1. What is an Application Network?

Application network is a way to connect applications, data and devices through APIs that exposes some or all of their assets and data on the network. That network allows other parts of the business to come in and discover and use those assets. Building an application network involves developing reusable assets and then encouraging those in the business to reuse and self-serve those assets.

1. What is API Led Connectivity?

API-led connectivity is a methodical way to connect data and applications through reusable and purposeful APIs. These APIs are developed to play a specific role – unlocking data from systems, composing data into processes or delivering an experience

The main purpose of API-led connectivity is to enable the integration flows to be reused by many parties and to be reused inside the integration platform**.**With the reusability of the already available logic (implemented in flows), the developers can evolve their logic in faster and safer ways, leading to a short time to market.

1. Features of Any Point Platform.

* Simple, drag-and-drop graphical design
* API Portal to help publish and promote your API
* Visual data mapping and transformation
* Control access, enforce SLAs, monitor traffic to APIs
* 100s of pre-built, certified connectors
* API Designer to build and test APIs
* One-click cloud or on-premise deployments
* Reporting for API top users, transactions by region, usage
* Built-in high availability & clustering
* Out of the box OAuth for rapid partner onboarding
* SLA Monitoring & Alerts
* Robust enterprise security enforcement capabilities
* Service flow analyser for rapid debugging
* Access sensitive data behind the firewall
* Secure Data Gateway for cloud/on-premise connectivity
* Web-based dashboard for control of your integrations
* Role-based access
* Mainstream Java development tool framework

1. When would you use Any Point Studio?

Anypoint Studio is MuleSoft’s Eclipse-based integration development environment for designing and testing Mule applications.

Anypoint Studio features enhance your productivity when building Mule applications:

* Instant run of your Mule application inside a local runtime
* Visual editors to configure API specification files and Mule domains
* Push changes to a local running app to test changes
* Integration with Exchange to import templates, examples, definitions and other resources from your Anypoint Platform organization
* Embedded unit testing framework
* Built-in support to deploy to CloudHub

1. How can you build Application Networks with AnyPoint Platform?

Anypoint Platform is uniquely positioned to enable API led connectivity Approach and thus we can build our application network.

Also Anypoint platform has the features like design centre, exchange, Runtime Manager, API Manager which helps to build an application and add it to the network

1. What are the benefits of Application Network and API-Led Connectivity?

An API-led connectivity approach to delivering IT projects ensures you are not only on time and budget with your first projects, but you have built the reusable assets that will save your company time and money, created an infrastructure which is designed for change, built in visibility, compliance and governance and, most importantly, met the needs of the business, which is long-term sustained agility.

It enables you to move fast on your first project, but then actually accelerate further from your second project onwards, due to reusable assets and a built-up organizational capability; API-led connectivity liberates resources, allowing you to innovate and to move quickly.

On average, MuleSoft’s customers found that the increases in agility and speed provided by API-led connectivity led to [delivering projects 3-5x faster](https://www.mulesoft.com/lp/whitepaper/api/application-network-benefits) and increased team productivity by 300%, compared to legacy or home-grown integration solutions.

1. Why would you use AnyPoint Platform?

Anypoint Platform is an integration platform that allows you to Manage and deploy APIs.

Anypoint Platform helps users deal with challenges of connectivity across SOA, SaaS, and APIs. The system is a unified, highly productive, hybrid integration solution that allows users to make a smooth application network of and between apps, data, and devices with API-led connectivity.

With Anypoint Platform, it is effortless to link apps, data, and devices anywhere, whether these are on-premise or in the cloud. Users can also design, run, and assess services and APIs, all on a unified platform.

Anypoint Platform is made of the Mule runtime engine and functions as a enterprise service bus (ESB), hybrid integration platform as a service or API gateway.

1. How would you build an Application Network using API led connectivity?

The application network formed by API led connectivity approach has network of devices and data connected together by APIs

We build Application network with API-led Connectivity approach with System APIs at the bottom encapsulating all the backend system and exposing the process API and experience API.

The power of this network is that when new node is added to the network, the number of connections increases multiplicatabily

1. What are APIs and Web services? What are the major differences?

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.

A Web service is a collection of open protocols and standards which are widely used for exchanging data between systems or applications.

* All Web services are APIs but all APIs are not web services.
* Web service supports only HTTP protocol whereas API supports HTTP/HTTPS protocol.
* Web service supports XML while API supports XML and JSON.
* Web service is used for REST, SOAP and XML-RPC for communication while API is used for any style of communication.
* API has a light-weight architecture where Web services does not have a light weight architecture as it need SOAP protocol to send or receive data over network

1. How can you secure your APIs?

API security is the protection of the integrity of APIs—both the ones you own and the ones you use.

Multifactor Authentication: Multi-factor authentication is when an app requests a single-use token from the user after it’s already authenticated the user’s credentials. This method recognizes the weakness of username and password credentials alone.

Token based: The first time a user accesses an Identity Provider with their username/password credentials, a token is issued. From there, rather than having users share their credentials over the network — which can present a security risk — the app only needs to send the token.

Digital signature: an app creates a signature using an algorithm and a secret code. The API applies the same algorithm with a new secret code to produce its own signature, and compares it to the incoming signature

Public key cryptography: Public-key cryptography is the method of producing an [encryption of a message](https://www.mulesoft.com/resources/esb/system-security-data-encryption) that’s nearly impossible to decode without a corresponding key.

Digital certificate: A digital certificate is a way to facilitate secure [transport-level communication](https://www.mulesoft.com/resources/api/api-layer) between a client and a server over a network so that the server can authenticate itself to the client

Object store connector  
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What is Object store connector?

Object Store Connector is a Mule component that allows for simple key-value storage. It is mainly designed for:

* Storing synchronization information such as watermarks
* Storing user information
* Storing temporal information such as access token
* Cache module uses Object store to maintain all cached data
* OAuth module uses Object Store to store the tokens

How to use it?  
When should we use OS?

Use cases of using OS?

* Storing synchronization information such as watermarks
* Storing user information
* Storing temporal information such as access token

Other uses of OS?

Mulesoft uses Object Store for below use cases

* Cache module uses Object store to maintain all cached data
* OAuth module uses Object Store to store the tokens

Limitations of OS?

Does OS is persistent or transient?

By default, Object Store is persistent, but we can change it to transient if required

What is persistent or transient?

Transient means it will store object key and values in in-memory while deploying the application and thus the data will be lost if there is any system crash occurs.

Persistent means object values will be stored in disk and it will be available even after a system crash.

Where does the object store values stored in Mule?

Persistent object store values are stored in disk file and transient object store values are stored in-memory

Why can’t we use database to store values instead of OS?

Database can also we used for storing and retrieving values. But making a database call for retrieving each value from database will be costly, instead of that we can use object store, which will perform storing and retrieving data faster

What is caching?

Caching is the process of storing frequently used data in memory, file system or database which saves processing time and load if it would have to be accessed from original source location every time.

In Mule caching can be achieved with Cache scope and object store

Difference between object-store and cache scope?

The Cache scope is for storing and reusing frequently called data. You can use a Cache scope to reduce the processing load on the Mule instance and to increase the speed of message processing within a flow

The Cache scope only caches non-consumable payloads. It does not cache consumable payloads (such as a streaming payload), which can only be read once before they are lost.

Object Store lets applications store data and states across batch processes, Mule components, and applications, from within an application.

When you will make an Object-store transient?

We use transient object store when data synchronisation is not required and when data will be loaded each time when server restarts.

Aggregator pattern.  
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What is a design pattern?

Design pattern is a repeatable solution to a commonly occurring problem in software design. It is a description or template for how to solve a problem that can be used in many different situations.

Why do we need to follow design patterns?

They provide way to solve issues related to software development using a proven solution.

Also design pattern make communication between designers more efficient

What is enterprise integration patterns?

Enterprise Integration patterns (EIP) is a catalog of design patterns for developing systems to integrate new and existing software in a business environment.

What is aggregator pattern?

Aggregator receives a stream of message from different sources and publish a single message

How it is used in Mule 4.

In Mule$ there is an Aggregator Module available and scatter-gather also uses aggregator internally

Does scatter-gather uses Aggregator Module internally?

Yes scatter-gather uses aggregator pattern internally

Rate Limiting policy.  
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What is Rate limiting policy?

In Rate Limiting Policy, one is allowed to send only a certain number of requests in a given time interval.

When a request is sent and the rate limit is not reached, the request is processed further. But if the rate limit has been reached, the request is not processed and is terminated

What is use-case of applying rate limiting policy?

Use case example - Sends traffic to a new data center if the rate of DNS requests exceeds 1000 per second.

How to apply the rate limiting policy?

In API Manager click the version number of the API

Click Policy -> Apply New Policy

In Apply Rate Limiting Policy, you can set the number of requests, period of time for receiving the requests, and a time unit

Munit  
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What is Munit?

Unit is a Mule application testing framework that allows you to easily build automated tests for your integrations and APIs. It provides a full suite of integration and unit test capabilities, and is fully integrated with Maven and Sure-fire for integration with your continuous deployment environment.

Why do any project need to be unit tested?

Developers write unit tests for their code to make sure that the code works correctly. This helps to detect and protect against bugs in the future

What are the advantages of unit testing?

* Improves the quality of the code
* Identify software bugs early
* Provide documentation
* Instant visual feedback that code worked as expected
* Helps with code reuse. Ability to re-use code and test
* Saves time and money