



Poznan Supercomputing  
and Networking Center

# Platform as a Service (PaaS) at PSNC

Michał Zimniewicz

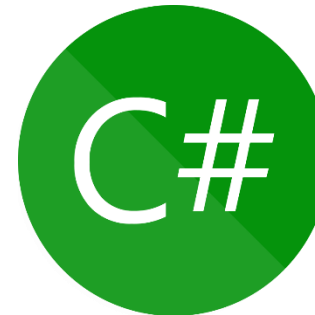
28 November 2022

# PaaS definition

On-site	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

# Runtime environment?

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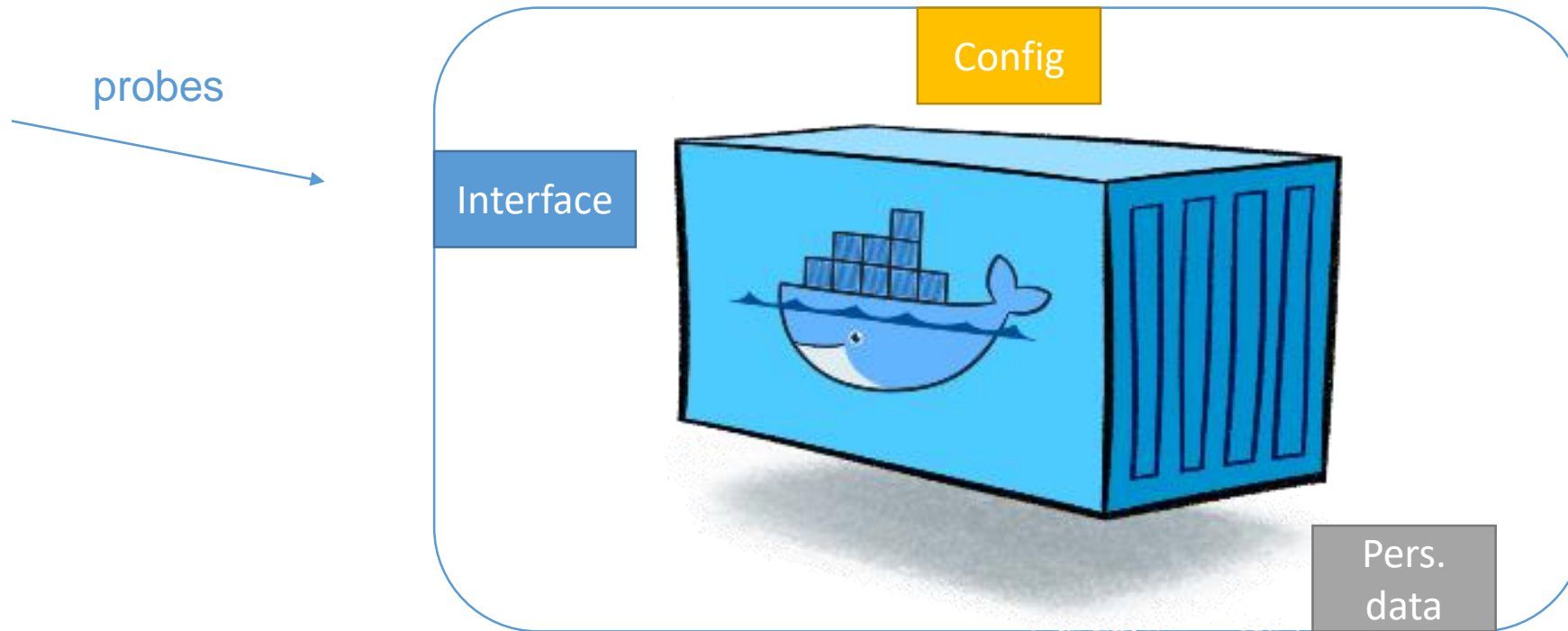


# Containers





# Containers



# Functionality of PSNC PaaS

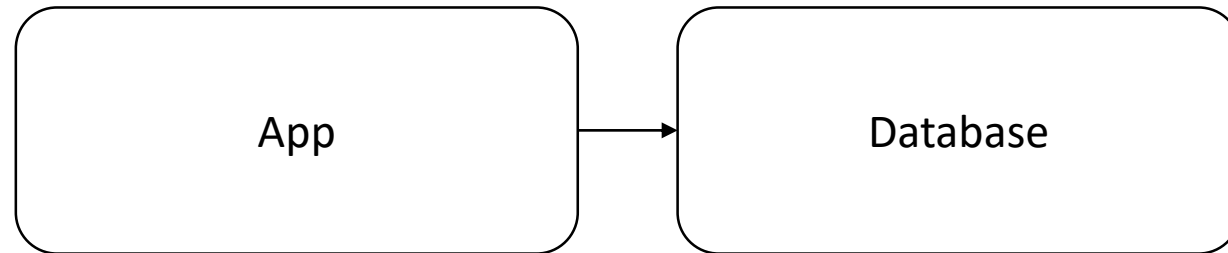


# Demo

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Web browser

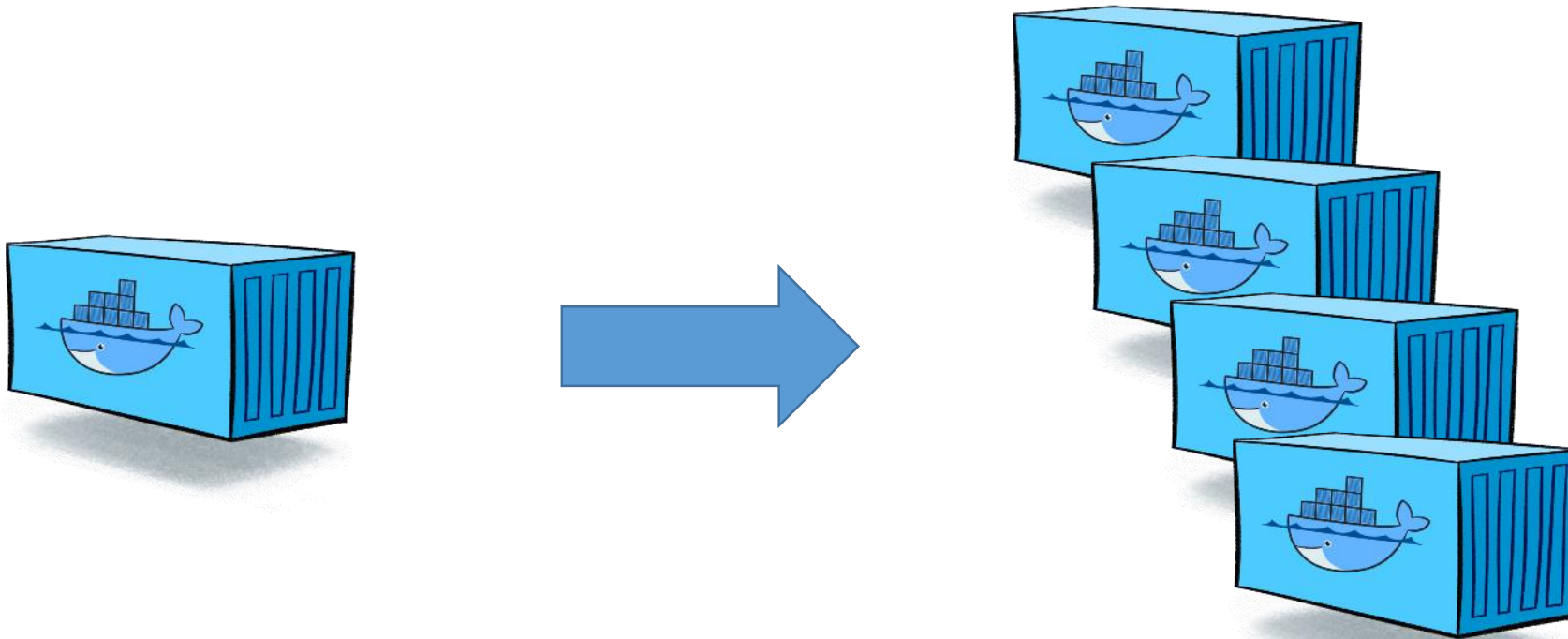


# Orchestration





# Scaling



# Storage



❖ Cold storage  ceph

❖ Hot storage



❖ Read-Write-Many  OpenZFS

❖ ...

# Container image registries

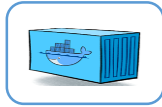


registry.apps.man.poznan.pl



cache

hub.docker.com



registry.apps.paas.psnk.pl

registry.apps.paas-dev.psnk.pl

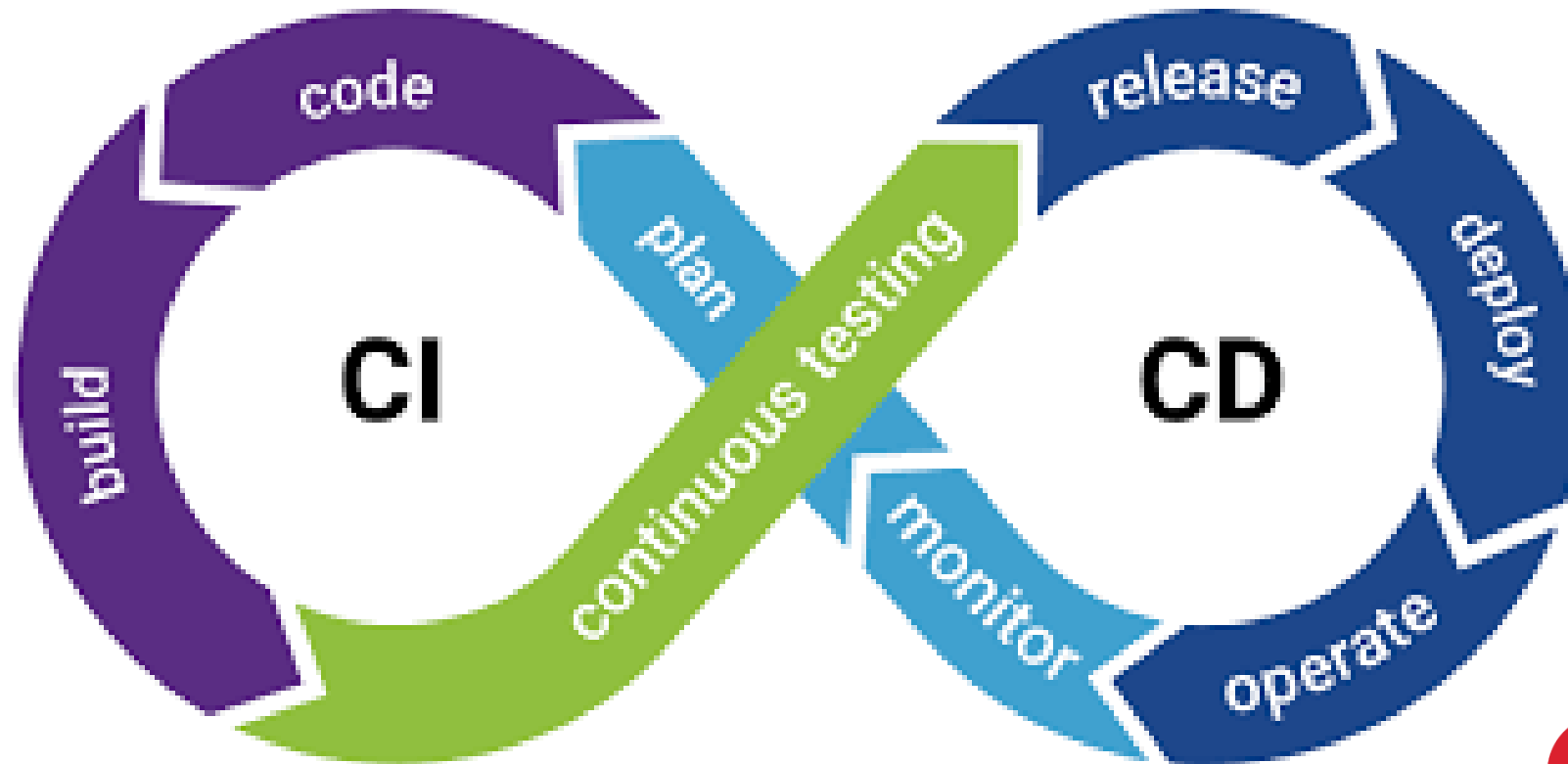


OPENSIFT

...



# CI/CD



# HTTPS certificates

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openshift-acme

<https://github.com/tnozicka/openshift-acme>



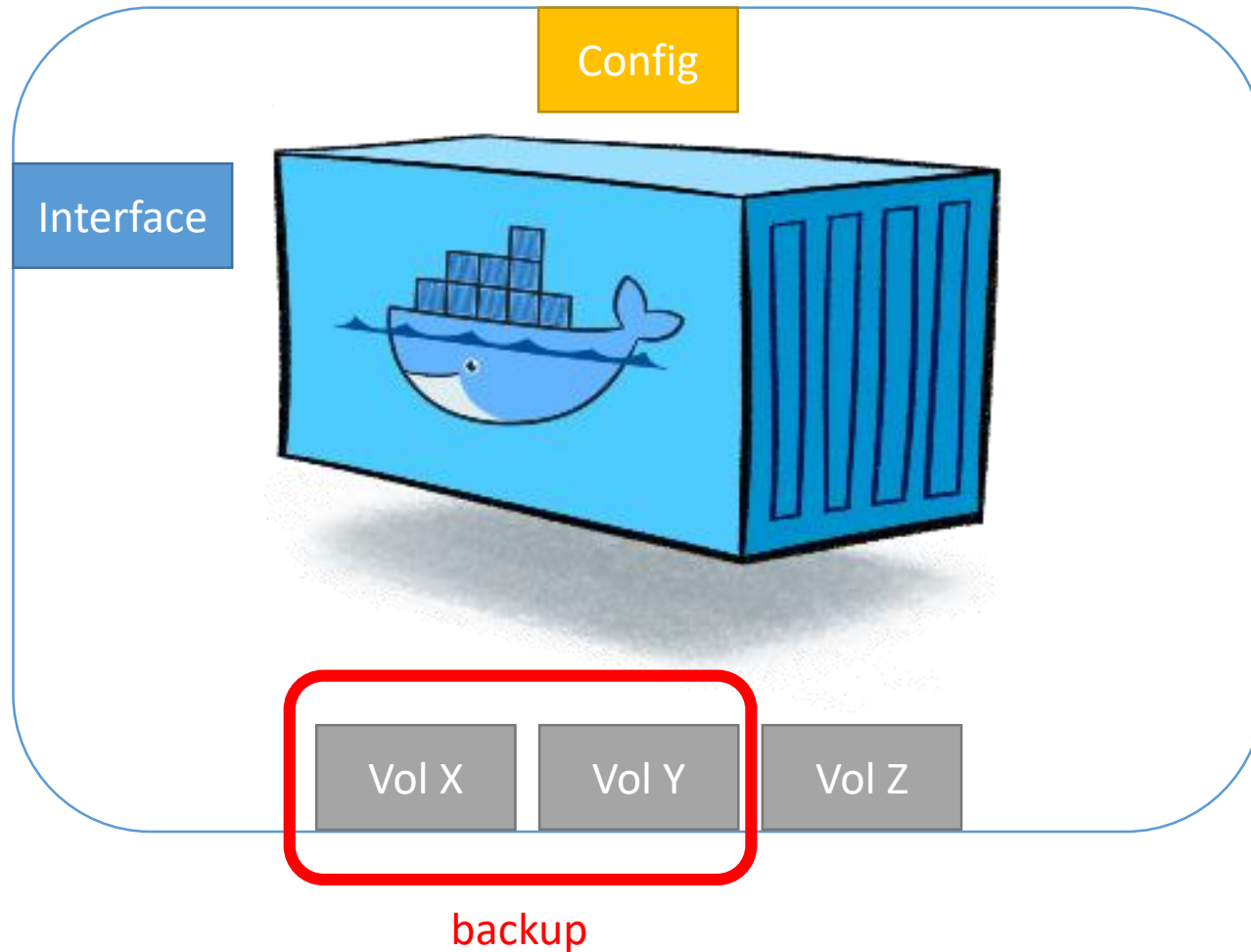


# Health checks & notifications



**Nagios<sup>®</sup>**

# Backup



restic

# Access control on URL/IP

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- <https://example.com/> – from anywhere
- <https://dev.example.com/> – from internal
- <https://example.com/admin/> – from internal

# Managed services

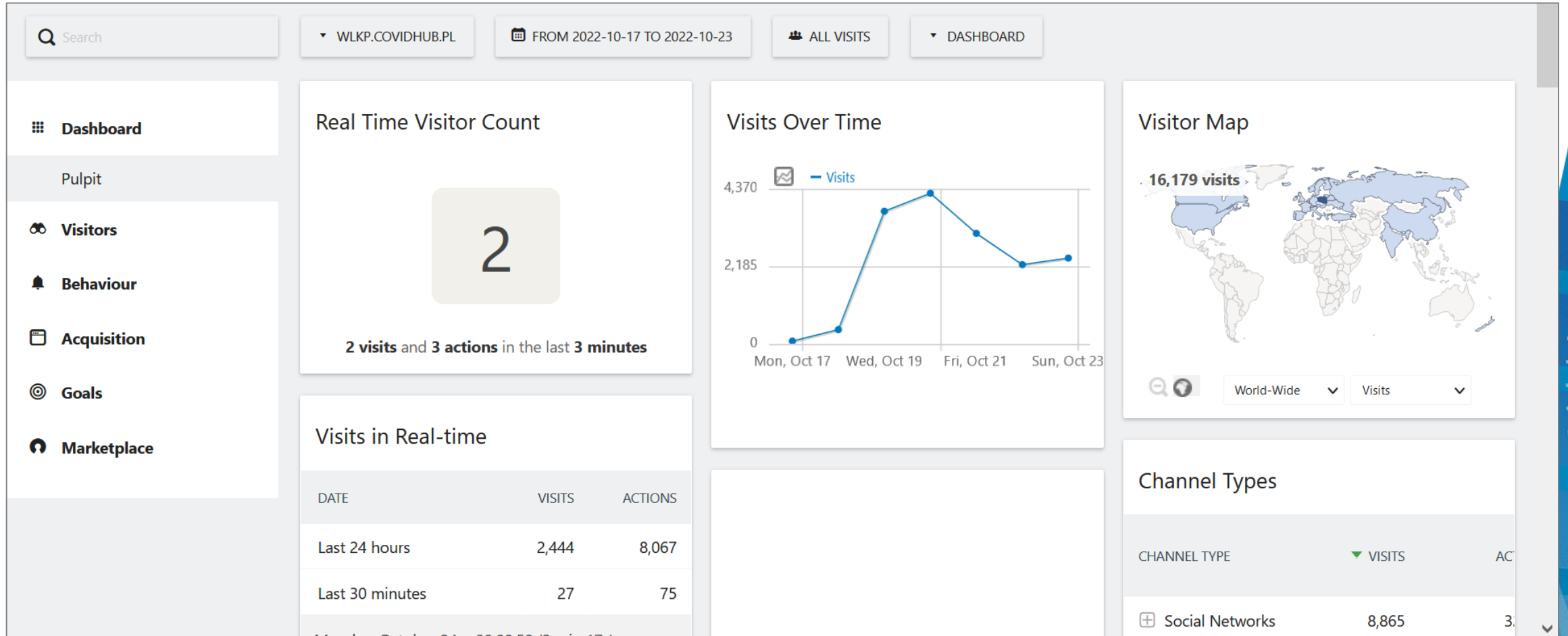
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<https://github.com/bitnami/charts/tree/main/bitnami>

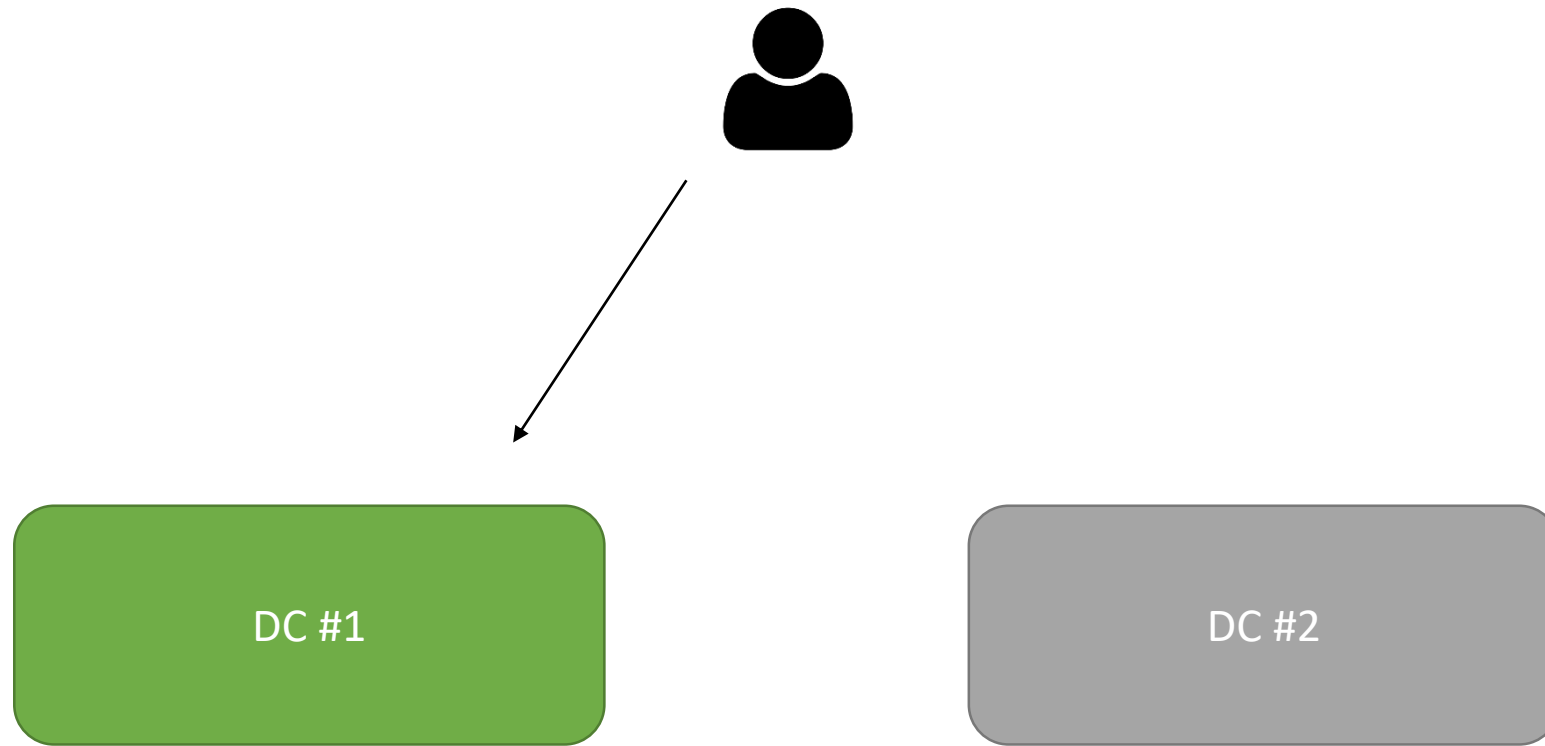
# Web analytics



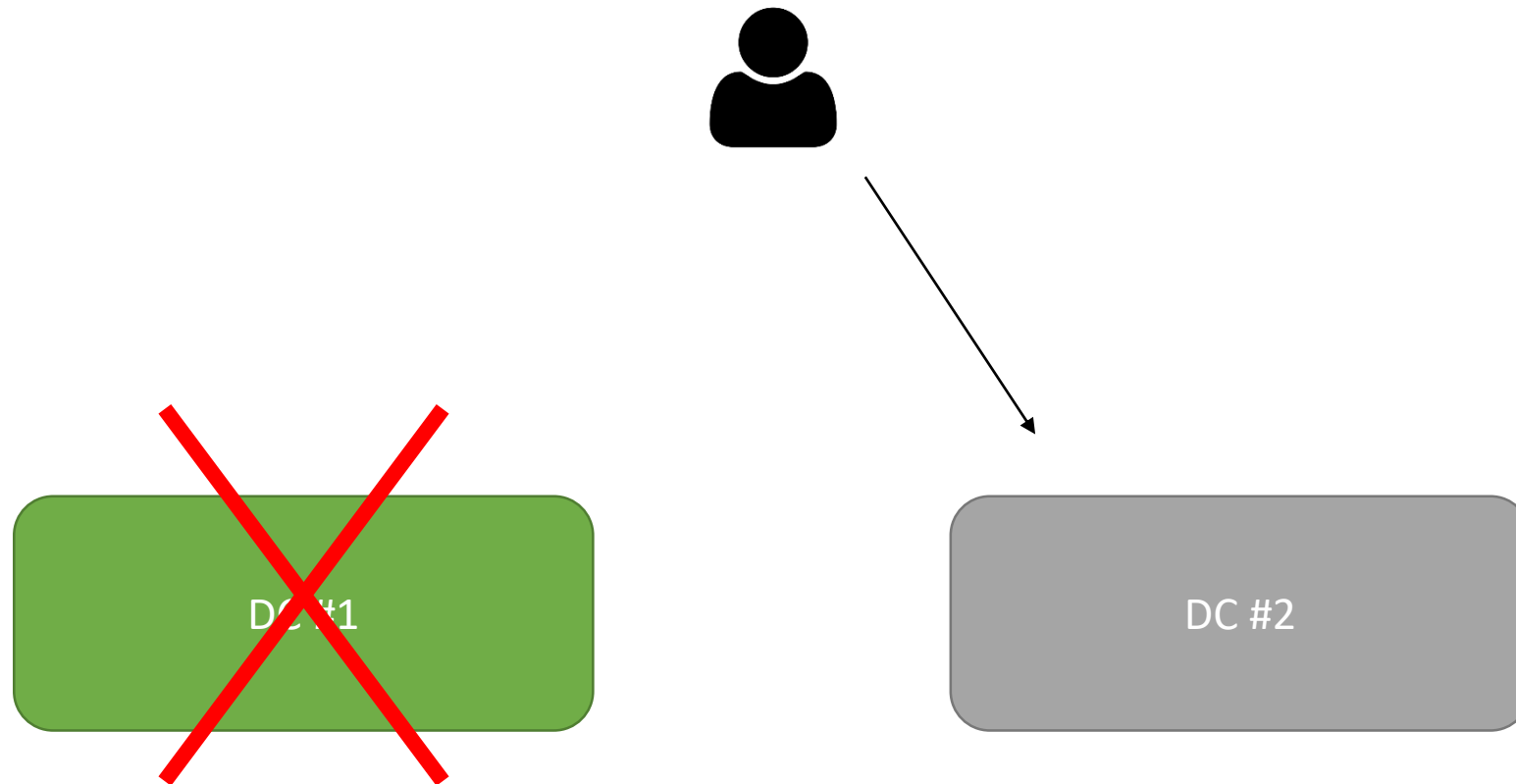


# Data center failover

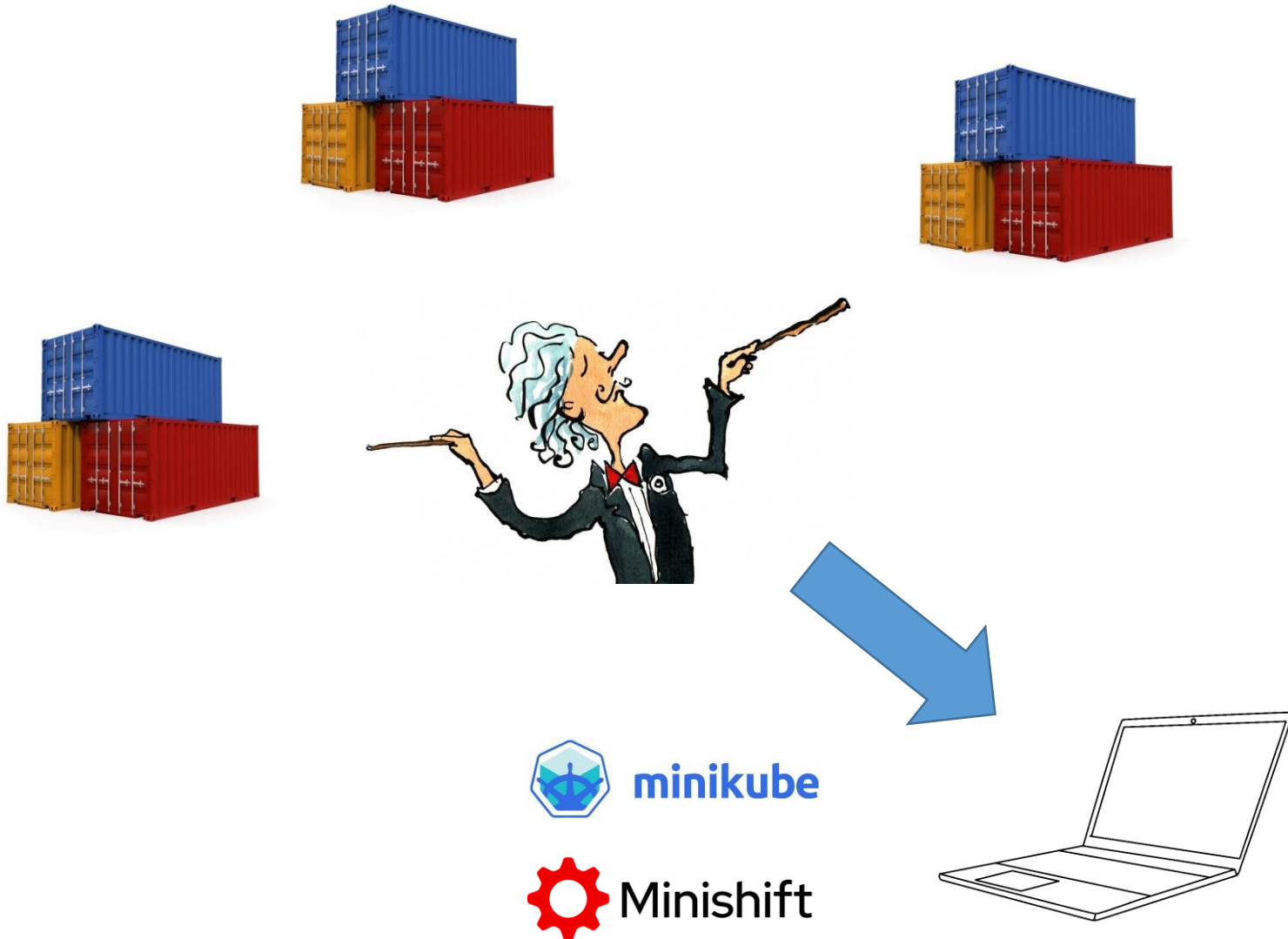
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# Data center failover



# Prod & local environment parity



# Log aggregation

The screenshot shows the Kibana interface with a search bar at the top left containing the text "source: \*.g. status:200 AND extension:html". The main area is divided into three sections: a left sidebar with navigation options, a top bar with document actions, and a central content area. The central area features a bar chart showing event counts over time, with a time range of "October 24th 2022, 08:47:20:995 - October 24th 2022, 09:02:20:995". Below the chart is a table of log entries with columns for "Time" and "source". The table lists various Kubernetes-related log sources such as "kubernetes.container\_id", "kubernetes.container\_image", "kubernetes.labels", "kubernetes.namespace\_id", and "kubernetes.pod\_id".



# CPU/RAM/network monitoring

Details Environment **Metrics** Logs Terminal Events

Container: wordpress Time Range: Last week



Prometheus

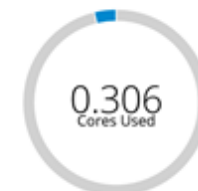
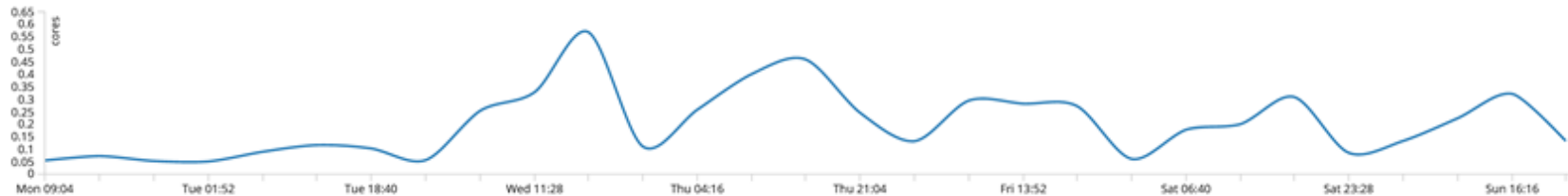
## Memory

5538 Available of 6144 MiB



## CPU

7.695 Available of 8 cores



## Network



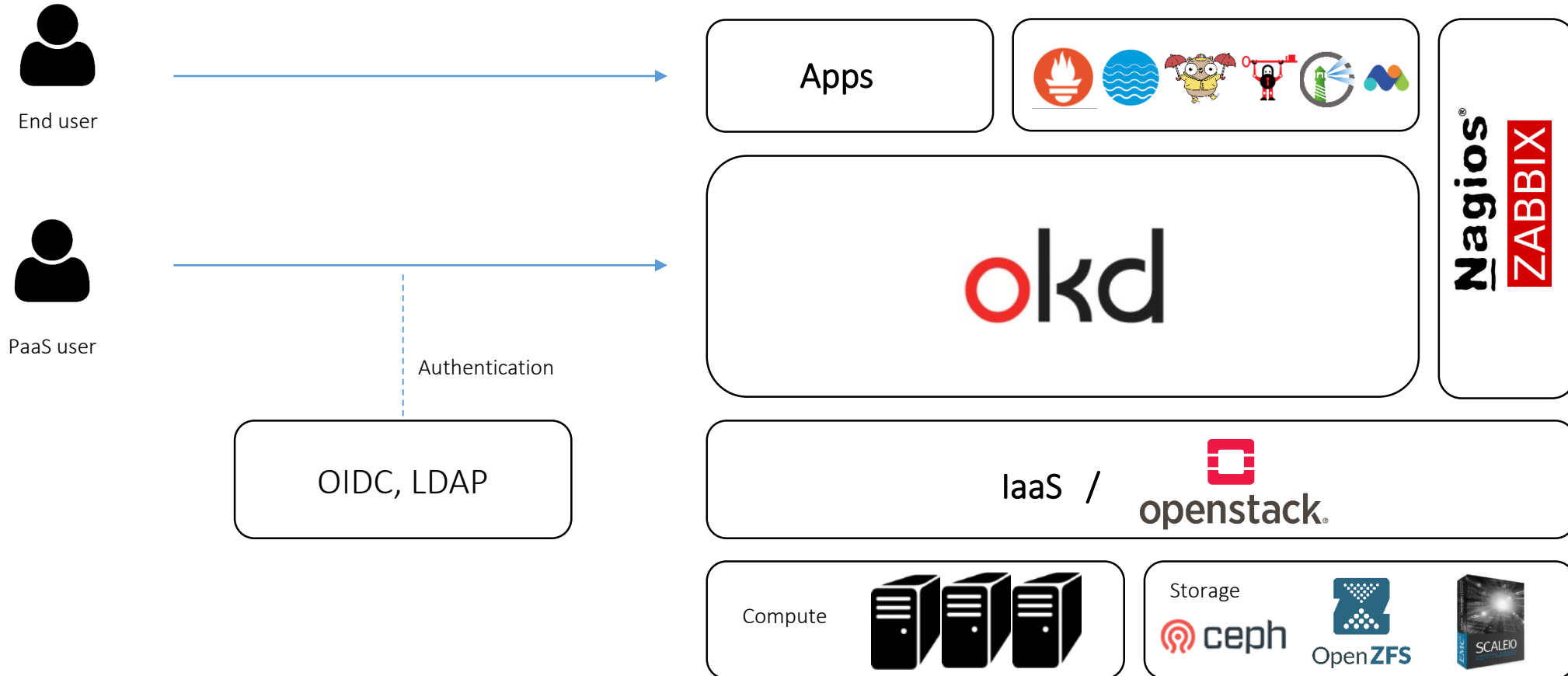


# Functionality of PSNC PaaS

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- Container orchestration
- Dynamic storage provisioning
- Container image registries
- CI/CD
- HTTPS certificates
- Health checks & notifications
- Backup
- Access control on URL/IP
- Managed services
- Web analytics
- Data center failover
- Log aggregation
- Monitoring

# PaaS architecture



# Statistics

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- 2 data centers
- 2 + 3 public OKD clusters
- 518 internet domains
- 4200 containers
- 120 users (administrators, devops, developers)

Updates from September 2022

# Next steps

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- Improving and adding managed services
- Two-factor authentication
- Web Application Firewall
- Accounting



**Poznan Supercomputing  
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**Thank you!**

Michał Zimniewicz

[mzimniewicz@man.poznan.pl](mailto:mzimniewicz@man.poznan.pl)