What is Cloud-native ?

- ***Cloud-native:***

  is modern approach to build and run software application that exploits the flexibility and scalability of cloud computing. and run application in dynamic environments such as public, private, and hybrid clouds,

- ***examples of this approach is:***

  I. *Containers,*
  II. *service meshes,*
  III. *microservices,*
  IV. *declarative APIs.*

Example

- **Companies use cloud native:**
  - Netflix,
  - Uber
  - WeChat
- **Reasons for using it :**

  speed, agility, and scalability

What Are Cloud-Native Applications?

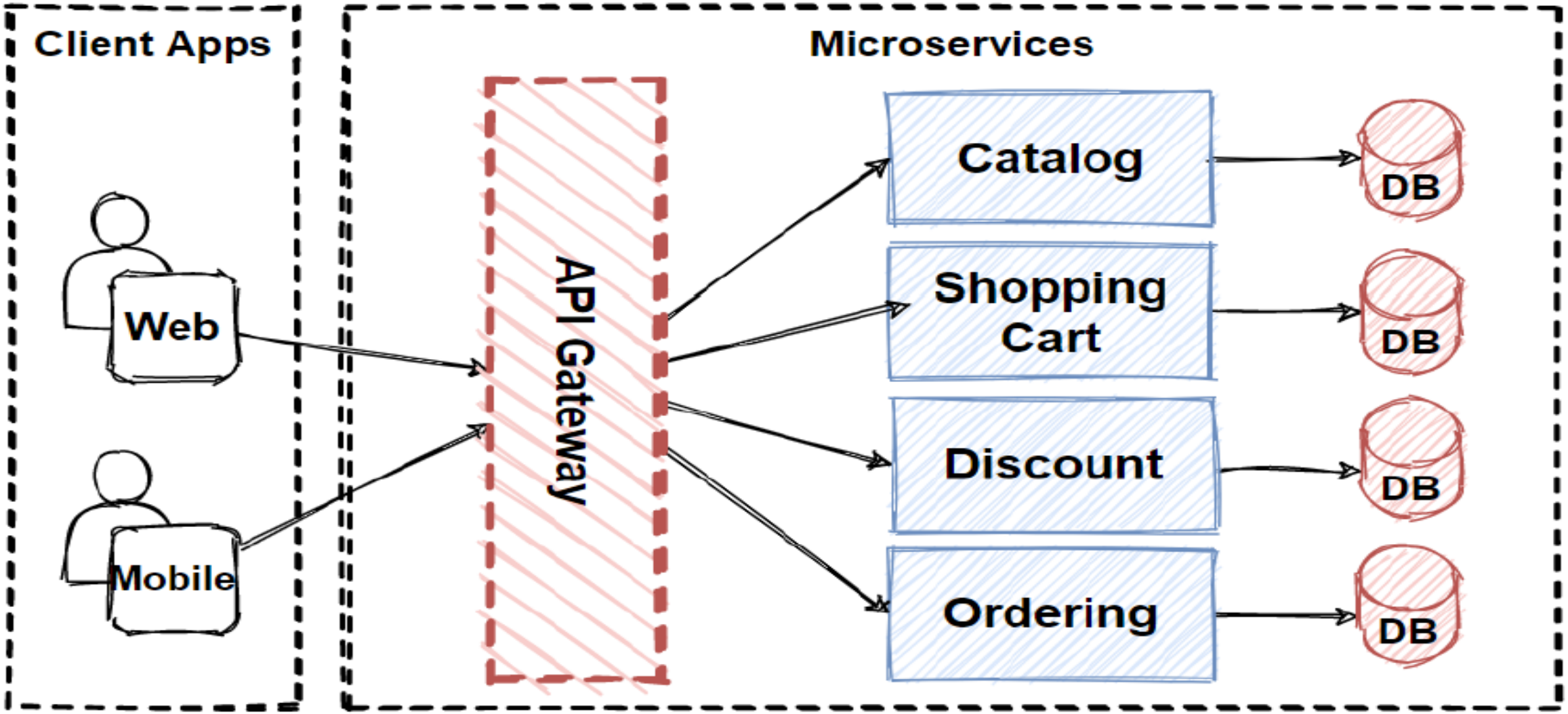
- **Cloud-native applications** are applications designed, developed, and hosted in public, private, or hybrid cloud environments. They are often built from smaller independent pieces, called **microservices**.

- cloud-native a little more narrowly, focusing on application containerization(organized)

    1. applications are broken down into microservices
    2. packaged in lightweight containers to be deployed and be used across a variety of servers.

Microservices & API

- **Microservices** : is an architectural approach in which a single application is composed of many smaller, loosely coupled and independently deployable components or services. These services (also called microservices) and communicate with each other via a combination of **(API)**
- Microservices work together as a whole to comprise an application , although they are separated
- This provides flexibility and scalability of the cloud-native applications.


Client Apps
Microservices
Web
Mobile
API Gateway
Catalog
Shopping Cart
Discount
Ordering
DB
DB
DB
DB

How APIs support cloud native ?

- **A challenge** for developers is the ability to quickly consume the services and use them to meet their needs so API support interface that consume the services in cloud which:

1. Cloud native promotes the use of microservices which are separated and self-contained
2. Communication between services(microservices) takes place using a well-defined interface **(API)**

- So let's know background about API

What is an API ?

- **API (Application Programming Interface) :** is refer to Application Programming Interface, which is a software intermediary that allows two applications to talk to each other (linking between multiple applications or application and services) there is a lot of companies depend on APIs in their revenue like (google)

- **Example :**

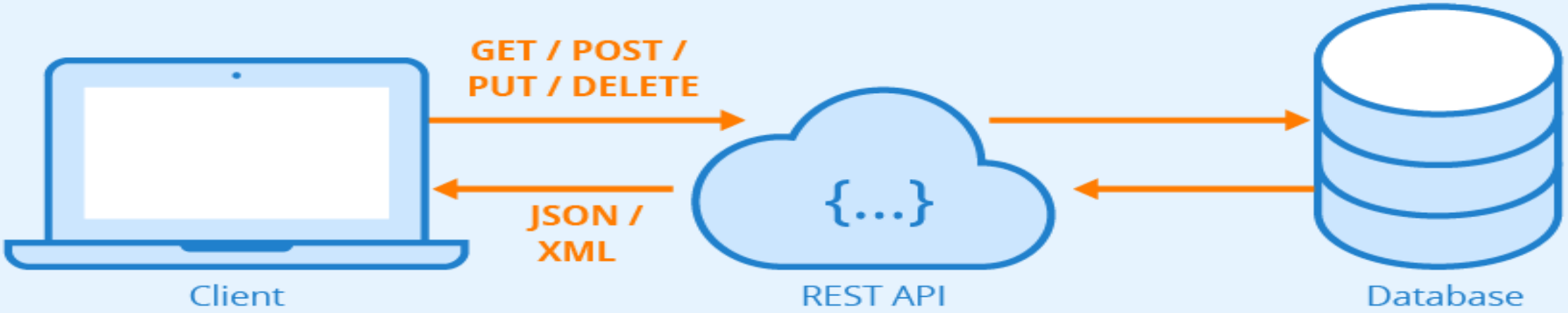
  Each time you use an app like Facebook and send an instant message or check the weather on your phone.

  here you're using an API.

How API works?

- **When you use an application on your mobile phone:**
  1. the application connects to the Internet and sends data to a server.
  2. The server then retrieves that data, interprets it, performs the necessary actions and sends it back to your phone.
  3. The application then interprets that data and presents you with the information you wanted in a readable way.

All of this things happen via API


GET / POST /
PUT / DELETE
JSON /
XML
{...}
Client
REST API
Database

What is the use of API's in cloud services?

- **What is Cloud API?**

  A cloud application programming interface (cloud API) enables applications to communicate and transfer information from one to another in the cloud.

- Cloud APIs essentially enable you to develop applications and services in the cloud.

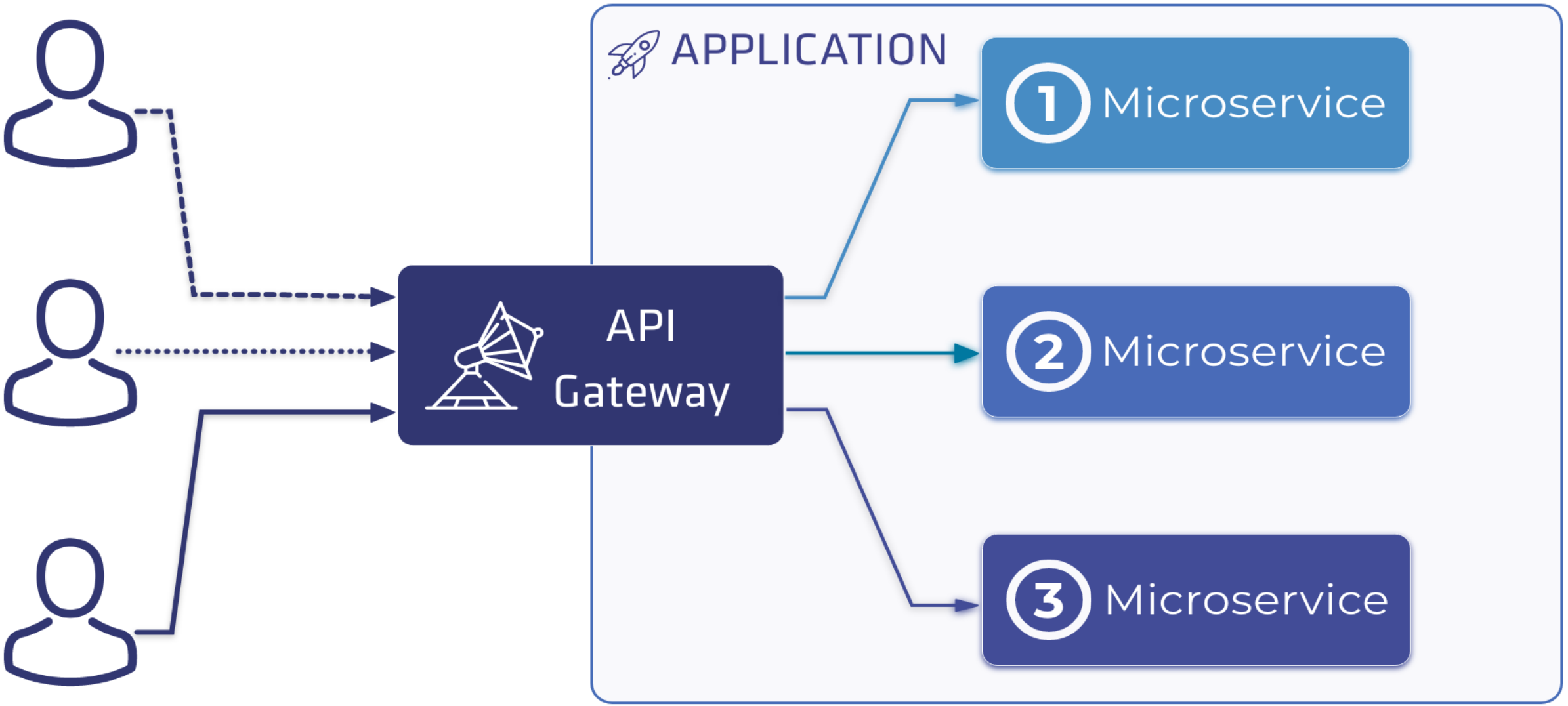
- allows developers to link cloud computing services together. Application programming interfaces **(APIs)** allow one computer program to make its data and functionality available for other programs to use.

As you build and manage cloud APIs, there are some considerations you'll need to make.

API architecture

- **There are four key layers you'll need to consider when planning your cloud architecture :**
  1. Information management layer — your data repositories.
  2. Application layer — where your applications live.
  3. Integration layer — where APIs connect your services.
  4. Interaction layer — where your **API gateway** enables interaction between services and a client
- **API gateway** sits between backend services and a client (requester) to transmit requests and responses. An API gateway receives calls, aggregates services to fulfill them, and returns a result.

API Gateway



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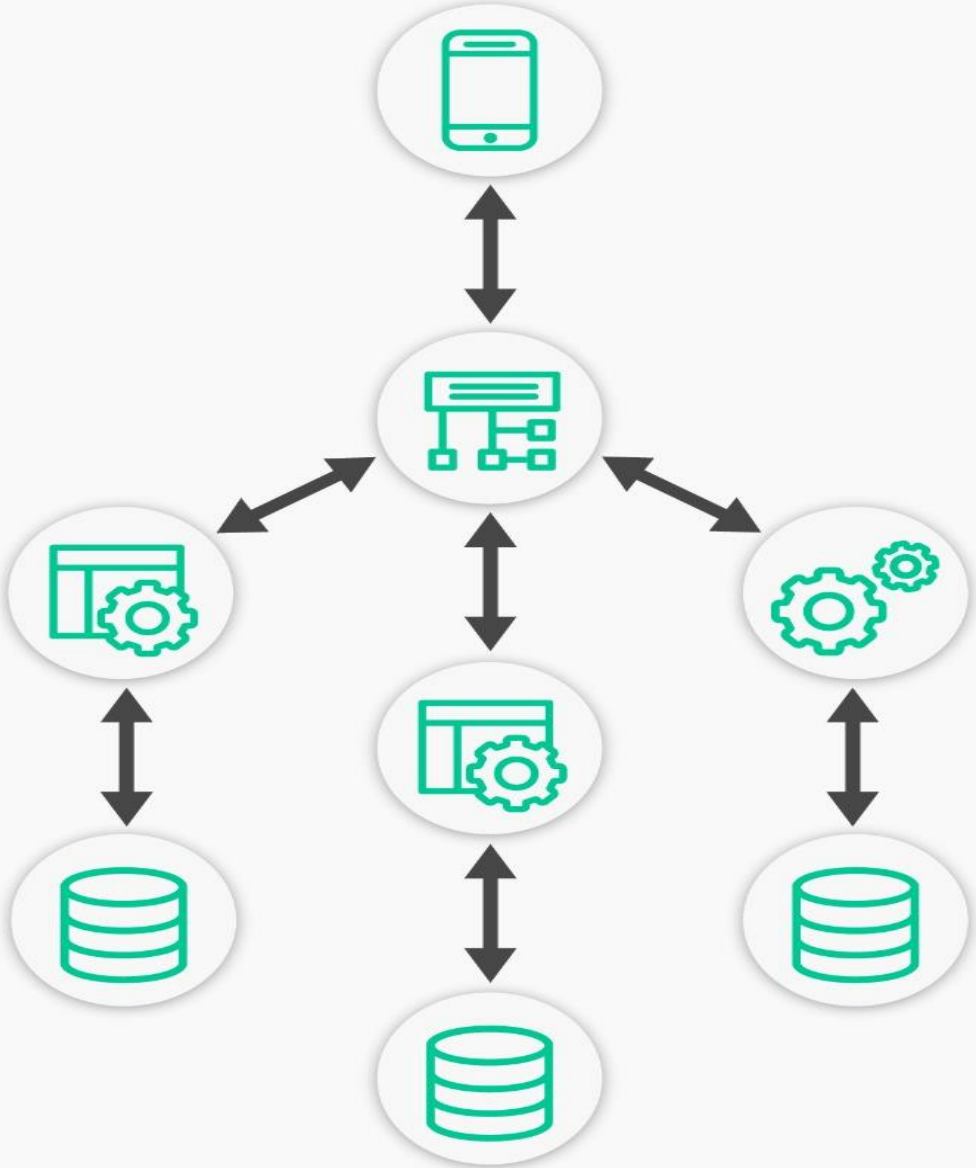
Orchestration

- **You will need in this topic three APIs:**
  1. **API orchestration:** typically requires creating a single API that offers valuable functions to its consumers, often by making multiple calls to multiple different services to respond to a single API request.
  2. So you will need **API gateway**
  3. You can design your **API catalog** and use the gateway to decide how to service each request in the cloud.

API catalog: allows you to strategically manage, promote, and share with relevant developers and end-users.

Orchestration



Integration

- Finally you will need to integrate your applications together so we will need **(API Integration)**
- **API Integration:** is the process of connecting applications, data sources, and systems
- So we will just need **API platform** to do this like (AKANA)
- **Akana** ensures you can connect your cloud applications easily, create new cloud APIs, and work with your existing data sources.

API INTEGRATION

Types of Cloud APIs

- **Cloud APIs are often categorized by type:**
  1. **PaaS APIs:** Platform as a Service APIs provide access to back-end services such as databases.
  2. **SaaS APIs:** Software as a Service APIs facilitate connections between cloud services at the **application layer** we talked about in architecture .
  3. **IaaS APIs**: Infrastructure as a Service APIs enable cloud-based compute and storage resources to be provisioned and de-provisioned as quickly as possible.