

GILAT BLOG

Did you know? SkyEdge IV is the leading ground segment solution for the Elastix Era

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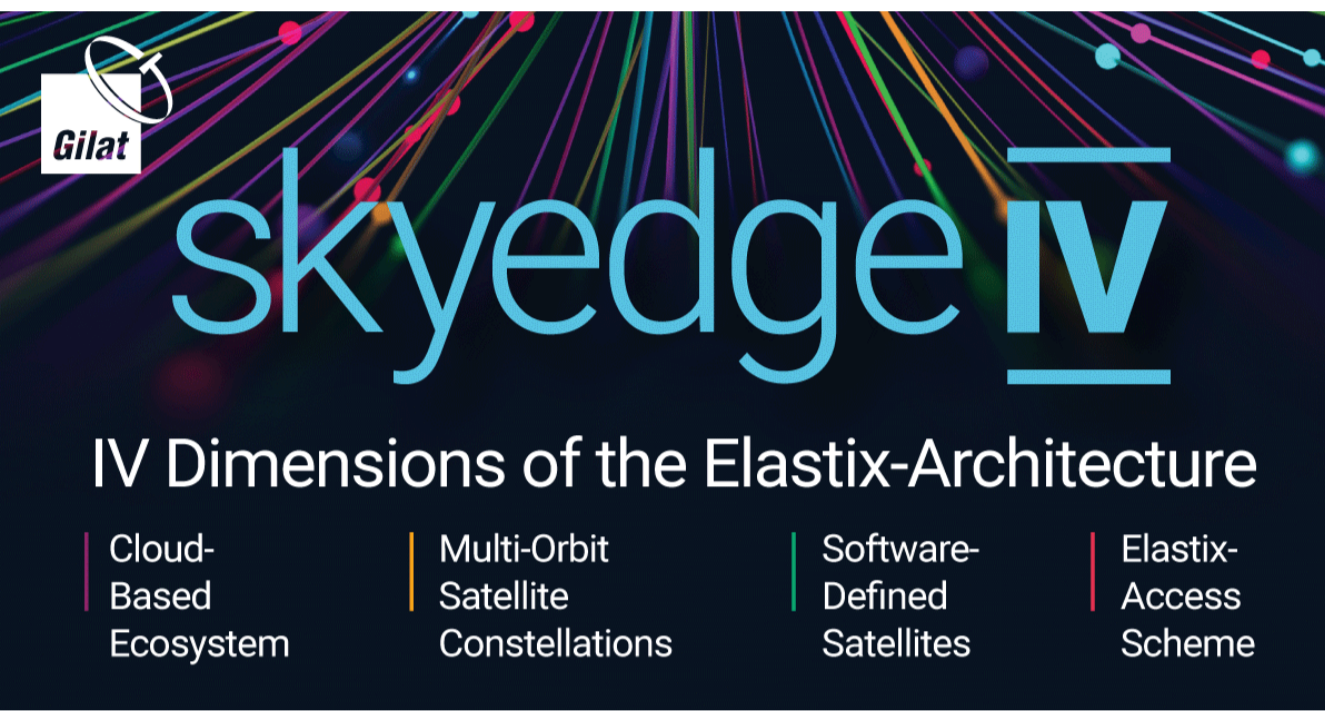
The satellite industry is undergoing tremendous innovation and change. The launch of Non-GEO Stationary (NGSO) constellations and highly configurable software defined satellites are offering the industry unprecedented increases in bandwidth and flexibility. But while these new satellites and digital payloads offer a profound step up in capability, they are also introducing far more complexity, and growing the need for tight integration between ground and space.

This next generation of satellite communication, including multi-orbit constellations and very high throughput satellites (VHTS), was named the Elastix Era by Gilat. The advancements in this era enable ubiquitous connectivity for fixed and mobility sites anywhere at land, sea and air, answer the promise of the cloud, 5G, IoT and enable superior service for mobility, defense, cellular backhaul and the enterprise markets. Disruptive innovation is required to provide the needed higher throughput and flexibility. A major enabler of this revolution is the ability to provide orchestration and harmonization between the ground equipment and the whole new software defined space.

This was the driving force in the development of Gilat's latest ground segment technology, SkyEdge IV. The ideal solution for the Elastix-Era of satellite communication, SkyEdge IV addresses the major satellite industry challenges of requiring higher network capacity, at a lower cost, with ensured availability, lower latency and higher throughput.

More specifically, Gilat's SkyEdge IV is a multi-orbit, multi-service platform built to work in harmony with software defined satellites and supports the cloud software defined network (SDN) centric infrastructure. To orchestrate network management for a unified network, the platform is also equipped with Elastix-TotalNMS. SkyEdge IV also includes Aquarius, a family of ultra-high-performance VSATs reaching over 2Gbps total throughput.

Furthermore, SkyEdge IV is a scalable software-centric platform that provides superior operational efficiencies and VSAT backward compatibility to preserve SkyEdge II-c customer investment.



SkyEdge IV Elastix-Architecture

SkyEdge IV, with its Elastix-Architecture, is built around IV basic dimensions that are key to next generation satellite communication:

I. Multi-Orbit Satellite Constellations: SkyEdge IV supports multi-orbit satellite constellations and Very High Throughput Satellites and provides seamless handover between orbits.

The first key dimension of the Elastix-Architecture is the expansion from GEO satellites to include VHTS and NGSO constellations. The increase in orders of magnitude of bandwidth using VHTS and the introduction of low latency orbits opens satellite communication to unprecedented opportunities that include expansive 5G coverage, high throughput applications such as demanded on cruise ships and airplanes, as well as opportunities for delay-sensitive applications.

The Elastix-Architecture addresses the multi-orbit operation of any satellite constellation, GEO, medium earth orbit (MEO) or low earth orbit (LEO), including seamless handovers between orbits, implementing 'make before break' for an uninterrupted and transparent user experience.

GEO, MEO and LEO constellations will continue to live in harmony as complementary technologies, each with their own advantages. It is important to enable multi-orbit, per application and per region configuration with varied service options and to deliver orbit redundancy. The elastic multi-orbit operation must allow users to continue to enjoy uninterrupted service that is completely oblivious to the orbit switch.

II. Cloud-Based Ecosystem: SkyEdge IV brings the agility and dynamic nature of the cloud to satellite communications, enabling demand-based network elasticity and dynamic scaling, while providing outstanding compute density.

The second key dimension of the Elastix-Architecture is the cloud-based ecosystem. The rising power of elastic cloud computing helps businesses improve their internal processes. They get better results, improve operational efficiency and ultimately increase the bottom line.

Cloud solutions correctly select and assign the right resources to a workload or application in order to achieve optimal efficiency. The resources are scalable and elastic in near real-time and are metered by use. Systems are primarily software, demand based with efficient and dynamic network scalability. Resources are used only as needed to meet surges in demand as they arise.

In next generation satellite communication systems, cloud elasticity is the way things are done. Virtualization and the ability to work seamlessly in a cloud environment support a cloud infrastructure and flexible data-throughput, thereby providing significant improvements to the economies of scale. Furthermore, one of the greatest benefits of the cloud is its flexible business model; the ability to pay based on what you use, is of course most relevant for the Elastix Era.

Gilat's SkyEdge IV is next-generation ready with a cloud based elastic architecture leveraging cloud technologies. This enables satellite operators to have a ground segment that can be easily integrated into the common computing infrastructure. In turn, operators can scale up/down based on the real-time network needs and thus increase their operational efficiency and reduce operational costs.

III. Software-Defined Satellites: SkyEdge IV enables software-defined satellites to work in harmony, creating an elastic network that constantly adjusts, to always be in sync with ever-changing conditions and service policies.

The next major dimension of the Elastix-Architecture is the innovation of Software-Defined Satellites (SDS) that influence and shape next generation satellite communication. SDS have the elastic capabilities to modify beams, bandwidth, power and connectivity as needed. The smart satellites of the Elastix- Era allow for programmable Software-Defined Networks (SDN) that support on-the-fly changes to optimally address dynamic network changes.

To accommodate SDN, SkyEdge IV plays a major role in providing elasticity to enable the required dynamics from such networks in several ways:

First, scalability is enabled with any beam structure and at any demand allocation. This gives a great advantage for network scaling not limited by beam coverage, bandwidth and peak throughput. Scalability enables a ground infrastructure that is better optimized to reduce throughput with smaller footprint, while capacity is added only as network utilization increases. This includes accommodation of day-one operation over a large coverage area, scaling up with increased bandwidth, an increase in users and expanded geographic coverage, as well as support during the network maturity phase and accommodating ongoing, changing demands.

Furthermore, SkyEdge IV's Elastix-Architecture also allows dynamic capacity steering of resources between beams to answer real-time changes in terminals throughput demand over specific geographic locations. No longer is it required to allocate the throughput demand carrier size and compute power ahead of time. The inefficient "design to peak usage" is no longer relevant. Allocation of resources is elastic at the point where demand meets accurate supply.

IV. Elastix-Access Scheme: SkyEdge IV provides a unique Elastix-Access Scheme that adapts to any application, combining TDMA agility with elastic SCPC efficiency.

The fourth dimension of the Elastix-Architecture is Gilat's superior highly efficient and flexible access scheme. The Elastix-Access Scheme is designed to optimally fit a variety of applications ranging from high throughput data intensive applications, to low throughput applications such as IoT. The Elastix-Era requires optimization, with terminal speeds moving from Kbps to Gbps, providing fast and dynamic adaption to change with maximum efficiency and minimal overheads. Gilat's Elastix-Access Scheme utilizes an innovative dense coding algorithm, named XDC for elastiX Dense Coding, to provide better space segment utilization and a more robust signal.

SkyEdge IV's Elastix-Architecture estimates the terminals required bandwidth and RF capability 40 times per second, calculates the optimal power, MODCOD and BW allocation to provide the best quality of service with maximum efficiency. The satellite access is planned and executed for best service availability with continuous power and MODCOD adjustments, to most efficiently and dynamically fit the SLA quality planned.

With full ACM, TDMA, elastic SCPC, dynamic allocation map, superior XDC coding, fast allocations, embedded protocol and header optimizations, all integrated with advanced QoS; Gilat's Elastix-Access Scheme provides operators with the most efficient, optimal, robust tool for a most demanding and versatile network applications.

SkyEdge IV is Quickly Becoming the Platform of Choice

Gilat has been revolutionizing the satellite communications industry for over 3 decades, bringing solutions to millions of people worldwide and as such taking part in closing the digital divide.

Gilat is continuing to innovate and lead the industry with SkyEdge IV, a deep-tech software-centric ground-segment platform to address the needs of the Elastix-Era.

The revolutionary SkyEdge IV ground segment platform for the new era of satellite communications, has already been chosen by the leading satellite operators such as SES and Intelsat, due to its outstanding capabilities discussed above.

To learn more, please contact us at: info@gilat.com