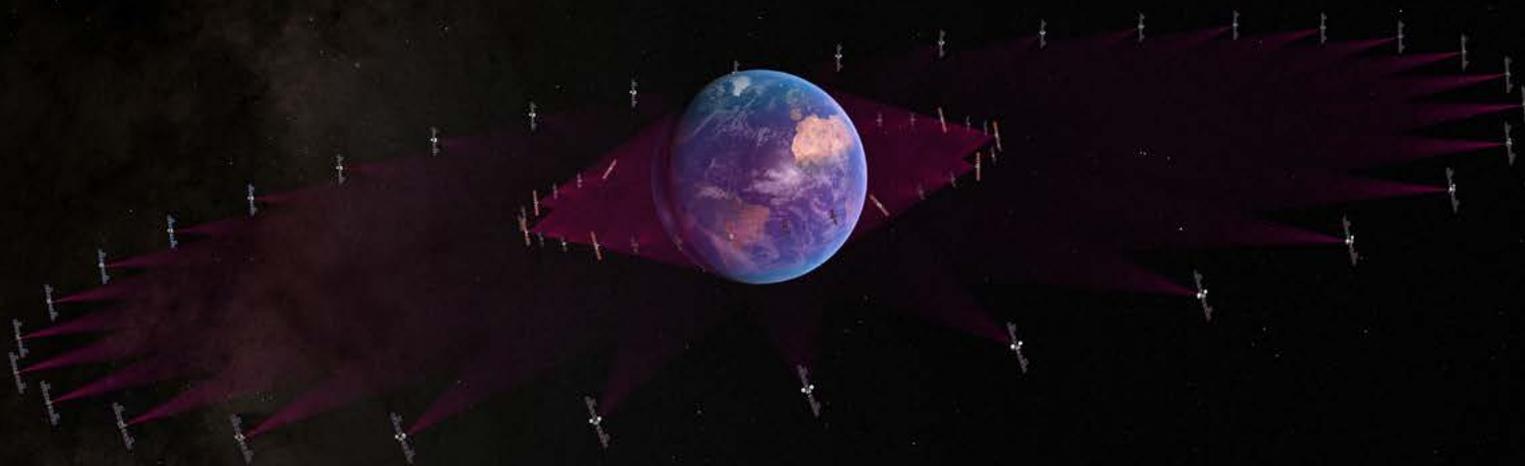


innovations

Focusing on innovation in the global cruise industry

Cruise ships to take advantage of new MEO satcoms system



Special Report
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Cruise ships to make use of the cloud

Last month, satellite communications service provider, SES' unveiled O3b mPOWER, a medium earth orbit (MEO) satellite system.

The company claimed that the new satellites will provide additional network diversity, service resiliency and gigabit connectivity when the first batch goes live next year.

This move comes as more critical workloads are moving to the cloud, including operations on board cruise ships.

SES' current O3b and forthcoming O3b mPOWER systems operate in MEO, around 8,000 km above the earth's surface. When fully operational in 2022, O3b mPOWER will deliver increased flexibility and throughput speed and capacity, for example, multi-gigabit connectivity to the maritime, telecommunications and aviation industries.

The company's O3b mPOWER customers include Orange, which has maritime clients, for enhanced enterprise and mobile networks, plus major major cruise ship operators, such as Carnival Corp and Virgin Voyages.

Once delivered, the constellation will consist of 11 satellites all manufactured by Boeing.

The first three satellites are currently being tested and undertaking systems integration at Boeing's satellite facilities in El Segundo, Calif in preparation for their launch in December of this year.

Being software-driven, the O3b mPOWER communications system is capable of delivering intelligence-driven connectivity services from tens of megabits to multiple gigabits per second, enabling customers to optimise their global bandwidth availability and resiliency.

SES also revealed that Microsoft was the first major company to sign up for O3b mPOWER. Microsoft will use the MEO services for additional network diversity, service resiliency and gigabit connectivity as more critical workloads move to the cloud.

"We believe that O3b mPOWER, defined by software and network elements based on 5G technologies, will provide a unique combination of flexibility and universal access," said Jean-Luc Vuillemin, Executive Vice President, International Networks of French-based telecommunications provider, Orange. "Adding 5G standards to the already flexible and software-driven satellite opens a new range of possibilities. O3b mPOWER could seamlessly complement both our international and customer networks, that's why we decided to go with SES."

He added that Orange still viewed the satellite as a key technology for the future.

"People thought we were insane to suggest that we could have cloud services on a cruise ship," said John

Padgett, Chief Experience and Innovation Officer, Carnival Corp. "With O3b mPOWER, we're transitioning into an operation that is fully synchronised with the cloud and cost efficiently moving into gigabit services for cruise ships."



Carnival Corp's John Padgett

He also said that the new service had been on Carnival's radar for more than three years.

"We go from serving the top 50 cruise ships on the planet to every single cruise ship on the planet," Steve Collar, SES Networks CEO said at a presentation, adding that this was the world's first terabit per second constellation.

In 2017, Carnival's Princess brand introduced its patented Medallion concept, whereby guests can remotely interact with services on board, plus access other functions.

Central hinge pin

For Carnival Corp, high-speed MedallionNet Wi-Fi, created in partnership with O3b, was the 'central hinge pin' for the entire MedallionClass experience. Padgett stressed that connectivity was 'beyond fundamental', as was reliability when transferring an entire operation from an offline system to an online operation that is fully synchronised with the cloud.

He explained that during the COVID-19 led shutdown of the cruise sector, Princess installed the Medallion system on every vessel in the fleet.

"With O3b mPOWER, we're transitioning into an operation that is fully synchronised with the cloud and cost-efficiently moving into gigabit services for cruise ships," he said.

He explained that 10 years ago, a cruise ship had around 10 megabits per second of connectivity, improving to 50 Mbps five years ago. MedallionNet has since taken the capability to more than 400 Mbps. "There are literally millions and millions of data points a day we're running in our global operations centres with a mobile platform like a cruise ship, which is enabled by the service," he said.

He also stressed that you cannot transform your business by using latent information in intelligence but

rather with real time information.

Padgett likened this transformation to making the cruise ships the world's first truly smart cities, providing every service — safety, health, hotel, casino gaming, recreation, spas, etc. He said that all of these services were now completely online.

He explained that several cruise ships will normally arrive and depart from Miami over a weekend, thus creating a huge peak in satcoms demand. By being flexible, the new service will be able to switch connectivity to where it is needed.

When every product and service and experience is fully available on a unified platform and then fuse this with connectivity, it essentially gives unlimited services, which are unique to an individual, he explained, adding that a ship's crew will also benefit from the increased connectivity. In addition, any terminal is capable of acting as a gateway.

With O3b mPOWER, SES claimed it was creating a cloud-scale operational environment that will leverage cloud networks to provide leading data analytics, geospatial tools, machine learning, and AI services.

The first batch of three O3b mPOWER satellites will be launched by SpaceX from Cape Canaveral in December, 2021, followed by two more launches in 2022. The constellation is due to start delivering services in the third quarter of 2022.

Talking with Gregory Martin, SES' Vice President, Product Management, Maritime, he explained that

SES Network's Global Mobility Platform is unique in the market, as the company uses a combination of low latency Medium Earth Orbit (MEO) and Geostationary Earth Orbit (GEO) services.

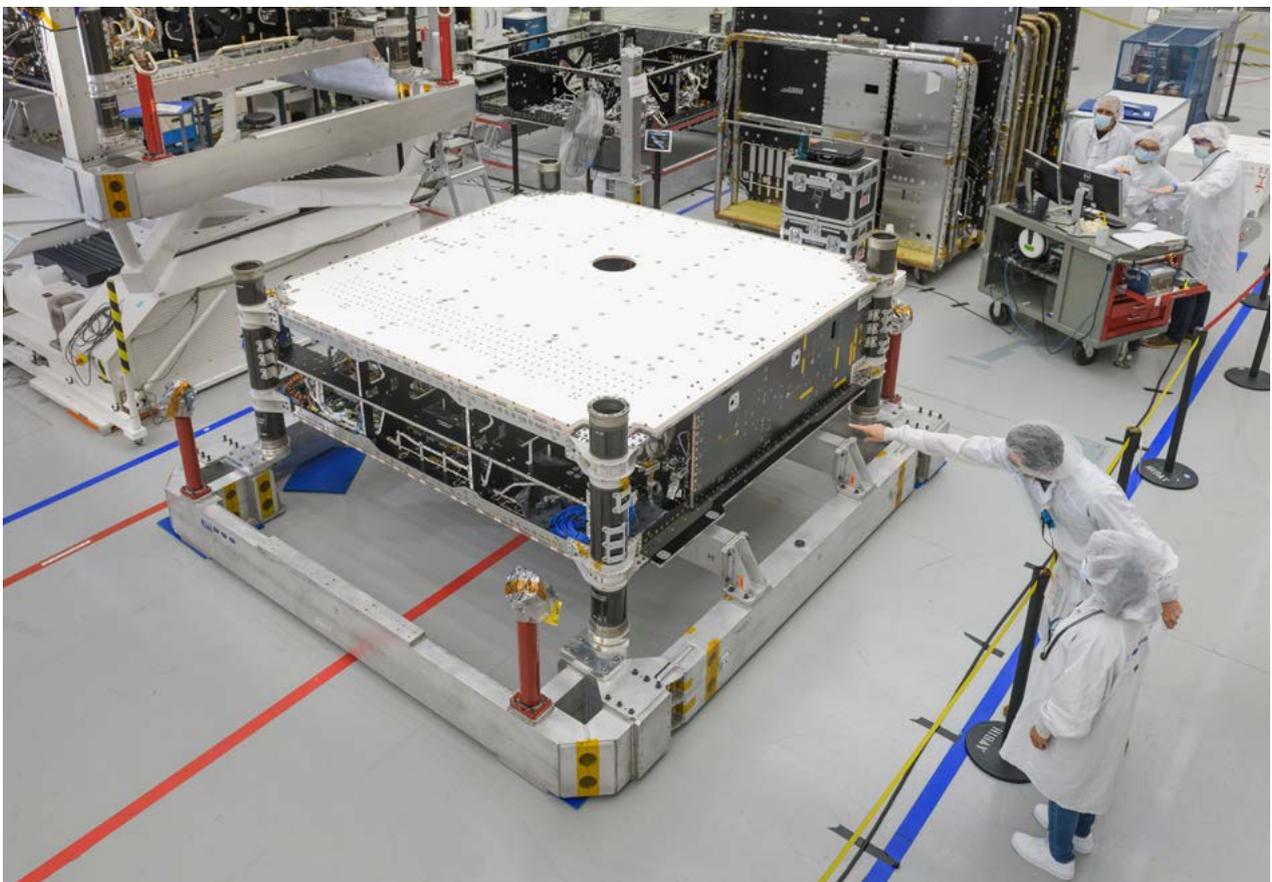
SES' platform covers 99% of the of the world's population and enables vessels to receive a strong and reliable signal, no matter where they're voyaging, and delivers the fastest and most reliable connectivity to the maritime market.

The cruise operators served make use of both these satellite constellations, adding that four out of the top five major cruise operators have contracted for connectivity services using the upcoming O3b mPOWER MEO system on board their vessels, powering some of the most technologically advanced cruise ships in history.

Alongside this, SES is the provider of choice for many of the niche and newer cruise lines – supplying them with the flexibility and reliability they need to grow, he claimed.

System upgrades

Martin also said that all customers will be upgraded to O3b mPOWER over time, as the new system offers the highest level of service and flexibility. "With that said, we have the benefit of our existing MEO services, which will also continue to provide service as needed during the transition. In the end, our robust multi-orbit solution will prove to be the best offer in the industry for ships of all sizes," he said.



One of the satellites under construction in California



SES' Gregory Martin

The new system is built on the foundation of the existing solution, leveraging Ka band and the associated equipment. However, technology evolves over time and therefore there will be an upgrade kit provided to existing ships to enable them to leverage O3b mPOWER's full capability. Going

forward, all new installations and new ships will have the ability to support O3b mPOWER built into their solution, he explained.

As for costs, he said that capacity cost and more importantly, the cost to provide the best guest experience anywhere continues to be priced at market rates. "This means that there will continue to be pressure to provide the best possible service at the lowest price, but we also see that the connectivity service is one of the top 10 requirements for that amazing guest experience on board," he said.

He revealed that the high bandwidth, low latency data connectivity is also providing cruise lines with the digital capabilities of land-based terrestrial competitors. Yet, cruise lines have gone far beyond what land-based resorts are offering as they leverage this data to provide seamless, truly carefree vacations through wearable technologies and endless customisation.

"The same principle applies to operational technologies," he added. "SES cruise customers have already recognised the potential that reliable, high bandwidth connectivity represents to streamline operations.

"Many owners have already radically improved the cost efficiency of their on board systems with connected condition monitoring, allowing problems to be diagnosed early by specialists ship centres ashore and guiding crew on repairs.

"Going forward, the higher capabilities of O3b mPOWER will make it easier to implement these technologies, and allow owners to go further. In the future, all major cruise lines will be able to utilise millions of data points throughout their vessels in real time to optimise maintenance and plan ahead by creating digital twins," he advised.

As for the new breed of expedition cruise ships designed for the Polar navigation, he said that SES's approach prioritises redundancy. The company's managed network uses a combination of MEO, GEO and land-based assets to provide ships with high-speed connectivity wherever a ship is.

As a result, an expedition cruise will never have to contend with wi-fi dead-zones and confused systems, and passengers will always be able to access the internet.

"O3b mPOWER will utilise the same systems, with an additional layer of automation that ensures that cruise ships have the highest speeds and lowest latency connectivity possible at any one time – even if the most remote location, outside of the 50 deg North or South latitude range," Martin concluded.

O3b mPOWER highlights

Unlike other non-geostationary orbit satellite systems (NGSOs), the upcoming O3b mPOWER system is fully-funded, built on commercially proven technology and based on a market-proven business case, eliminating business and operational risk for customers.

Originally announced in 2017 and on target to launch later this year, O3b mPOWER is backed by an ecosystem of technology partners and is designed for demanding applications with mobility, telecom, government and enterprise customers.

Even before the launch date, O3b mPOWER has achieved development and delivery milestones and major customer wins have already been announced.

Key details include:

- **Full system:**

O3b mPOWER comprises an initial constellation of 11 high-throughput and low latency MEO satellites, extensive ground infrastructure and intelligent software.

- **Capacity:**

Terabit-level system capacity based on dynamic ability to deliver thousands of uncontended managed services from tens of Mbps up to multiple Gbps per service.

- **Flexibility:**

Route customer traffic anywhere, optimise forward and return path bandwidth provisioning and control network resources to dynamically allocate capacity where needed.

- **Performance:**

Industry's most robust and comprehensive service-level agreement covering throughput, latency and availability.

- **Coverage:**

Expansive reach between 50 deg N and 50 deg S – covering 96% of the global population.