Automating Telco OpenShift Clusters Using GitOps & Validated Patterns

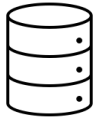
Tom Kivlin
L5 Principal Cloud Architect
Vodafone Networks

Agenda

- Our Cloud Evolution : The Journey To Automation
- What is GitOps? A Blueprint For The Network
- Validated Patterns & GitOps
- Implementation at Vodafone Networks
- Benefits
- Q&A

Our Cloud Evolution : The Journey To Automation

Stage 1: Legacy NFV Infrastructure



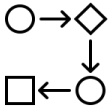
Platform: Virtualisation (NFVI)

Workloads: VNFs (Virtual Network Functions)

Management: VIM & Vendor VNF Managers

SLOW & VENDOR-SILOED

Stage 2: VM-based CaaS



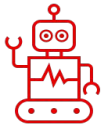
Platform: Virtualised CaaS

Workloads: CNFs (Containerised Network Functions)

Management: Central

CENTRALISED BUT COMPLEX

Stage 3: Bare Metal CaaS



Platform: Bare Metal CaaS

Workloads: CNFs and VNFs

Management: GitOps for CaaS & CNFs

AUTOMATED & SCALABLE

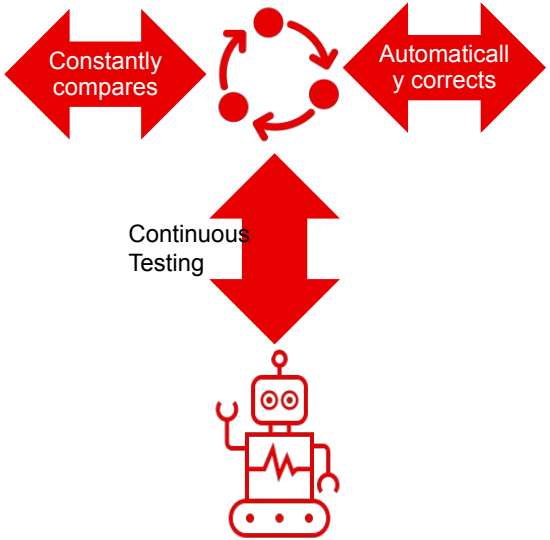
Goal: Target GitOps to deliver cloud-native network services faster & cheaper - with speed, reliability, and efficiency

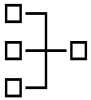
What is GitOps? A Blueprint For The Network

GIT REPOSITORY

- Single Source of Truth (Git)
- Includes configuration of Infrastructure (CaaS Clusters) and Applications (CNFs/VNFs)
- All changes proposed here
- Reviewed and approved by Humans

DESIRED STATE





PRODUCTION NETWORK

- Red Hat CaaS platform
- Live Network Functions
- Direct manual changes forbidden

ACTUAL STATE

Validated Patterns : Simplifying the creation of use cases

Bringing the Red Hat portfolio and ecosystem together - from services to the infrastructure

Configuration as code

Go beyond documentation using GitOps process to simplify deployment

From POC to production

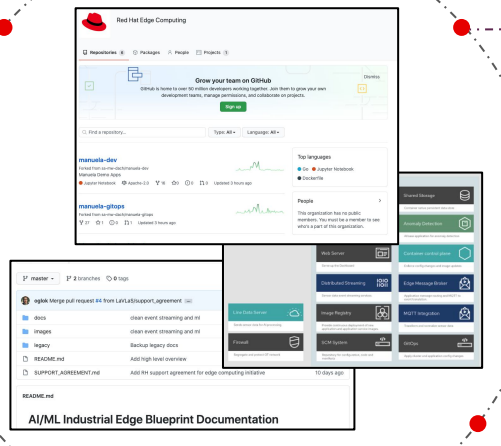
Ensure your teams are ready to operate at scale

Maintained over time

Each use case has a lifecycle to ensure they are kept up to date while they are being used

Tested as a use case

Confidence the configuration continues to work



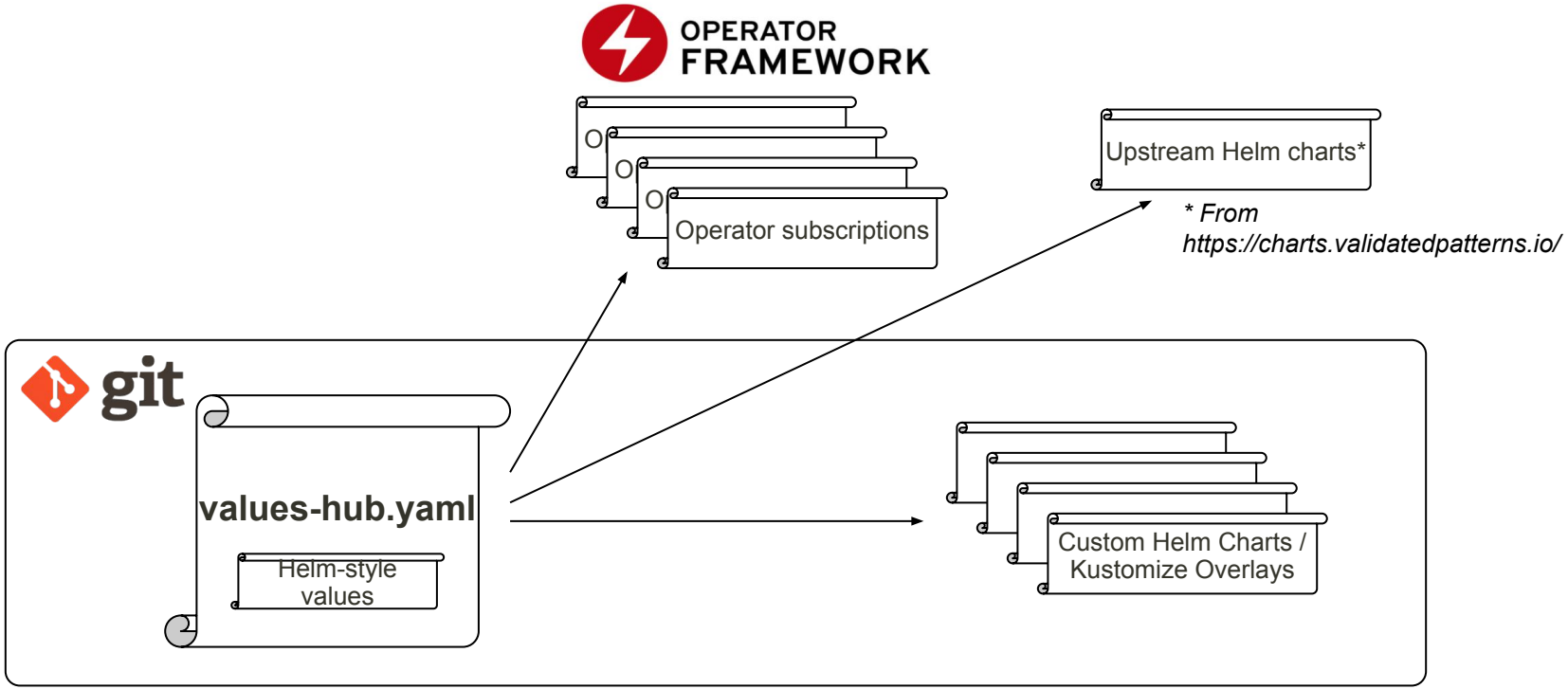
Highly reproducible

So that you can scale out your deployments with consistency

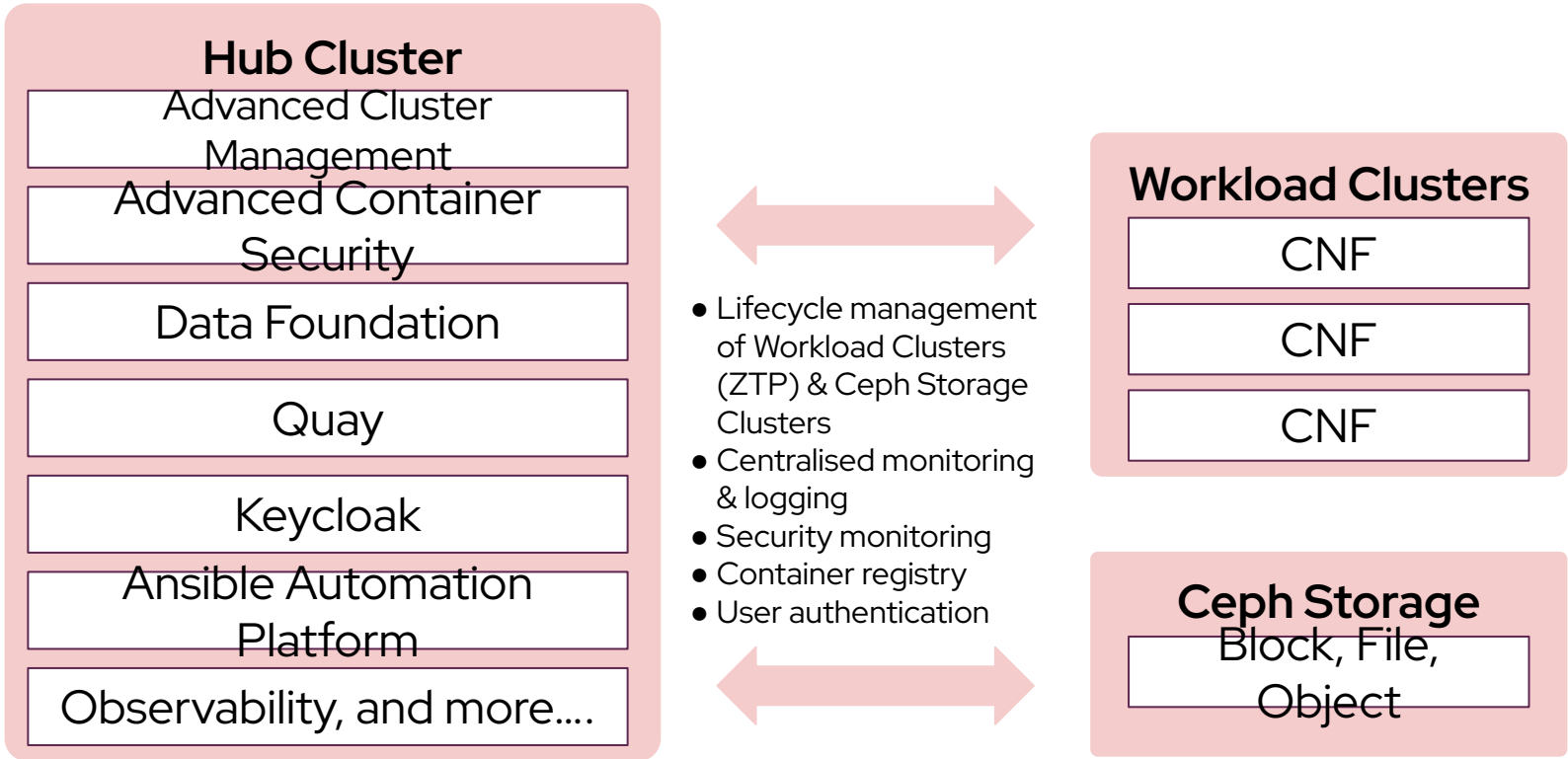
Open for collaboration

Anyone can suggest improvements and contribute

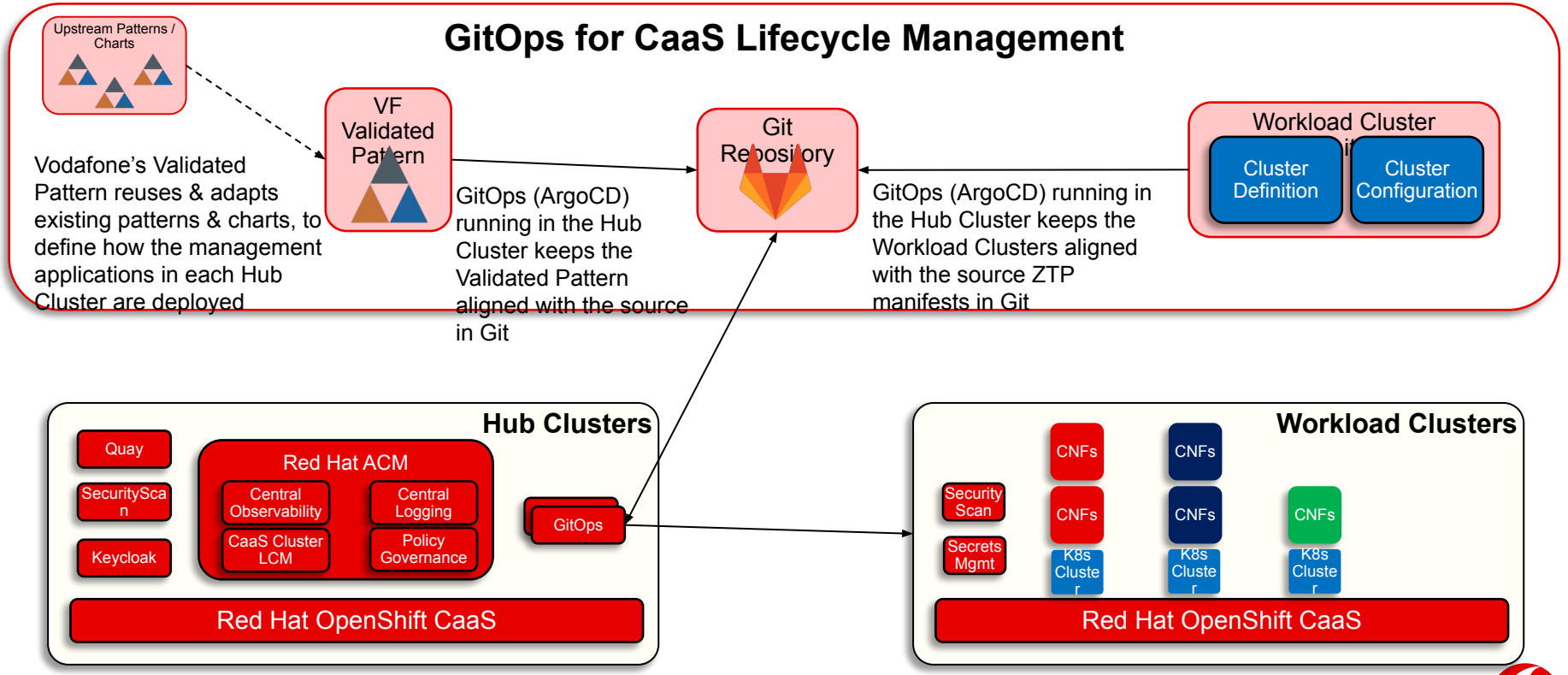
What Comprises A Pattern?



Vodafone's Pattern (Today)



Our Implementation In Vodafone Networks



What Lessons Have We Learned?

Reliability

- ALL configuration as code
- Able to re-run operations with consistent & predictable results
- End to end automation has reduced human error

Agility

- VPO provides the springboard
- Easy to adapt to our needs & avoids complex ACM manifest wrangling
- Common version control and approvals for execution

Operating Model

- Very different, so steep learning curve
- Linking & tracking upstream changes
- Do we need a Telco Cloud pattern?
  (Hint: it's in development)

For more information

Git Repos:

- github.com/validatedpatterns and github.com/validatedpatterns-sandbox
  - NB: Telco Hub Pattern under development: https://github.com/validatedpatterns-sandbox/telco-hub-pattern/tree/main

Helm Charts:

- https://charts.validatedpatterns.io/ → Helm Charts for Validated Patterns

Web Pages:

- validatedpatterns.io → Red Hat Validated Patterns Site
- redhat.com/architect/portfolio/→ Portfolio Architecture page

OpenShift Commons, Validated Patterns SIG: commons.openshift.org/sigs/

Together we can