Zwischenbericht zum Masterprojekt WS 2019/20

Durch die folgende Zeile (siehe im Markdown) werden andere Wiki-Seiten in diese inkludiert.

Introduction / Summary

Motivation

A large number of companies are renewing their customer service in order to quickly bring their range of offers to potential buyers. Digitalization is a useful tool for bringing information to interested parties. The chatbot plays an important role here. Chatbots are dialogue systems that communicate via voice or text messages. Chatbots are used in various areas and present a variety of offers to inform users. There are also other categories, such as chatbots, which provide specific information about the weather. The Beuth University of Applied Sciences in Berlin offers its students, employees, scientific staff and teachers various services. The focus is on important questions such as when the opening hours of Beuth University are. For students, the opening hours of the library, the study administration, the dean's offices, the study and recreation rooms are also important. For these reasons Professor Thomas Ziemer proposes to develop a chatbot for the university.

Target group

The chatbot is aimed primarily at students, teachers and visitors to Beuth University. It helps the above mentioned groups to quickly get information about the learning rooms, Mensaplan and other services of the university. The chatbot also provides information about the weather.

Scope

Beuth University has an interest in offering a service that leads through the university. This service is intended to help new students find their way around Beuth University. This includes, among other things, that students have knowledge of exam dates and the teaching staff's consultation hours in order to better organize their studies. The chatbot also answers questions about the Mensaplan. The Mensa's offer is varied, e.g. the Chatbot answers to inquiries, when there is vegetarian or vegan food. It has other functions as well: So it can answer questions about the next week's menu and can consider hints from users, such as the request of a vegetarian.

Software Architecture

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Overview

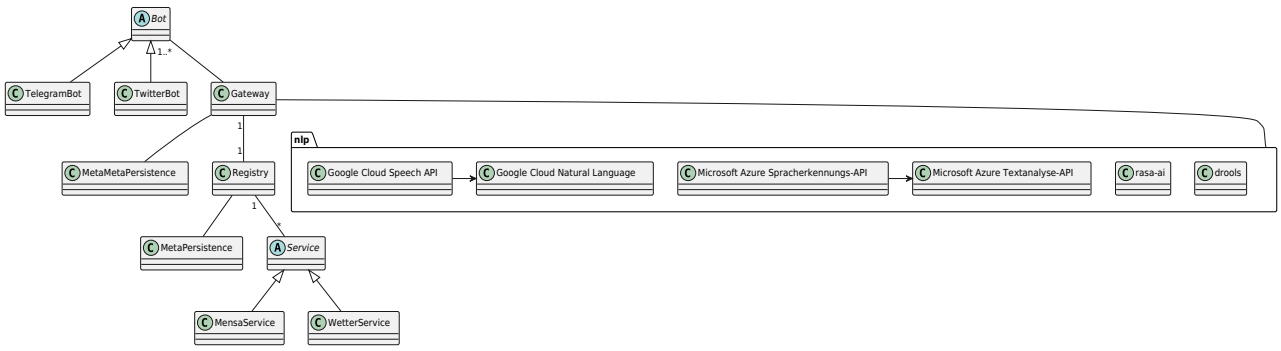
BeuthBot consists of many interwoven *Microservices*. Evey Microservice uses our basic API to communicate with other Microservices. This approach enables us to change parts of the system easily at any time or to introduce new Microservices, all they need to do is to implement our API.

Basic Structure

Our application is basically composed of the following four components.

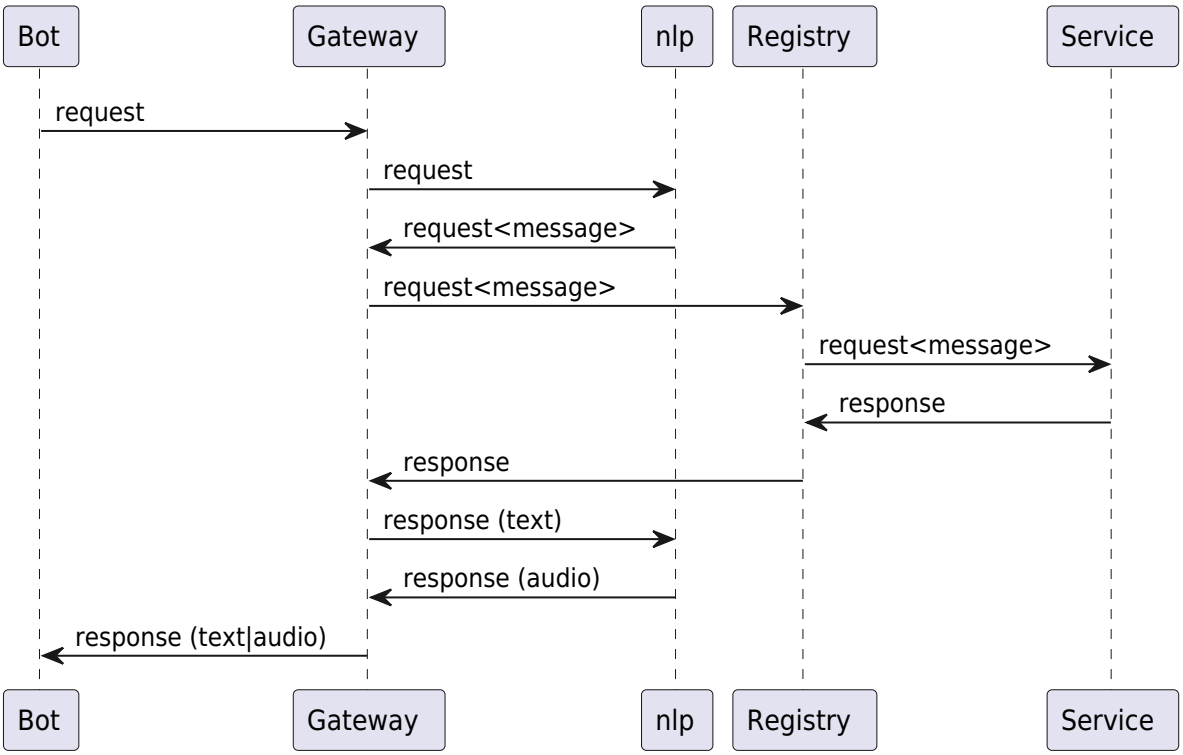
> Bot ⇔ Gateway ⇔ Registry ⇔ Service

Following diagram shows that in more detail:



A user can write the *Bot* to request informations, the meaning of the message is extracted and a fitting *Microservice* is choosen 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:



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: