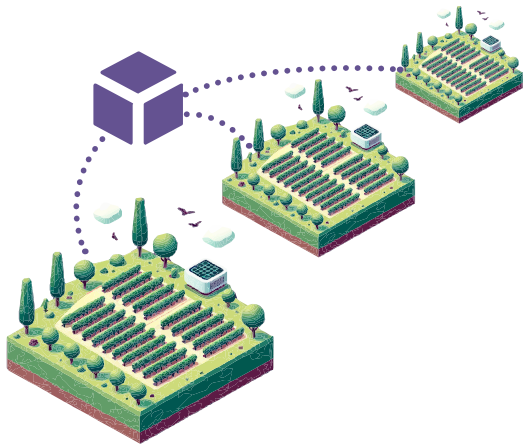


Unlocking Efficiency in Viticulture Management



TerraviewOS from Terraview GmbH, is a cloud-native service for agriculture and specifically in viticulture and helps producers manage their property inputs and outputs.

In this use case, software has to be installed and operated at both the edge property premises and in the cloud. The locations carry out different operations (e.g., data gathering at the edge, data processing in the cloud).

Customers operate through "crate" edge devices, aiming to integrate a central service by FLUIDOS technology to address specific problems. These edge devices handle specific TerraviewOS functions, while the central service provides additional capabilities. Each of these devices are FLUIDOS nodes and correspond to a customer managing one or more vineyards, using shared resources from Terraview.

PROBLEM

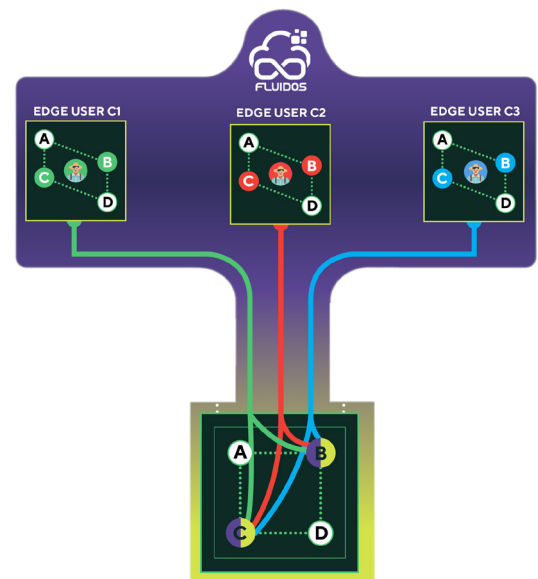
- ✘ No simple and integrated network fabric over cloud continuum: The current landscape lacks a unified network fabric across the cloud continuum, leading to connectivity and interoperability challenges among different microservices installed in different locations.
- ✘ No easy way to define and manage a cloud continuum application: Managing applications in cloud continuum environments is currently complex, affecting resource and lifecycle management. In particular, the location of each microservice within the Terraview application can vary based to the current operating conditions, e.g., a cloud-based micro-service should be installed at the edge when the connectivity is weak or absent, which is a per-customer, manual, costly, and error-prone configuration.
- ✘ Deficit of security, privacy or trust: Security, privacy, and trust issues hinder edge/fluid computing's efficiency. The Terraview application should benefit from advanced security measures (TEE/TPM, anomaly detection, etc.) for encryption, data protection, and access control.

CURRENT APPROACH

- ✘ Everything is centralised: The current centralised architecture, with services in one location, risks failures and latency.
- ✘ All data resides with the service provider: Concerns about privacy and security emerge from centralised data storage. The use case aims to create a distributed storage solution to boost security and user control.
- ✘ No reliability on the customer side - network dead, no service: Reliance on constant network access causes service interruptions during outages.
- ✘ Manual and per-customer configuration. The orchestration of the different components of the Terraview application has to be done per-customer based on its actual operating conditions, manually, which is expensive, error-prone, and not flexible (e.g., cannot adapt in case of a change in the operating conditions).
- ✘ Huge data ingress over limited network connection: Large data ingestion over restricted networks leads to congestion and inefficiency.

FLUIDOS APPROACH

The novel FLUIDOS-based TerraviewOS is designed with a focus on efficient and secure operation across multiple customer on-premise sites leveraging the support services operated upon centralised cloud infrastructure. At the core of this architecture lies the concept of the FLUIDOS domain, which encompasses both customer sites and centralised services. Each customer site will host a FLUIDOS node, responsible for running TerraviewOS services. These nodes are designed to ensure security, with data encrypted both at rest and in transit, and will provide multi-tenant access to necessary centralised services. This approach aims to facilitate the secure sharing of workloads and data across FLUIDOS nodes that reside in the cloud. The backend services of TerraviewOS will automatically be executed in the best available location, preferably in the cloud but also at the edge in case of network issues, with a crucial design choice being the avoidance of one backend instance per FLUIDOS node, without any manual intervention from the Terraview engineers.



FLUIDOS ADVANTAGES

- ✓ Security: raw data stays local, isolation and trusted execution on the network.
- ✓ Decentralisation: local access, no central cloud, reduced network traffic, workloads at edge and core.
- ✓ Operating costs: no manual intervention from Terraview engineers to deploy the application; everything is automatically deployed (and re-deployed) by FLUIDOS.
- ✓ Business continuity: adapt to network changes, operate without uplink, and replicate for failover.

KEY PERFORMANCE INDICATORS (KPI'S)

30% 

Reduction in cost per tenant operations by TER: at least 30% reduction.



Data transferred: reduction of one order of magnitude from GBs to hundred MBs.



Processing time of imagery: unchanged (no increase).



Complete disconnection: zero end-user downtime via state synchronisation.



Join FluidOS in the pursuit of creating an open and collaborative ecosystem focused on the development of a multistakeholder market of edge services and applications, promoting European digital autonomy.



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