MHI VESTAS OFFSHORE WIND

MHI Vestas – Cloud Native Journey

PRESENTER NAME

Agenda

- **Who are we?**
- **Who is MHI Vestas? Or the long version**
  - Mitsubishi Heavy Industries Vestas Offshore Wind Power
- **Cloud Native?**
  - Where do we come from
  - Where are we going

Who am i ?

Name: Thor Anker Kvisgård Lange
Occupation: IT Architect Cloud infrastructure

Who am i ?

Name: Anders Keis Hansen
Occupation: IT Architect Cloud infrastructure

Established in 2014 on decades of experience

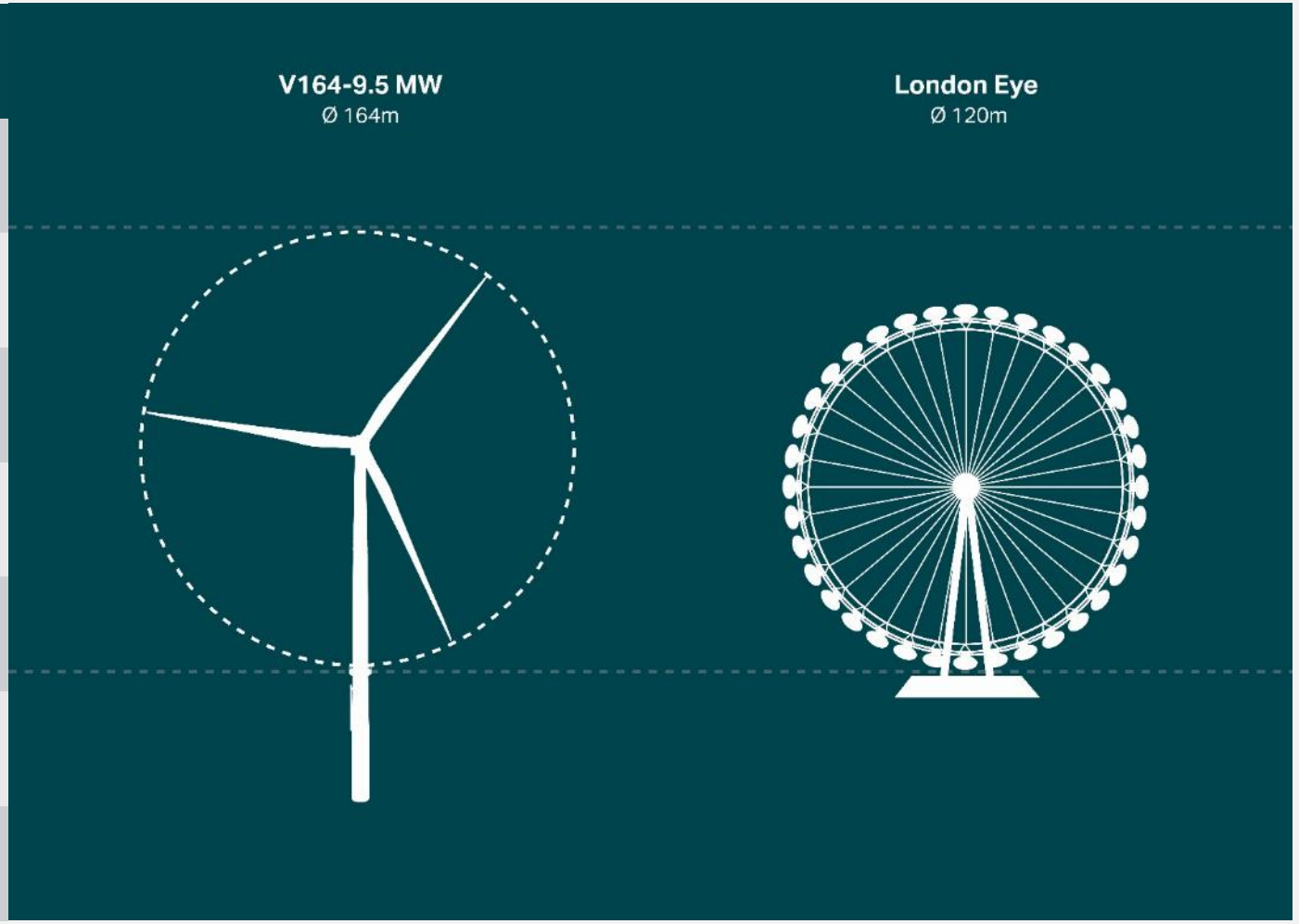
Delivering affordable offshore wind power

- A joint venture between two industry leaders: Vestas Wind Systems A/S (50%) and Mitsubishi Heavy Industries Ltd (50%)
- Founded 1 April 2014, now employing ~3,600 employees
- Sole focus on offshore wind
- Our business is to design, manufacture, install and service wind turbines
- Right now MVOW operates only in Europe, but is in process with opening up in the US and Taiwan

Dimensions of the V164-9.5 MW

The biggest commercially available offshore turbine – larger swept area than the London Eye

Dimensions	
Swept area	21,124 m2
Power	9.5 MW
Blade length	80 m
Approx. hub height	105 m
Rotor diameter	164 m
Approx. tip height	187 m
Weight (excl. tower)	~ 500 t



Cloud native
Where do we come from?

MHI VESTAS OFFSHORE WIND™

We focus on the core. MVOW First

MHI VESTAS OFFSHORE WIND™

Cloud Native

Where do we come from

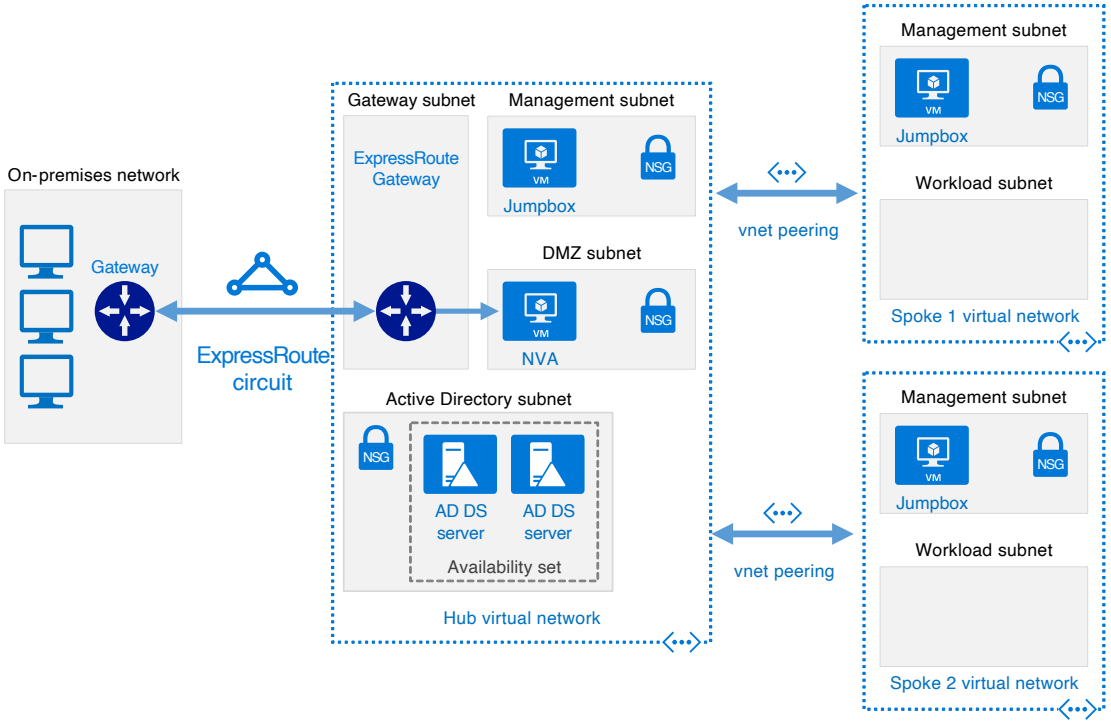
- **MVOW Cloud infrastructure**

  - 250% Microsoft house
  - Microsoft Azure, since 2014
  - Migrated from ASM to ARM in 2017
  - 80% off all workloads run in Azure
  - Started as a big co-op with Microsoft…
  - One big bucket…

- Critical on prem foot print : ERP ,factory systems, Scada Systems

Cloud Native

Where are we going?



The Future

- Cloud agnostic (Hence Cloud Native)
- Every application is an island
- Minimal use of PaaS with to much binding
- Common sense trumps religion ☺

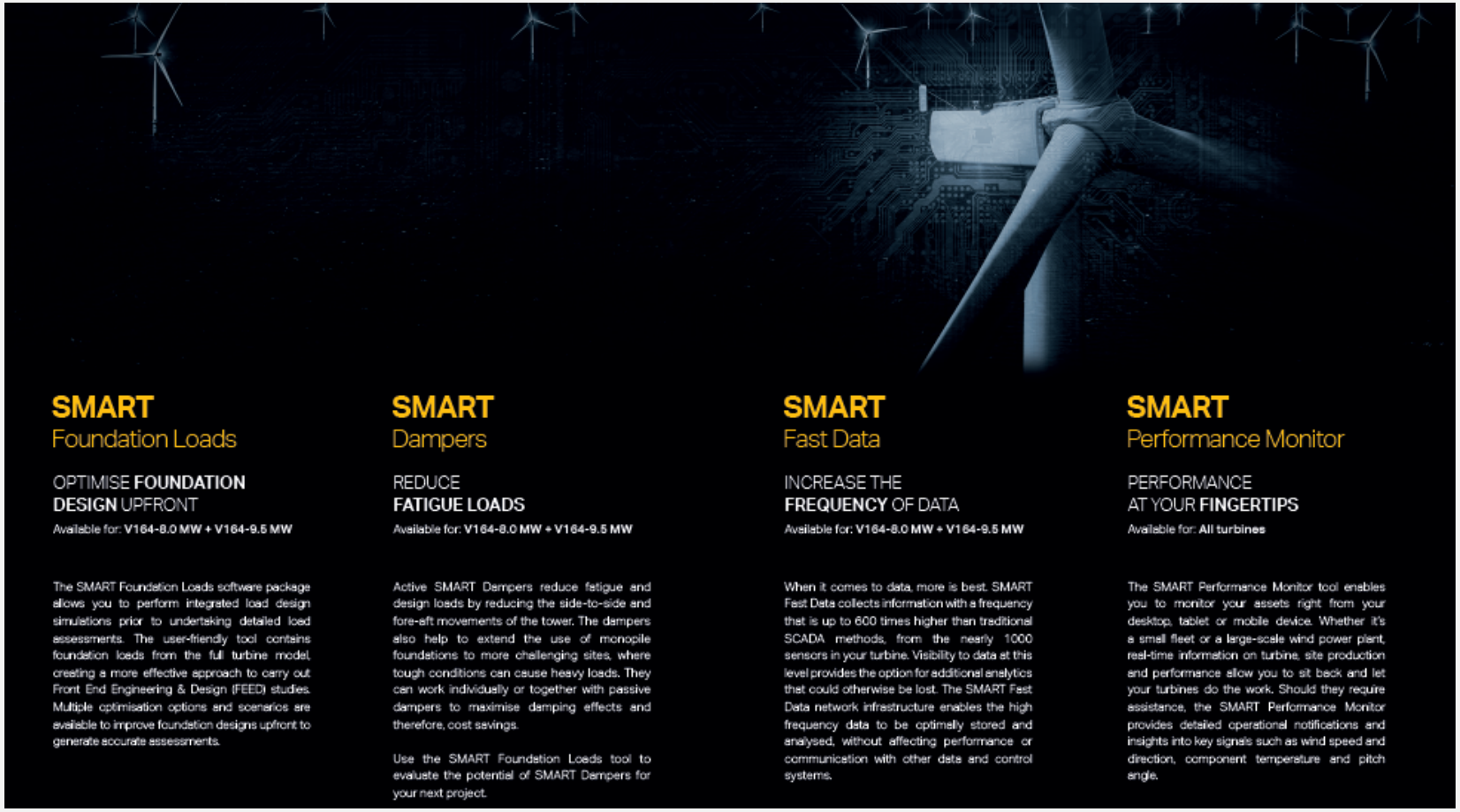
Tool Boox

- Using Azure Platform (Network, security, auth. Etc)
- Using Azure Websites(For now)
- Using Azure SQL
- Using Azure Kubernetes service
  - Fun Fact https://github.com/Azure/aks-engine
- Using Prometheus & Grafana
- Using Victoria Metrics

How are we using Cloud Native today?

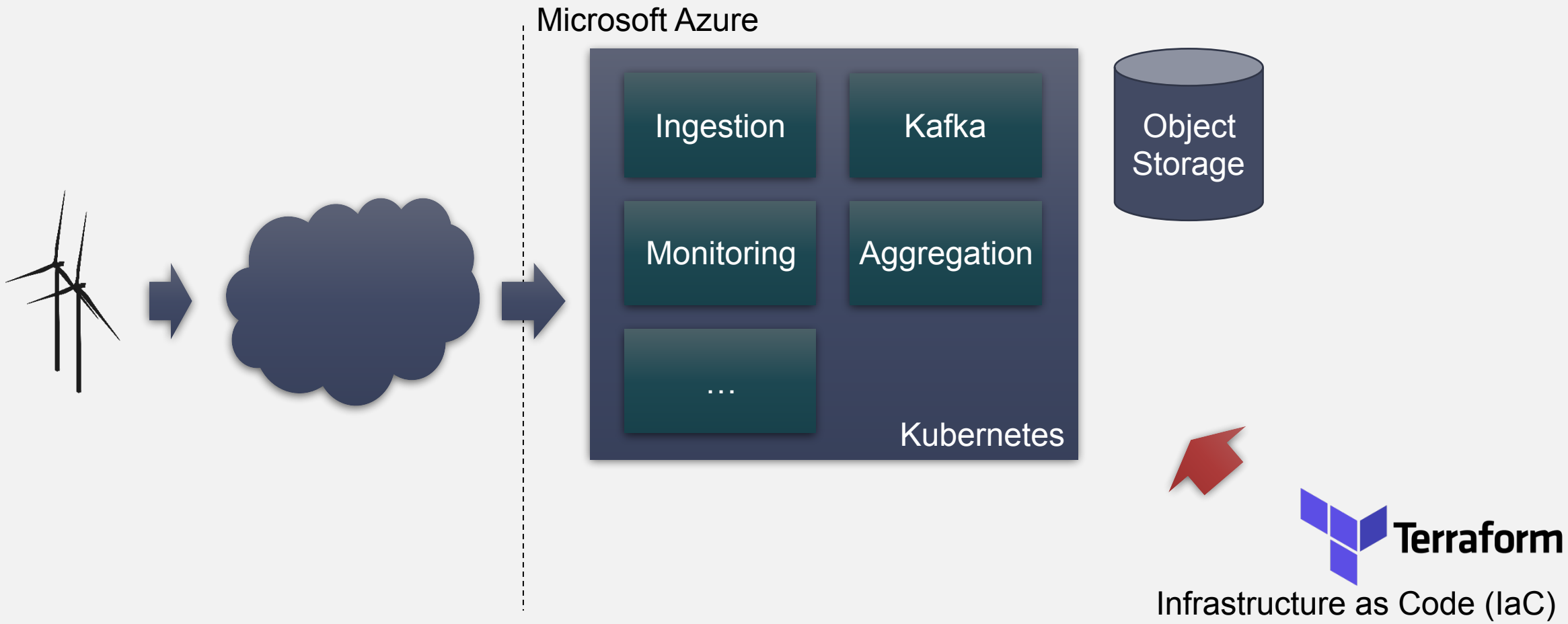
MVOW SMART Turbine® portfolio

When IT becomes part of the product



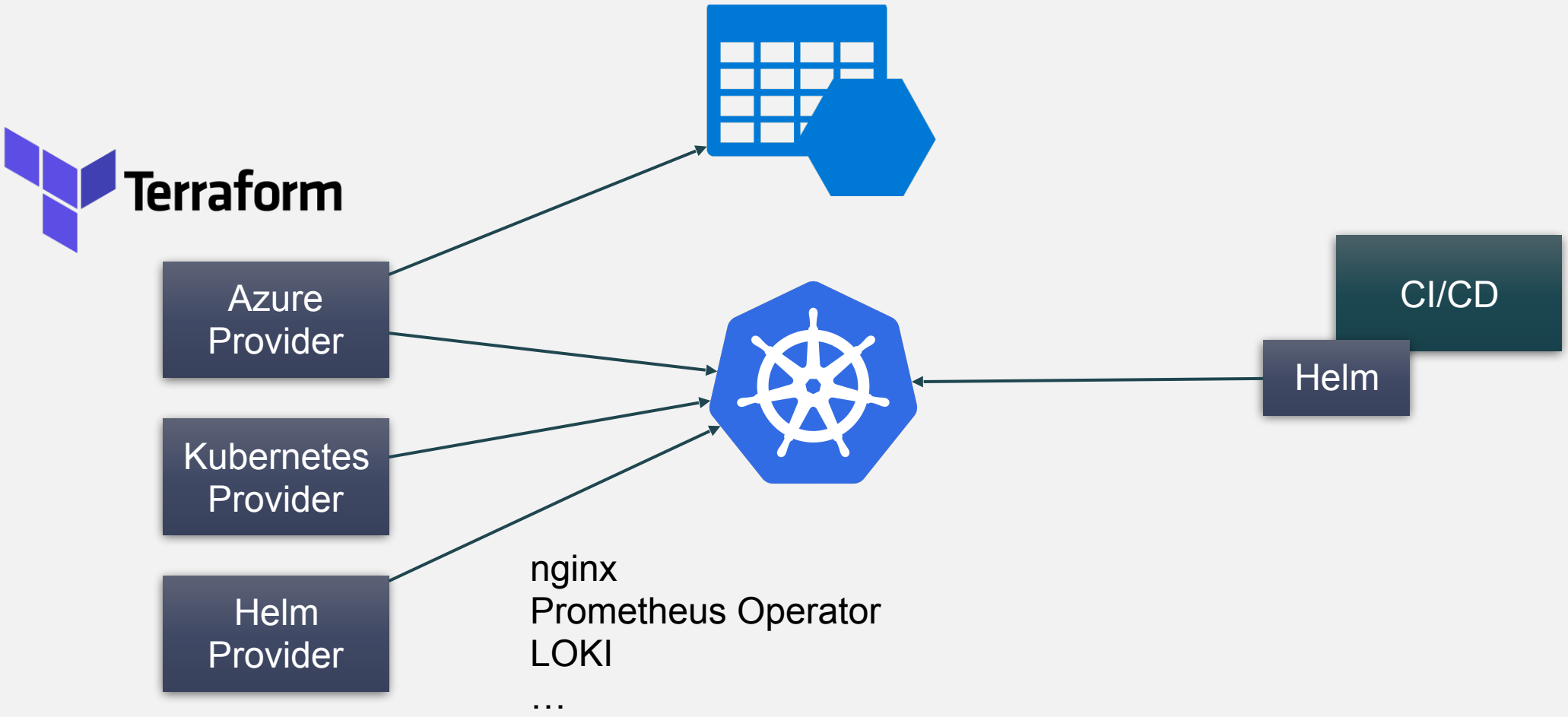
High Level Architecture – SMART Fast Data

…first in-house development from the ground up - CloudNative



Automation - Provisioning

…automate what you can



Observability

…with perspective of todays topic

- Metrics is key in objective monitoring

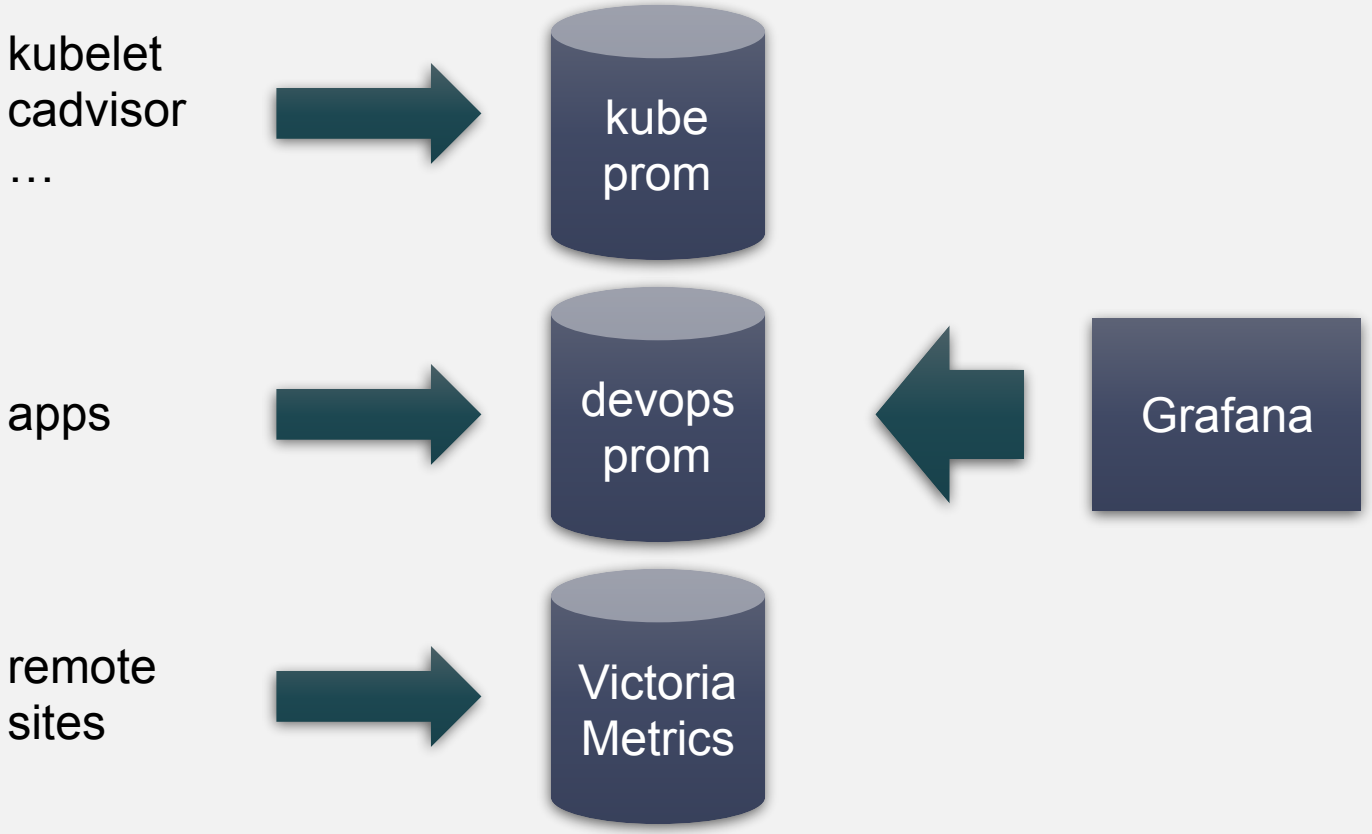
- All components expose metrics in Prometheus format
- Vendor components exposing metrics in Prometheus format

- Kubernetes installed with Prometheus Operator for easy configuration
- Metrics from remote sites streamed in
- Alertmanager used for alerting based on metrics
- Grafana used for dashboarding, exploration and visibility

- Logs collected and exposed by LOKI
- …distributed tracing is up next

Observability

…Grafana on multiple datasources



Let's take a look

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