



The OpenSpace Family – Solutions for Delivering Digitization, Virtualization, and Orchestration for Ground Operations

Space operations are growing in complexity. Satellite ground systems are embracing digital transformation to support this growth and the multi-orbit, multi-satellite, and multi-mission demands presented by new space.

Kratos' OpenSpace family of solutions enable the digital transformation of satellite ground systems to become a more dynamic and powerful part of the space network. The family consists of three product lines: OpenSpace SpectralNet for converting satellite RF signals to be used in digital environments; OpenSpace quantum products, which are virtual versions of traditional hardware components; and the OpenSpace Platform, the first commercially available, fully orchestrated, software-defined ground system.

These three OpenSpace lines enable satellite operators and other service providers to implement digital operations at their own pace and in ways that meet their unique mission goals and business models.

Digitization: The On-Ramp to Dynamic Ground with OpenSpace SpectralNet

Digitization facilitates digital transformation and is the first step towards successfully leveraging IP networking and cloud adoption for digital architectures.

OpenSpace SpectralNet readily converts analog signals into digital IP packets and transmits them over any distance and



OpenSpace SpectralNet digitizes the RF into IP for transport and signal processing using OpenSpace quantum products or the OpenSpace Platform.

network. It provides time deterministic, reliable, and assured data traffic using standards-based VITA-49 protocol for processing and utilization in public cloud, private data center or hybrid cloud environments.

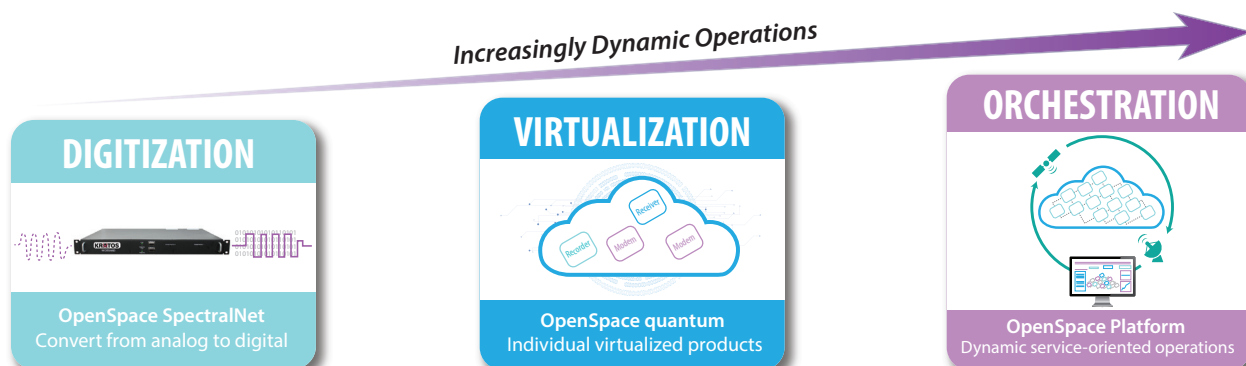
Advantages of SpectralNet

- Limitless - Digitized data transmission over a standard WAN without any distance barriers
- Dependable - Automate critical system redundancy and resilience with up to 7:1 failover
- Reliable - Configurable time deterministic latency to overcome network latency and jitter
- Optimized – Performance optimization for distributed transport over digital architectures

Virtualization: Replace Traditional Hardware Functions with OpenSpace quantum

Virtualization is being implemented in satellite ground systems as a method to reduce costs, increase efficiency in operations, and to avoid downtime.

OpenSpace quantum products are individual virtualized network functions that consume digital data streams from SpectralNet and replace hardware modems, FEPs, receivers, recorders and more for traditional or hybrid network





OpenSpace quantum individual virtualized software products replace proprietary hardware, reduce costs, and make operations more efficient.

architectures. quantum provides the unique capability of virtual signal processing without hardware acceleration on generic compute to enable lower operating costs, increased scalability, and more dynamic functionality beyond traditional hardware.

Advantages of quantum

- Flexible - Configure on the fly to support multiple satellites and payloads
- Scalable - Spin virtual instances up and down on demand
- Web-Enabled - Provide access and control from anywhere, anytime through the web
- Cost-Effective - Lower hardware investment and maintenance
- Versatile - Deploy flexibly on bare metal, virtually or in the cloud

Orchestration: Dynamic Ground System Operations with the OpenSpace Platform

Orchestration is what makes the OpenSpace Platform truly dynamic. The Platform enables automated workflows and logic across systems to deliver services end-to-end much faster.

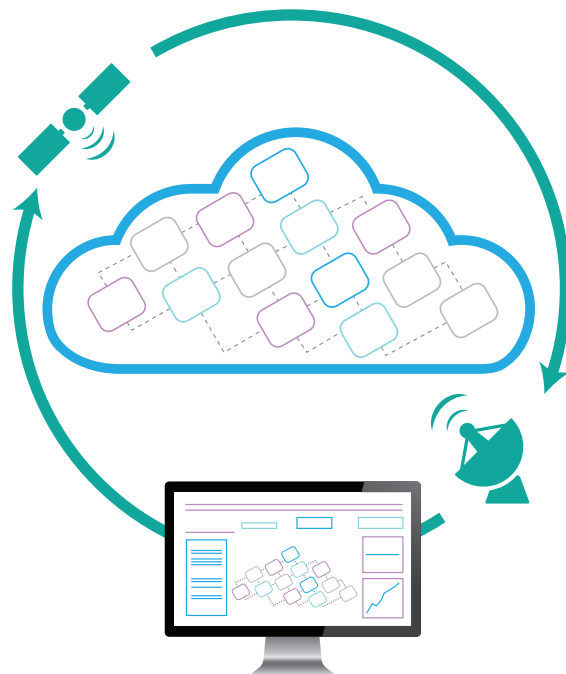
The OpenSpace Platform enables the satellite and ground system to operate in tandem as a real-time integrated system, driving coordinated change that can respond and synchronize to changes in customer demand.

The OpenSpace Platform supports open, third-party service orchestration frameworks to automate an end-to-end service delivery. Orchestration frameworks allow business and mission planning systems to communicate with the OpenSpace Platform to deliver end-to-end services.

Advantages of the OpenSpace Platform

- Fast - Accelerate the service delivery process from weeks to minutes to increase revenue and customer satisfaction
- Efficient - Maximize the usage of network resources to near 100%

- Automated - Remove hundreds of hours of manual tasks and maintenance
- Powerful - Supports software-defined satellites, 5G, integration with terrestrial networks and multi-constellation orbits
- Unified - Monitor across the ground system from the network to carriers all in a single dashboard



Deploy and orchestrate satellite services like never before, with the OpenSpace Platform - supporting multi-satellite, multi-orbit and multi-mission operations.

Digitization, Virtualization, and Orchestration with the OpenSpace Family

Digital transformation of the ground segment is within reach. The OpenSpace family of products enable the adoption of digital transformation based on your unique needs, plans and business models.

The path to a flexible, efficient and cost-effective software-defined ground system begins with digitization. Digitization provides fast, assured data transport without distance limitations. Once your antennas are equipped with SpectralNet digitizers, you can successfully leverage IP networking and migrate hardware products into software with OpenSpace quantum, or orchestrate all of your ground system operations with the OpenSpace Platform. The current activity and projected growth of your business will determine what's next beyond digitization and we are ready to navigate the journey with you.

Learn more about transforming your ground system operations at www.kratosdefense.com/OpenSpace.