

# Kapitel 10: Serverless

vorlesung

CLOUD  
COMPUTING

# Serverless

is the next logical evolution in  
Cloud Native Software Development







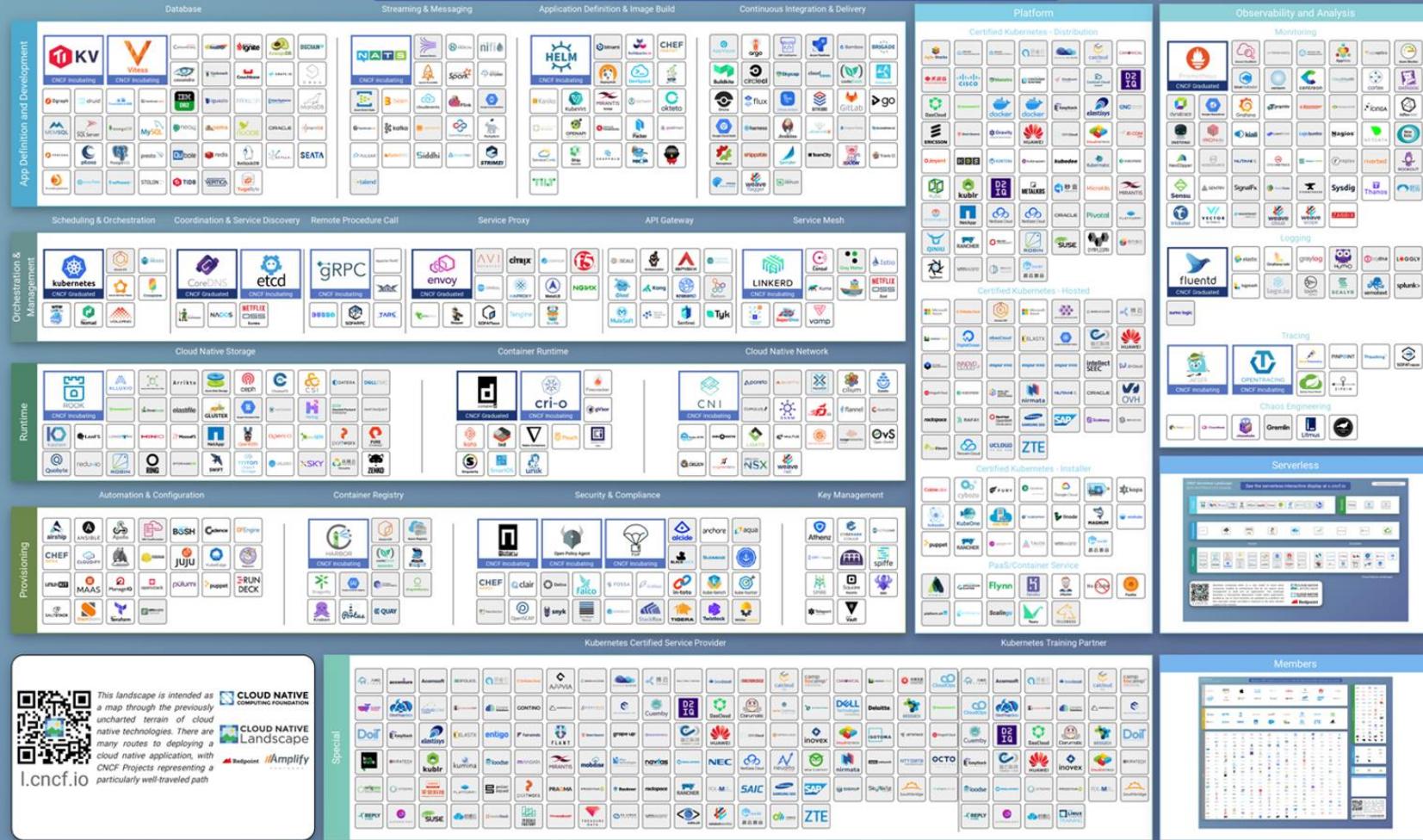


Bild: NatalyaLucia – gettyimages.de





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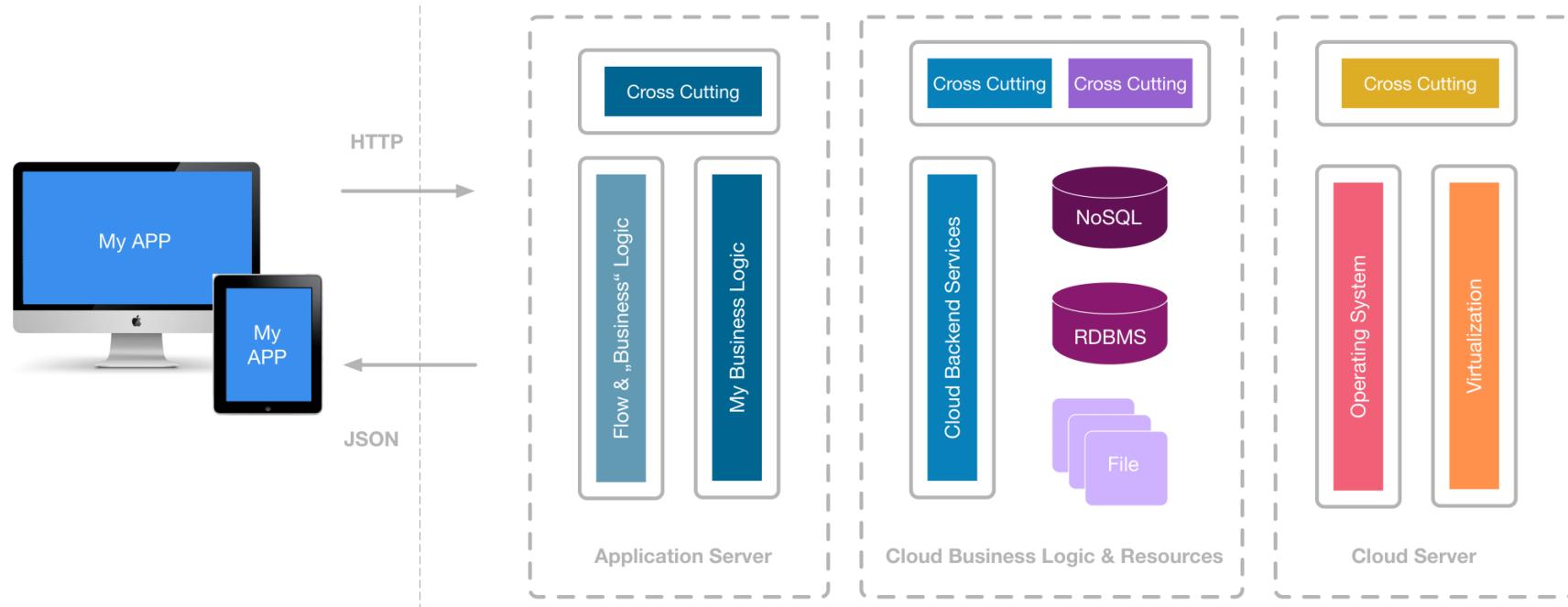
The background of the slide features a complex, abstract network graph composed of numerous small, semi-transparent white dots connected by thin white lines, creating a sense of a vast, interconnected system.

*CLOUD NATIVE SOFTWARE DEVELOPMENT IS*

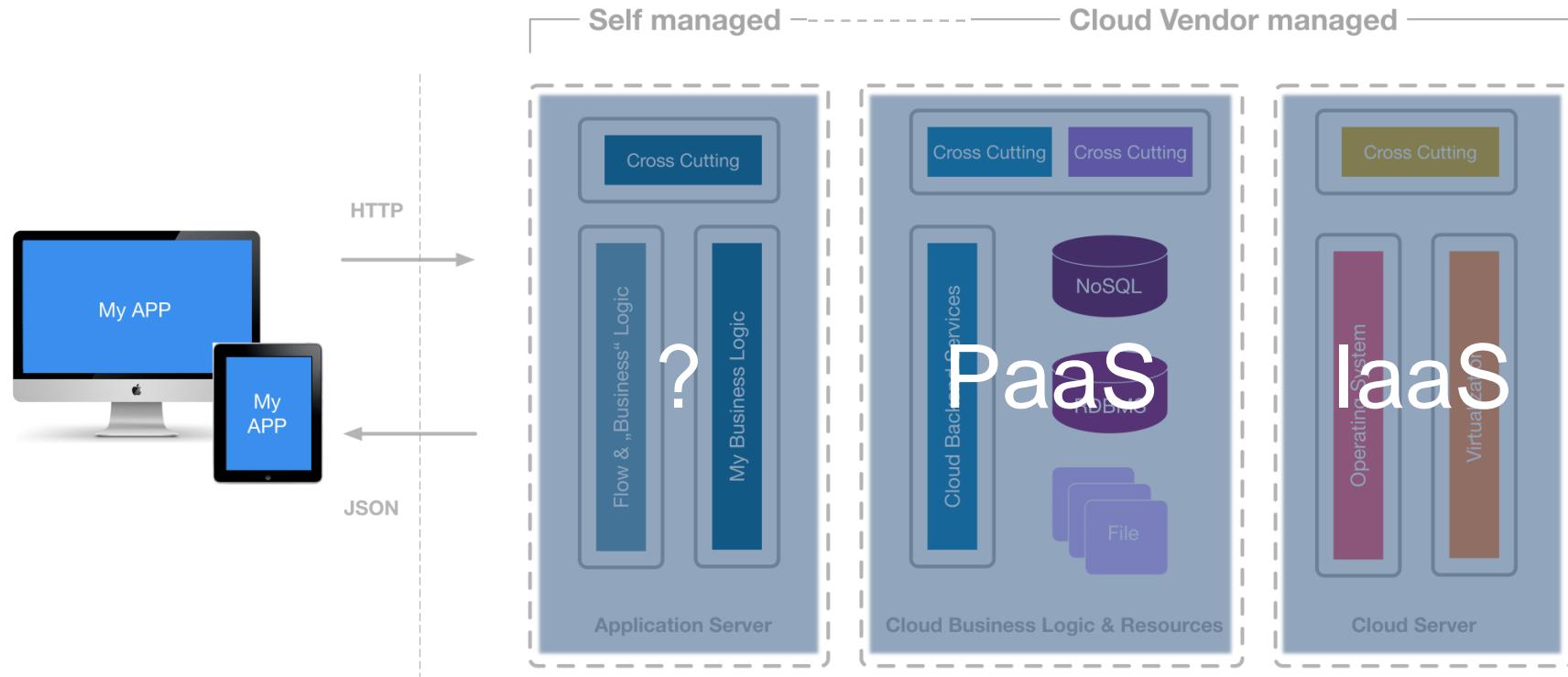
# **COMPLEX.**

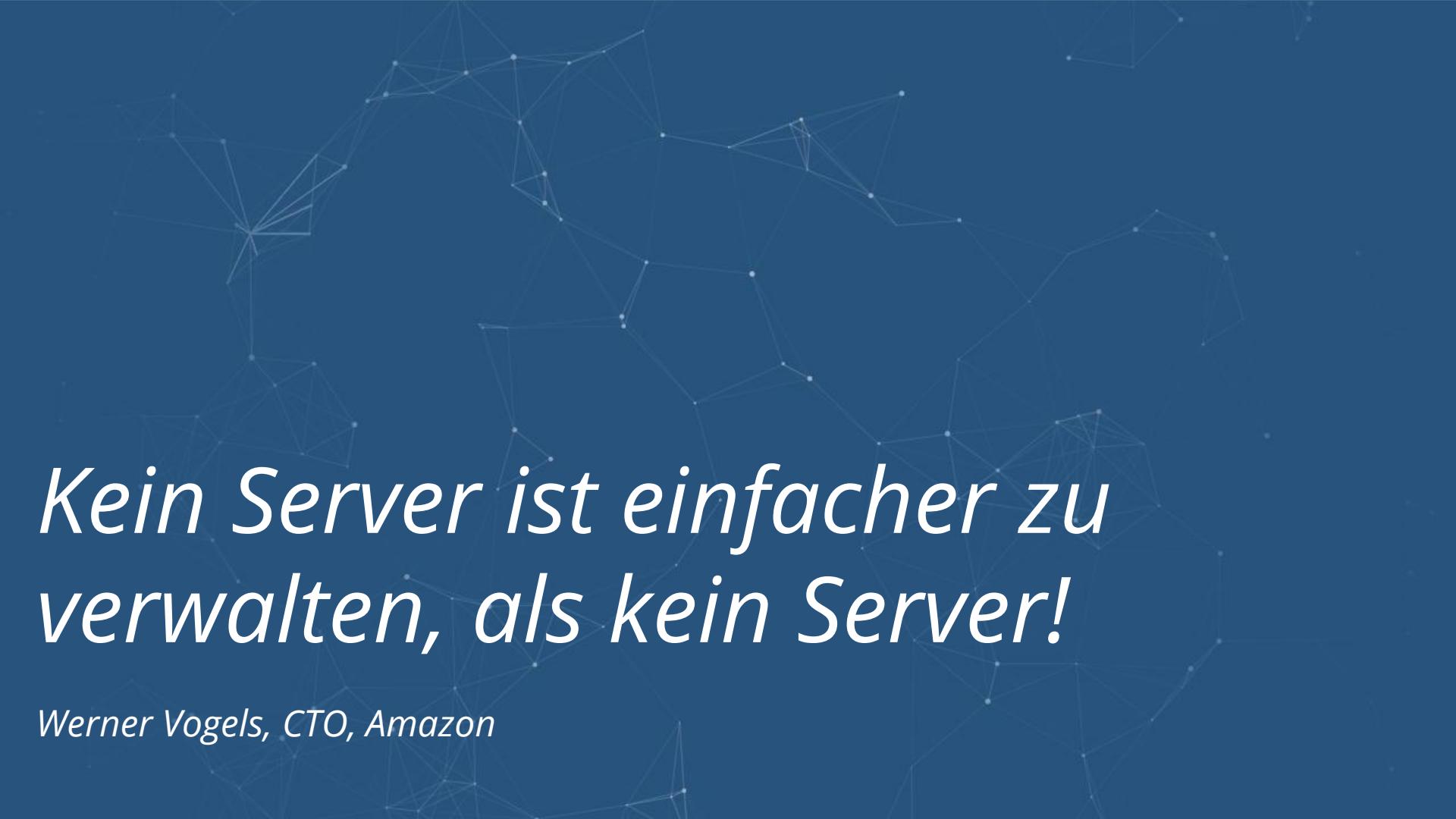
*DOCKER, YAML, MICROSERVICES, KUBERNETES, ET.AL.*

# Traditionelle Cloud-basierte Anwendungsarchitektur



# Traditionelle Cloud-basierte Anwendungsarchitektur



The background of the slide features a complex, abstract network graph composed of numerous small, semi-transparent white dots connected by thin white lines, forming a web-like structure against a dark blue background.

*Kein Server ist einfacher zu  
verwalten, als kein Server!*

*Werner Vogels, CTO, Amazon*



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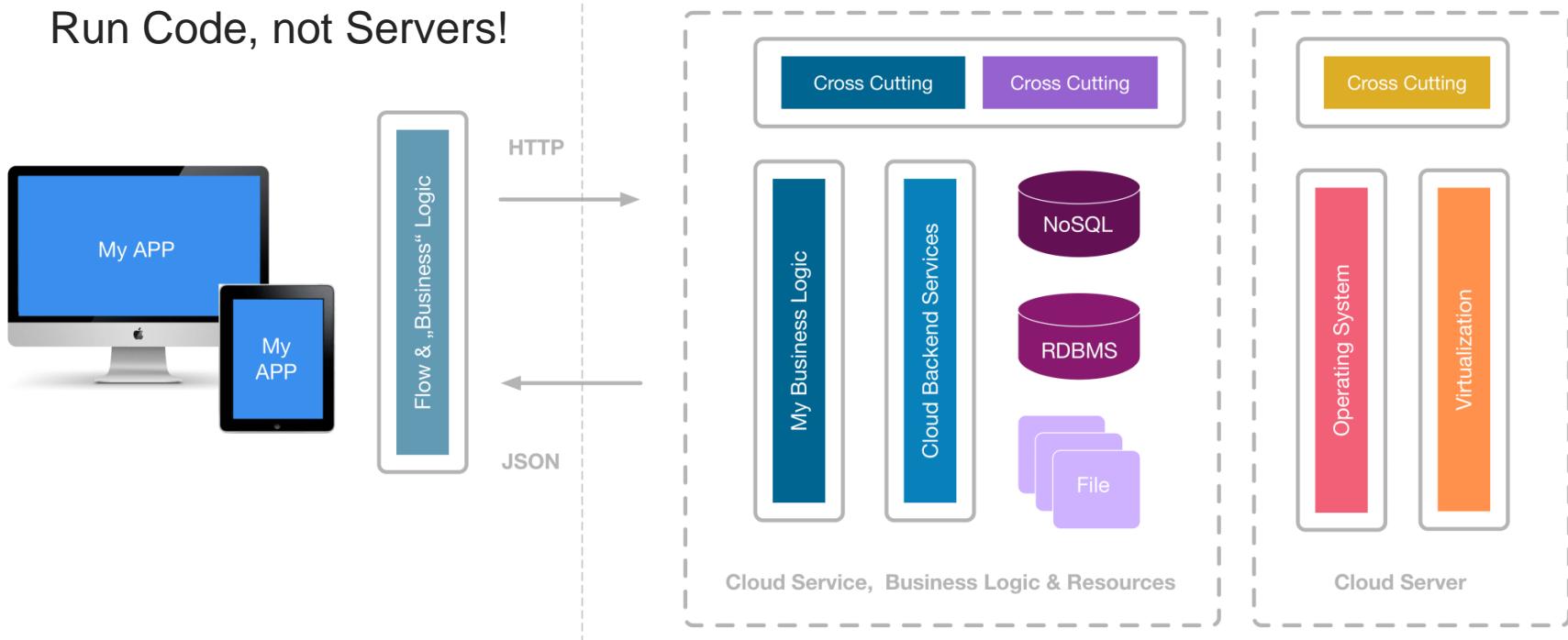
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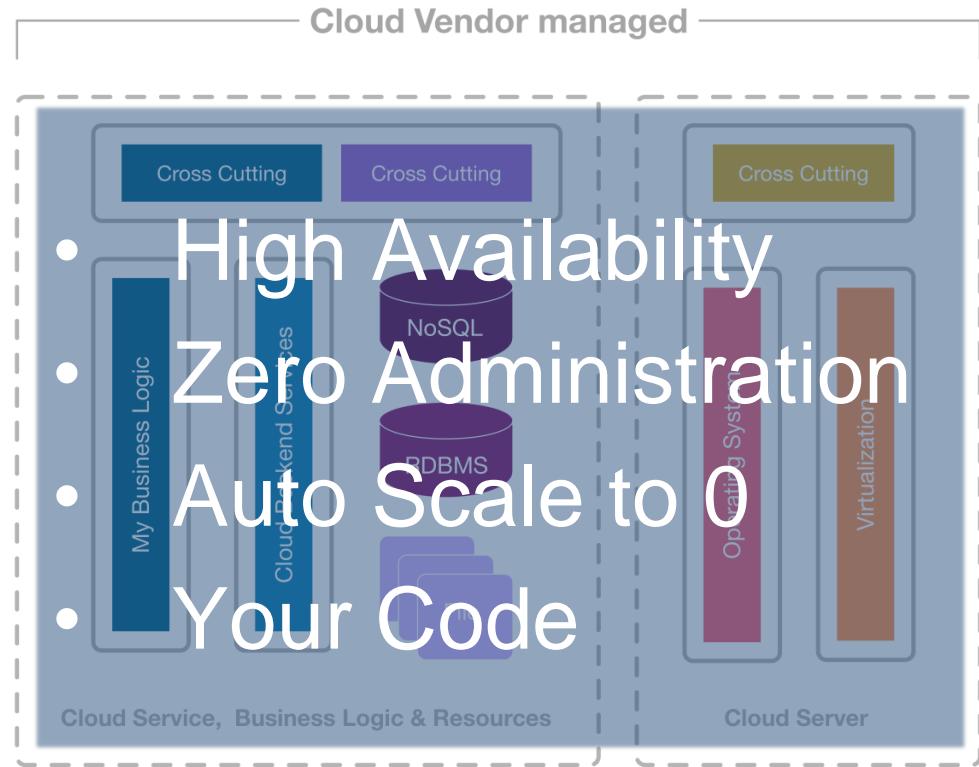
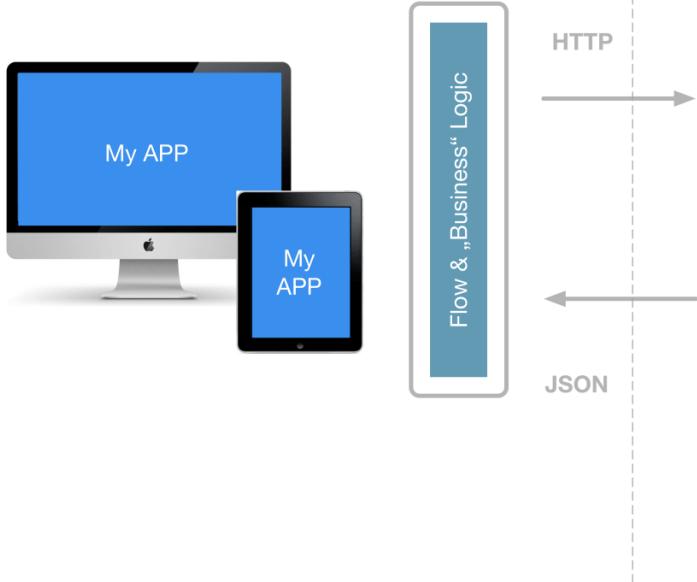
# Serverless Anwendungsarchitektur

Run Code, not Servers!

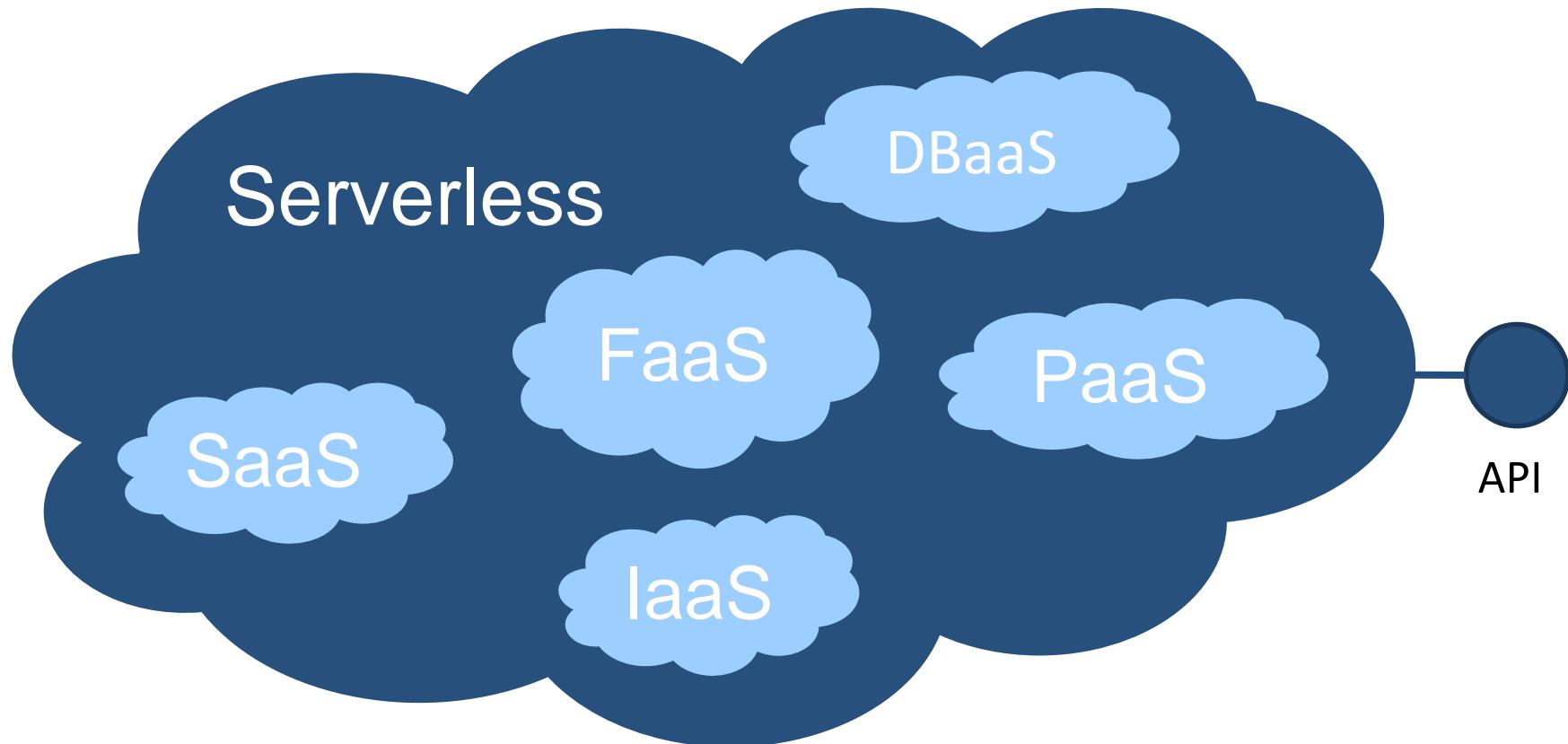


# Serverless Anwendungsarchitektur

Run Code, not Servers!



# Out-of the Box Self-scaling Fully Managed Backend

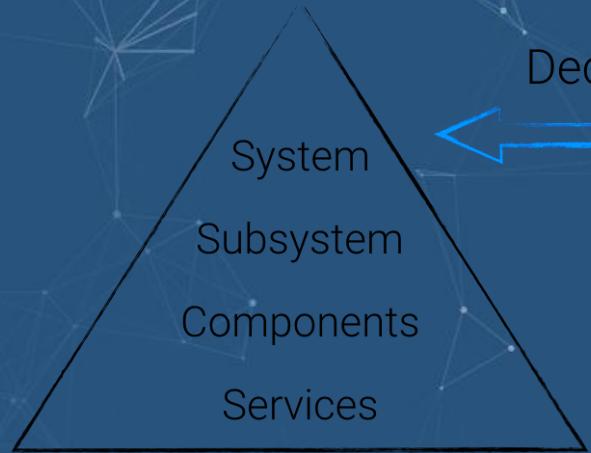


# Dev Components

? : 1

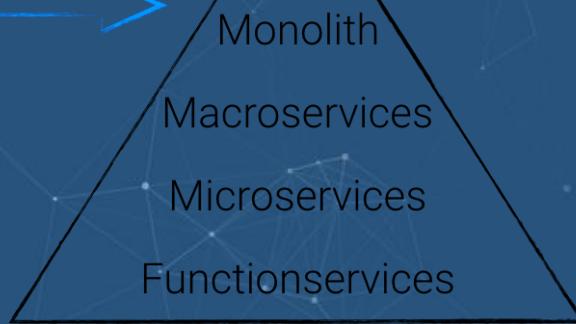
# Ops Components

Decomposition Level



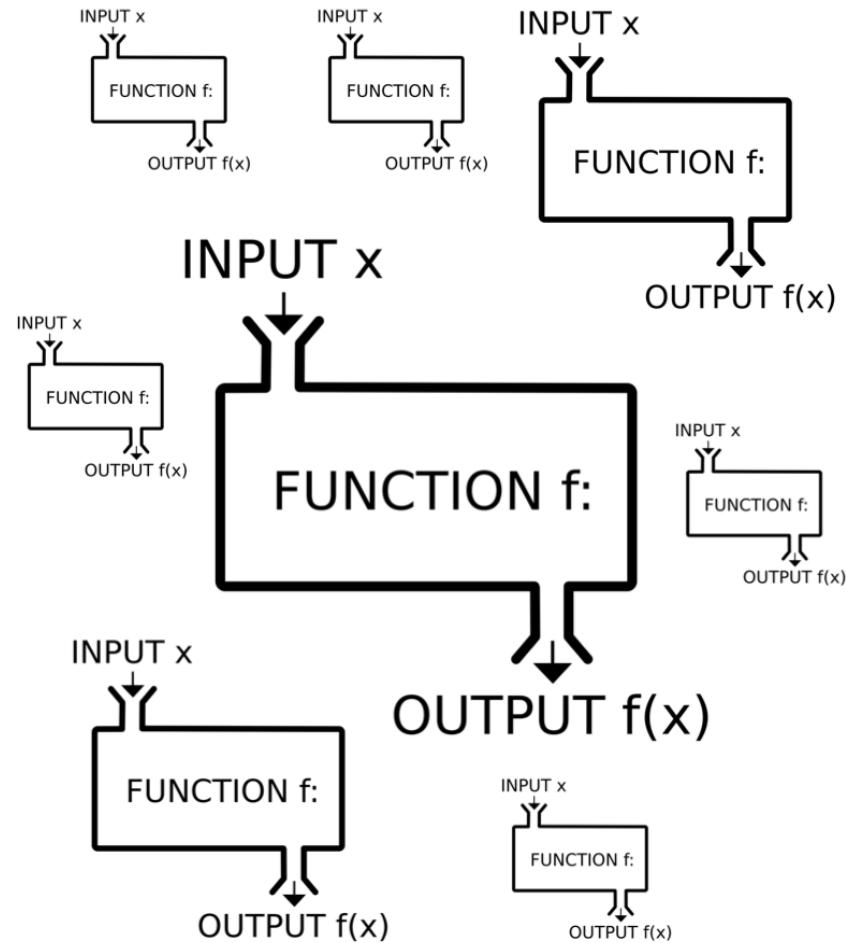
## Decomposition Trade-Offs

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>+ More flexible to scale</li><li>+ Runtime isolation (crash, slow-down, ...)</li><li>+ Independent releases, deployments, teams</li><li>+ Higher resources utilisation</li></ul> | <ul style="list-style-type: none"><li>- Distribution debt: Latency, Consistency</li><li>- Increased infrastructure complexity</li><li>- Increased troubleshooting complexity</li><li>- Increased integration complexity</li></ul> |
|--|---|



# Functions

as preferred Serverless Application  
Programming Model



# *EVENT-DRIVEN ARCHITECTURE*

*enables loosely coupled reactive  
software components and services.*

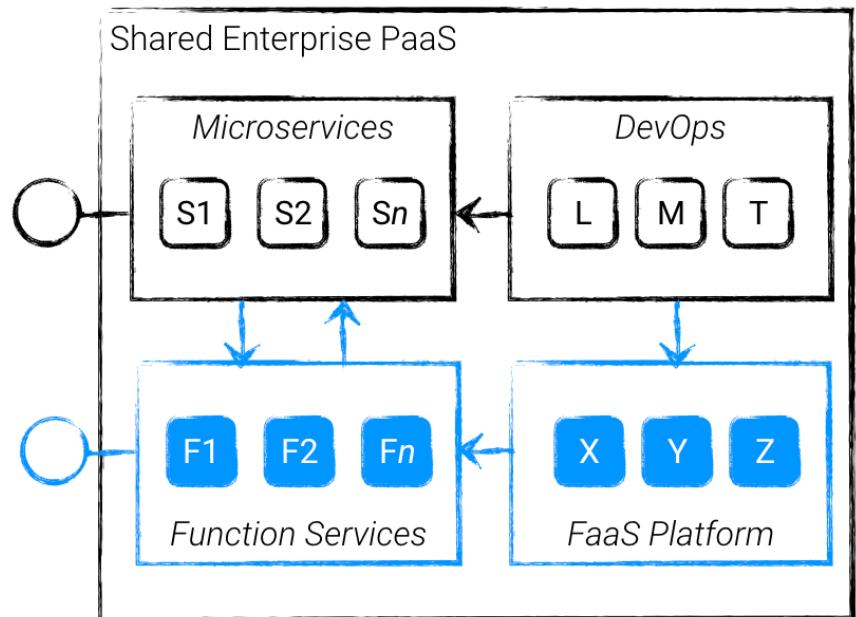
# Create Thumbnails the AWS Lambda Way



# Use Case 1

## Hybrid Architectures

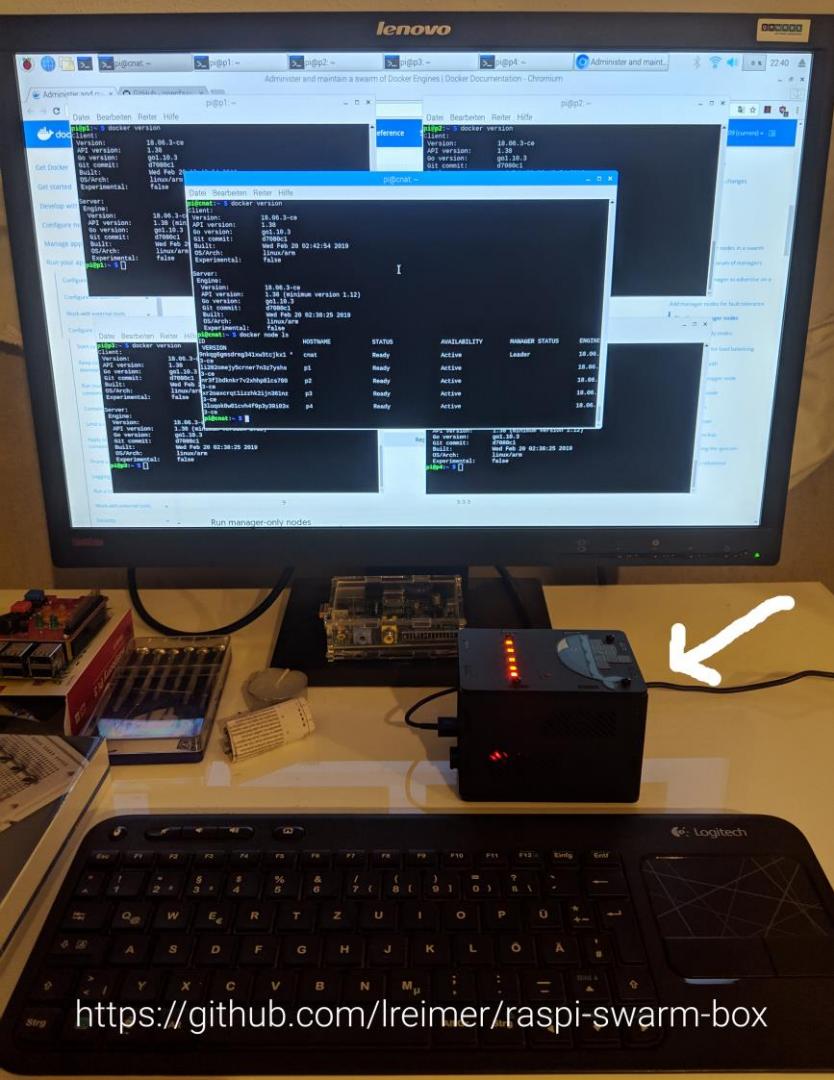
- Kombination von Microservice Architektur mit EDA
- Nutzung von Function Services für Eventgetriebene Use Cases
- Reduzierter Ressourcen-Verbrauch per Scale-to-Zero
- Integration in bestehende Enterprise PaaS Umgebung



# Use Case 2

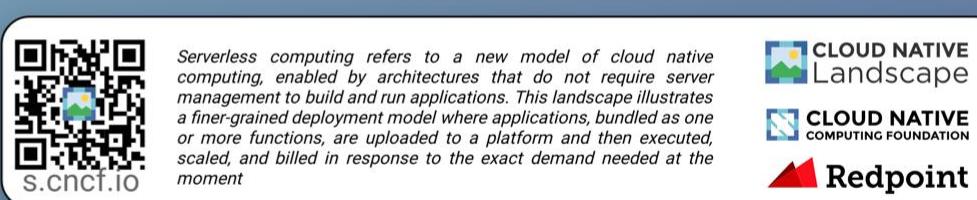
## Edge und Fog Computing

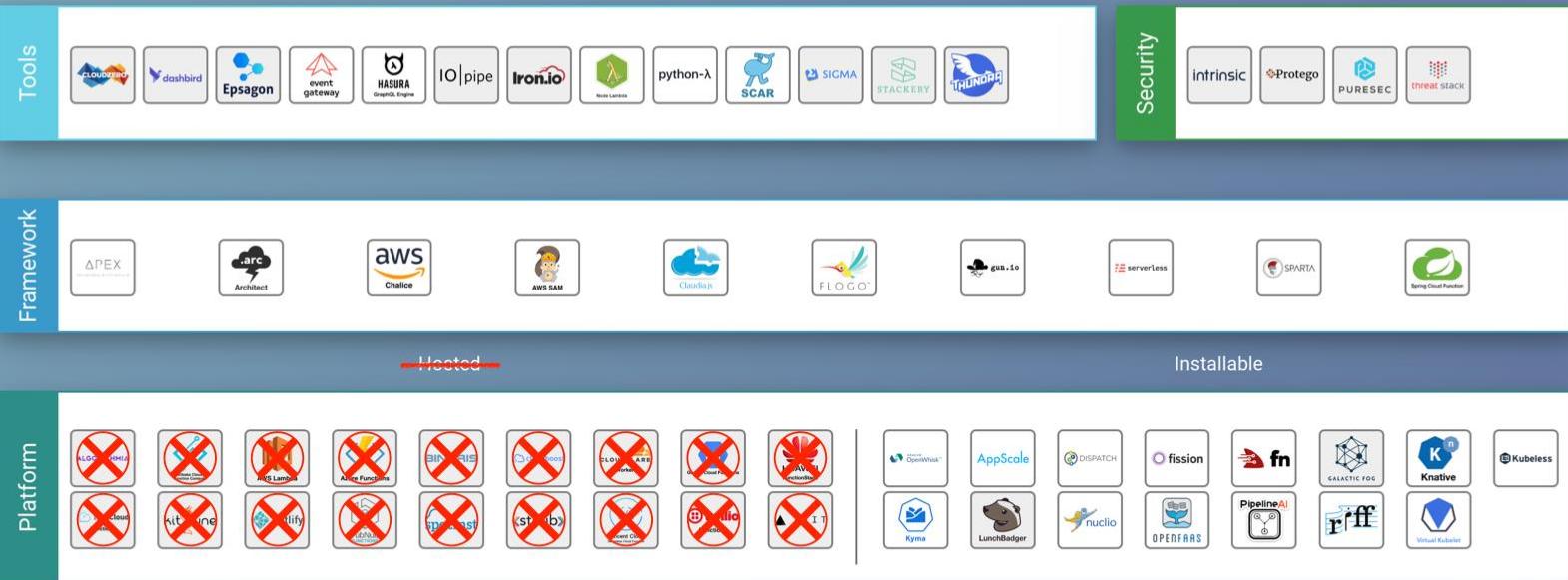
- Anbindung unserer LoRaWan Raum-Sensoren mittels Serverless Backend
- Couch Projekt: Nutzung von FaaS auf Low Power Devices
- Unterstützung von leichtgewichtigen Cluster Scheduler wie Docker Swarm





### Cloud Native Landscape





Serverless computing refers to a new model of cloud native computing, enabled by architectures that do not require server management to build and run applications. This landscape illustrates a finer-grained deployment model where applications, bundled as one or more functions, are uploaded to a platform and then executed, scaled, and billed in response to the exact demand needed at the moment





Security



Framework



Hooted

## Installable

Platform



Cloud Native Landscape



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OPENFAAS



fission



Kubeless



nuclio



Kyma

siehe auch <https://bit.ly/2Mh1kxJ>

# Die Kandidaten

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<https://fission.io>
- Kubeless  
<https://kubeless.io>
- Nuclio  
<https://nuclio.io>
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