

# Software Architecture

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## Overview

*BeuthBot* consists of many interwoven *Microservices*. Every *Microservice* uses our basic API to communicate with other *Microservices*. This approach enables us to change parts of the system easily at any time or to introduce new *Microservices*, all they need to do is to implement our API.

## Basic Structure

Our application is basically composed of the following four components.

Bot ⇔ Gateway ⇔ Registry ⇔ Service

Following diagram shows that in more detail.

![[structure]](../assets/structure-without-notes.png)

A user can write the *Bot* to request informations, the meaning of the message is extracted and a fitting *Microservice* is chosen to retrieve the necessary data. A response is build from that data and distributed back up to the bot which answers the users request.

following sequence diagram further illustrates that.

![[flow]](../assets/flow.png)

## Bot

This is an abstraction for the available chatbots, e.g. a *Bot* for *Telegram* and another *Bot* for *WhatsApp*.

The user interacts with this *Microservice*, here she can request information and gets answers from *BeuthBot*.

## Gateway

The *Gateway* is the centerpiece of *BeuthBot* one could say.

The *Bot* notifies the *Gateway* with the message it got from the user.

The *Gateway* then uses NLP (Natural Language Processing) *Microservices* to get the meaning and intention of the user. Here we try to extract what the user wants from *BeuthBot*, to notify the right service and present a fitting answer to our user.

## Registry

After obtaining the intention of our user, the *Gateway* notifies the *Registry*, to get the information the user requested.

The *Registry* distributes the request to the correct *Service*, that takes care of retrieving the right informations.

## Service

*Service* is an abstraction for the implemented *Microservices* that retrieve the necessary data we need to answer users requests. E.g. the *MensaService* is a *Microservice* that can give informations about the current menu, filtered by a number of parameters, e.g. a vegan user.

## API

Because of the complexity of the single *Microservices*, every single *Microservice* implements its own, distinct, API.

But to answer a users request we use a unified, comprehensive API. Its basic idea is to pass a *Response-Object* trough the individual *Microservices*, which consists of the initial request, an answer as a response to the users request and informations about the user.

Following class diagram further illustrates that:

![flow](../assets/response-request-api.png)

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