

# Open Data Framework

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In a distributed system, when a server becomes overburdened by requests, the server will spend less time servicing each requests, and will increasingly have to serve more and more requests until clients receive timeouts, provided there are no safeguards. This heavily reduces the effectiveness of a given server, and can essentially bring it to a standstill, making the server unresponsive to both subsequent requests and the current ones already being serviced.

To mitigate this, an introduction of circuit breakers, popularized by Michael Nygard [2], and load balancing patterns can be implemented and applied in a microservice context, to provide an improvement, as well as have them work in conjunction with each other, to increase time spent servicing requests, rather than time spent being unresponsive. These have been described and roughly outlined in a microservice context [1].

A load balancer will delegate its requests to several microservices, while a single microservice using the circuit breaker pattern will provide its service to the same amount of requests, but will manage to serve this in a reduced timeframe. By applying a circuit breaker pattern, a time threshold will be defined for answering the requests, which, when exceeded, will stop accepting new requests before servicing the initial ones. After the time spent with each request has been minimized, it again opens up for other request. The load balancer works by forwarding the request to one of several microservices, all providing the same functionality, preferably the ones with less active requests.

In this talk, we provide a look at the cooperation between the University of Southern Denmark and Odense Municipality (Odense Kommune). This includes a look at an MSA, with a way of continuously storing data, sent by a specific sender, and allowing for retrieval of the data by anyone. Additionally, a centralized service registry allows for deploying additional services, e.g. others using different protocols, and at different locations, applying load balancing where applicable, where the services can utilize circuit breakers as well. In addition to this, an overview of the operations provided by the different services is available through a web interface.

## References

- [1] Fabrizio Montesi and Janine Weber. Circuit breakers, discovery, and API gateways in microservices. *CoRR*, abs/1609.05830, 2016.
- [2] Michael T. Nygard. *Release It!: Design and Deploy Production-Ready Software (Pragmatic Programmers)*. Pragmatic Bookshelf, 2007.