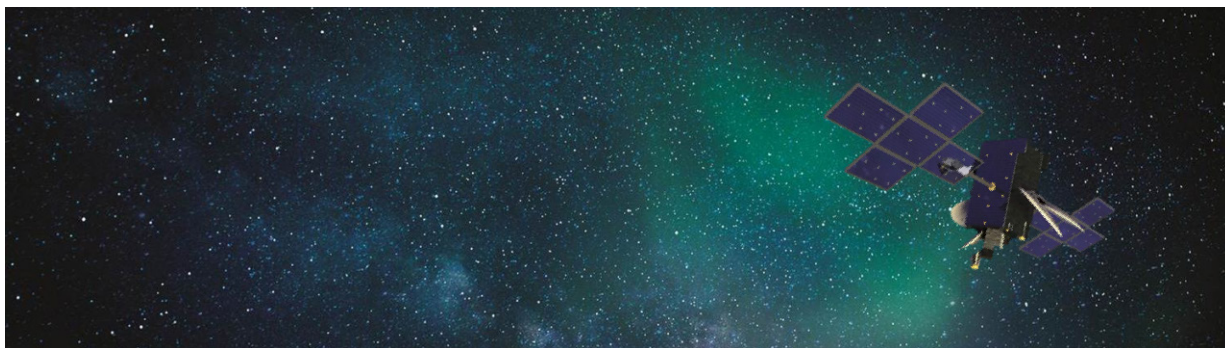


Cisco Satellite Services Platform Delivering Managed Services over Satellite



With the increase in available bandwidth from the launch of high-throughput satellites, satellite service providers need a service delivery infrastructure to meet user experience expectations and to monetize differentiated service offerings.

An intelligent satellite services platform from Cisco helps assure the proper allocation of network resources, based on what subscribers have purchased and what the network can deliver. The solution also supports the rapid and efficient deployment, management, and monetization of basic and advanced service offerings, such as service tiers, individualized price plans, prepayments, and a growing array of application services.

As satellite communications evolve from isolated stubs to become integrated with terrestrial networks, satellite service providers need to converge their management and ground technology with the standards-based approach used in terrestrial wireless networks. Integration with terrestrial service providers is essential to future profitability and partnerships. Satellite service providers can simplify the network through integrated functions and services to achieve:

- Simpler manageability
- Fewer points of configuration
- Consolidated accounting and billing
- Increased network efficiency through integrated policy enforcement
- Ease of implementing common subscriber policy use cases

Cisco provides a satellite services platform architecture, which incorporates the evolved packet core (EPC) satellite radio access network (SatRAN) solution to enable managed services delivery for differentiated user experiences over satellite communications. The EPC SatRAN solution uses 3rd Generation Partnership Project (3GPP) standards to address operator requirements for intelligent and scalable service delivery. This architecture incorporates the Cisco® ASR 5000 Series multimedia core platform, the Cisco Quantum™ Software Suite, Cisco Prime™ for service providers, and Cisco Unified Computing System™ (Cisco UCS®) server platforms. It provides a range of features and important attributes that are crucial for service delivery solutions today: scalability and reliability, multiaccess flexibility, and service velocity.

Service Delivery Challenge for Satellite Communications

Satellite communications service providers face at least two important challenges:

- How to transparently integrate with terrestrial networks of wireline and mobile wireless communications to better serve end-user customers.
- How to monetize the bandwidth proliferation expected during the next three to five years

Satellite service provider business models are also under pressure because enterprise customers no longer want to buy circuit-switched “pipes” and instead demand managed services. Satellite service providers are transforming sales models from selling bandwidth by the MHz to selling IP services by the Mbps or to full managed services, delivering business outcome service-level agreements (SLAs). This transition in business models requires a corresponding change in technical delivery to enable differentiated subscriber management to monetize these new sales models and deliver expected user experiences.

The expected fivefold increase in available bandwidth, combined with business model transformations, marks an inflection point in the satellite market. The transformation in satellite services will be similar to the change in the late 1990s for the telecommunications wireline industry, when it transitioned from the traditional “circuit-switched” model with time-division multiplexed (TDM) voice to an all-IP infrastructure. The industry introduced new services that were more relevant to customer needs and were offered at a differentiated pricing tier. They also provided greater efficiency and speed of deployment than were previously possible.

The satellite communications market is on the cusp of a similar change, requiring satellite service providers to migrate to an IP-based managed services model.

Business Benefits for Satellite Service Providers

The Cisco Satellite Services Platform is a modular, scalable architecture that supports multiple access types and flexible subscriber management, underpinned by common policy management and enforcement. The solution uses terrestrial research and development (R&D) investments in mobile wireless technology and standards using Cisco validated IP architectures.

The Cisco elastic EPC supports multiple SatRANs, creating a unified network across multiple hubs with interoperability at both the data and control planes across multiple platforms. This increases operational efficiency and reduces operational complexity. The virtualized service delivery framework lets the operator “build once and sell many.” In addition, centralized subscriber management, services, and policy are obtained without unnecessary duplication of hardware and systems. Optionally, policy enforcement may be distributed within the infrastructure elements to support larger remote communities. Virtual network operator (VNO) capability enables multiple commercial and government entities to share the service provider’s common platform in a secure manner.

At least four business benefits are made possible with the Cisco EPC SatRAN solution:

- New revenue generation through support of both consumer broadband and enterprise business class services by harnessing network intelligence provided by a single control layer of elastic EPC
- Differentiated services through innovation enabled by the Cisco Quantum Software Suite
- Operational expense (OpEx) reduction by managing satellite access in a fashion similar to that of terrestrial mobile wireless access networks
- Service optimization through a unified management layer across heterogeneous networks plus satellite by Cisco Prime

The technical benefits of the Cisco Satellite Services Platform include:

- Uses terrestrial R&D investment in mobile networking
- Delivers managed services using Cisco validated IP architectures
- Supports multiple SatRANs concurrently
- Virtualizes service delivery: “build once, sell many”
- Supports circuit-switched to IP managed services transition
- Integrates VNO capability for secure hosting and multiuser models
- Incorporates flexible subscriber management and policy enforcement

Cisco Satellite Services Platform and EPC SatRAN Solution

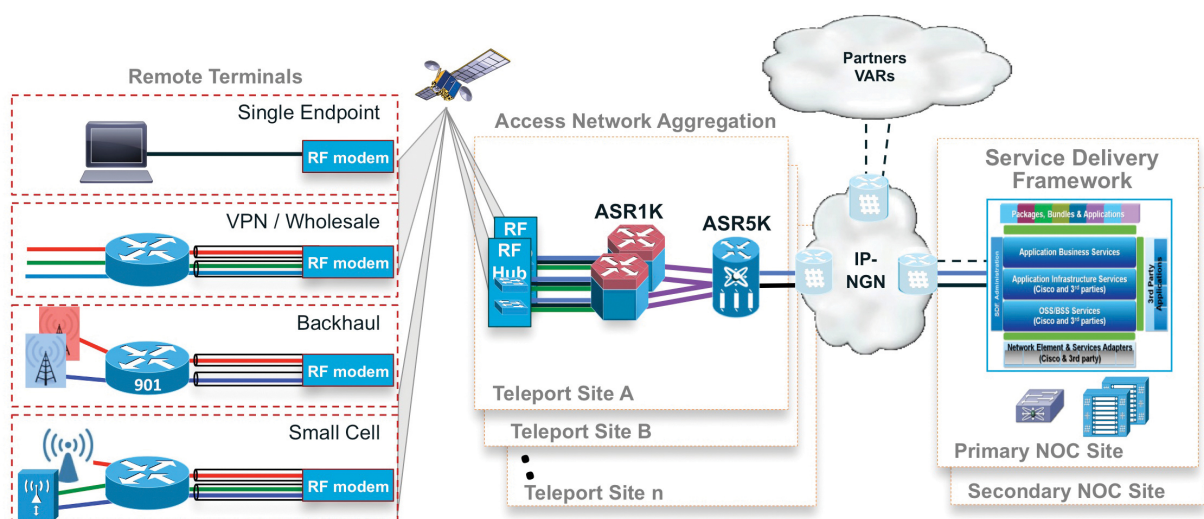
The Cisco Satellite Services Platform architecture encompasses solution elements supporting delivery of managed and cloud services, both over satellite and as part of an integrated, or hybrid, heterogeneous network (see Figure 1).


The major system elements include the:

- Services delivery framework (Cisco Prime, Cisco Quantum Software Suite, data center systems)
- IP next-generation network (NGN) (Multiprotocol Label Switching [MPLS] core)
- Access network aggregation (EPC and access gateways integrating multivendor SatRANs)
- Mobile edge or remote terminal, which includes customer premises equipment (CPE) routers, plus auxiliary devices such as small cells or wireless LAN systems

The remote terminals may provide remote service delivery functionality, including distributed access gateway functionality to complement the centralized deployment models for larger, multi-VPN sites. The architecture's foundation is the policy management framework inside each system element, providing maximum flexibility to deploy and manage services with the ability to enforce policy throughout the network.

Figure 1. Cisco Satellite Services Platform Architecture





The end-to-end Cisco Satellite Services Platform architecture, incorporating the Cisco EPC SatRAN solution, brings together several primary components, including:

- A new Cisco elastic EPC systems release: a validated design providing network intelligence for controlling and managing mobile SatRAN traffic.

Anchored in:

- The Cisco ASR 5000 Series, enabling a trusted non-3GPP radio access network for existing or new satellite systems in low, medium, or geostationary Earth orbit (LEO/MEO/GEO).

Working closely with:

- The Cisco Quantum Policy Suite, to enable innovative wireless Internet services, superior quality of experience, and new levels of network efficiency when used with context-aware analytics for monetization.

The Cisco Satellite Services Platform architecture and EPC SatRAN solution also demonstrate how communications service providers and satellite operators can offer multitenant, cloud-based services, such as infrastructure as a service (IaaS) and platform as a service (PaaS), to their channel partners or end-user consumers. The architecture provides the satellite industry with a standards-based approach to integrate satellite networks with terrestrial wireless networks, creating managed service models that can be developed once and deployed multiple times.

The Cisco solution enables satellite service providers to:

- Remove complexity from current satellite deployments, which makes the networks brittle and unresponsive to change
- Reduce OpEx by managing satellite communications like other wireless access networks
- Increase service velocity to deploy new offerings to customers
- Use satellite as the middle mile in a cost-effective method
- Consistently manage the end-to-end solution with integrated heterogeneous networks
- Support both consumer broadband and enterprise business-class services in the same platform
- Enforce policy throughout the network on a subscriber basis to improve monetization

Cisco offers more than products; we offer a deployable solution. We have a dedicated Advanced Services team that is experienced in delivering large commercial solutions. To help service providers deploy the solutions efficiently and successfully, Cisco offers professional services for custom design, implementation, integration, and support of the satellite network. With this approach, Cisco is in a unique position to help operators go to market quickly with new and enhanced satellite-based managed services.

Intelligent Networking

The Cisco Satellite Services Platform is an intelligent network architecture that enables new, connected experiences and new operational efficiencies that can change the way we work, live, play, and learn. It enables satellite to integrate into the Internet of Everything (IoE), intelligently connecting people, processes, data, and things with greater intelligence, security, and efficiency than ever before.

The EPC SatRAN solution delivers an elastic, flexible architecture of infrastructure and software with intelligence that enables satellite services providers to spend less time running the network and more time promoting innovations that can differentiate and transform their business. It allows operators to deliver differentiated user experiences, even to remote sites across satellite connections.

Why Cisco?

Cisco offers a comprehensive, end-to-end, intelligent wireless Internet architecture and solutions that provide satellite service providers with a range of features that allow them to enhance the existing customer experience, assure differentiated services, create new business-to-business and business-to-consumer service models with partners, and rapidly develop and launch innovative new services. Cisco has the breadth of products, technologies, and experience to provide a scalable and high-performance, carrier-grade satellite services platform solution and the expertise to help customers implement it for measurable benefits. Cisco provides expertise in mobile Internet that helps satellite service providers monetize the EPC SatRAN infrastructure.

The Cisco ASR 5000 Series provide a standards-based, market-leading EPC solution, integrating the control plane intelligence with the elasticity and scalability required to meet the performance demands of a heterogeneous network infrastructure. This capability, coupled with the Cisco Quantum Policy Suite, helps to make sure of differentiated services delivery optimized for quality of experience, supporting service innovation, and monetization.

Cisco Services

Cisco Services have unparalleled experience and expertise implementing converged network deployments and integrating systems and network services. We help operators speed time to value and resolve issues quickly using specialized tools, best practices, a collaborative delivery model, and an extensive global support infrastructure.

As operators plan, build, and manage the Cisco Satellite Services Platform, we promote success through a lifecycle approach customized to specific needs. Software-enabled smart service capabilities provide better visibility, better information, and better understanding at every stage:

- Plan: Create an agile infrastructure and cost-effective strategy with service capabilities ranging from architectural consulting to detailed design.
- Build: Speed time to value and reduce deployment risks through solution validation, solution integration and deployment, and migration support. Validate that the solution meets requirements through specialized labs for interoperability testing and system verification testing.
- Manage: Improve performance, availability, and resiliency; reduce costs through service offerings that provide better network insight; help improve network inventory management and health; and identify and mitigate potential problems before they can affect the network.

Satellite service providers can realize the full value of the Cisco Satellite Services Platform and the EPC SatRAN solution with professional and technical services from Cisco together with our partners. We can help mitigate risk, accelerate time to market for new revenue-generating services, and improve the end customer's experience:

- Cisco provides end-to-end solutions, allowing service providers to deliver high-quality user experiences through their satellite networks and to monetize and optimize their networks.
- Cisco Services provide technical expertise (including expertise on third-party equipment) across all phases of the network lifecycle, from design, testing, and implementation to network operations.
- Cisco Services-led deployment accelerates time to market and mitigates operational risks with SLAs.
- Service providers benefit from our cumulative experience across many wireless Internet solution deployments worldwide.

For More Information

For information about the Cisco EPC SatRAN solution for delivering managed services using the Cisco Satellite Services Platform, visit www.cisco.com/go/mobile or contact your local Cisco account representative.



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