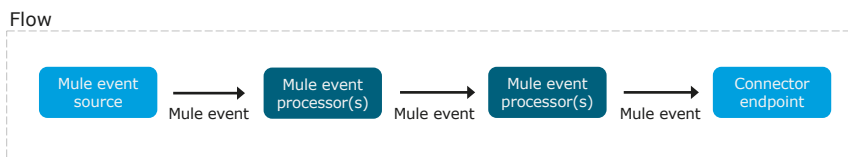
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Mule 4 applications and flows



- 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

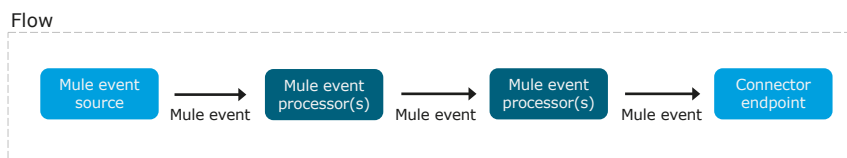
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What's in a typical Mule 4 flow?



- A **Mule event source** that initiates the execution of the flow
 - Can be triggered by an event like
 - 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

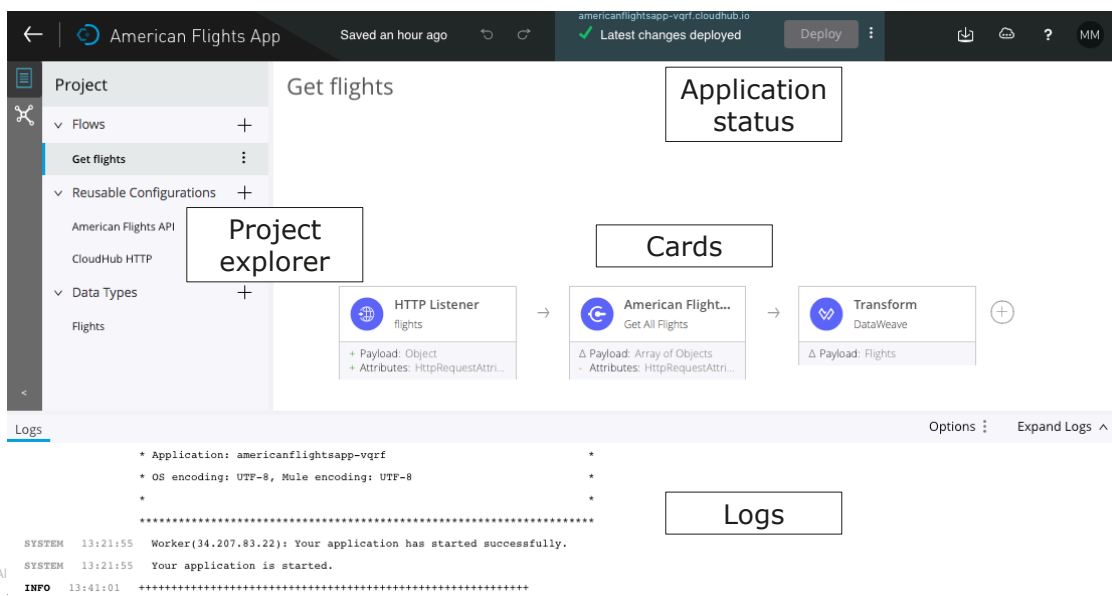


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26

Creating integration applications with flow designer

Flow designer anatomy



28

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 redeploy and restart the application

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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 |

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Flow designer applications



- Are automatically deployed to the **Design** environment
 - Worker runtime version set to **Mule 4.0.X**
 - Flow designer apps can only be built using Mule 4, currently an early access version
 - Worker number is set to **1**
 - Worker size is set to **0.2**

31

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
- Deploy, run, and test the application
- View application info in Runtime Manager

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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



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The Transform component



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

Select a component

All ▾

- Salesforce
- ServiceNow
- Transform**
- Try
- Validation

Transform

Input

- ▼ Payload: Array<Object>
 - > plane: Object?
 - code: String?
 - price: Number?
 - origin: String?
 - destination: String?
 - ID: Number?
 - departureDate: String?
 - emptySeats: Number?
 - Attributes: Void
 - Variables: Object

Output payload

- ▼ Payload: Array<Object> (Flights)
 - airline: String?
 - flightCode: String?
 - fromAirportCode: String?
 - toAirportCode: String?
 - departureDate: String?
 - emptySeats: Number?
 - totalSeats: Number?
 - price: Number?
 - planeType: String?

Preview

```

1  {
2    "flightCode": "ER38sd",
3    "fromAirportCode": "MUA",
4    "toAirportCode": "SFO",
5    "departureDate": "2016/03/20",
6    "emptySeats": 0,
7    "totalSeats": 150,
8    "price": 400,
9    "planeType": "Boeing 737",
10   "airline": "American"
11 },
12 {
13   "flightCode": "ER451f",
14   "fromAirportCode": "MUA",
15   "toAirportCode": "LAX",
16   "departureDate": "2016/02/11",
17   "emptySeats": 50,
18   "totalSeats": 300,
19   "price": 345.99,
20   "planeType": "Boeing 777",
21   "airline": "American"
22 }
23 }
24

```

Actions for: (root)/payload

Sample data Script Mappings

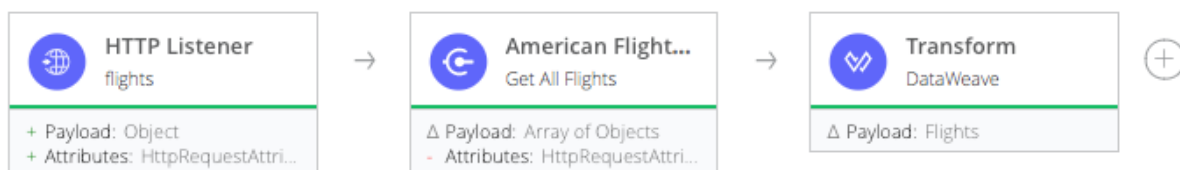
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36

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 American Flights API in Anypoint Exchange to get all flights
- Transform data returned from an API to another format



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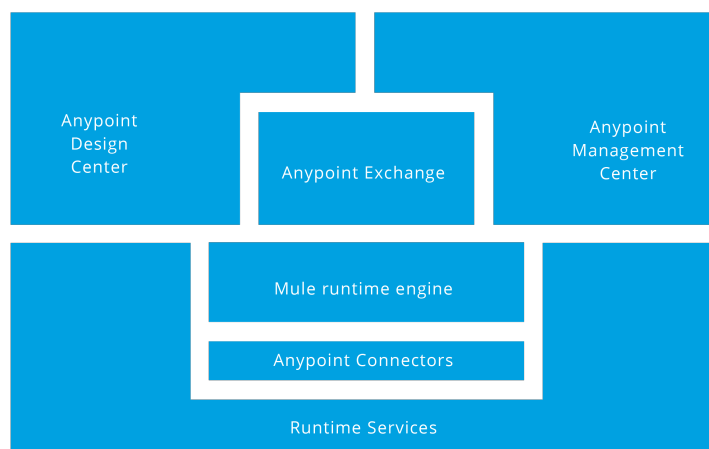
Summary



Summary: Anypoint Platform



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



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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

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