Image credit: Wrightstudio

Jon Collins
Sep 17, 2021

Infrastructure Automated v Weaveworks

The Story of Deutsche Telekom and How It Leveraged GitOps to Scale Its Applications Without Scaling the Team

Cloud & Infrastructure, Kubernetes Management

Case Study

Deutsche Telekom is a large global telco group with more than 220,000 employees working in over 50 countries. Vuk Gojnic leads the Kubernetes Engine team, which is responsible for Das Schiff, Deutsche Telekom's Infrastructure-as-a-Service platform built on Kubernetes and other cloud-native tools.

Challenge

As Squad Leader Kubernetes Engine at Deutsche Telekom, Gojnic's team is building a multi-site, multi-cluster, multi-infrastructure, GitOps-managed Kubernetes engine for the Technology unit of Telekom Deutschland, completely based on open-source technologies.

The aim of this "cloud-native" initiative is achieving portability across multiple clouds, data centers, and even the edge. In response to the industry trend of reducing data latency and round trip times for new use cases such as Internet of Things (IoT) and augmented reality (AR), the company wished to push processing and analytics to the edge of the network. In addition, given how devices are not always connected, or can be in hard-to-reach places, not all data can easily be sent to the cloud or an on-premises data center. In these cases it's useful to do some processing and filtering at the edge, and send it back when connectivity is established.

The team aimed to use the cloud-native initiative to enable and drive the transformation so that applications that were traditionally proprietary, monolithic, and hardware-specific, could still run, yet at the same time gain all of the benefits of modern cloud-native operating patterns like GitOps.

Gojnic was asked to work out how to deploy Kubernetes containers more broadly, to support developers and also vendors. He quickly realized the scale of the challenge: hundreds of clusters would be required. WIth a team of only 10-15 people to manage this and other infrastructure, he didn't have the time or resources to service this need in a normal way. He needed the platform to manage itself.

Solution

Gojnic's network technology group provides containerized Kubernetes and infrastructure services to application owners, who are responsible for providing infrastructure services to the vendors and to the application developers.

In both cases, software vendors and developers need the ability to test and deploy their Kubernetes workloads on-premises either at Deutsche Telekom or another operator. Vendors can also set requirements on how these workloads are deployed, whether on bare metal or in virtual machines.

In response, and with the help of Weaveworks, Gojnic and his team built a way to deliver Kubernetes that offers a managed Kubernetes service—or a cluster—with all the essential add-ons and tools that vendors and application teams need. This approach is known as GitOps, a term coined by the co-founder and CEO of technology firm Weaveworks, Alexis Richardson.

GitOps is a cloud-native operational model that is designed to facilitate and promote core DevOps practices, such as CI/CD, or, as it is sometimes described, CD/CO—Continuous Delivery and Continuous Operations. GitOps core principles are to use declarative configuration and declarative API versioning—or giving the system a command and letting it work out its own solution—and source code control.
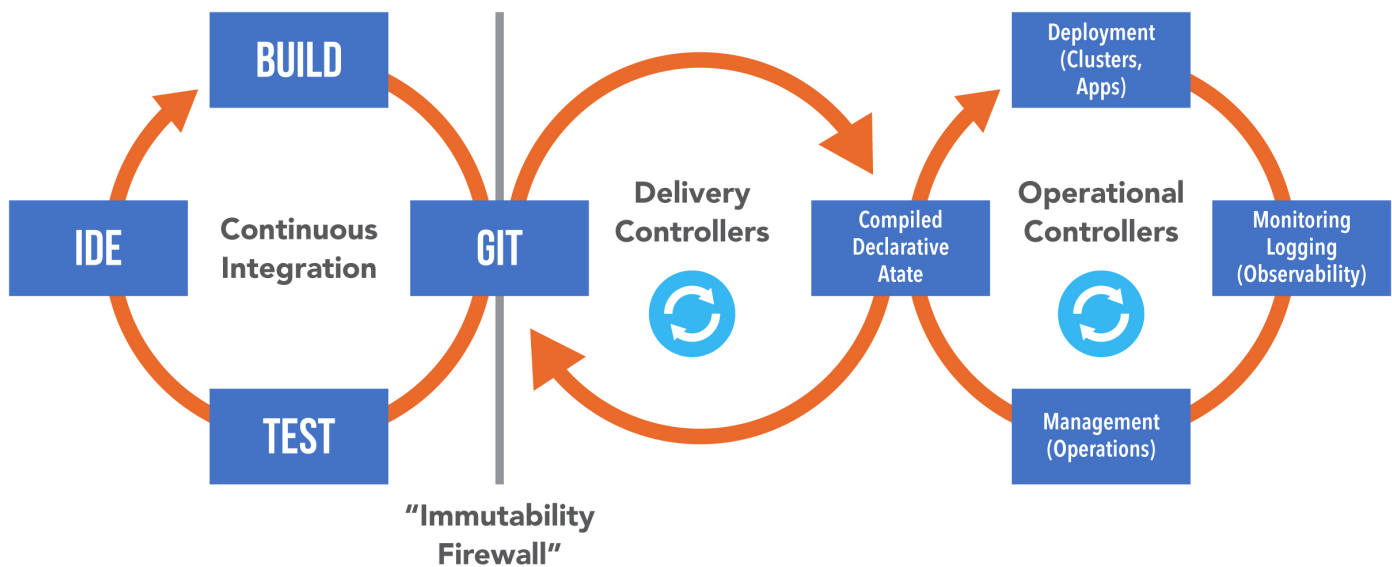
Source: GigaOm 2021

Figure 1: The GitOps Operating Model for Cloud Native

Result

The application teams run everything on-premises, across multiple locations. The team manages workloads at 20-25 core locations, as well as at a larger number of near-edge locations and finally at more than 10,000 edge locations.

Inspired by the writings of Weaveworks' Richardson, Gojnic's team now uses GitOps technology to self-manage numerous Kubernetes clusters, although the system is not yet totally autonomous—it still refers back to the GitOps "source of truth."

The team members now view themselves as auditors of the infrastructure, only intervening when there is an issue the system can't solve itself. This has achieved efficiencies for the team, allowing

them to manage a much larger infrastructure, although it's hard for them to specify a figure saved in monetary value.

The team is constantly innovating, transforming the internal market, building its own skills, using the GitOps framework to achieve more, and tackle higher value tasks.

Combining GitOps and the declarative system with Kubernetes allows the existing team to manage hundreds of clusters. The GitOps system has enabled them to scale without the linear scaling of associated costs.

The methodology has also allowed the Das Schiff team to speed up provisioning a complex construct in Kubernetes. Deployments that used to take weeks with the configuring of VMs and other issues, now take 5-10 minutes with GitOps and require virtually no human intervention.

The team benefits from using a comprehensive platform of services, rather than architecting and building from scratch, both in terms of using capabilities and benefiting from associated best practices. Use of the platform also enables finer, policy-based control over different users, roles, and groups. Another benefit: The system gives the team a good way to interact with customers directly within Git, which has become a de facto self-service customer interface. The team exposes the repo for every special configuration via Git where the clusters and components are defined, and this allows the customer to make special requests via pull requests.

Conclusion

GitOps has helped to make Deutsche Telekom's containerized clusters easier to manage and more responsive. They require less human management intervention. While it's difficult to point to precise cost savings, the team's ROI can be judged by the scale of its achievements—managing thousands of clusters with a tiny team, and managing cloud development and cloud operations continuously.

Team members have been able to focus their skills on tasks beyond day-to-day management of the services they provide and work toward improving those services and thereby benefiting the business directly.

About Jon Collins

Jon Collins has nearly 20 years of experience in IT. He has worked as an industry analyst for a number of years, and has advised some of the world's largest technology companies, including Cisco, EMC, IBM, and Microsoft in product and go-to-market strategy. He has acted as an agile software consultant to a variety of enterprise organizations, advised government departments on IT security and network management, led the development of a mobile healthcare app and successfully managed a rapidly expanding enterprise IT environment. Jon is frequently called on to offer direct and practical advice to support IT and digital transformation initiatives, has served on the editorial board for the BearingPoint Institute thought leadership program, and is currently a columnist for IDG Connect.

Jon wrote the British Computer Society's handbook for security architects and co-authored The Technology Garden, a book offering CIOs clear advice on the principles of sustainable IT delivery.

About GigaOm

GigaOm provides technical, operational, and business advice for IT's strategic digital enterprise and business initiatives. Enterprise business leaders, CIOs, and technology organizations partner with GigaOm for practical, actionable, strategic, and visionary advice for modernizing and transforming their business. GigaOm's advice empowers enterprises to successfully compete in an increasingly complicated business atmosphere that requires a solid understanding of constantly changing customer demands.

GigaOm works directly with enterprises both inside and outside of the IT organization to apply proven research and methodologies designed to avoid pitfalls and roadblocks while balancing risk and innovation. Research methodologies include but are not limited to adoption and benchmarking surveys, use cases, interviews, ROI/TCO, market landscapes, strategic trends, and technical benchmarks. Our analysts possess 20+ years of experience advising a spectrum of clients from early adopters to mainstream enterprises.

GigaOm's perspective is that of the unbiased enterprise practitioner. Through this perspective, GigaOm connects with engaged and loyal subscribers on a deep and meaningful level.

Copyright