**Real-Time Project Exercise – MuleSoft Transport Management**

Steps to be followed

* Understand Requirement
* Create RAML
* Develop API using RAML
* Testing
* Munit Testing
* Code Check-in

# Objective of this exercise

* To simulate real world scenario, where a solution architecture document will be handed down to the development team to build & implement.
* Make use of MuleSoft out of the box capabilities (as much as possible) to come out with a solution to address the design problems addressed in the use case.
* Include previous best practices experience when coming out with the solution.
* Make use of Design Center to create RAML projects and design RAML specification base RAML best practices based on the business scenario given.
* Organize and create the mule projects based on the business scenarios, and solution described in this document.
* Creating mule message flows, making use of mule components and connectors. implement a solution based on the scenario and specifications given in this document.
* M-unit test is created to test each of the possible scenarios.
* Test scripts creation to test the end point using testing tools such as Postman / Soap UI (if needed).
* Demo the working example at the end. During the presentation, outline in detail what you are trying to solve in your Mule project and the approach to resolve it.
* Extend and enhance your application in real-time.

# Business Scenario

TripEasy is a startup company providing a platform to perform booking services for land, air and sea transport across the world.

This platform will enable customers to query location routes and the departure schedule from multiple transport providers, and make booking directly to the platform. The platform will enable the customer to make payments, and issues tickets to the customers. Customer also will be able

This platform will connect to the respective transport providers back end systems, to query for the available routes and schedules and make purchases, track their booking and make changes to their bookings. This platform will also provide the capability for the regulatory agencies to manage their bookings, and all updates will be reflected to the transport provider back-end system.

# API Landscape

Diagram

Description automatically generated

Sequence Diagram Web Application

## Get Routes

Diagram, timeline

Description automatically generated

Get Schedules

## A picture containing diagram Description automatically generated

Sequence Diagram Mobile Application

## Get Routes

Diagram, timeline

Description automatically generated

Get Schedules

A picture containing diagram

Description automatically generated

Experience API : Web Application

**Retrieve Consolidated Routes**

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Routes |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/routes |
| **Objective** | : | * To consolidate routes from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | Used for logging and tracking purpose. Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName |  | N | String |
| departureLocation |  | N | String |
| destinationLocation |  | N | String |

Output

Type: Application/json

Output message for getRoutes (Experience API)

[

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

},

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

},

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

}

]

**Retrieve Consolidated Schedules**

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Schedules |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/schedules |
| **Objective** | : | * To consolidate schedules from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName |  | N | String |
| departureLocation |  | N | String |
| destinationLocatio n |  | N | String |
| requestTimezone | The time zone where request is originating from. E.g. 0800 | N | String |

Output

Type: Application/json

Output message for getScedules (Experience API)

[

{

"companyName": "TravelOnTip",

"availableSeats": 20,

"departureDateTime": "2019-04-30T16:41:41",

"travelRoute": {

"destinationLocation": {

"locationCode": "KLG-MY",

"locationDesc": "Klang Malaysia"

},

"originLocation": {

"locationCode": "BEN-SG",

"locationDesc": "Beauna Vista Singapore"

}

}

},

{

"companyName": "FastGo",

"availableSeats": 30,

"departureDateTime": "2019-04-30T18:41:41",

"travelRoute": {

"destinationLocation": {

"locationCode": "KLG-MY",

"locationDesc": "Klang Malaysia"

},

"originLocation": {

"locationCode": "BL-SG",

"locationDesc": "Beauna Vista Singapore"

}

}

}

]

Experience API : Mobile Application

Retrieve Consolidated Routes

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Routes |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/routes |
| **Objective** | : | * To consolidate routes from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | Used for logging and tracking purpose. Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName |  | N | String |
| departureLocation |  | N | String |
| destinationLocation |  | N | String |

Output

Type: Application/json

Output message for getRoutes (Experience API)

[

{

"companyCode":"TransNational",

"originLocation":{

"locationDesc":"Beauna Vista Singapore"

},

"destinationLocation":{

"locationDesc":" Klang Malaysia "

}

},

{

"companyCode":"TransNational",

"originLocation":{

"locationDesc":"Klang Malaysia"

},

"destinationLocation":{

"locationDesc":"Beauna Vista Singapore"

}

},

{

"companyCode":"TransNational",

"originLocation":{

"locationDesc":"Beauna Vista Singapore"

},

"destinationLocation":{

"locationDesc":"Klang Malaysia"

}

}

]

Retrieve Consolidated Schedules

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Schedules |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/schedules |
| **Objective** | : | * To consolidate schedules from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName |  | N | String |
| departureLocation |  | N | String |
| destinationLocatio n |  | N | String |
| requestTimezone | The time zone where request is originating from. E.g. 0800 | N | String |

Output

Type: Application/json

Output message for getScedules (Experience API)

{

"departureSchedules":[

{

"companyName":"TravelOnTip",

"availableSeats":20,

"departureDateTime":"2019-04-30T16:41:41",

"travelRoute":{

"destinationLocation":{

"locationDesc":"Beauna Vista Singapore"

},

"originLocation":{

"locationDesc":"Klang Malaysia"

}

}

},

{

"companyName":"FastGo",

"availableSeats":30,

"departureDateTime":"2019-04-30T18:41:41",

"travelRoute":{

"destinationLocation":{

"locationDesc":"Klang Malaysia¡"

},

"originLocation":{

"locationDesc":"Beauna Vista Singapore"

}

}

}

]

}

Process API

Retrieve Consolidated Routes

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Routes |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/routes |
| **Objective** | : | * To consolidate routes from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. * To map the transport provider specific location code to the common location code and description for standardization * To filter the result based on the input filter criteria   To populate the company code where the routes is being retrieved from |
|  |  |  |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | Used for logging and tracking purpose. Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName | If provided, only retrieve the list of routes from this transport provider | N | String |
| departureLocation | If provided, only retrieve the list of routes from this departureLocation code | N | String |
| destinationLocation | If provided, only retrieve the list of routes from this destinationLocation code | N | String |

Output

Type: Application/json

Output message for getRoutes (Experience API)

[

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

},

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

},

{

"companyCode":"TransNational", "originLocation": {

"locationCode": "BEN-SG", "locationDesc": "Beauna Vista Singapore"

},

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

}

}

]

Retrieve Consolidated Schedules

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Schedules |
| **Method** | : | GET |
| **URL** | : | /booking/{transportType}/schedules |
| **Objective** | : | * To consolidate schedules from multiple transport providers. Retrieval from the transport providers need to parallel as there is no dependencies between both of the transport providers. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

Query Parameter

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| companyName | If provided, only retrieve the list of voyages from this transport provider only | N | String |
| departureLocation | The departure location code, selected by the customer | N | String |
| destinationLocatio n | The destination location code, selected by the customer | N | String |
| requestTimezone | The time zone where request is originating from. E.g. 0800 | N | String |

Output

Type: Application/json

Output message

{

"departureSchedules": [

{

"companyName": "TravelOnTip",

"availableSeats": 20,

"departureDateTime": "2019-04-30T16:41:41", "travelRoute": {

"destinationLocation": {

"locationCode": "KLG-MY",

"locationDesc": "Klang Malaysia"

},

"originLocation": { "locationCode": "BEN-SG",

"locationDesc": "Beauna Vista Singapore"

}

}

},

{

"companyName": "FastGo",

"availableSeats": 30,

"departureDateTime": "2019-04-30T18:41:41", "travelRoute": {

"destinationLocation": { "locationCode": "KLG-MY", "locationDesc": "Klang Malaysia"

},

"originLocation": { "locationCode": "BL-SG",

"locationDesc": "Beauna Vista Singapore"

}

}

}

]

}

System API : TravelOnTip

## Retrieve TravelOnTip Routes & Schedule

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

### Routes

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Routes |
| **Method** | : | GET |
| **Security** | : | Basic Authentication within Mule Flow |
| **URL** | : | /{transportType}/{transportCompany}/routes |
| **Objective** | : | To retrieve route list from FirstCoach. Routes list are usually static and are only updated once a month. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

#### Output

Type: Application/json

[

{

"originLocation": { "locationCode": "BEN-SG"

},

"destinationLocation": { "locationCode": "KLG-MY"

}

},

{

"originLocation": { "locationCode": " KLG-MY "

},

"destinationLocation": { "locationCode": "BEN-SG"

}

},

{

"originLocation": { "locationCode": "BEN-SG"

},

"destinationLocation": { "locationCode": "KLG-MY"

}

}

]

Schedules

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Schedules |
| **Method** | : | GET |
| **URL** | : | /{transportType}/{transportCompany}/schedules |
| **Objective** | : | To Retrieve departure schedule list from the FirstCoach Transport Provide based on the routes selected |
| **Exception Handling** | : | If fail to get the response from back end, return previous successful inquiry back to front end |

Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

QueryParams

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| departureLocationCode | If provided, only retrieve the list of routes from this departureLocation code | N | String |
| destinationLocationCode | If provided, only retrieve the list of routes from this destinationLocation code | N | String |

Output

body

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| departureSchedules (multiple occurance) | | | |
| departureDateTime | Departure date time according to the FirstCoach timezone | Y | DateTime |
| availableSeats | No of available seats for the schedule | Y | int |
| travelRoute.originLocati on.locationCode | The departure location code | Y | String |
| travelRoute.destination Location.locationCode | The arrival location code | Y | String |

Type: Application/json

[

{

"availableSeats":20,

"departureDateTime":"2019-04-30T16:41:41.090Z",

"travelRoute":{

"destinationLocation":{

"locationCode":"KLG-MY"

},

"originLocation":{

"locationCode":"BEN-SG"

}

}

},

{

"availableSeats":30,

"departureDateTime":"2019-04-30T16:41:41.090Z",

"travelRoute":{

"destinationLocation":{

"locationCode":"KLG-MY"

},

"originLocation":{

"locationCode":"BL-SG"

}

}

}

]

System API : FastGo

## Retrieve TravelOnTip Routes & Schedule

|  |  |  |
| --- | --- | --- |
| **Version** | : | 1.0.0 |

### Routes

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Routes |
| **Method** | : | GET |
| **Security** | : | Basic Authentication within Mule Flow |
| **URL** | : | /{transportType}/{transportCompany}/routes |
| **Objective** | : | To retrieve route list from FirstCoach. Routes list are usually static and are only updated once a month. |

#### Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

#### Output

Type: Application/json

[

{

"departureLocationCode": "BEN-SG", "arrivalLocationCode": "KLG-MY"

},

{

"departureLocationCode": "BEN-SG", "arrivalLocationCode": "BU-MY"

}

]

Schedules

|  |  |  |
| --- | --- | --- |
| **Resource** | : | Schedules |
| **Method** | : | GET |
| **URL** | : | /{transportType}/{transportCompany}/schedules |
| **Objective** | : | To Retrieve departure schedule list from the FirstCoach Transport Provide based on the routes selected |
| **Exception Handling** | : | If fail to get the response from back end, return previous successful inquiry back to front end |

Input

Header

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| transactionId | If provided, only retrieve the list of routes from this transport provider  Example: hdsfhjdh-jxbv859-sjdf7643-3746bbd | Y | String |

QueryParams

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| departureLocationCode | If provided, only retrieve the list of routes from this departureLocation code | N | String |
| destinationLocationCode | If provided, only retrieve the list of routes from this destinationLocation code | N | String |

Output

body

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Rule** | **Mandatory** | **Type** |
| departureSchedules (multiple occurance) | | | |
| departureDateTime | Departure date time according to the FirstCoach timezone | Y | DateTime |
| availableSeats | No of available seats for the schedule | Y | int |
| travelRoute.originLocati on.locationCode | The departure location code | Y | String |
| travelRoute.destination Location.locationCode | The arrival location code | Y | String |

Type: Application/json

[

{

"departureDateTime": "2019-04-30T16:41:41.090Z", "fromLocation": "BEN-SG",

"toLocation": "KLG-MY," "availableSeats" : 50

},

{

"departureDateTime": "2019-04-30T18:41:41.090Z", "fromLocation": "BEN-SG",

"toLocation": "KLG-MY," "availableSeats" : 50

}

]