

# Orchestrator

## Calian's multi-orbit resource orchestration platform for GEO, MEO and LEO networks

The Calian Orchestrator is an advanced resource orchestration platform to optimize and manage Software-Defined GEO and NGSO satellites and ground systems for satcom, earth observation and defence solutions. Designed for the dynamic nature of LEO constellations, the Orchestrator manages fast-changing link availability, handover events, and multi-satellite resource coordination.

**Maximize Network Capacity and Ensure Resilient Connectivity.** Resource orchestration empowers satellite operators to manage GEO, LEO, and multi-orbit networks with unparalleled flexibility, efficiency, and service quality. By automating and orchestrating the management of space and ground segment resources, operators can precisely deliver services to meet customer demands. This capability allows them to maximize market reach, boost sellable capacity, enhance service delivery, and swiftly adapt their network for emerging business opportunities.

The Orchestrator platform offers a powerful and intuitive interface to maximize the capabilities of your satellite network

### Increased Satcom Monetization

Identify new market opportunities and amplify your presence by seamlessly reconfiguring your network for an ever-changing landscape. With the Orchestrator, you have the power to define beam layouts, channels, carriers, and power allocation—automatically or manually—with unmatched flexibility.

Our innovative platform ensures rapid reconfiguration, enabling your network to swiftly adapt to both planned changes and unforeseen world events. This dynamic flexibility allows you to maintain optimal performance and achieve higher utilization.



The Orchestrator user interface provides data-rich visualizations to monitor and control the network.

### Increased Throughput

Software-Defined Satellites can target resources to high demand geographical areas. The Orchestrator allows you to use both historical and forecasted traffic demand to craft optimized beam layouts and channel plans to meet these demands. By dynamically coordinating changes between payload and ground systems, the Orchestrator ensures peak system utilization and an exceptional customer experience. The Orchestrator dynamically optimizes inter-satellite links, gateway visibility windows, and user terminal handovers to maximize capacity.

### Reduced Operator Workload

The Orchestrator provides operators with actionable insights into network performance, enabling a competitive edge. It features automated deployment mechanisms for seamless configuration updates and sophisticated orchestration with external systems to minimize user disruption. By simplifying system management, it frees operations personnel to focus on optimizing system and network performance, driving efficiency and excellence.

## LEO & MEO Resource Management

LEO and MEO constellations require continuous adaptation as satellites move, links change, and gateway visibility evolves. The Orchestrator includes:

- Orbit prediction and pass scheduling, with real-time updates for ephemeris changes
- Gateway visibility and capacity allocation
- User terminal and beam handover optimization to maintain service continuity during satellite transitions
- ISL routing control, enabling resilient multi-hop connectivity across the constellation
- Adaptive power and spectrum management, factoring in constellation geometry, network element failures, and regulatory rules

By continuously optimizing resources as satellites move through their orbits, the Orchestrator ensures consistent performance, peak utilization, and resilient service delivery across LEO and MEO networks.

## Earth Observation Support

Utilizing awareness of ground station constraints, satellite capabilities, mission and data collection priority; the Orchestrator's task planning capabilities weigh the value of tasking activities across missions and stakeholders to deliver the greatest value possible from the spacecraft.

Dynamically coordinating commands, data downlink, and pass orchestration allows for a highly agile system which can respond to last minute changes in the operational environment.

Mission planning for scientific, earth observation, and SAR applications demands schedule arbitration and pass planning. The Orchestrator efficiently prepares and deconflicts mission demands on satellite assets. The Orchestrator executes pass schedules and coordinates with gateways and ground antennas to ensure seamless support. Orbit calculations are performed to determine contact opportunities and used to prioritize and prepare passes. Advanced ML algorithms can enable agile adjustments to pass plans, accommodating urgent commands or maneuvers with ease.

## A Complete Solution

- **Align Space and Ground:** Alignment of space resources with the ground segment to meet customer demands.
- **Plan Capacity Usage:** Deployment of resources at the right times and locations to deliver better services.
- **Interoperability:** A vendor-agnostic and standards-base solution which creates a resilient and adaptable network.
- **End-to-End Orchestration:** Coordinated automation of resource assignments and service allocations across payloads and ground platforms.



The Orchestrator provides interactive displays of network metrics, like traffic demand, for analysis and planning purposes.