

## Message-Based Communication

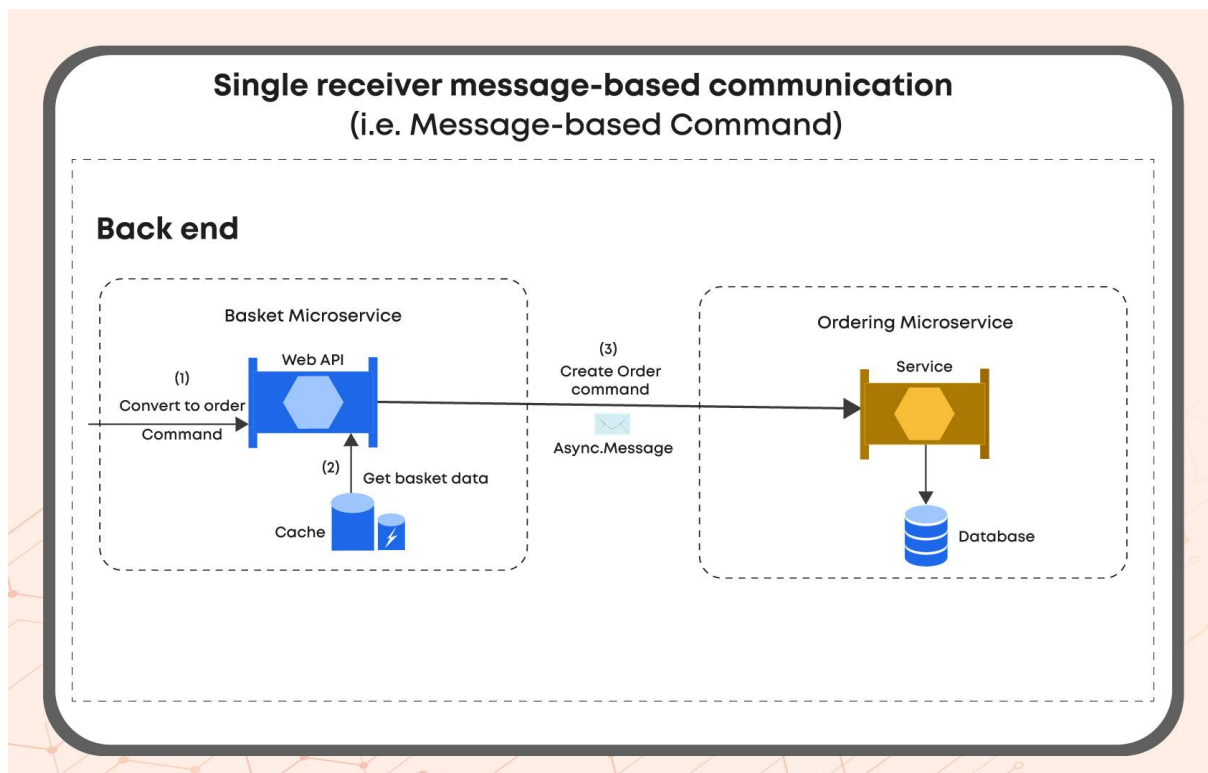
Message-Based Communication is an example of Asynchronous Communication.

### Definition

Message-Based Communication is the exchange of information based on messages. The client makes a request in the form of a message to a service. The service replies back with the response in the form of a message. Since it is asynchronous communication, the client is not required to halt the process and wait for the process but has the freedom to start or stop any other process.

### Terms used:

- Producer: The person sending the message.
- Consumer: The person receiving the message.
- Agent: The medium between producer and consumer responsible for successfully delivering the producer's message to the consumer is called the agent. The agent is generally a queue. A queue functions in the FIFO(First In First Out) Sequence or LILO(Last In Last Out) Sequence. A queue acts like a temporary data storage where the messages can be stored.



## Models of Message-Based Communication System

### 1. P2P(Peer to Peer Messaging)

The exchange of information between two peer computers takes place using a queue as an agent, and the request message is only targeted to a single consumer.

Example: You send an email to your teacher to recheck your last test. The email is only targeted to your teacher and no one else. This is an example of P2P communication.

### 2. Publish-Subscribe Model

The exchange of information between two peer computers takes place using a queue as an agent, and the request message is target to multiple consumers.

Example: Tanuja has subscribed to a newsletter group. Every week, a newsletter is sent to all the members of the newsletter group and not only Tanuja, but Tanuja receives a copy of it. Similarly to the youtube channel subscriptions, a user can subscribe to a channel, and the single video would be broadcasted to multiple channel subscribers. The agent used for the exchange of information must be a queue in this model of messaging.

## Industrial Tools for Asynchronous Communication:

- Kafka(Messaging Solution)
- RabbitMQ/ActiveMQ(Message-broker Software)
- Amazon Kinesis
- Akka
- Apache Spark