RUNNING STORAGE INSIDE CONTAINERS

Giant Swarm leverages Quobyte's unique software storage capabilities
to run a reliable and high-performance storage for their microservice infrastructure

Quobyte

Summary

Needs/Challenge: Provide a reliable and high-performance storage foundation for a microservice infrastructure with the possibility of running a storage infrastructure inside a container and enabling live migrations.
Solution: Quobyte's software storage system
Platform: A heterogeneous setup consisting of solid-state drives and hard drives.
Use Case: Software Storage – Microservices and Containers

Benefits

- Reliability and lights-out operations
- Storage scales up and down flexibly and seamlessly depending on business needs
- Rolling updates keep systems running without any downtime
- Drastically reduced maintenance time and administrative expenses
- Quobyte delivers an excellent performance and allows running business-critical databases

Giant Swarm

> " Quobyte exceeded our already high expectations in terms of storage performance and we're thrilled about how smooth it runs. "
>
> **Timo Derstappen**
> *Giant Swarm's CEO and founder*

Giant Swarm – The Container Experts

Giant Swarm is an innovative microservice infrastructure provider based in Cologne. Feeling the growing pains when trying to scale a monolithic app during a former project, the three founders set out to find a way to handle the scalability problem. The answer was to isolate problems into small services. Their resulting unopinionated solution for microservices infrastructures blends existing open-source components – with CoreOS as a basis – with custom-created software and third-party tools. Together, this makes for a unique framework for running microservices. Giant Swarm is currently expanding their portfolio after open-sourcing their technology stack to helping businesses tailor container-based infrastructures to their needs. Serving enterprise clients on premise, equipping small and medium-sized businesses with a managed solution, and procuring the infrastructure in their own data centers, they provide fast and reliable services and help their clients set up a scalable and flexible container infrastructure.

The Quest for Container Storage Flexibility

In order to find the right storage system that would fulfill all of Giant Swarm's needs and provide a solid foundation for their microservices framework, they decided to first evaluate various software storage systems. The guiding idea was to find a solution that just worked and would let them focus on developing their Container as a Service (CaaS) platform instead of adding overhead to managing the infrastructure. Early on, they focused on Ceph and Quobyte because the two had the most promising features that would fit their needs: a shared file storage interface and massive scalability.

With both products checking those two features off the list, a distinguishing factor in Giant Swarm's decision making was to find a reliable and scalable storage solution that could run inside containers. Containers have so far not always played well with storage: they are great for virtualizing stateless applications but when a containerized application requires file system access, it becomes a lot harder to move the container from one host to the next because the container's data volume is tied to a specific server. "That's when Quobyte really tipped the scales," said Dennis Benkert, Lead Storage Administrator at Giant Swarm, "their product was the only one that allowed mounting a storage volume inside a container. And it also didn't hurt that the system was easy to set up and just worked."

A related benefit was the possibility of live migrations: whenever you move a container to another host, its attached volume is already there. If a host fails and the container shuts down, you can fire it up on another host and reattach the storage volume.

No less important were the question of overall compatibility with the container ecosystem and the performance issue: is storage access fast and reliable enough for Giant Swarm's needs? Quobyte came out strong again – in both respects. As far as integration with current tools go, Quobyte integrates perfectly with cutting-edge orchestration tools like Apache Mesos, Mesosphere DCOS, and Kubernetes. And as for performance: the testers were thrilled with the IOPS Quobyte provided.

To sum up, Giant Swarm decided to subscribe to Quobyte because of its simplicity, functionality, and high performance. But let's not forget another significant contributing factor: a major plus weighing in for Quobyte was that the developers at Giant Swarm could rely on Quobyte's first-rate support. "I could call in and talk with a developer directly and have my problem taken care of asap. That also really set Quobyte apart and made the whole experience even more worthwhile," Benkert said.

Storage for Microservices That Just Works

Giant Swarm deployed Quobyte on their hyper-converged server infrastructure and integrated the container lifecycle with Quobyte's volume management. When customers start up a container, a corresponding Quobyte volume is created and attached to the container. Moving a container between hosts leaves the container-volume relation intact, completely with state.

Scaling Services Without Any Downtime

With Quobyte, Giant Swarm deployed a drop-in file system that could readily be used with a very wide range of container workloads. Quobyte's extensive API made the integration with their container lifecycle an easy task. In day-to-day operations, their Quobyte storage stays out of the way and transparently keeps storage up across server reboots and hardware failures – without any downtime.

Quobyte positions Giant Swarm optimally for future expansion. "Looking ahead, we're all set for whatever our clients decide. Whether they want to switch from hard drives to SSDs or need to quickly scale out due to temporarily high traffic, we don't have to go out of our way to make it happen," Benkert said. "Thanks to Quobyte, we can now easily replace old machines without any downtime."

Reflecting on the ongoing experience, Timo Derstappen, Giant Swarm's Co-Founder and CTO, added, "I really like Quobyte's solution. It exceeds our already high expectations in terms of storage performance and we're thrilled with how smooth it runs. In our case, it's of course also a major benefit that we could seamlessly incorporate it into our microservices framework."

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About Quobyte®

Quobyte combines recent distributed systems research with proven concepts for large-scale storage systems. With its scalability, reliability and automation, Quobyte's software storage system builds the foundation for next-generation warehouse-scale data centers. The company was founded in 2013 and draws on a decade of research with the open-source distributed file system XtreemFS.

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