**1. What is Mulesoft? For what Mulesoft is used for?**

**Answer:**  
MuleSoft is the most widely used integration platform. Here we will find 2 types Mule ESB and Cloud Hub for connecting enterprise and SAAS applications in the on-premises and cloud. Mulesoft allows developers to connect applications together quickly and easily and it helps in exchanging the data.

**What is Mule ESB?**

**Answer:**  
Mule ESB is a Java-based ESB (enterprise service bus) and it is the integration platform all the developers can connect to their respective application directly with ESB. Mule ESB uses service oriented architecture. The main use of Mule ESB is it enables easy integration of existing systems. It can integrate with different technologies that the applications use- Including JMS, [Web Services](https://www.educba.com/web-services-interview-questions/), HTTP, etc.

Let us move to the next Mulesoft Interview Questions.

**4. What is ESB?**

**Answer:**  
ESB stands for Enterprise Service bus. It’s software architecture for middleware and it provides fundamental services for more complex architectures. This is the common Mulesoft Interview Questions which is frequently asked in an interview.

Example: In ESB incorporates with the features required to implement an [SOA](https://www.educba.com/what-is-soa/)(service-oriented architecture ).

**5. What is the MuleSoft Anypoint platform and where it will be used?**

**Answer:**  
MuleSoft Anypoint Platform of integration products is designed to tie both software as a service (SaaS) and on-premises software.

**Part 2 – Mulesoft Interview Questions (Advanced)**

Let us now have a look at the advanced Mulesoft Interview Questions.

**6. What are the main features of Mule ESB? What are the different ESBs in the market?**

**Answer:**

1)The main Features of Mule ESB are::

* It is very simple and easy to use-Drag and drops Graphical design
* SLA monitoring and API management
* High scalability
* We can deploy in a One-click cloud or on-premise deployments

2)Different ESB’s in Market are::

* Talend
* Mule ESB
* JBoss Fuse ESB

**7. How will we identify ESB is needed in a project?**

**Answer:**  
Implementation of ESB is not suitable for all the projects. We should analyze is really ESB is required here or not. You need to analyze by taking below points into consideration:

* In the project, require 3 or more applications and services to be integrated and there must be a need to communicate between the applications.
* If there is plain of interacting with more applications and Services in the future then we can go with Mule ESB because it is highly scalable.
* We need to keep cost also in mind before going to ESB implementation

Let us move to the next Mulesoft Interview Questions

**8. Explain the difference between Callout and Service Invoke?**

**Answer:**  
**Callout:** We can call the service using callout or with service invoke. Use the Callout if we need to mediate a message (without calling an intermediate service) and then call a service provider.

* The Callout provides the simplest model for this configuration.  
  **Service Invoke:** You need to interact with multiple services, and produce an output that combines service responses. The Service Invoke primitive does not switch from request flow to response flow.
* Use the Service invoke if we need to call an intermediate service.  
  **Example:** We can use an intermediate service to adjust a message or to validate a message externally. The mediation flow contains Service Invoke mediation primitive, and a Callout node that is connected to the service provider there will be no intermediate service.

**9. What is the full form of SDO and SMO?**

**Answer:**

* **SDO:** Service Data Object and it represent the Object.
* **SMO:** Service Message object and it is used to represent messages

**10. Explain about Fan-in and Fan-out?**

**Answer:**  
**Fan-In:**  Fan-In is always in the flow with Fan-Out and helps in taking a decision to continue flow execution. The Fan In may only be used in combination with Fan Out.

**Fan-out:** We can use the Fan Out-primitive to fire the output terminal once with the input message or to fire the output terminal multiple times. Fan-out can be used as a combination of Fan Out and Fan In.

**7) Mention the features of Mule ESB**

The features of Mule ESB are:

* Offer SLA (Service Level Agreement) monitoring and API management facility.
* It has easy to use and drag and drop graphical design.
* Mule ESB provides high scalability.
* It enables developers to deploy in one click cloud or on-premise deployments.

**8) Mention the basic principles of ESB Integration**

The basic principles of ESB integration are:

* **Transportation:**It negotiates between different formats like JDBC, HTTP, JMS, etc.
* **Transformation:**It deals with the transportation of data between data formats needed by the ESP connector.
* **Non-functional consistency:**It is the way of how monitoring and security policies are applied and should be consistent.
* **Mediation**: It involves offering different interfaces to:
  1. Enables different channels to the same component implementation.
  2. Support various service versions for backward compatibility.

**9) What is Mule Expression Language?**

MEL or Mule Expression Language is a light-weight mule specific language that can be used to access and evaluate data in the payload.

**10) List various types of endpoints in Mule ESB**

Various types of Endpoints in Mule are 1) JMS, 2) HTTP, 3) SMTP, 4) IMAP, and 5) AJAX.

**11) What is the full form of SDO?**

The full form of SDO is a Service Data Object.

**12) Mention different types of Exception Handling**

Different types of exception handlings are:

* Rollback exception handling.
* Default exception handling.
* Catch exception handling.
* Global exception handling.
* Choice exception handling.

**13) What are the advantages of using ESB?**

The advantages of using ESB are:

* It offers a high level of the operational controlling facility from the portal that is based on the web.
* ESB provides numerous connectivity options using SaaS-based applications.
* It provides API and analytics management.
* ESB is equipped with numerous bug fixing and automated testing facilities.
* EDI (Electronic Data Interchange)/B2B (business to business) integration.
* Batch integration feature using real-time integration methods.

**14) What is a transient context?**

Transient context is used to pass the values within the existing flow, either requesting flow or the responding flow.

**15) What is Mule Transformer?**

Mule transformer is an event instance that refers to a library, org.mule.api.MuleEvent. This object carries the message with the event. The main aim of the Mule transformer is to create a chain of transformers.

**16) What is API?**

API is the acronym for Application Programming Interface. It is a software interface that allows two applications to interact with each other without any user intervention.

APIs provides product or service to communicate with other products and services without having to know how they're implemented.

**17) What are the features of API?**

Here are some essential features of API:

* Efficiency
* Wider reach
* Customizable
* Personalization
* Data ownership
* Easy integration with GUI
* Time effective
* Language-independent

**18) What is the payload in MuleSoft?**

The payload is a mule runtime variable that stores objects or arrays. It helps developers to access payload under different forms.

**19) What are the various parts of composing a message in Mule?**

Different parts of composing a message in Mule are:

* **Properties:** it contains the header or meta-information or header similar to the SOAP (Simple Object Access Protocol) message.
* **Payload**: It is the main data context carried by a particular message.
* **Multiple name attachments:** It provides support for multiple messages or payload that occurs during event processing.

**20) Mention flow processing strategies in MuleSoft.**

MuleSoft has six types of strategy for flow processing:

* A queued asynchronous flow processing
* Custom flow processing
* Tread per processing
* Queued flow processing
* Non-blocking flow processing
* Synchronous flow processing
* Asynchronous flow processing

**21) Explain the concept of Correlation Context.**

It is a primitive that is used to pass values from request flow to response flow.

**22) Mention different types of primitives used in Mediation**

Different types of primitives used in Mediation are:

* Endpoint lookup
* Data handler
* Message element setter
* DB lookup
* Service Invoke
* Type filter
* Stop
* Sub Flow
* Custom mediation fan-out
* Fan-in
* Even emitter
* Header setters
* Message logger
* XSLT
* BO MapMessage filter
* Fail

**23) Name different types of ESPs used in the market**

Different types of ESPs used in the market are:

* Mule ESB
* JBoss fuse ESB
* Talend

**24) Define the model layer in mule**

The model layer is the first logical layer. It represents the runtime environment that hosts services. This layer describes the behaviour of Mule when processing requests that are handled by services. It offers services with default values to simplify configuration.

**25) Explain connector in MuleSoft**

A connector in Mule controls how a particular protocol used. It can be configured with parameters which are specific to that protocol. The connector holds any state context which can be shared with any entity in charge of actual communications.

**26) What is Endpoint in Mule?**

An endpoint in MuleSoft indicates a particular usage of a protocol. It is for polling, reading from, or writing to a destination.

Therefore, it controls what underlying entities would be used with a dependent connector.

**27) Define component in Mule**

Components perform an important role in MuleSoft services. Every service is organized with core components and core and inbound and outbound routers.

They are used to implement behavior in service. It can be very simple, like logging messages or invoking other services.

**28) What is the use of Outbound Endpoint in MuleSoft?**

Outbound Endpoint in MuleSoft is used to perform the following things:

* Send SOAP messages
* Write to file streams
* Send email messages

**29) Define configuration builders In MuleSoft**

MuleSoft is a configuration builder to translate a configuration file into the graph of the object that makes the running node of ESB.

**30) List the types of configuration builders in MuleSoft**

Types of configuration builders In MuleSoft are 1) Spring-driven builder and 2) script builder.

**31) What Is TSD in Mule?**

TSD or transport service descriptor is a connector used for technical configuration. It defines classes name used for message receivers, dispatchers, and requesters. This default value can vary to grasp the behaviour of transport.

**32) Define multicasting router in MuleSoft**

Multicasting router in MuleSoft sends messages to more than one endpoints over different transports. It allows the user to move the same messages across different endpoints.

**33) What are the characteristics of Global Endpoint?**

Characteristics of global endpoint are:

* The global endpoint is not typified or outbound routing.
* It can be usable in different places of configuration files.
* The global service name must be applied so that it can reference the endpoint.
* It helps to clarify the usage of a particular destination.

**34) Explain VM transport in MuleSoft**

The VM (Virtual Machine) transport is a special type of transport that can be used to send a message via memory. These messages never leave the Java Virtual Machine, and the Mule instance is running in.

**35) Name different types of web services**

Different types of web services: 1) RESTful web services and 2) SOAP web services.

**36) What are Web Services?**

Web services are a standardized way or medium to propagate communication between the client and server applications on the World Wide Web.

**37) What is Restful Web Service?**

Restful Web Service is a light-weight, maintainable, and scalable service that is built on the REST architecture. Restful Web Service, expose API from your application in a secure, uniform, stateless manner to the calling client. The calling client can perform predefined operations using the Restful service.

**38) Mention the difference between SOAP and REST**

The difference between SOAP and REST is:

|  |  |
| --- | --- |
| **SOAP** | **REST** |
| SOAP stands for Simple Object Access Protocol | REST stands for Representational State Transfer |
| SOAP cannot make use of REST since SOAP is a protocol, and REST is an architectural pattern. | REST can make use of SOAP as the underlying protocol for web services because, in the end, it is just an architectural pattern. |
| SOAP can only work with XML format. As seen from SOAP messages, all data passed is in XML format. | REST offers various data formats such as JSON, plain text, HTML, XML, etc. But the most preferred format for transferring data is JSON. |

**39) What is RAML?**

The full form of RAML is the RESTful API Modeling Language. It is a YAML-based language that describes RESTful APIs.

RAML is best for the information needed to describe RESTful APIs. It is similar to WSDL (Web Services Description Language).

RAML contains request/response schema, URI parameter, endpoint URL, HTTP methods, and query.

**40) What is caching?**

The cache concept is a way of storing the copy of the file in the cache, or any temporary storage location to access it quickly.

**41) What are the Models?**

Model is a grouping of services that are created in MuleSoft studio. User has the liberty to start and stop all the services inside a particular model.

**42) Name supported languages by MuleSoft**

Supported languages of MuleSoft are 1) Ruby, 2) Python, 3) Groovy, and 4) JavaScript.

**43) List various the categories of Mule Processors**

Categories of Mule Processors are: 1) Components, 2) Exception strategies, 3) Business events, 4) Routers, 5) Connectors, and 6) Transformers.

**44) What are the configuration patterns provided by MuleSoft?**

Configuration patterns provided by of MuleSoft are:

* Bridge
* Validator
* WS proxy
* Simple service pattern
* HTTP proxy

**45) What are the advantages of the logger component?**

The advantages of the logger component are:

* Users can add this core component anywhere in the workflow.
* It can be configured to any combination of strings and expressions.

**46) What is scheduler Endpoint?**

Scheduler Endpoint is a MuleSoft component or middleware are working on time-based conditions. It allows the user to trigger whenever this condition is met.

**47) Explain the parameters to configure a scheduler**

Parameters related to configuring a scheduler are:

* **Frequency:** It is a frequency used by Scheduler to triggers flows.
* **Start Delay:**It is the time to wait before triggering any flow.
* **Time Unit:**The time unit for frequency and Start Delay.

**48) What is Choice Router?**

Choice Router dynamically routes messages using a flow. It is based on a set of DataWeave expressions to evaluate the message content.

**49) What is a Scatter-Gather Router?**

Scatter-Gather Router is the most used routing event processor. It can send a request message to more than one target concurrently. This router then collects responses from all routes and aggregate back into one response.

**50) What are error types in MuleSoft?**

Following are the effort types:

* Transformation
* Expression
* Routing
* Duplicate\_Message
* Source\_Response
* Timeout
* Security
* Connectivity
* Validation

**51) What are the features of MUnit?**

The features of MUnit are:

* In MUnit framework, a developer can create a Mule test by using Java code as well as Mule code.
* The programmer can design and test Mule APIs and apps, either in XML or graphically within Anypoint studio or platform.
* MUnit allows integrating the testing into the current CI/CD process.
* MUnit offers auto-generated tests and coverage reports to reduce manual work.
* Developers can also use local FTP/DB/mail servers to make the testing process more portable through the Continous Integration.
* It allows enabling/disable tests.
* Programmers can extend the MUnit framework using plugins.
* Features to verify message processor calls.
* It provides error reports with a Mule stack trace.

**52) What is Exchange?**

Exchange is a hub for the development team. It is used to store and access API, connectors, templates, documentation, and more.

**53) What are the advantages of SOAP?**

The advantages of SOAP are:

* SOAP is the perfect medium that is developed for web service to talk with client applications.
* SOAP is a light-weight protocol which can be used for data interchange between applications.
* SOAP protocol can work any programming language based applications on Windows and Linux platforms.
* It does not require customization to run the web services built on the SOAP protocol to work on the WWW.

**54) Define Batch Jobs in Mule ESB**

A batch job is an element in Mule that split large size messages into records that process asynchronously in a batch job.

**55) Explain the Mule data integrator.**

A mule data integrator is a tool that is used for mapping data by visualizing it. It offers drag and drop feature to make a developer's coding process easier.

**What are the different ways we can create API Manager instance?**

* Creating from RAML,
* Creating from WSDL,
* Importing from another environment.
* Creating based on URL.

**Difference between Rating Limit and SLA Based policies?**

Rating Limit: Selecting a limit in API Manager defines the quota per time window.

SLA-based rate limiting: Restricts the number of requests by application to your API based on the configuration of an SLA tier.

**What is Throttling and when to use?**

Throttling is intended to smooth spikes, Mule Runtime can delay requests and retry the requests later. delay the number of requests to process later.

**How do you deploy API**

What is the difference between Rate limiting and Throttling

**What is the MuleSoft Anypoint platform and where it will be used?**

MuleSoft Anypoint Platform of integration products is designed to tie both software as a service (SaaS) and on-premises software.  
  
  
  
  
**What is API Gateway?**

API Gateway is embedded inside mule runtime, using this gateway any user can apply basic authentication policy on top of Mule application, enrich and incoming outgoing message or any other complex capability to an API without writing code. Basically it is an orchestration layer on top of your back end API to help you separate orchestration from implementation.

**What are API security policies are available in MuleSoft?**

* Basic Authentication
* Basic Auth LDAP
* XML Threat Protection
* IP Whitelisting
* IP Blacklisting
* JSON Threat Protection

**What is the difference between Throttling and Rate Limiting?**

**Rate Limiting:** The Rate Limiting policy limits the number of requests an API accepts within a window of time. The API rejects requests that exceed the limit

**Throttling:** The Throttling policy queues requests that exceed limits for possible processing in a subsequent window. The API eventually rejects the request if processing cannot occur after a certain number of attempts. You can configure a delay between retries, as well as limit the number of retries

**What is Anypoint Platform?**

* Anypoint platform is highly productive, hybrid integration platform that creates an application network of app, data and devices by producing and consuming reusable assets.
* It is collection of Tools and Framework ( building application) and runtime for running application

**What are Anypoint Connectors in MuleSoft?**

Anypoint connectors are used to integrate with Saas and Cloud API e.g. Salesforce, AWS etc. also you can connect your on-premise applications using connectors, there are various connectors available like Database, Email, File, Salesforce etc.

**What is API Portal in MuleSoft?**

API Portal allows providers to expose and publicise their APIs, educate developers communities about them, provision user access generate client keys and more

**What are deployment options available in MuleSoft?**

* Cloud hub
* On-premise
* Runtime Fabric(RTF)
* Anypoint PCE(Anypoint Private Cloud Edition)
* Anypoint PCF(Anypoint Platform for Pivotal Cloud Foundry)

**What is Cloudhub?**

Cloudhub is an (IPass) Integrated platform as a service which is multitenant, secure, highly available service where we can deploy our integration application on cloud also integrate on-premise application with cloud services

**How many ways you can deploy application on Cloudhub?**

* Anypoint Studio
* Runtime Manager
* Anypoint CLI
* Cloudhub API

[Mulesoft Top Interview questions and answers](https://mulesoft.designgrows.com/top-mulesoft-mule-esb-developer-interview-questions/)

**What is RTF (Run time Fabric)?**

Anypoint Runtime Fabric is a container service that automates the deployment and orchestration of your Mule applications Runtime Fabric runs on customer-managed infrastructure on AWS, Azure, virtual machines (VMs)

**Features of RTF**

* + You can scale your mule application
  + There is option to run multIPle version of mule runtime on same set of resources
  + Isolation between application by running a separate Mule runtime per application

**What is the difference between op-premise deployment and cloud hub deployment strategy?**

* With Cloud hub deployment strategy you can deploy maximum 10 Application on 1 vCore machine but in on-premise you can deploy 100 application on 1 vCore depends on the
* In Cloudhub mule runtime will be managed by the MuleSoft, in on-premise mule runtime will be managed by the Customer itself

**What is persistent queue?**

Persistent queues ensure zero message loss and allow you to distribute non-HTTP workloads across a set of workers, Persistent queues also guarantee delivery of your messages; even if one or more workers or datacenters go down, persistent queues facilitate disaster recovery and provide resilience to hardware or application failures.

**Why we used Anypoint VPN?**

We use Anypoint VPN to create a secure connection between MuleSoft VPC and on-premise network

**In which time zone MuleSoft scheduler runs?**

Schedulers follow the timezone used by the machine where the Mule runtime is running. If an application is running in Cloudhub, the timezone that the Scheduler conforms to corresponds to the region in which the Cloudhub worker is running.

**What happens to your logs when you delete mule application from Cloudhub?**

After you delete your application your log data is no longer accessible through the console, Cloudhub archive old log data for a limited period of time before being purged, if you want to recover data you have to raise support ticket with MuleSoft.

**What is object store V2?**

* Object Store v2 lets Cloudhub applications store data and states across batch processes, Mule components and applications, from within an application.
* Persists keys for 30 days unless updated. If a key is updated, the TTL (time-to-live) is extended by another 30 days from the current expiration date
* Allows for an unlimited number of entries. There is no limit on the total size of v2 object-stores.
* Stores values up to 10 MB

**How can one mule app access the object store of another mule app?**

You can use object store v2 Rest API to access the object store of another app

**What is Anypoint MQ?**

Anypoint MQ is a multi-tenant, cloud messaging service that offers customers to perform asynchronous messaging scenarios between their applications.

**How MuleSoft scheduler runs in multi worker cloud hub environment**

Mule runtime cluster or multi-worker Cloudhub deployment, the Scheduler runs (or triggers) only on the primary node (that is, only in one Mule runtime).

**How you can prevent your application hosted in Cloudhub from being publicly accessible**

Remove the Anypoint VPC Firewall rules with source Anywhere (0.0.0.0/0) and port 8081/82 or create a whitelist in your dedicated load balancer with the IP Address you want to authorize.

**What is Control Plane?**

In Anypoint Platform, the control plane consists of Anypoint Design Center, Anypoint Management Center, and Anypoint Exchange, API Manager Etc. Control plane is used to deploy, monitor and manage the running application in Mule runtime

[Mulesoft Dataweave Interview questions and answers](https://mulesoft.designgrows.com/dataweave-interview-questions-answers-mule/)

**What is Anypoint Visualizer?**

* Anypoint Visualizer displays views of different aspects of an application network graph.
* It provides a real-time, graphical representation of the APIs and mule application that are running.
* It also displays third party system that are invoked by a mule API, proxy or application within your application network
* It collects data from Mule applications, APIs, and proxies deployed to Cloudhub; from standalone Mule runtime engines (Mule instances); or from Runtime Fabric, to discover all incoming and outgoing connections through an embedded plugin.

**What is Anypoint Virtual Private Cloud?**

The Anypoint Virtual Private Cloud (VPC) offering allows you to create a virtual, private, and isolated network segment in the cloud to host your Cloudhub workers

Connecting to your Anypoint VPC extends your corporate network and allows Cloudhub workers to access resources behind your corporate firewall. You can connect on-premises data centers through a secured VPN tunnel, or a private AWS VPC through VPC peering, or by using AWS Direct Connect.

**What are the methods to connect on-premise network with Anypoint VPC**

You can use an IPsec tunnel with network-to-network configuration to connect your on-premises data centers to your Anypoint VPC. An IPsec VPN tunnel is generally the recommended solution for VPC to on-premises connectivity

**What is VPC Peering?**

VPC peering provides connectivity between two VPC, this enables you to route traffic between 2 VPCs so that they can communicate as though they are in same network.

To use VPC peering your AWS and Anypoint VPCs must be located in the same AWS region

**Why we use Shared Load Balancer (SLB)?**

Shared load balancer is a default load balancer provides basic load balancing functionality, with Shared load balancer you cannot configure customer SSL certificate proxy rule. Shared load balancer has lower rate limits

**Why we used Dedicated Load Balancer?**

Cloudhub dedicated load balancers (DLBs) are component of Anypoint Platform that enable you to route external HTTP and HTTPS traffic to multiple Mule applications deployed to Cloudhub workers in a Virtual Private Cloud (VPC).

Features of DLB:

* It handles the load balancing among different cloud hub workers
* You can also configure the custom SSL certificate and enforce 2-way SSL client authentication

**What are the prerequisite to create DLB?**

* Your profile is authorized to perform this action by adding the **Cloudhub Network Administrator** permission to the profile of the organization where you are creating the load balancer.
* Create an Anypoint Virtual Private Cloud (Anypoint VPC) in the organization where you want to create a load balancer.
* Create at least one certificate and private key for your certificate.

**How many ways you can configure the Dedicated Load Balancer**

There are three ways to create and configure a dedicated load balancer for your Anypoint VPC

* [Runtime Manager](https://docs.mulesoft.com/runtime-manager/lb-create-arm) from Anypoint Platform
* The [Cloudhub load-balancer create](https://docs.mulesoft.com/runtime-manager/anypoint-platform-cli#cloudhub-load-balancer-create) command from the Anypoint Platform CLI
* The [Cloudhub API](https://docs.mulesoft.com/runtime-manager/cloudhub-api)

**How can you achieve the High Availability in MuleSoft?**

* HA is to keep overall system operational when a system component fails, usually it is achieved with multiple level of fault tolerance or load balancing.
* on-premise you can deploy the mule application on multiple Clusters
* Cloudhub you can deploy the mule application on multiple cloud hub workers i.e horizontal scaling to multiple mule run time