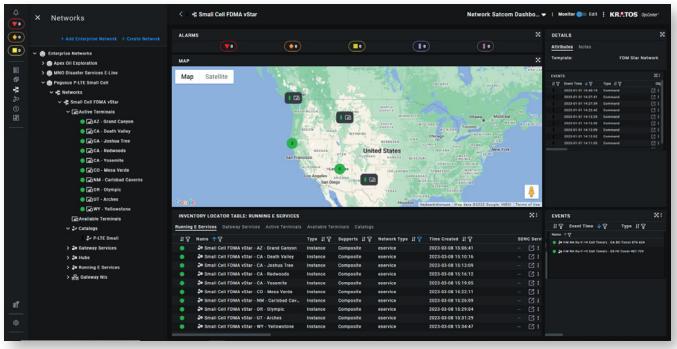
Delivering Dynamic Satellite Services with vStar

Deploy Satcom Networks Faster, On the Fly, and at Scale



OpenSpace OpsCenter™ displays status and health of a satcom network

Your customers are demanding more services and want them delivered when and where they need them. The launch of software-defined satellites, multi-orbit constellations, and the terrestrial network innovations with 5G offer the promise to deliver these more dynamic services. However, the traditional ground system serves as a bottleneck between the satellite and terrestrial networks with its static and manual design.

Digitally Transforming the Ground System

The OpenSpace® Platform is the first fully virtualized, software-defined, and orchestrated system in the satellite industry. The Platform digitally transforms the satellite ground system to become much more dynamic to support software-defined satellites and interoperate seamlessly with terrestrial and cellular networks. Leveraging Carrier Ethernet standards widely deployed in the telecom industry enables the OpenSpace Platform to deliver satellite services like mainstream communication networks with scale, faster time-to-revenue, and seamless integration with other networks.

Modernizing the Satcom Network

As part of the OpenSpace Platform, the vStar solution is the first fully virtual and orchestrated hub capability in software that is digitally transforming the gateway.

The solution replaces traditional hardware hubs with software equivalents that can run on generic x86 computing platforms in the data center or the cloud without hardware acceleration. This enables vStar products to run almost anywhere — no longer concentrated at one physical location.

As software, vStar offers dramatic advantages over traditional hardware-based hubs, including faster service delivery, scalability on demand, simultaneous support for point-to-point and star topologies and touchless deployment within private or public clouds or hybrid environments.

Delivering Dynamic Services

By virtualizing the functions of a traditional hub, vStar can deliver services at an enterprise-grade scale without the limitations of hardware hubs. vStar simplifies, orchestrates and automates operations, as well as lay the foundation for satellites to eventually become part of mainstream 5G service delivery.

Support for Key Satcom Applications

- *Cellular backhaul*
- *Enterprise network extensions*
- *Telecom trunking*
- *Defense and government*

vStar supports key satcom applications including enterprise network extensions, cellular backhaul, telecom trunking, and defense and government use cases. Enterprises can now manage remote branches over satellite as easily as they can with their terrestrially connected equivalents for seamless connectivity.

As customer demands change and new missions arise, the vStar product enables faster, more flexible and far more powerful service delivery.

Accelerate time-to-revenue

- Deliver and reconfigure services in minutes by automating the service provisioning process from Operational Support Systems (OSS) to the Platform.

Provide simultaneous support for multiple topologies

- Toggle between point-to-point and star topologies to deliver needed capacity.
- Start on a star topology and migrate as needs change through orchestration and service-chain deployment. No hardware re-deployment needed.

Scale on demand and optimize resources

- Automatically instantiate fully virtualized hubs as demand grows, without the need to over-provision the network.
- Deploy and optimize resources by using them only when needed.
- Provision a vStar cost-effectively for a single tenant use-case, rather than re-engineering an existing large shared star network.
- Reduce shipping, installation and export issues with software instead of hardware.

Support cloud native operations

- Design the best network architecture for growing needs, mixing onsite implementations with public and hybrid cloud environments.
- Enable predictable operational expenditures to grow with service demand.
- Deploy virtualized services on generic compute, negating the need for expensive Graphics Processing Unit (GPU) instances or acceleration hardware.

Deliver high throughput

- Deliver services over satellite at rates over 1 Gbps to support high bandwidth applications.

Seamlessly Integrate with Carrier Networks

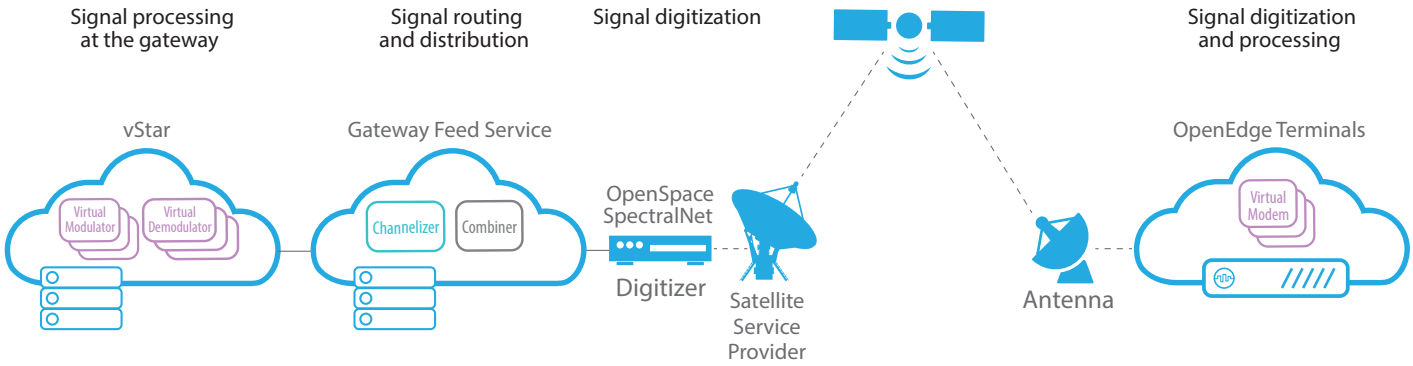
- Interconnect seamlessly with global carrier networks using widely deployed Carrier Ethernet standards such as E-Line Ethernet private line (EPL), Ethernet virtual private line (EVPL) or E-Access service architectures.
- Extend Multiprotocol Label Switching (MPLS) networks over satellite without Maximum Transmission Unit (MTU) limitations, easing site integration with existing terrestrial carrier or enterprise networks.

OpenSpace: A Complete Satcom Platform

By digitally transforming the ground system there is no longer a piece-meal approach to integrating all the elements of the teleport together. The OpenSpace Platform was built as a completely integrated and digital end-to-end satcom system that includes the following parts:

- Gateway Feed Service - replaces much of the traditional analog RF hardware with software and enables the digitizing, splitting and combining of digital IF signals across the ground system.
- vStar Service - first fully virtual and orchestrated hub capability in software that runs in private data centers and public and hybrid cloud environments, providing enhanced scale and resiliency.
- OpenEdge™ product - first software-enabled satellite terminal that brings virtual signal processing and other applications closer to the end user for faster, more flexible and powerful service delivery at the network edge.
- OpenSpace OpsCenter – a single pane of glass management application that enables operators to design, monitor and control (hardware and virtual functions), troubleshoot, and report on services across the ground system.

The fully digital and software-based approach to the Platform enables the system to be deployed in a single teleport or scaled across multiple teleports and data centers, depending on service scale requirements.



Kratos' End-to-End Dynamic Ground System