Mod 5

1. Difference between Mule projects and Domain projects?

* Mule project is a MuleSoft project which have all the dependencies defined in itself, it doesn’t share its resources or use shared resources. Domain project will have all the properties that need to share with other projects in the same domain
* Domain project cannot be deployed to Cloudhub whereas Mule projects can be deloyed to Cloudhub
* There is no message flow in domain project. Has only global elements and configuration.xml
* Configuration.xml file starts with domain tag in domain project whereas it starts with mule tag in mule project
* Pom file packaging is also different. In domain project it is domain package and in mule project it is mule-application package

1. What is logging? What is the relation of log4j2 with logging?

Logging helps you to monitor and troubleshoot your application and server.

There are many ways to log some are log4j, slf4j, JSON Logger. Mule internally use slf4j logging.

Log4j is a java logging utility.

The **log4j**. properties **file** is a **log4j** configuration **file** which keeps properties in key-value pairs.

1. What do you mean by Appenders?

Log4j2 File has appenders to specify where we need to log data whether in file or splunk or database

1. Differentiate between App logs and Runtime logs.

App logs: The log contains information about any errors raised in the app (unless you have app logic to handle those errors). It also contains anything you want to explicitly log, if you build the logic in the app.

You can view an app log as follows:

* If you’re running an app from Anypoint Studio, the output from the app log is visible in Anypoint Studio’s console window.
* If you’re using Mule from the command line to run an app, the app log is visible in your OS console.

Runtime logs:

The runtime log (mule\_ee.log) contains information about app and lifecycle events. For example, the log records an entry when a Mule service or app starts, deploys, stops, or undeploys.

The runtime log configuration is located in the log4j2.xml file, in the /conf directory. You can customize this file when running the server in standalone mode.

1. What are other debug options for a Mule application outside of Anypoint studio?

* Use MUnit to Test an App
* Activate remote debugging
  + You can start Mule with the **-debug** option to activate remote debugging, as shown in this Linux example:

$MULE\_HOME/bin/mule -debug

* With this option, Mule starts normally and remotely debuggable on port 5005

1. How can one share Mule applications with other developers?
2. Differentiate between Message Id and Correlation Id?

A Correlation ID can be defined as an 'identifier value attached to messages and request headers which allows referencing a particular transaction or event'

1. How can the Correlation Id be maintained even after making an external HTTP request?

9. What are the standards to be followed when versioning of assets in Exchange? Explain

various versioning models? What is the impact of versioning to the consumers using the API?

1. Discuss various control flows in Mule 4?

**Choice**

The Choice router dynamically routes messages through a flow according to a set of DataWeave expressions that evaluate message content.

**First successful**

The First Successful router iterates through a list of configured processing routes until one of the routes executes successfully. If any processing route fails execution (throws an error), the router executes the next configured route.

If none of the configured routes execute successfully, the First Successful router throws an error.

**Round Robin**

The Round Robin router iterates through a list of two or more routes in order, but it only routes to *one* of the routes each time it is executed. It keeps track of the previously selected route and never selects the same route consecutively

**Scatter Gather**

The routing message processor Scatter-Gather sends a request message to multiple targets concurrently. It collects the responses from all routes, and aggregates them into a single message.

1. How can one introduce content based routing in a flow?

In Mule, the choice flow control is used to achieve content-based routing where routing will be done based on the message content, like inbound properties, flow variables, and payload. A choice router will always choose only one route. If no route matches, then the default route is used.

1. Differentiate between mapObject, map and flatMap functions?

* mapObject Iterates over an object using a mapper that acts on keys, values
* Iterates over each item in an array and flattens the results.
* flatMap Iterates over each item in an array and flattens the results.
* Flatten only acts on the values of the arrays, while flatMap can act on values and indices of items in the array.

1. How to convert an Object into Array?

Using Pluck

1. How to convert a nested array into a normal array?

Using flatMap or Flatten

1. Difference between flatten and flatMap?

Flatten turns a set of sub-array into a single flattened array. It flattens only the forst level of subarrays and omits the empty subarray

1. Describe the various Error handling mechanisms and when to use them?

On-Error Propagate

* Roll back previous transaction
* processes the error message and re-throws the error to its parent flow.
* The HTTP listener returns an error response.

On-Error Continue

* + Commit previous transaction
  + catches the error and does not report it as an error
  + The HTTP listener returns a successful response

1. What are the available Transaction Types in Mulesoft? Explain citing examples?