



1. Cybersecurity



2. Onboard Entertainment



3. Redundancy

# Top technology trends

With 23 new cruise ships set to launch this year, cruise operators are looking at ways to set themselves apart in this competitive environment. This means increasing crew and passenger satisfaction, maintaining a positive brand image and introducing latest technologies.

**W**ith continued growth projected, **Sanjay Singam, vp of Global Engineering, ITC Global** shares his top technology trends emerging as must-haves for cruise brands to remain relevant:

**1. Cybersecurity** – As data use for business operations increase, as well as that from the crew and passengers on board a cruise ship, cybersecurity may be the most important trend cruise operators will need to get ahead of, if they haven't already. The sheer volume of data, along with the increased implementation of cloud-based networks and applications, make cruise ships an easy and attractive target for cyber criminals. Ensuring security standards are up to date helps keep customer networks operational and brand reputations strong.

Now more than ever, operators need to update their security systems to make sure their customers' data remains secure for the duration of their trip, not just for their customers' sake, but also for the sake of their business. This includes installing

cybersecurity solutions and network updates that can protect operator, crew and passenger data.

Maintaining a secure network requires a multifaceted methodology to optimize resiliency and protection. This includes implementing a defense-in-depth approach to network monitoring, where multiple layers of security are implemented to mitigate the impact of a compromise or breach of any one layer. This ensures that a compromise in one device results in unexpected traffic being detected by the layers on either side of the compromised device, thus drawing attention to the breach. Additionally, this approach dramatically increases the time required for a malicious attacker to compromise the network, thereby giving additional time for Intrusion Detection systems to signal a security event.

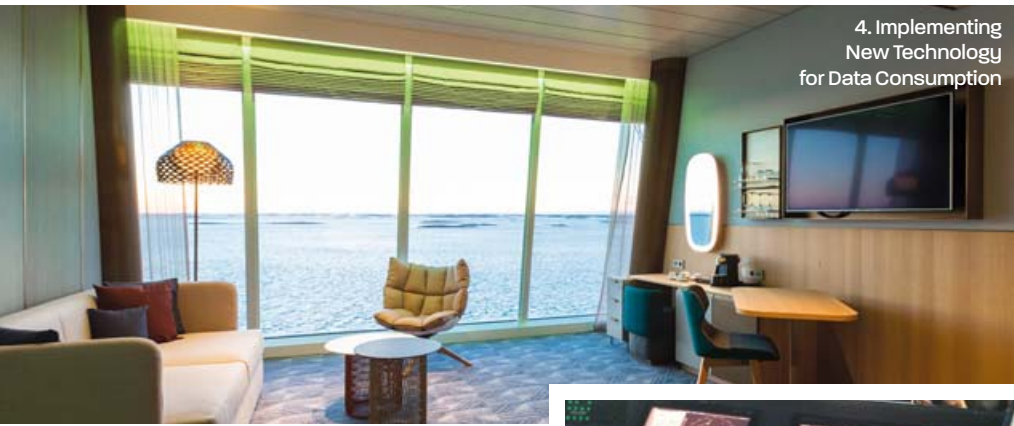
Building intrusion detection into the network design is also critical to a robust cybersecurity posture. Operating multiple internet transit ports with separate

providers and hub firewalling on each, and ensuring the network has multiple layers of resiliency to help mitigate risks, are all practices that can ensure operators are alerted to and protected from threats.

**2. Onboard Entertainment** – Crew members and passengers now expect to be able to connect to their social platforms, contact friends and family, and access their favorite TV shows and movies similar to their at-home experience.

With onboard streaming services and on-demand applications, cruise operators must consider how significant increases in data usage will impact not only day-to-day operations, but also the quality of the network service being delivered to passengers and crews.

This can be mitigated by creating dedicated bandwidth pools and separating allotted capacity between connectivity needed for business, and that of crew and passenger entertainment. In addition to securing bandwidth for each user set, Quality of



4. Implementing New Technology for Data Consumption

Service (QoS) and Quality of Experience (QoE) tools can also be layered on to the network to prioritize certain applications and block others. This enables operators to prioritize streaming services to further meet passenger demands, ensuring the continued satisfaction of their cruise guests.

**3. Redundancy** – Another cruise ‘must’ when it comes to connectivity and communications is network redundancy. Network issues and the inability to maintain connectivity at any point can put crew and passenger safety at risk and can put a strain on the cruise brand’s reputation.

A truly redundant system design includes leveraging multiple satellites with backup systems in place. This ensures that if a satellite connection is lost due to harsh weather or a system malfunction, another is already in place to ensure near-100 percent uptime. Taking this concept a step further, cruise operators can partner with service providers that are capable of managing advanced network intricacies, including switching between bands as necessary based on location, power and availability. The same strategy can also be applied to satellite beams themselves, as well as to ground equipment, including teleports. All this preplanning in the network design phase helps to safeguard against unforeseen issues and guarantees the highest levels of resiliency.

As cruise ships travel across the globe, they often move out of range of a specific satellite beam and into that of another. Manual switching between beams to maintain coverage can often cause connectivity losses for short periods of time because the switch is not triggered until there is a notification that the vessel is outside of the beam coverage area. Map-based automatic beam switching, however, helps ensure always-on connectivity by detecting when a satellite beam is weakening and searching for a new,



5. The Connected Ship

stronger beam in the region the ship is travelling in. Once a new beam is detected, an automatic switch occurs with a limited loss in connectivity.

**4. Implementing New Technology for Data Consumption** – As the leading consumers of satellite capacity, with no end in sight – cruise operators must leverage technology innovations and platform improvements to ensure that both ship operations and cruise guests alike can easily send and receive more data than ever before, at the fastest speeds available.

High-throughput satellites (HTS) leverage spot beams and frequency reuse to increase throughput across a finite radio frequency (RF) spectrum. With satellite options spanning low-, middle- and geostationary-earth orbit (LEO, MEO and GEO), operators can select the satellite and capacity that best fits their connectivity needs based on parameters such as regional requirements, latency expectations, throughput, and equipment complexity. Likewise, modem technologies play just as much of a role in increasing network efficiencies and creating further advancements and improvements in overall connectivity. This is especially true in terms of keeping pace with HTS and future eXtreme throughput satellite (XTS) capabilities, because without the proper modem capable of supporting HTS advancements, customers won’t be able to realise the network gains touted by network providers.

**5. The Connected Ship** – The idea of ubiquitous connectivity is also helping cruise operators to elevate the passenger experience and simplify access to onboard amenities. Cruise brands are monitoring customer trends and reshaping the customer experience to respond to passenger needs. They are embracing the ‘connected ship’ model by saying goodbye to paper wristbands, drink tickets, itineraries and dinner reservations, and moving all of these elements central to the cruise experience onto mobile apps and more. Onboard systems are being deployed to enable crew members and passengers to unlock their rooms, register for excursions, and reserve dining experiences all from their mobile devices.

Similarly, cruise ships are working to incorporate everything from location tracking and cabin system interfaces, and more, onto mobile platforms for better integration into the ship’s folio system. With operators able to track and predict passenger trends, they can make real-time changes for an improved onboard experience. This includes things like opening additional dining spaces or adding bar servers to respond to high traffic almost instantly. These platforms also create an opportunity for cruise brands to better target new guests and to leverage the data collected for additional onboard revenue generation.

Operators that not only implement, but embrace, these technology trends will no doubt be the ones that strengthen the connection with their cruise passengers and amplify their brand, foster loyalty and reduce operating costs, giving them an advantage against the competition.



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leads engineering and space segment management activities in support of customer projects and operations around the world. He has worked for ipDatatel and Harris CapRock Communications, and launched his career at Invocon Inc., where he completed engineering projects for NASA and the International Space Station, as well as for the U.S. Navy.