

# Road to Kubernetes

# Wer bin ich?

Tim Stoffel

:em engineering methods AG

Fachinformatiker Anwendungsentwicklung

7. Semester Bachelor IT Sicherheit

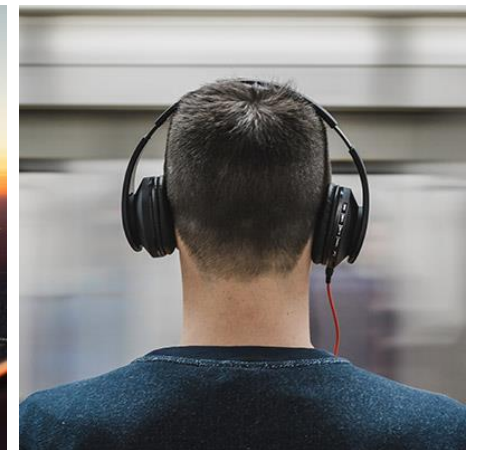
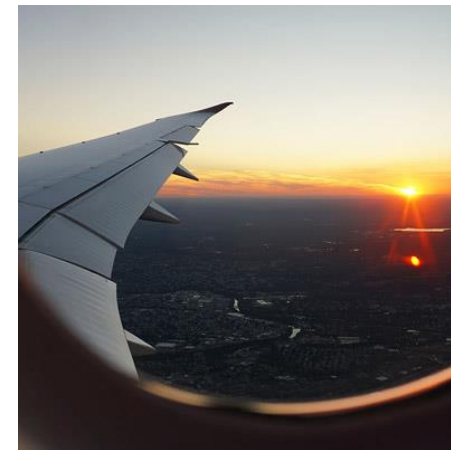


# :em engineering methods AG

Wir liefern die digitale Zukunft für das Engineering.

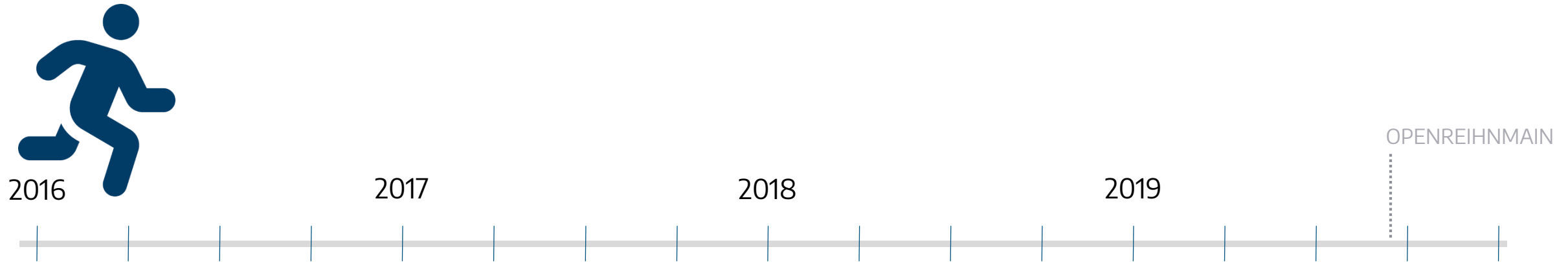
- Gründung 2001 in Darmstadt als „Spin-Off“ der TU Darmstadt, mit Standorten in Darmstadt und Böblingen
- Unabhängiges IT- und Beratungsunternehmen für Prozesse, Methoden und Technologien im Engineering
- Software- und Lösungsanbieter für Engineering Applikationen
- Fundiertes Know-how in den Branchen
  - **Automobil- und Zulieferindustrie**
  - **Maschinen- und Anlagenbau**
  - **Luft- und Raumfahrttechnik**
  - **Elektrik/Elektronik und Konsumgüter**
- 100 begeisterte Ingenieure, Softwareentwickler und IT-Spezialisten
- Erfolgreiche, nachhaltige Entwicklung – Inhabergeführtes Unternehmen

Zertifiziert nach  
ISO 9001



# Wie hat es angefangen?

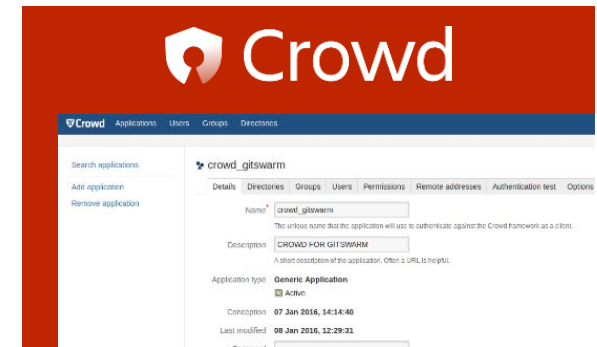
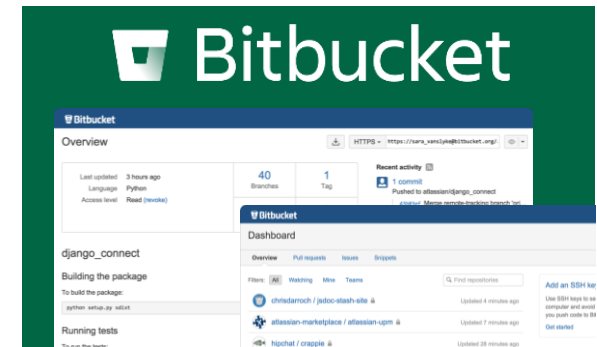
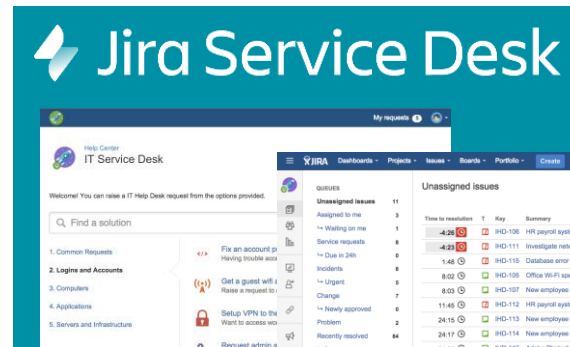
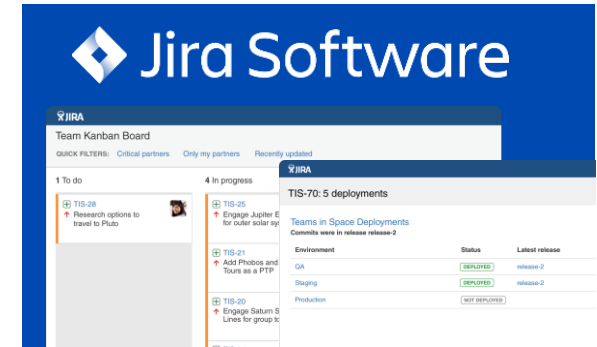
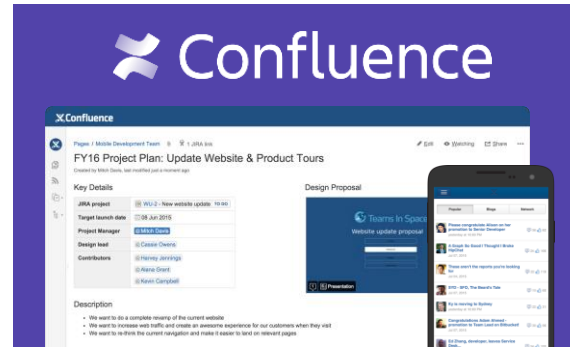
# Zeitstrahl





# Atlassian Tools

## Der Atlassian Stack





Demos



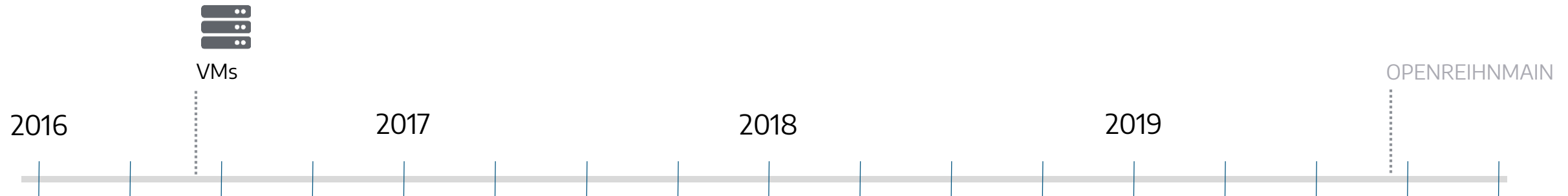
Workshops



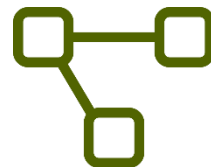
Plugin Entwicklung



# Zeitstrahl



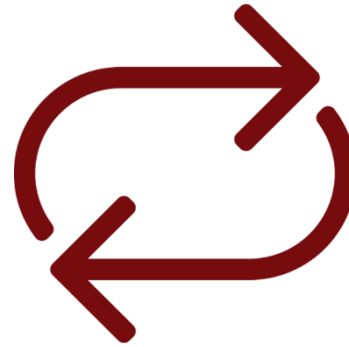
# Der VM Prozess



# Probleme



Zeit



Routine Aufgabe

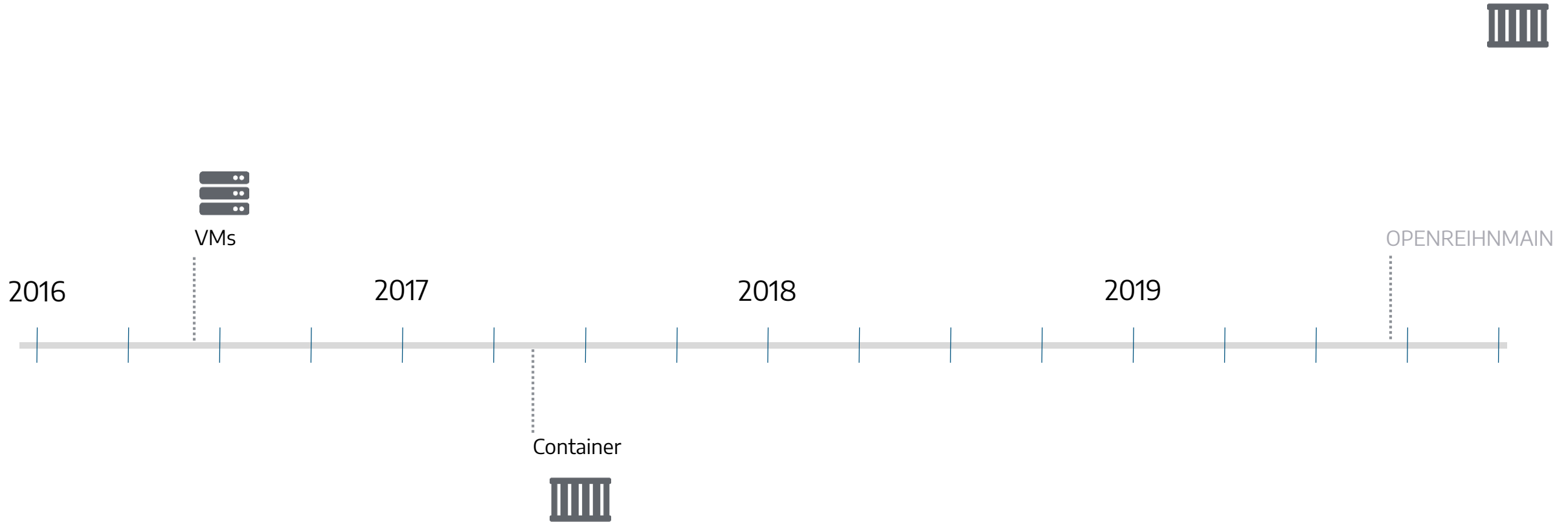


Wartung

# Container



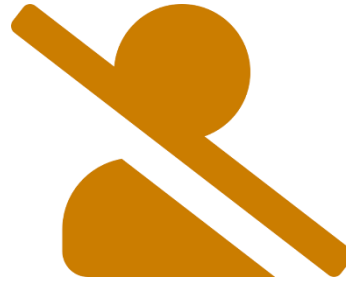
# Zeitstrahl



# Verbesserungen



Schneller



wenig manuelle  
Arbeit



Einfache  
Wartung & Betrieb

# Der Container Prozess



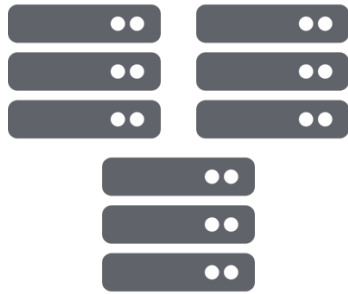
Beantragung App

Bereitstellung des Containers

Übergabe



# Probleme von Containern



Skalierung

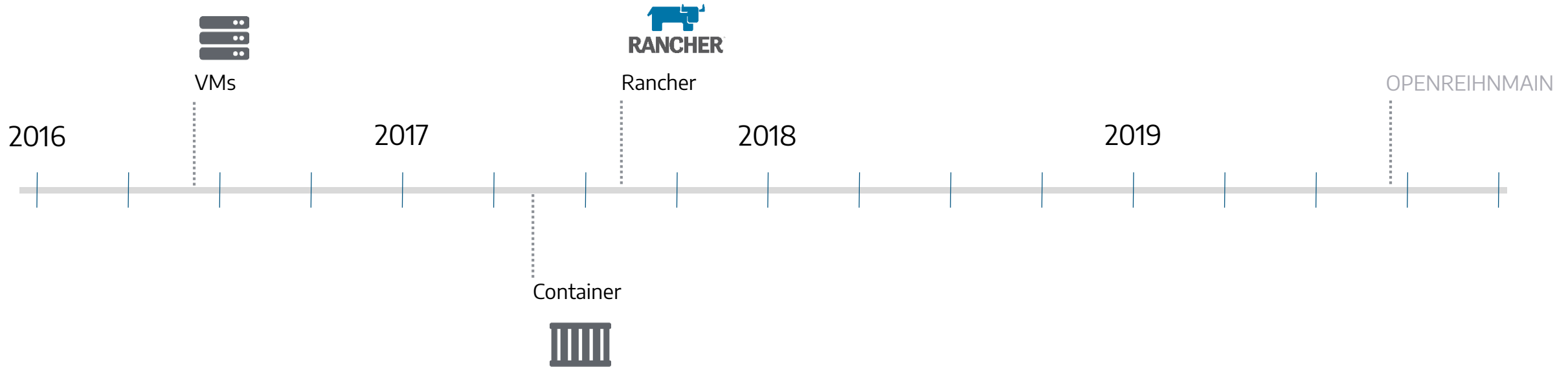


Interaktion für  
Bereitstellung



# Wie kann es verbessert werden?

# Zeitstrahl



# Vorteile von Rancher



Cluster



App Store

# Der Rancher Prozess



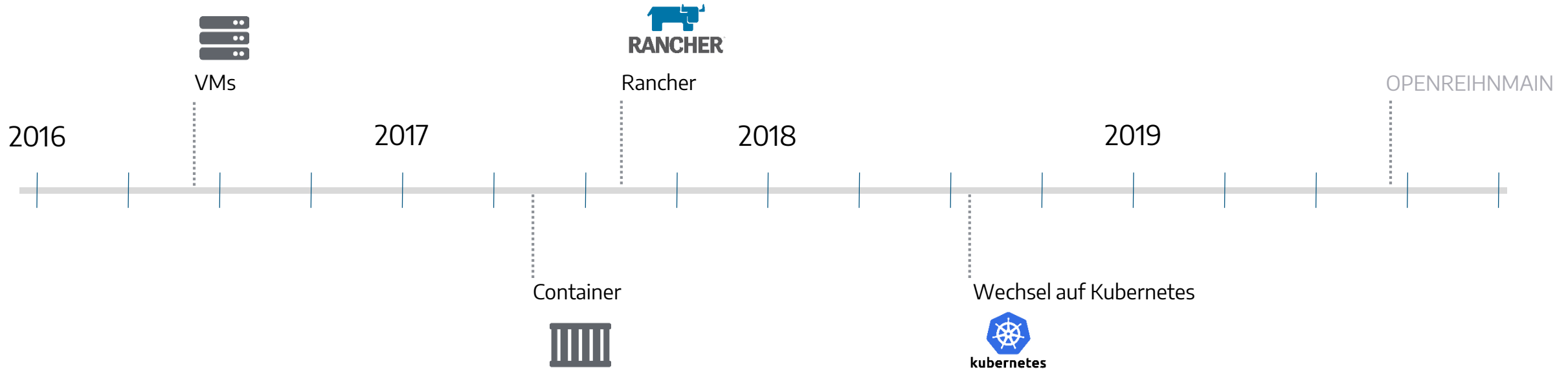
# Kubernetes

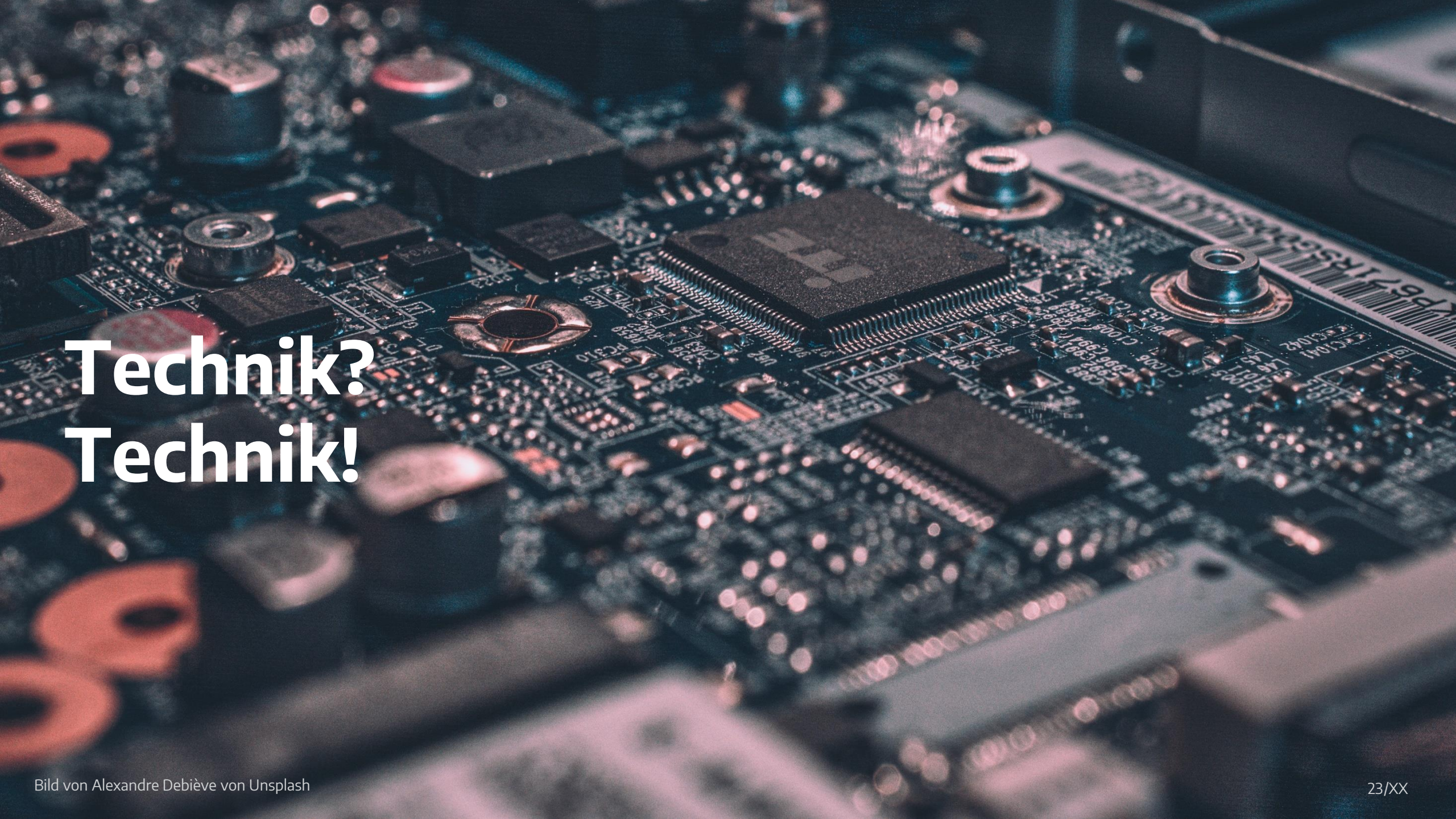


# Zeitstrahl



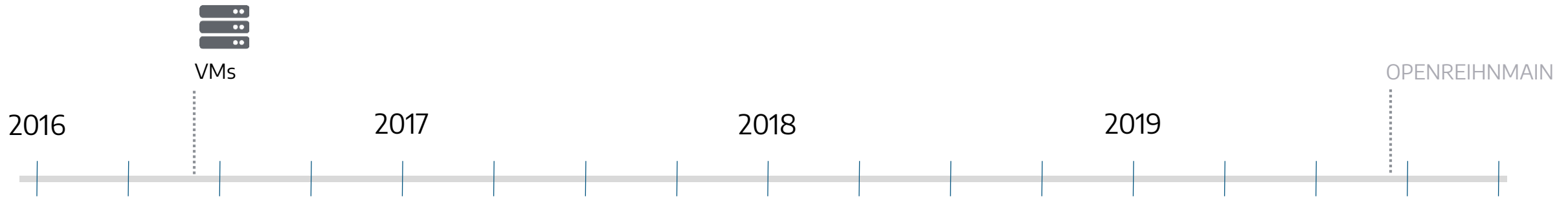
kubernetes





# Technik? Technik!

# Zeitstrahl





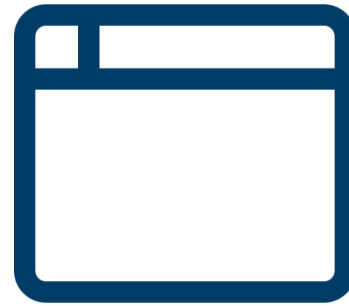


# Automatisierung

# Was muss automatisiert werden?



System &  
Abhängigkeiten



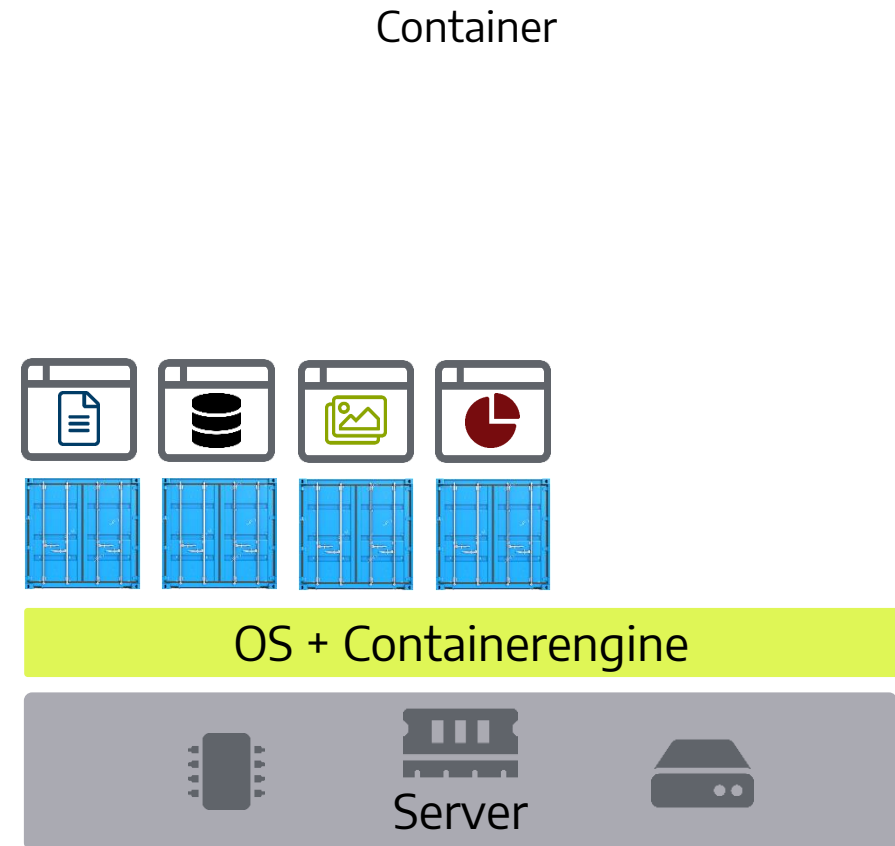
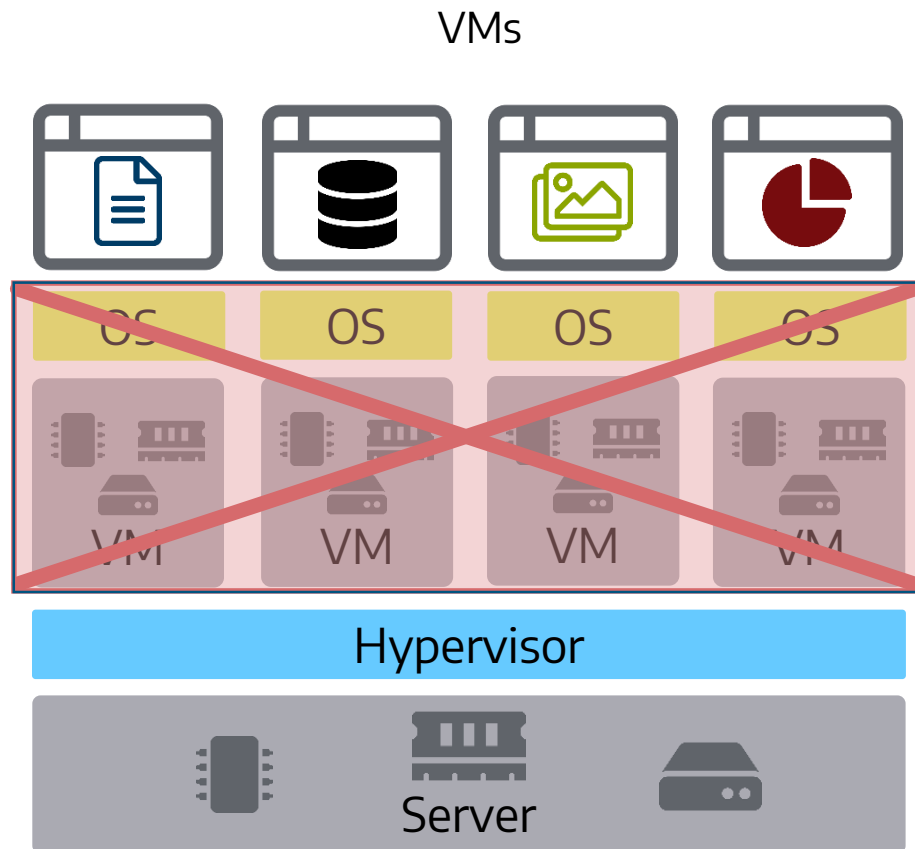
Applikation



Setup



# Das System automatisieren



# Die Applikation automatisieren

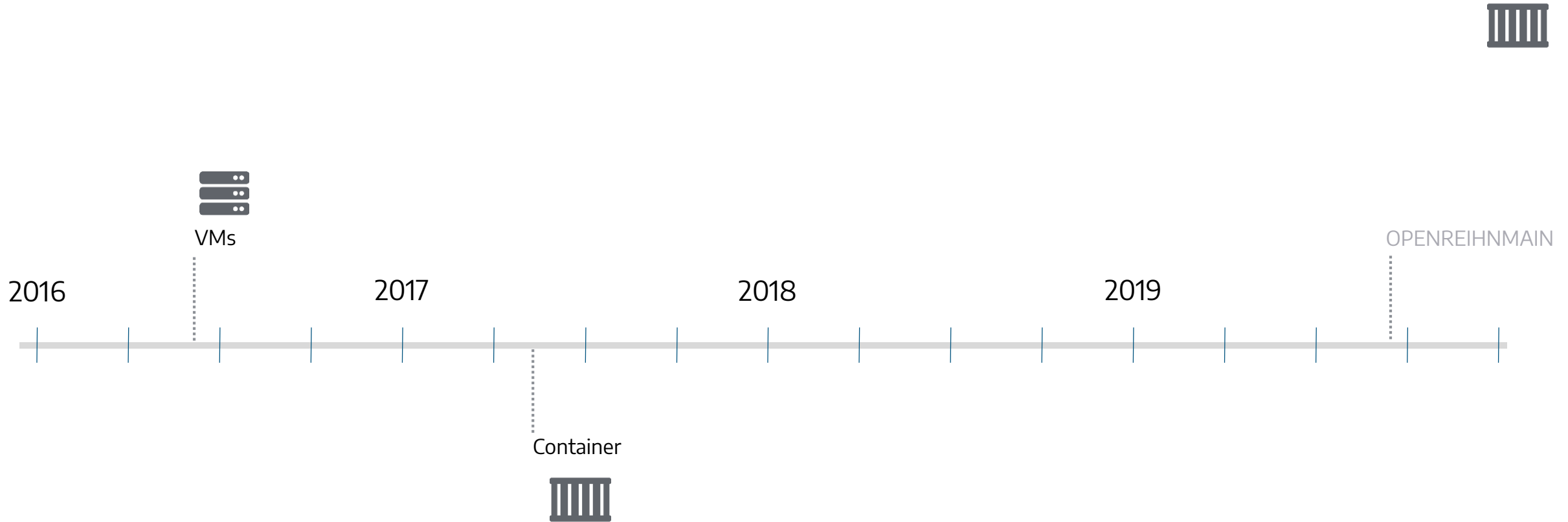


# Den Webwizard automatisieren



The screenshot shows the JIRA Database setup wizard. The title is "Database setup". There are two radio button options for "Database Connection": "Built In (for evaluation or demonstration)" and "My Own Database (recommended for production environments)". The "My Own Database" option is selected. Below this, there is a note: "Built in database can be migrated to a database of your own later. Learn more about connecting JIRA to a database." The "Database Type" is set to "PostgreSQL". The "Hostname" field is empty, with a note: "Hostname or IP address of the database server." The "Port" field contains "5432", with a note: "TCP Port Number for the database server." The "Database" field is empty, with a note: "The name of the database to connect to." The "Username" field is empty, with a note: "The username used to access the database." The "Password" field is empty, with a note: "The password used to access the database." The "Schema" field contains "public", with a note: "Specify the schema name for your database." At the bottom, there are two buttons: "Next" and "Test Connection".

# Zeitstrahl



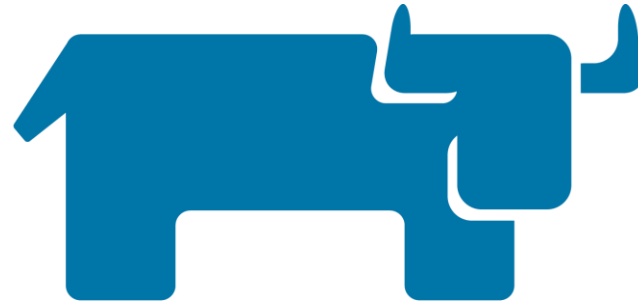


Was brauche ich noch?

# Welche Plattform?







# RANCHER®

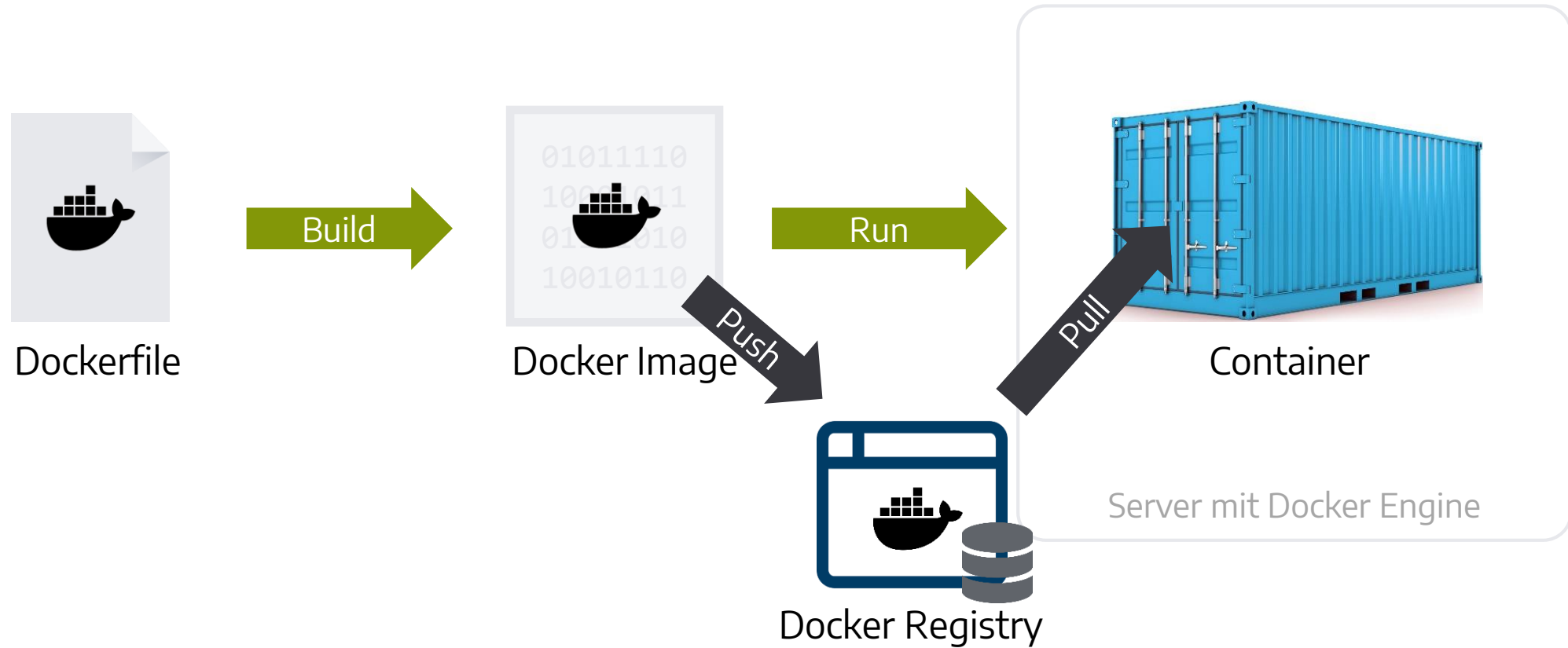
# Self Service Plattform



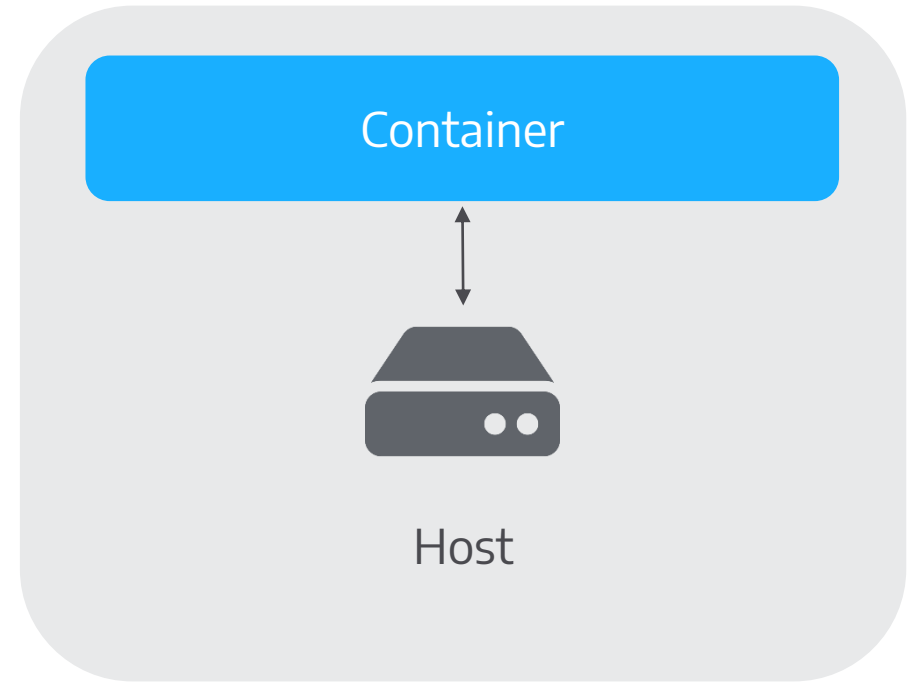
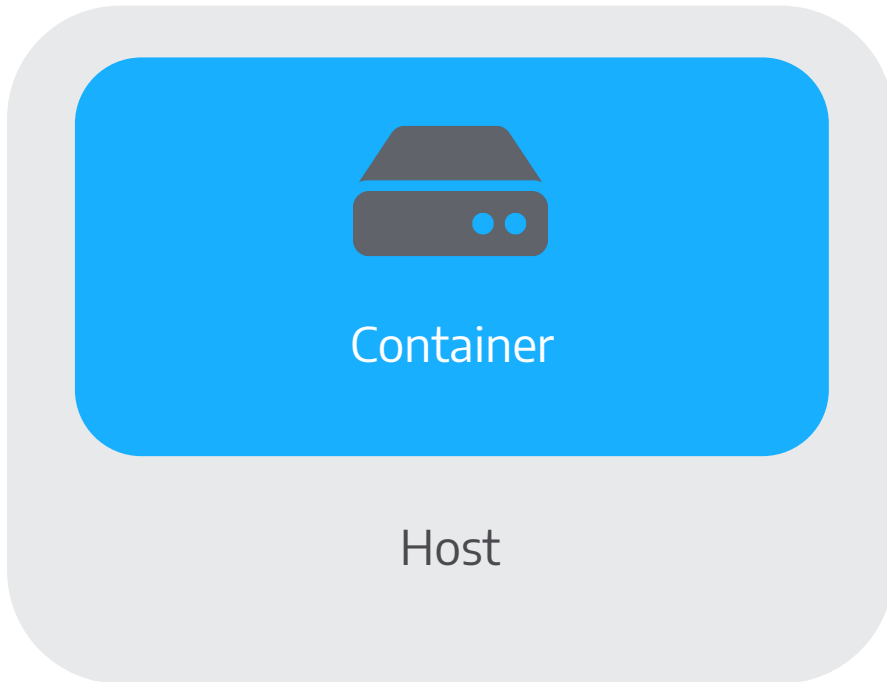
The screenshot displays the Rancher self-service platform interface. At the top, there is a navigation bar with a cluster dropdown menu set to 'Atlassian', and tabs for 'Workloads', 'Apps', 'Resources', 'Namespaces', 'Members', and 'Tools'. Below the navigation bar, the 'Catalog' section is visible, featuring a 'Refresh' button and a 'All Categories' dropdown. The main content area is a grid of application cards, each representing a Helm chart. Each card includes an icon, the chart name, its source ('from Helm'), a brief description, and a 'View Details' button.

Chart Name	Source	Description
acs-engine-autoscaler	from Helm	DEPRECATED Scales worker nodes within agent pools
aerospike	from Helm	A Helm chart for Aerospike in Kubernetes
airflow	from Helm	Airflow is a platform to programmatically author, schedule and monitor workflows
anchore-engine	from Helm	Anchore container analysis and policy evaluation engine service
apm-server	from Helm	The server receives data from the Elastic APM agents and stores the data into a datastore like Elasticsearch
ark	from Helm	DEPRECATED A Helm chart for ark

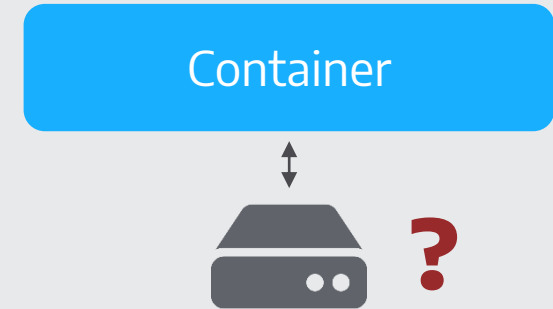
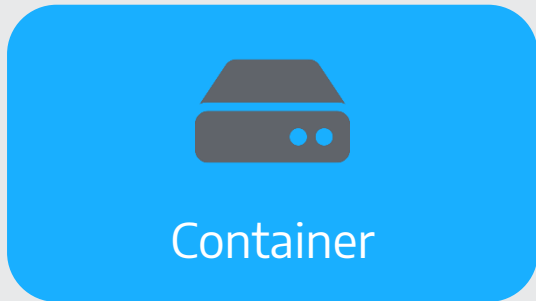
# Container Registry



# Speicher



Container Cluster

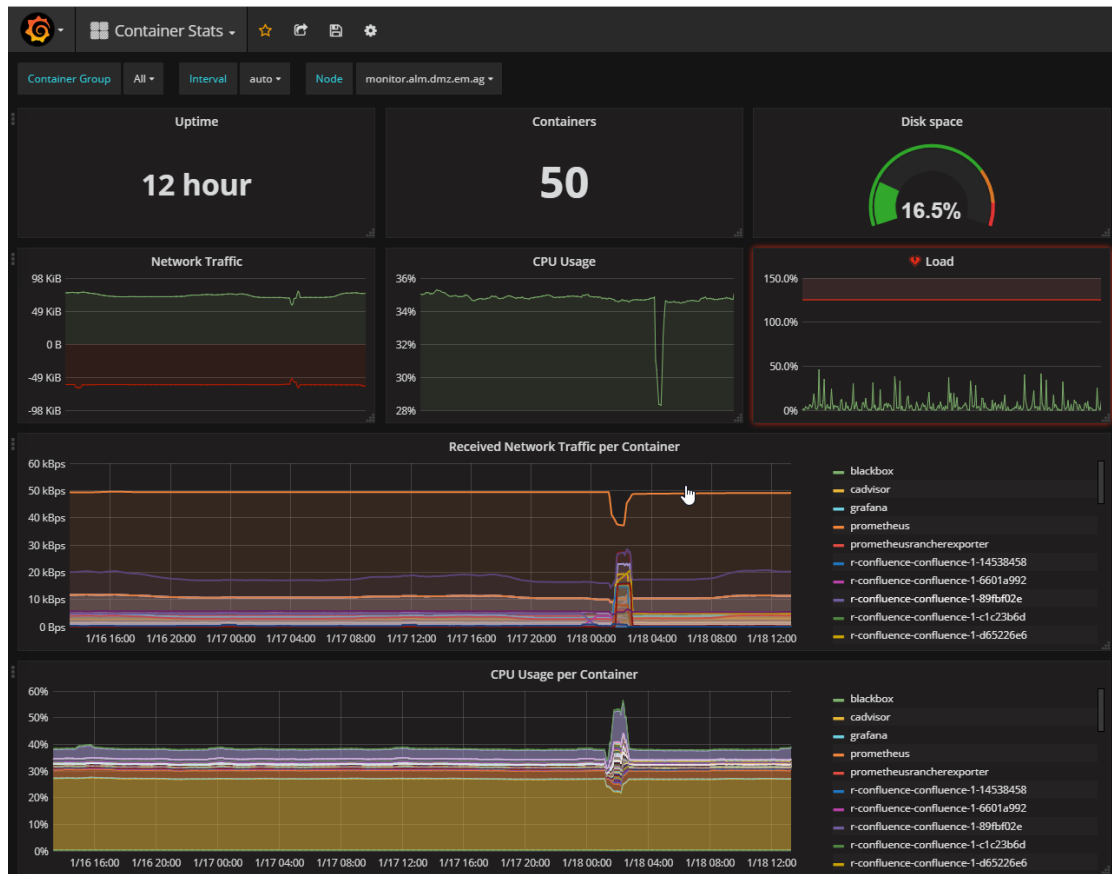


Host 1

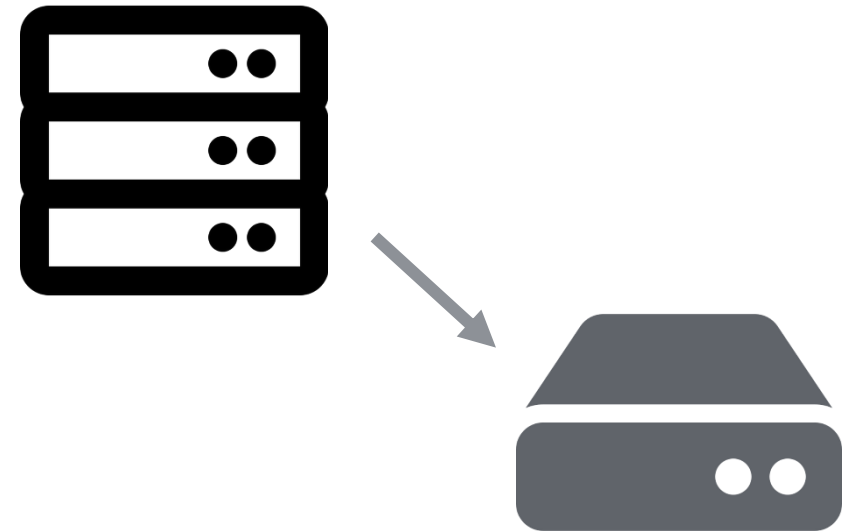
Host 2

Host 3

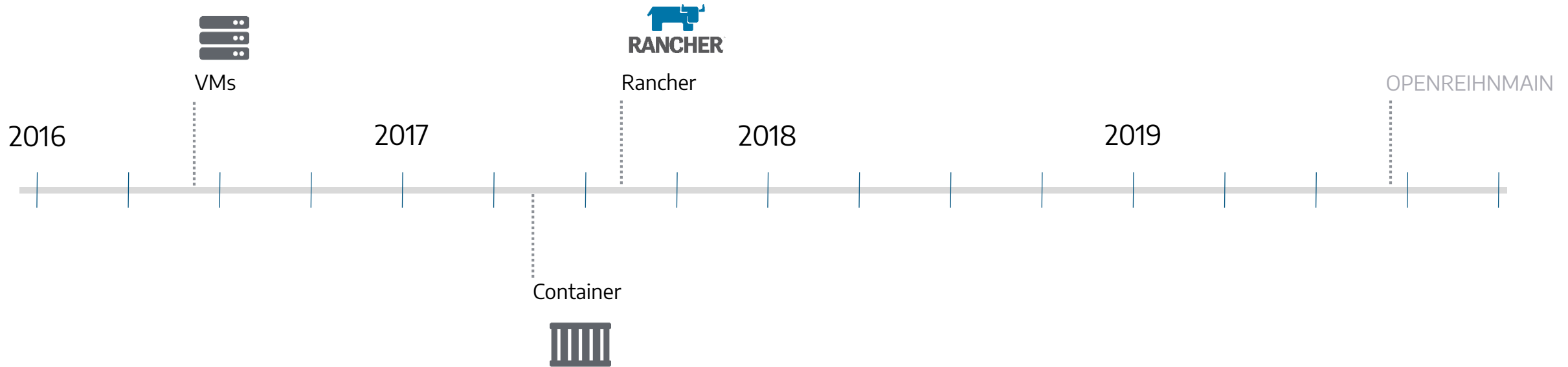
## Monitoring



## Backups



# Zeitstrahl

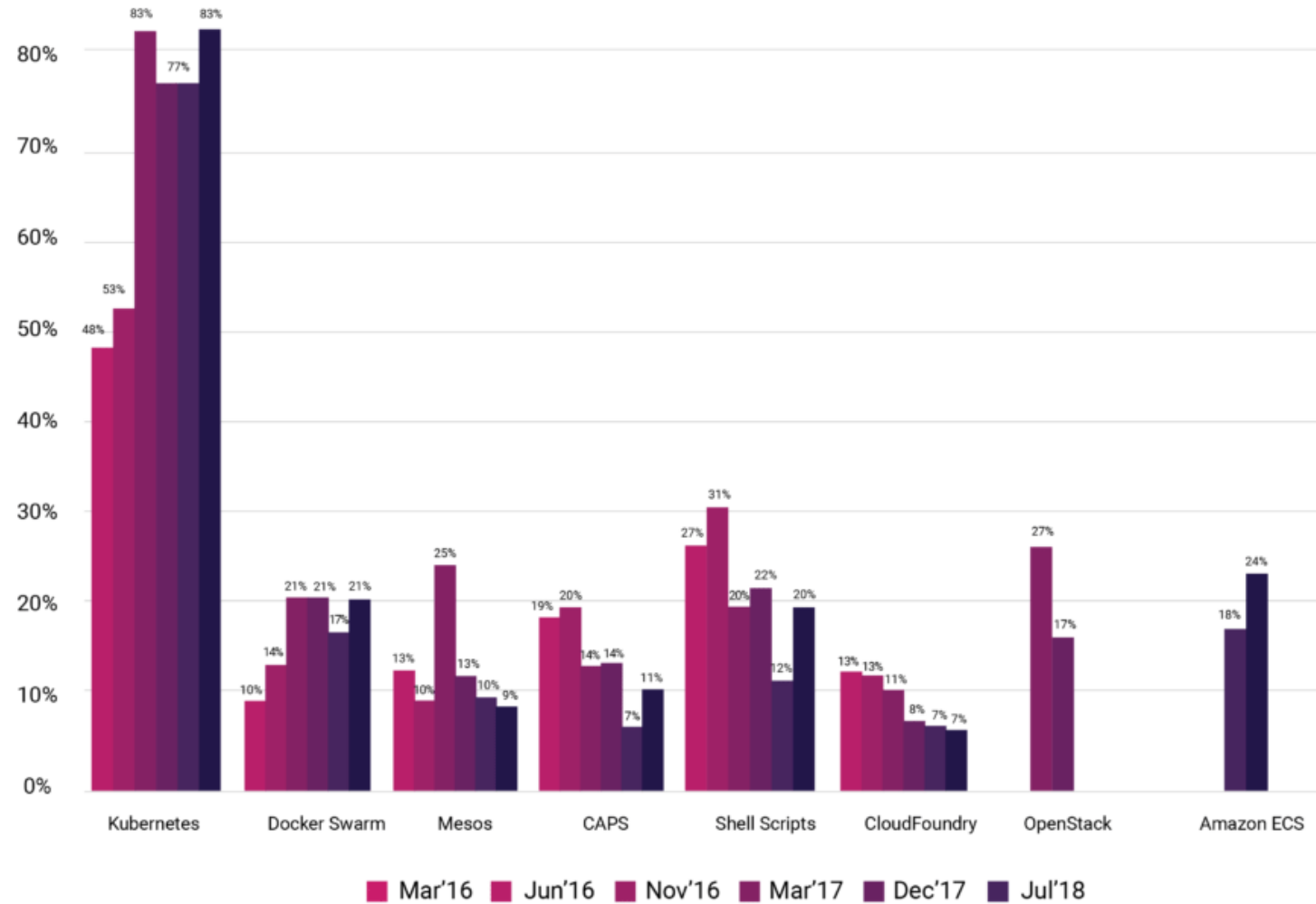


A man with dark, curly hair is sitting on the hood of a yellow taxi. He is wearing a dark, quilted jacket over a red shirt. He has a thoughtful expression, with his hand resting on his chin. The background shows a city street with other cars and buildings, slightly out of focus.

Und dann?



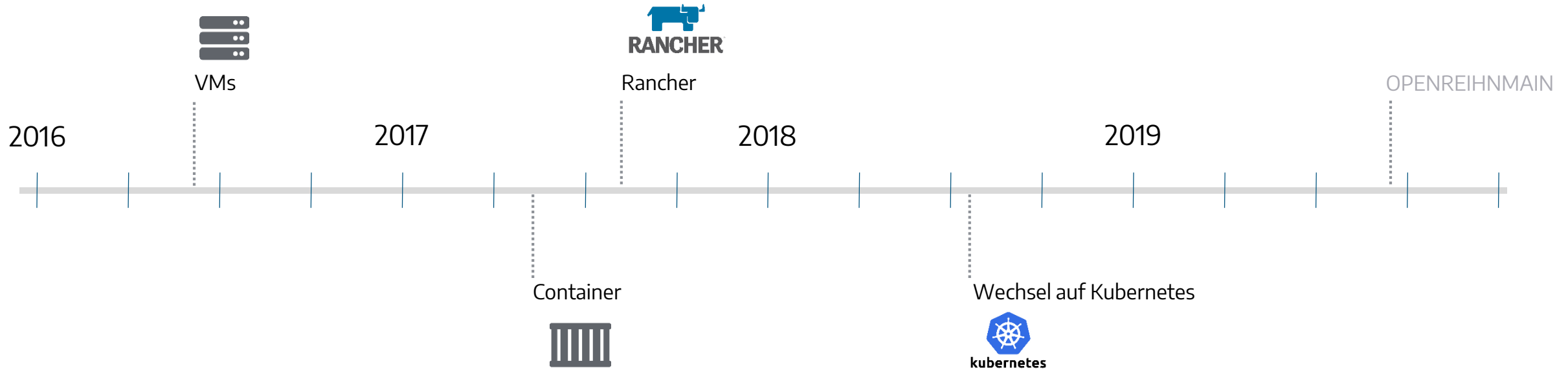
# Rancher wechselt zu Kubernetes



# Zeitstrahl



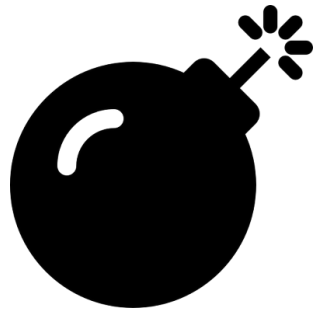
kubernetes



# Was kann schon schief gehen?



# Probleme

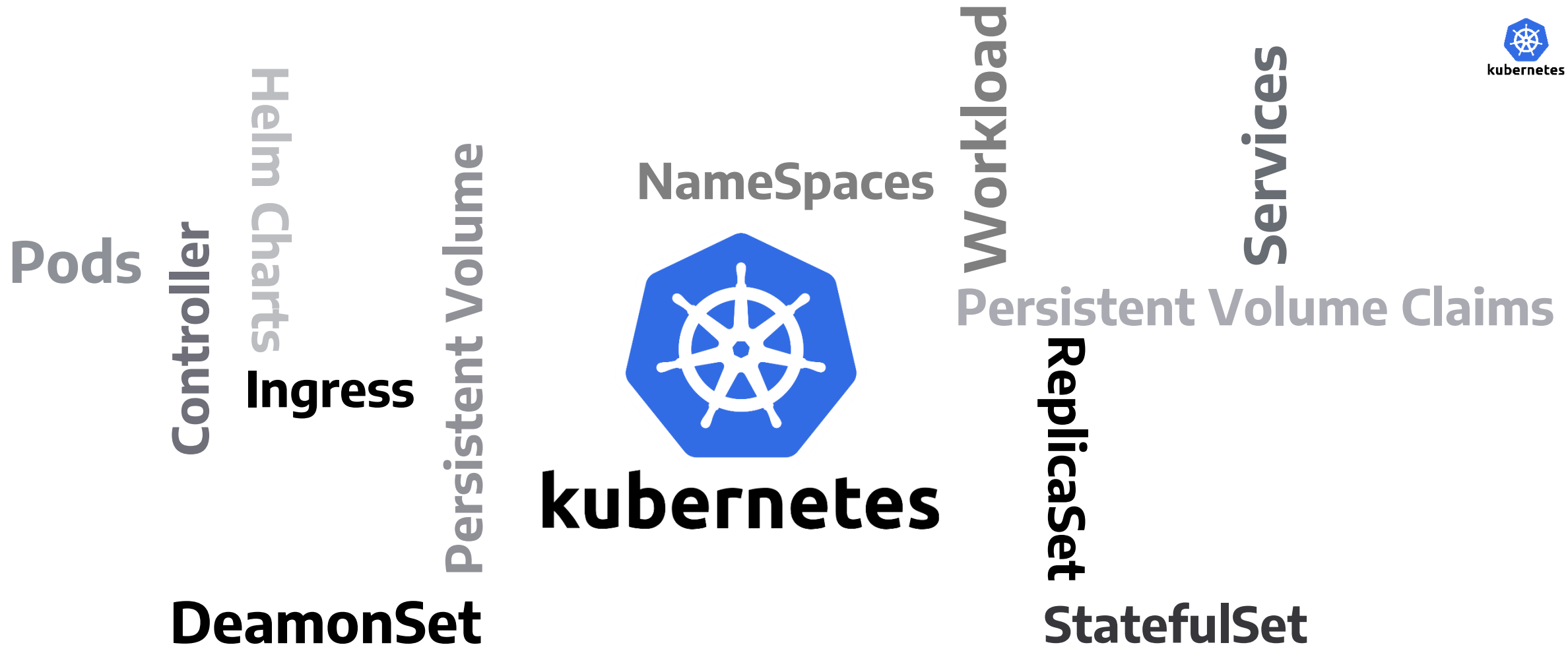


Downtimes



Speicher

# Komplexität



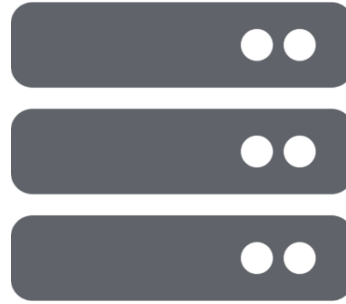
# Was ist die Lösung?



# Lösung?



Besseres Verständnis



Änderungen an der  
Architektur



Updates

# Kubernetes Benefits



Skalierung



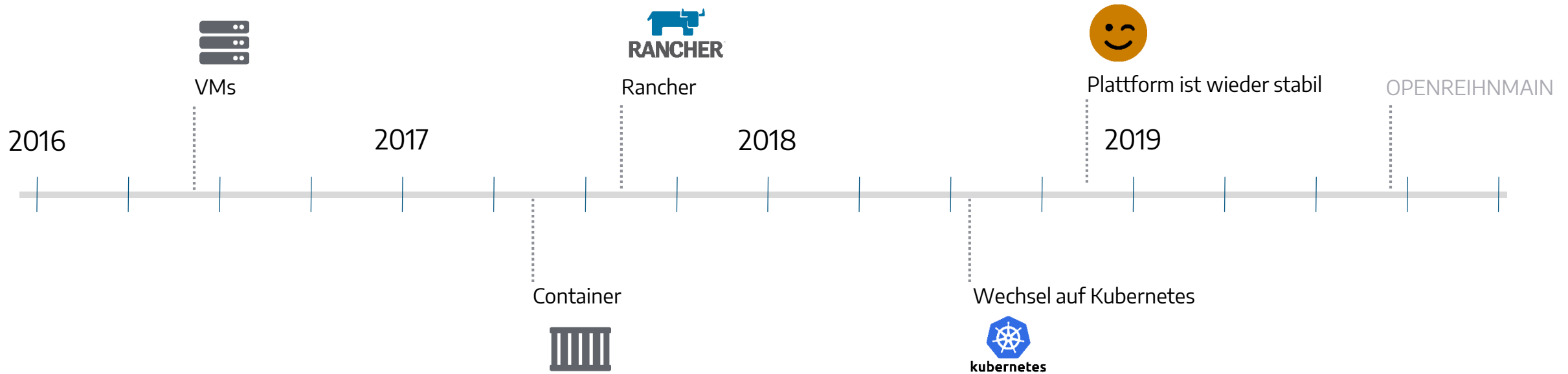
Apps



Betrieb



# Zeitstrahl



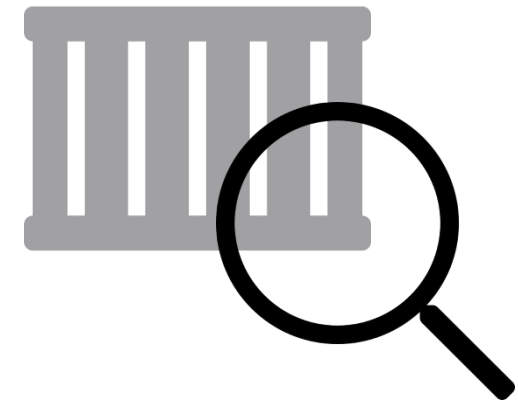
**Darf es noch ein  
bisschen mehr sein?**



\*\*\*\*\*



Vault





**MORE  
AWESOME  
NOW**

**Und jetzt?**

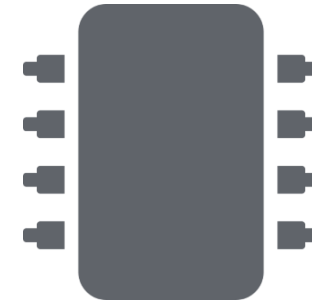
# Zahlen



15 User



100-200 Pods

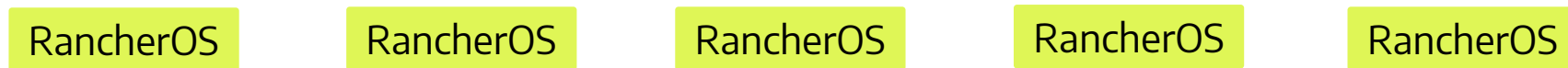
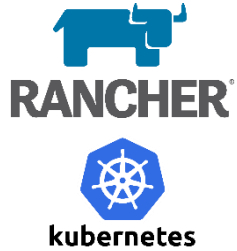


32 Cores



120 GB RAM

# Architektur



Controller & etcd

Controller & etcd

Worker

Worker

Worker

NFS



# Was nehme ich mit?

Bild von Holly Mandarich auf Unsplash



**Das beste Kubernetes wird  
von jemand anderem  
betrieben.**





# Wir liefern die digitale Zukunft für das Engineering

**Vielen Dank für Ihr Interesse!**

Bei Fragen sprechen Sie mich gerne an:

**Tim Stoffel**, Fachinformatiker

E-Mail [tim.stoffel@em.ag](mailto:tim.stoffel@em.ag)

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Rheinstr. 97, 64295 **Darmstadt**

Herrenberger Str. 14, 71032 **Böblingen**