How can you protect multiple  
micro services?



# Sub-Questions

To answer my main question I split it up in smaller questions which I would research.

1. How can I ensure only my application can access the service?
2. How do I verify witch user sends an request to the service?
3. How do I make sure the data sent to the service is valid?

To answer these questions I used the dot framework. I started by doing Library research and after I learned some basic principles I started implementing the things I learned in my workshop fase.

# Dot Framework

The Dot research framework is mostly used ICT. Usually the research is specific for a product and aims to answer a question important to making a product. Its important to consider the What, Why and the How in your research so you don’t get distracted by information which is not important to your question. First you define what you would like to know and formulate a main question. This question can be clarified by dividing it in sub-questions. After that you can consider why you would like to know these things and if it is important for the product. Finally you can start doing the how step of your research and decide in what way you are going to research the information. There are 5 different strategies in the Dot Framework for the how fase.

Library research is done to explore what is already done and what guidelines and theories exist that could help you further your design. Since the advent of the internet library research is also called desk research.

Field research is done to explore the application context. You apply a field strategy to get to know your end users, their needs, desires and limitations as organizational and physical contexts in which they will use your product.

Lab research is done to test parts or concepts of your product, of the final product. You use lab research to learn if things work out the way you intended them, or to test different scenarios.

Showroom research is done to test your ideas in relation to existing work. Showing your prototype to experts can be a form of showroom research or spelling out how your product is different from the competition. Also testing your product to general guidelines is a form of showroom research.

Workshop research is done to explore opportunities. Prototyping, designing and co-creation activities are all ways to gain insights in what is possible and how things could work.

# Library

To start my research I wanted to protect my services from other people. I could use an Ip whitelist but all of my services would need to have this whitelist and if an Ip changed it would need to be updated in all services. To make this easer I looked into an api gateway for my services. An api gateway takes all the responsibility for the protection of the other services. This way only the gateway has the Ip list and if an request comes from an invalid Ip it will return an error. To verify the users JWT can be used. A JTW is string containing a header, a body which are base64 encoded jsons and a RSA signature. Every request sent to the gateway has to be a JTW. In the gateway the JTW will be encoded and verified if the user has the permission to make the request. If he has permission the gateway will call the request from another service and return the information. If the data comes in it will be decoded so only valid data will make it true.

# Workshop

After I did my library research I started making a gateway for myself to try out the basic principles. I used the whitelist to make sure all the requests had to go true the gateway. This way I could verify if someone sent correct data by asking an other service first and then making the original request. For example in our group project a user is able to create a new product. A product has a brand and when creating a new one the brand has to be submitted as an id. If the request goes to the gateway first it can check the brand service if the id exist and is valid in the context before sending the request to the product service to create a new product in its database.

# Sources

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