

Advanced analysis



Back in 2001, MTN Satellite was one of the first satcoms suppliers that provided a 'ship tracker portal' to its maritime customers. 'Today such a capability is taken for granted, but back then it was revolutionary,' says Kevin McCarthy, the company's senior VP of network engineering. 'It was the first time customers could view the location of their vessels on a map, and quickly pull up key parameters such as signal strength and utilisation.'

McCarthy is responsible for the design, management and support of the company's global VSAT satellite network. Since joining the company in 1999, he has successfully led MTN through several major technology upgrades, steadily increasing the performance and capabilities of its network.

A few years later MTN deployed SatManage, a system created by Parallel (since acquired by iDirect) which provided orders of magnitude more granularity. 'Owners can see utilisation as before, but drill down for more detail. They can see how much data is being consumed by voice calls, web-surfing, email. It's also possible to delineate crew, business and passenger usage.'

Watchful eye

But SatManage is more than an eye-candy front-end. For experienced network engineers like McCarthy it is an indispensable tool. 'Bandwidth is a scarce and expensive resource, so it is critical we monitor our services in real-time to look out for unusual usage patterns. Out of the ordinary usage could indicate the

MTN Satellite's **Kevin McCarthy** explains how powerful data-mining and troubleshooting tools have made the shore-side management of maritime satcoms more efficient

presence of a virus or other malware, but is also caused by streaming media sites left running. The Satmanage traffic analyser lets us drill down to gain a better idea of the reasons for the anomaly and then take remedial action as appropriate.'

The back-end database is invaluable to McCarthy for another reason: forecasting future demand. Each year MTN has to work out how much capacity to purchase from satellite operators to ensure that it can fulfil the expectations of its clients (as specified in their SLA) plus a bit extra for contingency.

But there was definitely room for improvement in McCarthy's traditional methodology for attacking this problem: 'Because

passenger ships plan and publish their itineraries a year in advance, we would know their approximate location. And past experience would offer an indication how much bandwidth they were likely to require. Then we effectively just correlated the two sets of data. It wasn't the most sophisticated of techniques.'

Accurate predictions

Now SatManage is continually gathering and storing information on where, by whom and how much data is being transmitted usage, as well as a plethora of technical parameters. This can be mined to investigate trends over time and make predictions about future usage with a greater level of precision, which, says McCarthy, is particularly helpful for regions and waters with high population density. Indeed, to do this effectively, McCarthy and his team have created reports and developed their own forecasting tools to extrapolate the necessary patterns from the data.

Cruise ships still represent the core of MTN Satellite's customer base. 'Setting up the satcoms for a large passenger vessel is not dissimilar to provisioning connectivity for a small town. Capacity has to be shared among passengers, crew and officers, through a diverse range of applications: internet cafés, WiFi, mobile telephony, credit-card transactions and operational data.

'As might be expected, the scale of these projects results in considerable customisation on how things are set up on board. The Allure of the Seas for instance has six iDirect modems for load balancing and to ensure adequate redundancy. What remains consistent however is a

Successful troubleshooting

MTN USES SatManage to help it proactively detect and prevent network issues. A recent example of an issue that would have been difficult to spot without SatManage involved the tracking system on one of MTN's large teleport antennas.

Previously, it was nearly impossible to detect a subtle teleport antenna tracking issue by looking at one ship's signal strength. However, by using SatManage to correlate the data from dozens of ships over a period of several days, MTN was able to detect similar fluctuations in signal strength throughout the data. This common fluctuation helped isolate that the problem was at the teleport.

Up and running in 24 hours

need to maintain QoS – Quality of Service – in order to prioritise and redirect traffic. The ability of SatManage to do deep analysis allows us to make sure this happens correctly!

Diversification ahead

Nonetheless, over the last few years, the MTN has tried to break into other verticals, namely white-boat, merchant fleet, offshore energy and governmental/military sectors. Commercial shipping has proved to be a very tough market. The number of vessels has acted like a magnet in attracting lots of players, but at the same time owners have a reputation for being spendthrift and highly price sensitive, so overall the margins are slim.

Expansion into mega-yachts and other high-end leisure craft however has come much more easily. McCarthy says: "The owners are very demanding: they have high expectations and low tolerance for problems. However, that's not so different from a typical cruise-ship operator. In fact, some of our first leisure customers were cruise line owners!"

All MTN Satellite's airtime packages – whether for cruise ships, billionaire yachts or even vessels in the merchant fleet – are based around the Committed Information Rate (CIR) model. 'CIRs provide the end-user a guarantee the service they're signing up for won't degrade over time. It is different from an

SPANISH RESEARCH vessel *BIO Hesperides* has become one of the first recipients of MTN's rapid deployment [VSAT] system (RDS). Installed in just one day, by MTN and Spanish VSAT provider Erzia, RDS is designed to ensure connectivity 'no matter the location or conditions' aboard the *Hesperides* as it travels across the Pacific from Sydney, Australia to Cartagena de Indias in Columbia for the Malaspina expedition.

The project's main objective is to develop a high-resolution inventory of the impact of global climate change on deep ocean ecosystems. As it approached the final segment of the expedition across the Pacific Ocean, the vessel required a temporary broadband satellite communications solution that could be installed in quick time.

'*Hesperides* is a Navy ship dedicated to marine science that uses X-Band satellites to connect their systems,' said Bradford Briggs, senior vice president for MTN's commercial shipping and energy business. 'When the vessel required additional coverage, they turned to the MTN/Erzia team for a fully operational temporary Ku-band VSAT solution. RDS solution was developed for this very kind of situation.'



▲ **BIO Hesperides: Ku-band connectivity was installed in a day**

"up to" model, whereby vessels can end up competing for limited bandwidth. While CIR is a fixed minimum transmission rate, ships can take advantage of extra capacity on the circuit whenever it's available, for example, during off-peak hours.'

Teleport handovers

MTN Satellite standardised on iDirect technology for its maritime customers in 2003. A key driver was the prospect of centralising the management of multiple hubs. 'In practice this meant we could control the traffic flowing back from ships through teleports at various geographic locations from a server sitting at a single site.'

Moreover it made moving vessels from one teleport to another more straightforward, particularly when compared to the equivalent procedures for vessels transmitting data on SCPC (single channel per carrier). 'With SCPC you had to adjust input frequencies on modems and coordinate everything with the people onboard and at the earth station,' recalls McCarthy.

Bandwidth allocation was also easier. 'As vessels move around the load on different satellites is continuously changing. Managing that on SCPC circuits was very cumbersome and labour intensive. The TDMA method employed by iDirect, in effect, created pools of bandwidth for inbound/outbound traffic, making the process more efficient!' 

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