

Planning a Satellite 5G Future



A Fully Connected World

The future of telecommunications is bright, with new users coming online in Latin America, Middle East and Africa, and Asia Pacific. Billions of devices are being added to the Internet of Things (IoT) and connected vehicles are emerging as a new market. Meanwhile, passengers and crew alike are hungry for high-speed broadband access on cruise ships, yachts, cargo vessels, fishing vessels, commercial airliners, and private jets.

All this demand is driving projections for total global IP traffic to rise 24%¹ year-after-year and mobile data traffic to accelerate at even faster 47%² year-after-year. Rapid growth is expected for the foreseeable future because people are insatiable in their desire for connectivity.

Fiber and cellular alone won't satisfy all the needs. Satellites can also play a critical role in enabling global connectivity. High Throughput GEO and new MEO and LEO constellations are dramatically expanding satellite capacity that can help absorb this growth.

To gain fullest advantage of this opportunity, satellite service providers must undergo a transformation, becoming part of the converged solution in a seamlessly integrated world.

Future Expectations

End users are no longer satisfied by basic connectivity. Customers expect a blend of connectivity options, seamlessly transitioning between WiFi, cellular, and VSAT coverage as they move from place to place. They want personalized services that are highly adaptable as they change applications. And they don't want to wait weeks or days to activate a new plan or modify a service feature.

This means satellite service providers will need to achieve new levels of agility and partner closely with other access networks. This is no small task, as satellite communication has tended to exist through separate networks relying on manual processes and isolated management structures. At the same time, satellite service providers will need to find ways to incorporate these expanded capabilities while lowering operating costs to make satellite competitive on a broader scale.

Fortunately, satellite service providers are not the only ones trying to become more agile while lowering costs. Global telecom is working on a plan to resolve the same challenge.

¹ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper. Cisco, March 2017.

² The Zettabyte Era: Trends and Analysis. Cisco, June 2017.

Get Ready for 5G

Every decade, cellular communications makes a big leap forward. From 1G's rudimentary analog voice calls in the 1980s, we've reached advanced digital communications over 4G LTE. Now the telecom industry is developing the next generation of cellular networks, called 5G.

Although not expected to be deployed until the early 2020's, the telecom industry hopes that 5G will become a master wireless platform, able to merge mobile cellular, fixed broadband, and local area networks into one converged solution. To accomplish that and broaden the applications supported, the industry is designing this new network to support faster speeds, greater capacity, massive scalability, ultra-low latency, and high reliability.

5G is relevant to satellite communications in several ways. First, the satellite industry can learn from the underlying technologies instead of trying to invent proprietary solutions. Second, satellite networks will need to support 5G data and management interfaces in order offer viable 5G extensions through broadband and backhaul VSAT links. Third, satellite has opportunity to become part of a multi-access solution and enter new markets, such as connected cars capable of receiving both cellular and VSAT.

Foundational Principles

The telecom industry is building the 5G revolution upon technologies such as network programmability, function virtualization, and service orchestration. Satellite service providers can align with this vision by adopting the same foundational principles:

Software Defined Networking (SDN) – separates the data plane from the control plane, so control plane decision-making is centralized through a programmable interface.

Network Function Virtualization (NFV) – pulls network functions out of boxes and turns them into pieces of software that operate as needed within the cloud.

Service Orchestration – automates the provisioning workflow using service chaining to reduce the time for implementing network changes from weeks to minutes.

Evolved Packet Core (EPC) – manages the complexities of an ever changing mobile network, making sure the user can access from anywhere and maintain the expected services.

Through satellite 5G, service providers will be able to exchange inflexible, hardware-based networks for reconfigurable, software-based networks. Embracing a 5G-based architecture will elevate the relevancy of satellite communications as a tier one participant in global telecom. Toward that end, iDirect has started researching how to best incorporate SDN, NFV, and EPC within a standardized satellite architecture that is easier to integrate and deploy.

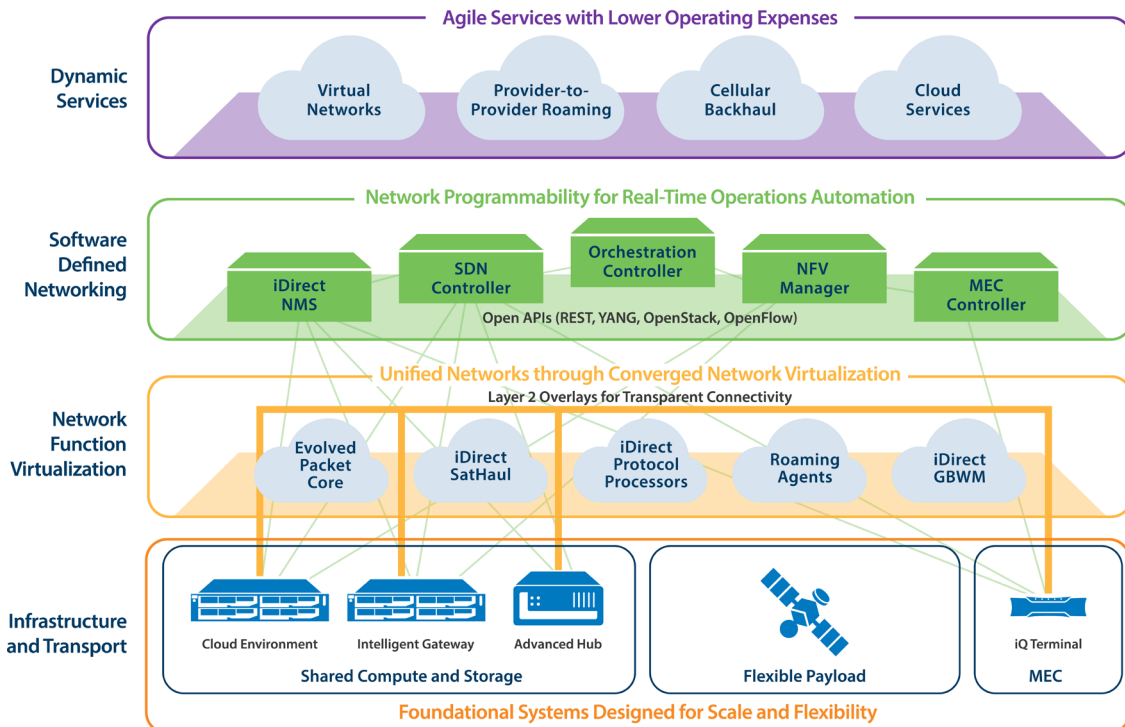
Partnering for a 5G Future

Satellite's global coverage across land, sea, and air is a powerful asset that extends the reach of telecoms. Through satellite-based 5G, telecoms will be able to integrate satellite communications into their broader networks as easily as any other 5G compliant solution, making VSAT a true "plug-and-play" solution.

iDirect is leading the industry toward a transformative architecture that will empower satellite service providers to realize fully dynamic, service oriented satellite networks. This goal requires cross-industry collaboration and unified standardization that brings satellite into the emerging 5G architectural domain.

Join us as we participate in international organizations such as the EU's Satellite and Terrestrial Network for 5G (SaT5G) program, ESA's Satellite for 5G initiative, European Telecommunications Standards Institute (ETSI), and 3rd Generation Partnership Project (3GPP). Working together, we'll guide satellite into a new era of opportunity.

Conceptual Satellite 5G Architecture



To learn more, please visit IntelligentPathForward.com/Satellite-5G