Improving Observability & Security in Kubernetes with MDE

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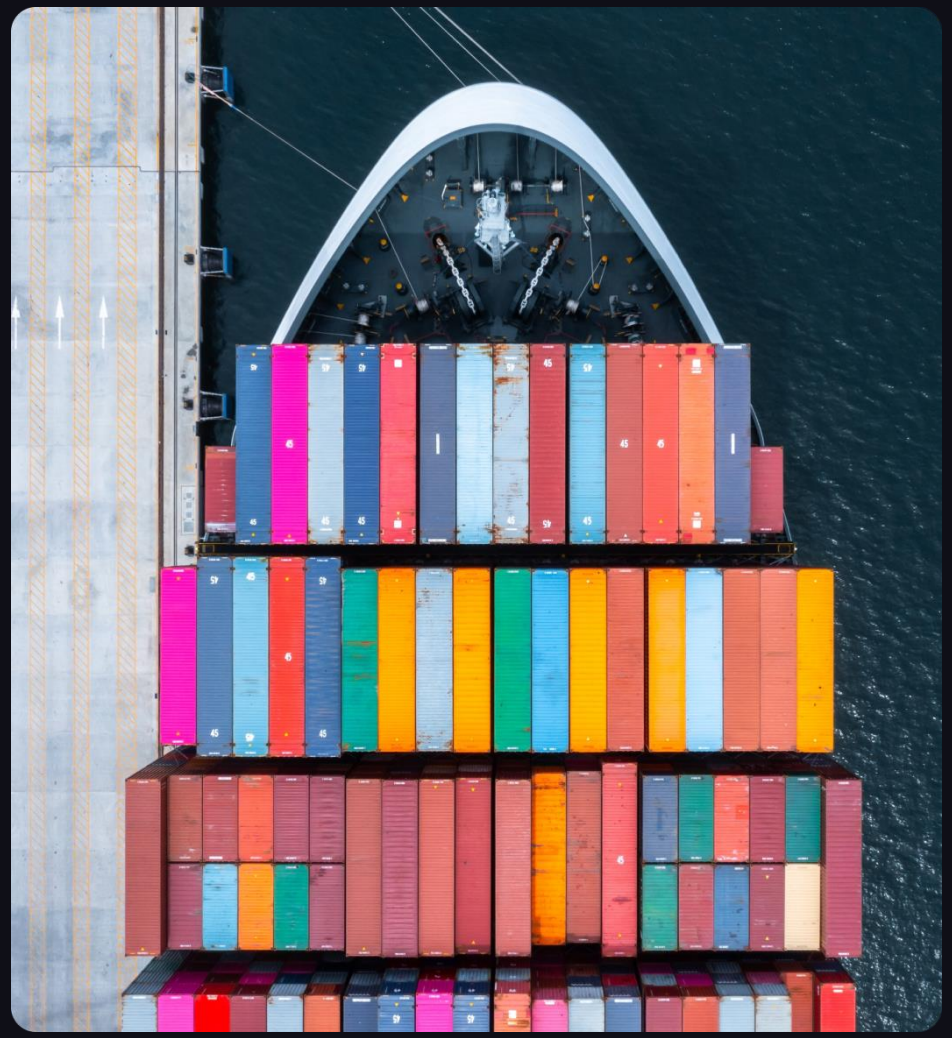
METADEV



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Content

B3JB

ProxyHands

1. Context: K8s & container orchestration
2. Problem: Observability at scale
3. Observability
4. Graphical Language Design
5. Demo
6. Security
7. Discussion

Containers & Kubernetes

- Containers in Enterprise Software are thriving
- Kubernetes (K8s) is the de-facto standard for managing workloads of containers

kubernetes

- At scale, **Observability** is critical to identify, diagnose & fix problems when they occur.
- Tools for **security** and **observability** in the k8s ecosystem are far from maturity or standardization.

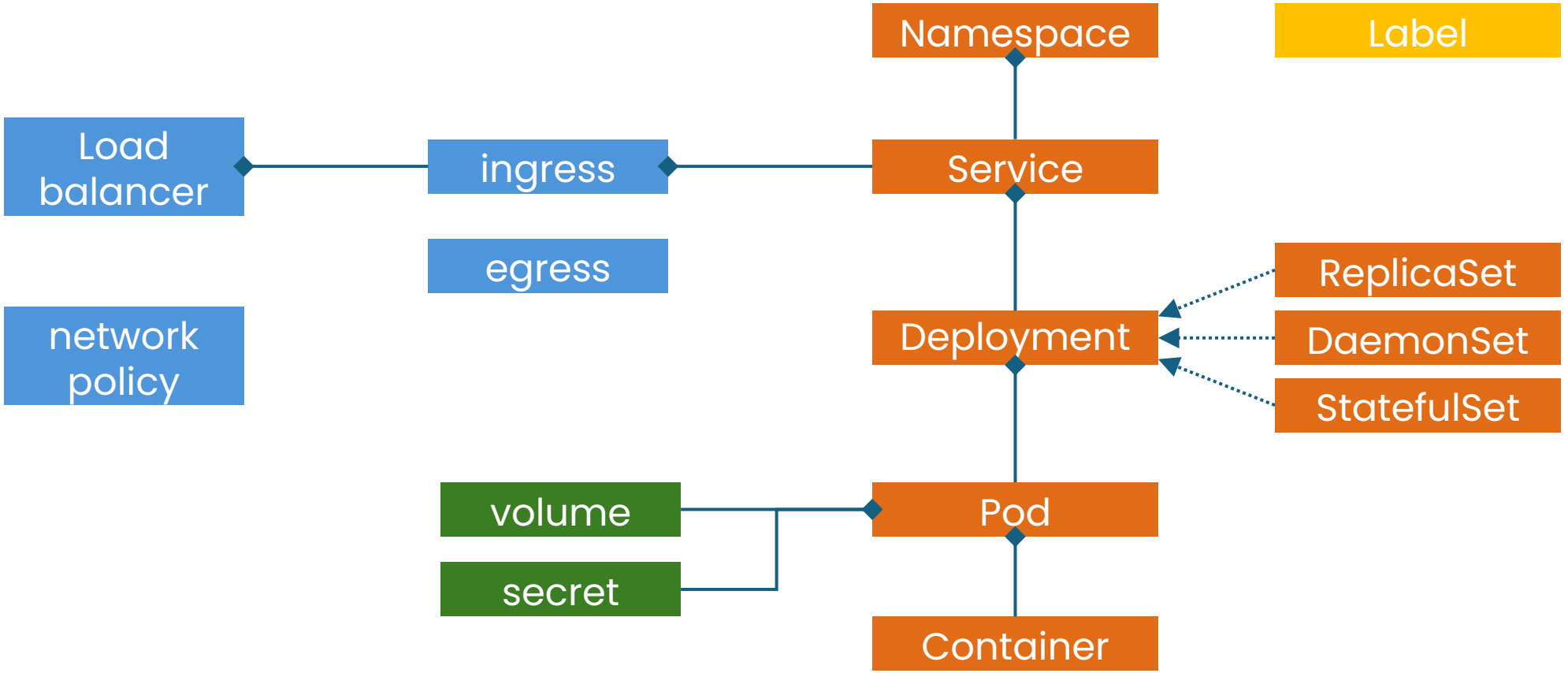
Starting point

- K8s is full of YAML configuration files and CLI oriented tools.
- Some **patterns** for humans are faster recognizable in a graphical way than scrolling YAML.
- We explored graphical container orchestration with **Orca**, last year.
- At scale, **relations** between containers are better presented graphically.

MDE?

- A K8s cluster is **a model** we can interrogate via API
- Conforms to typed concepts
- Can **reverse engineer** the model querying the API
- And **project & filter** the model as needed
  - Graphical
  - Textual
  - Tabular
- Zoom in/out
- Drill down in details

K8s Metamodel



Use Cases - Observability

Observability

- Explore dependencies between services
- Detect and track failure conditions
- Dependency analysis

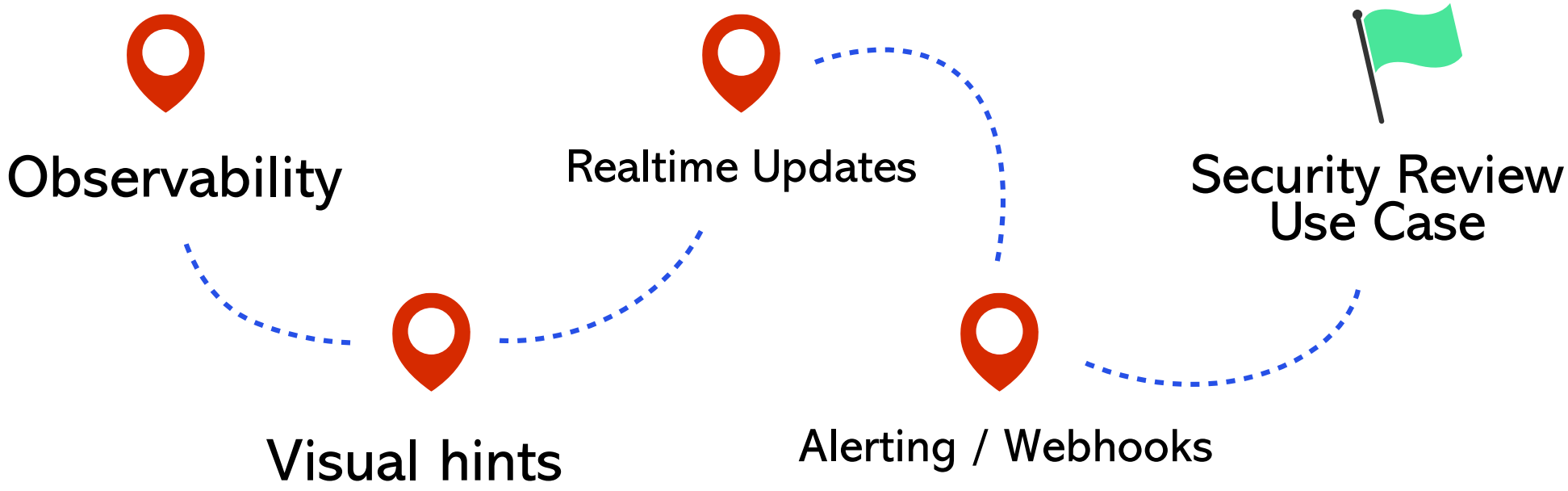
Graphical Language Design

Use Cases - Security

Security

- Hardcoded secrets
- Ingress control rules
- Network policies
- Known vulnerabilities in container images
- Outdated dependencies
- CPU / Memory / Resource limitations

Roadmap


Observability
Realtime Updates
Security Review
Use Case
Visual hints
Alerting / Webhooks

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ProxyHands

Q & A

Try it at https://k8s.metadev.pro

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